

A-19 PATRIOT

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823) (U) (S)
 PROGRAM: PATRIOT

AS OF DATE: December 31, 1986

86-037

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DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (OASD-PA)
 DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name): Guided Missile System, Air Defense (PATRIOT).

2. (U) DoD Component: Department of the Army

3. (U) Responsible Office and Telephone Number:

Project Manager, PATRIOT/JTMD
 U.S. Army Missile Command
 ATTN: AMCPM-PA/JTMD
 Redstone Arsenal, AL 35898-5620

PM: COL(P) Larry R. Capps
 Assigned: July 8, 1985
 AV 742-3240; COMM (205) 895-3240

4. (U) Program Elements:

RDTE: 64307A D212, D213, D291 (all sunk)
 PROCUREMENT: APPN 2032 SSN C49100, CA0252
 MILCON: 1335,1336,1337,1348,1349,1346,1347,0498

5. (U) Related Programs: Improved HAWK and PATRIOT Anti-Tactical

6. (U) Mission and Description:

(U) PATRIOT replaced NIKE HERCULES and some of the Improved HAWK units. Deployment of the PATRIOT System significantly reduces manpower and logistical costs and provides an improved Army air defense. In the field Army, PATRIOT defenses are complemented by short range, low altitude forward area air defense weapons and is integrated with the U.S. Air Force in the overall air defense of the theater of operations. The advanced features of PATRIOT provide an increased capability against saturation attacks, electronic countermeasures (ECM), and maneuvering targets.

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NOTE: THE PATRIOT SAR WILL NOT BE SEPARATED INTO CONFIDENTIAL AND SECRET DOCUMENTS AT ANY LEVEL, BUT WILL BE GROUPED/DISTRIBUTED AS A SINGLE SECRET DOCUMENT.

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6. (U) Mission and Description (Cont'd):

(U) PATRIOT uses an advanced surface-to-air guided missile system with a high single-shot kill probability capable of operation in an Electronic Countermeasures Environment (ECM) and is able to conduct multiple simultaneous engagements against the high-performance air-breathing targets (ABT) likely to be encountered by deployed United States forces. To cope with the threat, PATRIOT utilizes a trainable, multifunction, electronically-scanned, phased array radar. In addition, a digital computer is used to automatically control the system functions and provide the operator, through various displays, the ability to control and monitor operations. The guidance system combines command guidance and homing guidance (track via-missile [TVM]) systems. A listing of the principal items of the PATRIOT weapon system is provided in paragraph 11.

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- The PATRIOT (formerly SAM-D) Weapon System development program began in 1965 when the Secretary of Defense authorized Concept Definition (CD). In May 1967, CD was completed and a contract for Advanced Development (AD) was awarded to Raytheon Company, the prime contractor. On January 10, 1974, the Deputy Secretary of Defense directed the Army to redirect the SAM-D Program to permit early flight verification of the TVM guidance system and emphasize greater austerity. As a result, the SAM-D development effort was restructured by letter contract modification dated February 11, 1974. ASARC/DSARC decisions in January 1976 approved the program to resume full-scale Engineering Development.

(U) OT II began on November 19, 1979, and was completed on March 10, 1980. During the OT-II testing, some shortfalls were experienced in the areas of reliability, maintainability, target identification, and ECCM performance. As a result of these shortfalls, the September 10, 1980 Secretary of Defense Decision Memorandum (SDDM) approved only limited production and prescribed a series of four test units to demonstrate system performance, reliability and maintainability prior to a full production decision. By October 1981 test units one, two, and three had been completed. Full production authority was granted, but due to maintainability shortfalls, deployment was limited. In September 1984, SDDM Test Unit 4 (Follow-On Evaluation) was successfully completed, and PATRIOT was given authority to fully deploy.

(U) During 1985, two PATRIOT battalions were successfully deployed in Europe and began performing their NATO mission. In February 1985, the Federal Republic of Germany signed a Foreign Military Sales Case for 14 PATRIOT Fire Units. In addition, on October 4, 1985, a Memorandum of Understanding for the coproduction of 26 Fire Units and attendant Missiles and support equipment was signed with the Government of Japan.

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7. (U) Program Highlights (Cont'd):

b. (U) Significant Developments Since Last Report --

(U) The third PATRIOT battalion was successfully deployed to Europe in November 1986. A fourth PATRIOT battalion completed training at Fort Bliss, TX, and will be fielded in Europe during 1987.

(U) The Netherlands received the first PATRIOT units on schedule in January 1986. The Netherlands Foreign Military Sales Case, signed in February 1984 is for a total of four PATRIOT Fire Units.

(U) On July 15, 1986, the contractor submitted a multiyear proposal for Fiscal Years 1987 through 1991. This contract, planned for award early in 1987, will save at

(b)(1)

(U) Throughout 1986, data received from the deployed European units showed PATRIOT to be exceeding the operational readiness requirements of the system. It is anticipated that this trend will continue in 1987.

(U) The system is expected to meet its mission requirements. Completion of the program on schedule is dependent upon full-funding support.

c. (U) Changes Since "As Of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCPs (dated October 14, 1976, with Cover Sheet No. 1, approved January 20, 1978, and Cover Sheet No. 2, approved November 24, 1978) or SDDM (dated September 10, 1980) threshold breaches.

9. (U) Schedule:

a. (U) Milestones --

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
<u>Initiation of ADDEV</u>	May 67/May 67	May 67
DCP Thresholds: Contract for ED	Mar 72/Mar 72	Mar 72

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9. (U) Schedule (Cont'd):

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
<u>PATRIOT DCP Milestones (Oct 76/Jan 78):</u>		
First Electronic Countermeasures (ECM) Flight	Aug 76/Dec 76	Dec 76
Delivery of FU-2 to White Sands Missile Range	Jan 77/Jul 77	Jul 77
Completion of Phase II ECM Search/Track Tests	Jun 77/Dec 77	Dec 77
Start of Producibility Engineering and Planning (PEP)	Oct 77/Oct 77	Oct 77
Delivery of FU-3 to White Sands Missile Range	Sep 78/Dec 78	Dec 78
First Modular Digital Airborne Guidance System (MDAGS) Flight	Oct 78/Sep 78	Sep 78
Delivery of FU-5 to White Sands Missile Range	Jan 79/Feb 79	Feb 79
Contractor Flight Tests completed and start of DT/OT II testing	Jul 79/Jan 80	Jan 80
<u>Secretary of Defense Decision Memorandum (SDDM) (10 Sep 80) Tests:</u>		
Completion of DT/OT II testing	May 80/Dec 80	Dec 80
Completion of SDDM Test Unit 1	Jan 81/Jan 81	Jan 81
Completion of SDDM Test Unit 2	Jun 81/Jul 81	Jul 81
Completion of SDDM Test Unit 3	Oct 81/Oct 81	Oct 81
Completion of Component/System Design Confirmation	Sep 82/Feb 83	Feb 83
Completion of SDDM Test Unit 4	May 83/Sep 84	Sep 84
<u>Contract for Initial Production Facilities (IPF)</u>	Apr 79/Mar 79	Mar 79
<u>Limited Production Decision (DSARC-III [LP])</u>	N/A	Sep 80
<u>Full Production Decision</u>	Apr 80/Apr 82	Apr 82
<u>Initial Operational Capability (IOC)</u>	Apr 82/Feb 83	Feb 83

b. (U) Previous Change Explanations --

The differences reflect delays in initial availability of Fire Units 1, 2, and 3 and interruptions of the flight test program for MDAGS integration. System integration difficulties delayed the completion of contractor flight tests, start and completion of DT/OT II, full production decision, and the IOC date. Additionally, the differences reflect delays in delivery of production hardware. Schedules were adjusted to incorporate additional stress and reliability verification testing prior to the beginning of SDDM Test Unit 4 (Follow-On Evaluation).

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Program: Revised DCP #50, approved October 14, 1976, with Cover Sheet No. 1, approved January 20, 1978, and Cover Sheet No. 2, approved November 24, 1978. SDDM, dated September 10, 1980.

(U) Approved Program: FY88-89 President's Budget.

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10. (U) Technical/Operational Characteristics:

a. (U) Characteristics			
	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(U) Firing Unit Static Inherent Availability	0.97/0.97	.97	0.97

(b)(1)



b. (U) Previous Change Explanations --

The primary difference in the performance estimates is due to changes in hardware configuration as a result of OSD redirection of the program in January 1974. The current estimate reflects PATRIOT performance for specific conditions of target size, altitude, speed, and maneuver (and time of execution of maneuver). Predicted performance presented is against the system requirement and is projected for the worst case conditions. The system performance should be substantially better when the system is employed against targets in a full tactical environment where the full multiple environment favorable to the enemy is unlikely to be encountered.

1/ (U) The values shown reflect range to intercept for a target not in line from jammer to radar; the numbers shown in parentheses reflect range to intercept for a target in line from jammer to radar.

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10. (U) Technical/Operational Characteristics (Cont'd):

c. (U) Current Change Explanations --

(b)(1)

d. (U) References -- (U) Development Estimate DCP #50, approved October 14, 1976.

(U) Approved Program: FY88-89 President's Budget.

11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development Estimate	Changes	Current Estimate
Development (RDT&E)	\$1106.2	\$ +448.6	\$1554.8
Procurement	3121.2	+80.4	3201.6
Guided Missile	(964.7)	(+257.2)	(1,221.9)
HE Warhead	(121.9)	(-10.5)	(111.4)
Adaption Kit	(271.7)	(-271.7)	(0.0)
Fire Control Section (FCS)	(1141.8)	(-285.8)	(856.0)
Launcher	(254.0)	(+65.8)	(319.8)
Other (GSE)	(186.0)	(-47.5)	(138.5)
Advanced Prod Engr	(56.9)	(-56.9)	(0.0)
IPF		(+140.5)	(140.5)
Total Flyaway	(2997.0)	(-208.9)	(2788.1)
Peculiar Support Equipment	(26.7)	(+6.9)	(33.6)
Training Devices		(+26.6)	(26.6)
Software Support		(+63.7)	(63.7)
ILS		(+65.7)	(65.7)
DMPE		(+8.4)	(8.4)
Initial Spares	(97.5)	(+118.0)	(215.5)
Construction (MILCON)	40.0	+17.1	57.1
Total FY 72 Base-Year \$	4267.4	+546.1	4813.5
Escalation	973.1	+6818.6	7791.7
Development (RDT&E)	(93.8)	(+489.3)	(583.1)
Procurement	(848.6)	(+6262.6)	(7111.2)
Construction (MILCON)	(30.7)	(+66.7)	(97.4)
Total Then-Year \$	5240.5	+7364.7	12605.2
b. (U) Quantities --			
Development (RDT&E)	6.0	-1	5.0
Procurement	234.0	-131	103.0 1/
Total	240.0	-132	108.0 1/
c. (U) Unit Cost --			
Procurement:			
FY 72 Base-Year \$	13.3	17.8	31.1
Then-Year \$	17.0	83.1	100.1
Program:			
FY 72 Base-Year \$	17.8	26.8	44.6
Then-Year \$	21.8	94.9	116.7

1/ Does not include the 3 fire units funded by NATO Air Base Defense funds.

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11. (U) Program Acquisition Cost (Cont'd): (Current Estimate in Millions of Dollars)

d. (U) Approved Design to Cost Goal --

	<u>Development Est 1/</u>		<u>Approved PGM</u>		<u>Current Est</u>	
	<u>Qty/Rate</u>		<u>Qty/Rate</u>		<u>Flyaway Cost</u>	
	<u>Per Mo.</u>	<u>Cost</u>	<u>Per Mo.</u>	<u>Cost</u>	<u>Per Mo.</u>	<u>Cost</u>
Missile Round						
FY 72 Base-Year \$	6250/120	.090 2/	6037/80	.196	6037/80	.196
Then-Year \$		.113 2/		.656		.656
Radar						
FY 72 Base-Year \$	125/3	2.828	101/1.25	6.056	101/1.25	6.056
Then-Year \$		3.585		18.661		18.661
Engagement Control Station						
FY 72 Base-Year \$	125/3	.887	102/1.25	1.743	102/1.25	1.743
Then-Year \$		1.125		5.347		5.347
Launching Station						
FY 72 Base-Year \$	625/15	.250	588/11	.476	588/11	.476
Then-Year \$		.316		1.509		1.509

1/ The Mar 72 DCP reflected contractor Design-to-Unit Production Cost Goals.

2/ Missile Round without Warhead and Canister.

e. (U) Foreign Military Sales --

<u>Quantity</u>	<u>Estimate Cost</u>	<u>Country</u>
4	Then-Year \$	Netherlands
14	\$292M	Germany
	\$1157M	

f. (U) Nuclear Costs - - None

12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>(Dec 86 SAR)</u>	<u>(Dec 85 SAR)</u>	<u>(Dec 86 SAR)</u>
a. (U) Program Acquisition			
(1) (U) Cost	12605.2	12095.9	12605.2
(2) (U) Quantity	108 1/	105 1/	108 1/
(3) (U) Unit Cost	116.7	115.2	116.7
b. (U) Current Procurement	(FY 1987)	(FY 1987 APPN)	(FY 1988)
(1) (U) Cost	996.2	1037.4	984.8
Less CY Adv Proc	45.3	45.3	40.1
Plus FY Adv Proc			45.3
Net Total	950.9	992.1	990.0
(2) (U) Quantity	12	12	12
(3) (U) Unit Cost	79.2	82.7	82.5

1/ Does not include the 3 fire units bought with NATO Air Base Defense funds.

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13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1200.0	3969.8	70.7	5240.5
Previous Changes				
Economic	+83.4	+2114.0	-38.0	+2159.4
Quantity	-87.8	-874.5	-79.4	-1041.7
Schedule	+322.4	+2024.6	+2.7	+2349.7
Engineering	+331.0	-573.1	-	-242.1
Estimating	+132.4	+1780.5	+195.5	+2108.4
Other	+27.6	-	-	+27.6
Support	+130.6	+1363.5	-	+1494.1
Subtotal	+939.6	+5835.0	+80.8	+6855.4
Current Changes				
Economic	-1.7	-104.8	+3.0	-103.5
Quantity	-	+225.2	-	+225.2
Schedule	-	-	-	-
Engineering	-	+138.9	-	+138.9
Estimating	-	+309.7	-	+309.7
Other	-	-	-	-
Support	-	-61.0	-	-61.0
Subtotal	-1.7	+508.0	+3.0	+509.3
Total Changes	+937.9	+6343.0	+83.8	+7364.7
Current Estimate	2137.9	10312.8	154.5	12605.2

(FY 1972 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1106.2	3121.2	40.0	4267.4
Previous Changes				
Quantity	-65.1	-1048.4	-45.4	-1158.9
Schedule	+231.4	+443.3	-	+674.7
Engineering	+129.4	-455.4	-	-326.0
Estimating	+63.5	+495.4	+61.9	+620.8
Other	+24.5	-	-	+24.5
Support	+63.6	+464.3	-	+527.9
Subtotal	+447.3	-100.8	+16.5	+363.0
Current Changes				
Quantity	-	+58.7	-	+58.7
Schedule	-	-	-	-
Engineering	-	+35.8	-	+35.8
Estimating	+1.3	+104.2	+0.6	+106.1
Other	-	-	-	-
Support	-	-17.5	-	-17.5
Subtotal	+1.3	+181.2	+0.6	+183.1
Total Changes	+448.6	+80.4	+17.1	+546.1
Current Estimate	1554.8	3201.6	57.1	4813.5

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13. (U) Cost Variance Analysis (Cont'd):

b. (U) Previous Change Explanations --

RDT&E

Economic: revised escalation rates
 Quantity: reduction in test hardware and missiles
 Schedule: program stretchout/redirection and acceleration of deployment
 Engineering: improvements in ECCM to accommodate state-of-the-art changes
 Estimating: changes of PEP, redefined estimating procedures, add RSI and increased development tasks
 Other: reflects a negotiated overrun
 Support: changes in training, maintenance concept and support equipment

Procurement

Economic: revised escalation rates
 Quantity: reduction of 134 fire units and reconfiguration of a fire unit to 8 launchers vice 5
 Schedule: change from 24 to 12 fire units per year and stretchout caused by program redirection and funding cuts
 Engineering: elimination of nuclear warhead, change missile guidance, computer memory, antenna mast set, ARM decoy, fuze, and radar side lobe cancellors
 Estimating: reflects refined estimating techniques, deletion of non-peculiar GFE, and savings due to FMS and multiyear procurement.

Construction

Quantity: deletion of CONUS fire units and reduced two European sites based on U.S./ German agreement
 Estimating: change in reporting requirements

c. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) (U) RDT&E

Revised Dec 86 escalation rates (Economic)	N/A	-1.7
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(2) (U) Procurement

Revised Dec 86 escalation rates (Economic)	N/A	-104.8
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13. (U) Cost Variance Analysis (Cont'd):

Additional requirements	+206.6	+798.9
° Addition of 415 Missiles in FY92 (Quantity)	(+40.4)	(+157.3)
° Addition of 3 Fire Units in FY90 (Quantity)	(+18.3)	(+67.9)
° Cost Revision for 415 missiles (Estimating)	(+102.5)	(+398.9)
° Cost revision for 3 Fire Units (Estimating)	(+9.6)	(+35.9)
° Addition of ATM (Engineering)	(+35.8)	(+138.9)
Estimating changes	-20.8	-186.1
° Revised estimate of the hardware based on more recent production cost data (Estimating)	(-3.3)	(-125.1)
° Revised estimate for Initial Spares (Support)	(-26.1)	(-92.2)
° Revised estimate for Training Devices (Support)	(+8.6)	(+31.2)

(3) (U) MILCON

Revised Dec 86 escalation rates (Economic)	N/A	+3.0
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d. (U) References --

(1) (U) Revised DCP #50, dated March 1972.

(2) (U) SDDM, dated September 10, 1980.

14. (U) Program Acquisition Unit Cost (PAUC History): (Millions of then-year dollars)

a. (U) Initial SAR Estimate to Current Baseline Estimate --

PAUC (Initial SAR Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
6.881	+6.580	+3.888	+0.897	+1.346	+2.243			+14.954	21.835

b. (U) Development Baseline Estimate to Current Estimate --

PAUC (Dev Est)	Changes								PAUC (Cur Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
21.835	+19.036	+19.129	+21.756	-0.956	+22.390	+2.256	+13.269	+94.880	116.715

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15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E

Engineering Development

Initial Contract Price

(b)(4)



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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

b. (U) Procurement

IPF (Buy 7)

Initial Contract Price

(b)(4)



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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

Production Contract (FY83)

Initial Contract Price

(b)(4)



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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

Production Contract (FY84)

Initial Contract Price

(b)(4)



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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

Production Contract (FY85)

Initial Contract Price

(b)(4)



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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

b. (U) Procurement (Cont'd)

Production Contract (FY86)

Initial Contract Price

Target Ceiling Qty

(b)(4)



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16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) (U) Percent Program Completed: 82.1% (23 yrs/28 yrs)

(2) (U) Percent Program Cost Appropriated: 69.6% (\$8769.0/\$12605.2)

b. (U) Appropriation Summary -- (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY65-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance To Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93)</u>	<u>Total</u>
RDT&E	2137.9	0	0	0	2137.9
Procurement	6497.4	984.8	2830.6	0	10312.8
MILCON	117.9	7.7	28.9	0	154.5
Total	8753.2	992.5	2859.5	0	12605.2

c. (U) Annual Summary --

Fiscal Year	Qty FU/Msl	FY 72 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1965				17.8			13.6	1.8
1966				18.8			15.0	2.7
1967				14.7			12.0	3.2
1968				33.0			28.0	3.6
1969				67.1			59.9	4.7
1970				63.2			59.4	5.5
1971				84.2			83.1	5.1
1972				111.0			115.4	4.6
1973				154.0			170.9	4.4
1974				164.6			193.8	8.0
1975				81.5			104.1	10.9
1976				95.9			130.0	6.6
FY77				28.5			40.0	2.9
1977				126.1			182.0	2.6
1978				136.7			214.4	6.8
1979				132.3			228.4	8.4
1980				68.7			128.9	10.6
1981				37.2			75.2	10.6
1982				23.4			51.5	7.6
1983				19.7			45.4	4.9
1984				33.0			78.7	3.8
1985				24.6			60.5	3.4
1986				18.8			47.7	2.9
Subtotal	5/126			1554.8			2137.9	

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. (U) Annual Summary --

Fiscal Year	Qty FU/Msl	FY 72 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: MIPA

1979	0/0	31.8	0	32.8			67.1	8.9
1980	5/117	40.3	128.4	180.3			413.8	11.8
FY81	5/130	5.4	160.1	189.6			485.6	11.6
1982	9/176	14.0	226.1	260.2			733.7	14.3
1983	12/287	10.8	251.1	282.0			848.9	9.0
1984	12/440 1/	13.6	278.0	311.6			961.5	8.0
1985	12/440	7.1	284.9	322.9			1034.6	3.4
1986	12/560		259.3	290.7			956.0	2.9
1987	12/700		276.8	293.0	45.3		996.2	3.1
1988	12/715		247.2	280.5	40.1	45.3	984.8	3.5
1989	9/815		226.7	250.8	37.4	40.1	906.6	3.5
1990	3/815		188.7	199.9		18.7	741.7	3.3
1991	0/817		148.0	149.2		18.7	567.0	2.9
1992	0/440		156.9	158.1			615.3	2.4
Subtotal	103/6452 1/	123.0	2832.2	3201.6	122.8	122.8	10312.8	

1/ Does not include the 3 fire units and 40 missiles procured with NATO Air Base Defense funds.

Appropriation: MILCON

1972				1.4			1.4	5.9
1973								5.6
FY74								11.8
1975								16.1
1976								3.0
FY77								1.6
1977								2.8
1978								7.7
1979				1.4			2.4	9.3
1980								10.6
1981								10.6
1982				4.7			11.7	7.6
1983				18.4			48.1	4.9
1984				5.7			15.4	3.8
1985								3.4
1986				6.8			19.0	2.9
1987				6.9			19.9	3.1
1988				2.6			7.7	3.5
1989				4.6			14.1	3.5
1990				1.4			4.3	3.3
1991				2.6			8.4	2.9
1992				0.6			2.1	2.4
Subtotal				57.1			154.5	
Total				4813.5			12605.2	

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16. (U) Program Funding Summary (Cont'd):d. (U) Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated <u>1/</u>	Expended <u>1/</u>

Appropriation: RDT&E

1965	13.6	13.6	13.6
1966	15.0	15.0	15.0
1967	12.0	12.0	12.0
1968	28.0	28.0	28.0
1969	59.9	59.9	59.9
1970	59.4	59.4	59.4
1971	83.1	83.1	83.1
1972	115.4	115.3	115.3
1973	170.9	170.8	170.8
1974	193.8	193.7	193.7
1975	104.1	104.2	104.1
1976	130.0	129.9	129.9
FY77	40.0	40.0	40.0
1977	182.0	181.8	181.5
1978	214.4	214.3	214.0
1979	228.4	228.1	227.5
1980	128.9	128.5	128.3
1981	75.2	74.5	72.9
1982	51.5	51.3	49.7
1983	45.4	44.8	43.1
1984	78.7	78.3	70.3
1985	60.5	60.4	59.4
1986	47.7	47.2	39.7
To Complete			
Total	2137.9	2134.1	2111.2

Appropriation: MIPA

1979	67.1	67.1	67.1
1980	413.8	397.2	395.0
1981	485.6	438.8	435.4
1982	733.7	675.9	664.3
1983	848.9	778.8	760.3
1984	961.5 2/	869.9	741.2
1985	1034.6	922.6	477.0
1986	956.0	832.6	129.1
1987	996.2	87.8	0
1988	984.8		
1989	906.6		
1990	741.7		
1991	567.0		
1992	615.3		
To Complete			
Total	10312.8	5070.7	3669.4

1/ Does not include MIPA for Initial Spares. Spares are procured by the U.S. Army Missile Command.

2/ Does not include \$185.0M of FY84 NATO Air Base Defense funds.

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PATRIOT, December 31, 1986

16. (U) Program Funding Summary (Cont'd):

d. (U) Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated <u>1/</u>	Expended <u>1/</u>

Appropriation: MILCON

1972	1.4	1.4	1.4
1973			
1974			
1975			
1976			
1977			
1978			
1979	2.4	2.4	2.4
1980			
1981			
1982	11.7	9.5	3.7
1983	48.1	23.4	0.8
1984	15.4	14.0	
1985			
1986	19.0		
1987	19.9		
1988	7.7		
1989	14.1		
1990	4.3		
1991	8.4		
1992	2.1		
To Complete			
Total	154.5	50.7	8.3

1/ Reported in the 31 Dec 84 SAR. Updated information has not been provided by the Corps of Engineers.

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17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current <u>1/</u> Estimate	Maximum <u>2/</u> Economic

Missiles

1978	34	N/A		
1979	524	N/A		
1980	960	117	117	220
1981	1080	130	130	220
1982	1440	176	176	220
1983	1440	287	287	440
1984	1440	525	440	440
1985	1080	815	440	660
1986	1080	815	560	800
1987	607	816	700	840
1988		830	715	880
1989		891	815	880
1990		815	815	880
1991		N/A	817	880
1992			440	880

Fire Units

1978	4	N/A		
1979	18	N/A		
1980	36	5	5	5
1981	36	5	5	5
1982	36	9	9	9
1983	36	12	12	12
1984	36	15	12	12
1985	32	17	12	15
1986		17	12	15
1987		17	12	15
1988		6	12	15
1989		N/A	9	15
1990			3	15
1991				15

1/ Current estimate indicates U.S. requirements.2/ Combined FMS and U.S. requirements put the production facility at capacity.

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17. (U) Production Rate Data Cont'd:

b. (U) Cost Variance -- Dollars in Millions

ITEM	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	4690.2	+127.9	4818.1	0.0	4818.1
(TY \$)	11312.2	+1293.0	12605.2	0.0	12605.2
PAUC (BY \$)	43.4	+1.2	44.6	0.0	44.6
(TY \$)	104.7	+12.0	116.7	0.0	116.7

c. (U) Schedule Variance --

	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (Mo/Yr)	9/80	N/A	9/80	N/A	9/80
Duration (in Months)	123	48	171	0	171
End Date (Mo/Yr)	12/90	N/A	12/94	N/A	12/94

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	
Fire Units	5/5
Missiles	126/126
Procurement	
Fire Units	43/41 ^{1/}
Missiles	1220/1262

FOOTNOTES:

1/ 42 of 43 units required had been delivered as 13 Jan 87.

18. (U) Operating and Support Costs: N/A

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SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A) 823)
PROGRAM: PERSHING II

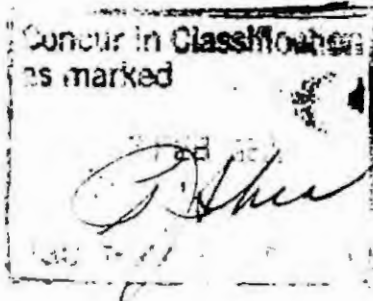
AS OF DATE: December 31, 1986

SUBJECT	INDEX	PAGE
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DCP Threshold Breaches		3
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Technical/Operational Characteristics		5
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Program Acquisition Unit Cost History		12
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1. (U) <u>Designation/Nomenclature (Popular Name):</u> Not assigned/Field Artillery Missile System (PERSHING II).		
2. (U) <u>DOD Component:</u> Department of the Army		
3. (U) <u>Responsible Office and Telephone Number:</u>		
PERSHING Project Manager's Office		
Program Management Office		
Redstone Arsenal, AL 35898-5690		
PM: COL Thomas M. Brown		
Assigned March 17, 1986		
AUTOVON: 746-1165		
4. (U) <u>Program Elements/Procurement Line Items:</u>		
RDTE: PE 64311A (D599); PE 63311A (D599); PE63319A (DH22) - (Sunk)		
PROCUREMENT: APPN 2032, SSNs C76600 (Missile) and C83700 (GSE)		
MILCON: Project Nos. P6100 (Idaho) and 2193E (Germany)		
5. (U) <u>Related Programs:</u> None		

CONCUR IN CLASSIFICATION
AS MARKED AND

FEB 26 1987

INFORMATION FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (GAGD-7A)
DEPARTMENT OF DEFENSE



SEA) OF ISR 87-T-6391

Classified by: PII SCG
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6. (U) Mission and Description:

The PERSHING II (PII), a modular improvement to the PERSHING Ia (PIa) missile system, is a ground mobile, two-stage, solid propellant, terminally guided, surface-to-surface nuclear weapon system. Its primary mission is to deliver fire on planned targets in support of the Supreme Allied Commander, Europe. In peacetime, portions of each PERSHING battalion are required to be on a quick reaction alert (QRA) status. Through the use of a new terminally guided reentry vehicle with a new warhead, new propulsion sections, and modified PIa ground support equipment, PII provides increased effectiveness covering longer ranges with reduced collateral damage over the PIa. The PII system basically consists of the missile, erector launcher (EL), 10-ton tractor/crane, platoon control central, reference scene generation facility, system component test station, rear area power unit, and electrical and mechanical shop sets.

7. (U) Program Highlights:

a. ~~(S)~~ Significant Historical Developments:

(b)(1)



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(b)(1)

b. (U) Significant Developments Since Last Report:

(1) (U) On February 11, 1986, the PERSHING FY86 funding guidance for the procurement appropriations was decreased by \$10.2M due to the Gramm-Rudman Act reduction. As a result of an additional adjustment for inflation, the final FY86 funding was \$212.8M.

(2) (U) On February 14, 1986, the second SSO firing of three missiles took place at McGregor Range Launch Complex, Fort Bliss, TX. The missiles were fired at a target on White Sands Missile Range. All firing objectives were met.

(3) (U) By May 13, 1986, all ESD modifications identified in the accident investigation were accomplished on PII motors in Germany (GE).

(4) (U) The week of June 28, 1986, the Demonstration and Shakedown Operation (DASO) of five missiles was conducted. The missiles were fired from the Eastern Test Range, Cape Canaveral Air Force Station, Florida. All firing objectives were met.

(5) (U) A letter order contract for the FY86 procurement of 146 EL covers was awarded to Martin Marietta Orlando Aerospace (MMOA) on May 30, 1986. Subsequently, the quantity was reduced to 131. Thirty-seven covers were delivered by December 1986.

(6) (U) The letter order contract for the procurement of 54 inert counting sections was definitized on July 25, 1986. A value engineering proposal for the 54 low cost trainers was validated in May 1986 with a cost avoidance savings of \$48.7M. Forty-two motors were delivered by December 1986.

(b)(1)

(8) (U) The PII weapon system is expected to meet all its mission requirements.

c. (U) Changes Since "As Of" Date: None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches:

There are currently no DCP threshold breaches.

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9. (U) Schedule:

a. (U) Milestones:

	<u>Development/Approved Estimate/Program</u>	<u>Current Estimate</u>
Milestone I (DSARC)	NA / Jan 74	Jan 74
DT/OT I		
a. Start	NA / Nov 77	Nov 77
b. Complete	NA / May 78	May 78
Milestone II (DSARC)	Dec 78 / Dec 78	Dec 78
Award ED Contract	Feb 79 / Feb 79	Feb 79
Integrated Test Program (DT/OT II) ^{1/}		
a. Start	Dec 81 / Jul 82	Jul 82
b. Complete	Apr 83 / Sep 83	Sep 83
Production Readiness Review	Feb 83 / Nov 81	Nov 81
Long Lead Procurement	Mar 83 / Dec 81	Dec 81
Milestone III (DSARC)	Jul 83 / Waived	Waived
Award Production Contract	Oct 83 / Jun 82	Jun 82
First Production Delivery	Jul 84 / Apr 83	Apr 83
IOC	Dec 84 / Dec 83	Dec 83

b. (U) Previous Change Explanations:

(1) (U) At a special ASARC on December 21, 1981, the PII test program was evaluated, and the decision made to restructure the DT/OT II test program to incorporate developmental and operational testing.

(2) (U) The requirement for DSARC III was waived and the Army was directed to proceed with production and deployment. Progress was reviewed through DA IPRs.

(3) (U) The change in IOC date was directed by a Secretary of Defense memorandum dated November 24, 1980.

c. (U) Current Change Explanations: None

d. (U) References:

(1) (U) Development Estimate:

(a) (U) DCP number 132A, April 21, 1980.

(b) (U) Secretary of Defense Memorandum, November 26, 1980, subject: PERSHING II Initial Operational Capability.

(c) (U) Special ASARC, December 21, 1981, subject: PII Test Program.

(4) (U) Approved Program: FY88-89 President's Budget.

^{1/} (U) The Integrated Flight Test Program was completed in September 1983. The overall development program was completed in June 1985.

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(b)(1)



2/ (U) MICOM's assessment based on warhead scoring committee results, flight reliability computed using AMSAA Discrete Model (Grouped), remote phase reliability based on DT/OT III, A/O, SSO I and II, and DASO. The pre-remote phase reliability is based on European field operations.

3/ (U) The results of the scoring conference for the automatic fault isolation to a single module during the 1984 SCTS demonstration was 21.4 percent. Some systematic problems with the software have since been corrected, which will improve this figure. By testing all suspected defective modules as individual tests, the SCTS should have the capability to determine the defective modules 90 percent of the time.

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10. (U) Technical/Operational Characteristics (Cont'd):

c. (U) Previous Change Explanations: None

d. (U) Current Change Explanations: (Ch-1) This value increased from 71 percent to 84 percent due to improved field performance in Europe for the pre-remote phase countdown reliability.

e. (U) References:

(1) (U) Development Estimate: DCP number 132A, April 21, 1980.

(2) (U) Approved Program: FY88-89 President's Budget.

11. (U) Program Acquisition Cost: (Current Estimate in Millions)

a. (U) Cost

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
Development (RDTE)	\$ 582.6	\$ -0.8	\$ 581.8
Procurement	615.6	+418.8	1034.4
Weapon System	(582.9)	(396.6)	(979.5)
Prop Section	(194.6)	(132.4)	(327.0)
Reentry Vehicle	(266.0)	(181.0)	(447.0)
GSE	(88.4)	(60.1)	(148.5)
Total Flyaway	(549.0)	(373.5)	(922.5)
Oth Wpn Sys Cost	(33.9)	(23.1)	(57.0)
Initial Spares	(32.7)	(22.2)	(54.9)
Construction (MILCON)	0.0	+2.7	2.7
Total FY 79 Base Year \$	\$ 1198.2	\$ +420.7	\$1618.9
Escalation	372.8	+594.9	947.7
Development (RDTE)	61.1	+49.5	110.6
Procurement	311.7	+524.3	836.0
Construction (MILCON)	0.0	+1.1	1.1
Total Then-Year \$	\$ 1571.0	\$ +995.6	\$2566.6

b. (U) Quantity



1/ Defined as 9 missiles, 9 launchers, 1 Reference Scene Generation Facility (RSGF), and 4 Platoon Control Centrals (PCCs).

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11. (U) Program Acquisition Cost: (Current Estimate in Millions)

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
c. (U) Unit Cost			
(1) (U) Procurement			
(b)(1)			
(2) (U) Btry Equiv	36.9	+25.2	62.1
Then-Year \$			
(b)(1)			
Btry Equiv	55.6	+ 56.6	112.2
(3) (U) Program FY79 Base-Year \$			
(U) Btry Equiv	71.1	+26.0	97.1
Then-Year \$			
(U) Btry Equiv	94.2	+59.8	154.0

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d. (U) Approved Design-to-Cost-Goal:

		Average Unit Flyaway Cost		Latest Approved Threshold
		Development/Approved Estimate/Program	Current Estimate	
(b)(1)				
(U)	Launcher Mod	166 @ 5/mo /	166 @ 5/mo	166 @ 5/mo
	FY 79 Base-Year \$	0.258 /	0.271	0.271
	Then-Year \$	0.389 /	0.423	0.423
(U)	Ref Scene Gen Fac	16 @ 1/mo /	9 @ 1/mo	9 @ 1/mo
	FY 79 Base-Year \$	0.949 /	0.966	0.966
	Then-Year	1.429 /	1.554	1.554
(U)	Plt Ctrl Central	69 @ 3/mo /	36 @ 3/mo	36 @ 3/mo
	FY 79 Base-Year \$	0.210 /	0.220	0.220
	Then-Year	0.316 /	0.343	0.343
(U)	Btry Equivalent Sets ^{1/}	16 2/3 /	16 2/3	16 2/3
	FY 79 Base-Year \$	14.5 /	29.3	29.3
	Then-Year \$	22.0 /	52.0	52.0

e. (U) Foreign Military Sales: None.

f. (U) Nuclear Costs: This cost is borne by the Department of Energy. It is omitted here due to classification.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

		Current Year		Budget Year
		Current Estimate	UCR Baseline	UCR Baseline
		(Dec 86 SAR)	(Dec 85 SAR)	(Dec 86 SAR)
a.	(U) Program Acquisition			
(1)	Cost	2566.6	2582.5	2566.6
(2)	Quantity	16 2/3	16 2/3	16 2/3
(3)	Unit Cost	154.0	154.9	154.0
b.	(U) Current Procurement	(FY87)	(FY87 APPN)	(FY88)
(1)	Cost	30.6	30.6	6.7
	Less CYAdv Proc	-	-	-
	Plus FY Adv Proc	-	-	-
	Net Total	30.6	30.6	6.7
(2)	Quantity	0	0	0
(3)	Unit Cost	NA	NA	NA

^{1/} Defined as 9 missiles, 9 launchers, 1 RSGF, and 4 PCCs.

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13. (U) Cost Variance Analysis:

a. (U) Summary: (Current (Then-Year) Dollars in Millions)

	RDTE	PROC	MILCON	TOTAL
Development Estimate	643.7	927.3	0.0	1571.0
Previous Changes:				
Economic	+51.4	+250.6	0.0	+302.0
Quantity	-20.0	-309.5	0.0	-329.5
Schedule	0.0	+239.1	0.0	+239.1
Engineering	-2.8	+99.7	0.0	+96.9
Estimating	+19.6	+650.2	+3.8	+673.6
Support	+0.7	+58.7	0.0	+59.4
Other	0.0	-30.0	0.0	-30.0
Subtotal	+48.9	+958.8	+3.8	+1011.5
Current Changes:				
Economic	0.0	-3.2	0.0	-3.2
Quantity	0.0	0.0	0.0	0.0
Schedule	0.0	0.0	0.0	0.0
Engineering	0.0	0.0	0.0	0.0
Estimating	-0.2	-12.5	0.0	-12.7
Support	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0
Subtotal	-0.2	-15.7	0.0	-15.9
Total Changes	+48.7	+943.1	+3.8	+995.6
Current Estimate	692.4	1870.4	3.8	2566.6

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13. (U) Cost Variance Analysis (Cont'd):
(FY 79 Constant (Base-Year) Dollars in Millions)

	RDTE	PROC	MILCON	TOTAL
Development Estimate	582.6	615.6	0.0	1198.2
Previous Changes:				
Economic	0.0	0.0	0.0	0.0
Quantity	-14.2	-158.2	0.0	-172.4
Schedule	0.0	+145.4	0.0	+145.4
Engineering	-1.8	+55.5	0.0	+53.7
Estimating	+14.8	+364.9	+2.7	+382.4
Support	+0.5	+36.1	0.0	+36.6
Other	0.0	-18.4	0.0	-18.4
Subtotal	-0.7	+425.3	+2.7	+427.3
Current Changes:				
Economic	0.0	0.0	0.0	0.0
Quantity	0.0	0.0	0.0	0.0
Schedule	0.0	0.0	0.0	0.0
Engineering	0.0	0.0	0.0	0.0
Estimating	-0.1	-6.5	0.0	-6.6
Support	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0
Subtotal	-0.1	-6.5	0.0	-6.6
Total Changes	-0.8	+418.8	+2.7	+420.7
Current Estimate	581.8	1034.4	2.7	1618.9

b. (U) Previous Change Explanations

(1) (U) RDTE

(a) (U) ECONOMIC: Revised inflation/escalation rates.

(b) (U) Quantity: Reduction of six missiles due to restructuring of the ED program.

(c) (U) Engineering: Direction from OSD to cancel earth penetrator (EP) warhead; thrust-reversal design changes; impact of maintaining a single-stage option; and extension of ED program in FY 84 which required reprogramming of \$3.999M.

(d) (U) Estimating: OSD-directed adjustments for inflation; and deobligation of FY81, 82, and 83 dollars.

(e) (U) Support: Addition of the command control interface unit.

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13. (U) Cost-Variance Analysis (Cont'd):

(2) (U) Procurement

(a) (U) Economic: Revised inflation/escalation rates; and transfer of \$85.M to estimating.

(b) (U) Quantity: Directed decrease in total missiles by 116 which caused reductions in production buys in FY85 and 86.

(c) (U) Schedule: Acceleration of the production program as directed by the Amended Program Decision Memorandum; stretchout of the production program due to: (a) funding constraints for 16 months in FY 82-84 and (b) insufficient funding to procure the FY 84 missile quantity; and reduced quantity resulted in decrease in production period required.

(d) (U) Engineering: Cancellation of EP warhead effort by OSD; changes in thrust-reversal design; the impact of maintaining a single-stage configuration option; and addition of funding to partially support implementation of safety and security provisions.

(e) (U) Estimating: Transfer of \$85.0M from economic; OSD-directed decrement in current estimate; increase due to revision of the PII acquisition strategy to not "breakout" major subcontractor hardware/components; Congressional decrement of \$25.0M in the FY 83 procurement program; adjustment to the FY 84 program due to inflation indices; increase in contractor overhead rates; refinement of prior year (FY 83-84) estimates, including net adjustments for spares and reprogramming costs for FY 82-83 AVCO overrun; adjustments due to FY 84-85 contract negotiations; learning curve adjustments in FY85 and 86 due to reduced total quantity and smaller lot size; adjustments for inflation; and refinement of projected outyear program requirements.

(f) (U) Support: Transfer of DMPE to PII budget; incorporation of SWAP program; addition of PCC/RSQF shelters; reestimation of spares; and increase in initial spares.

(g) (U) Other: Due to the original "zero out" of the FY 83 procurement program by Congress, \$30.0M FY 83 OMA funds was provided by the Joint House/Senate Conference in Dec 82 in order to meet IOC and cover engineering services, refurbishment of training missiles and project SWAP.

(3) (U) MILCON

Estimating increase for addition of refurbishment of launch site, Shofly, Idaho and maintenance project, Frankfurt, Germany.

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13. (U) Cost Variance Analysis (Cont'd):

c. (U) Current Charge Explanations:

	(Dollars in Millions)
	<u>Base-Year</u> <u>Then-Year</u>
(1) (U) <u>RDTE</u>	
Deobligation of funds in FY 84 (Estimating)	-0.1 -0.2

	(Dollars in Millions)
	<u>Base-Year</u> <u>Then-Year</u>
(2) (U) <u>Procurement</u>	
(a) (U) Revised Jan 86 economic escalation rates. (Economic)	NA -3.2
(b) (U) Deobligation of prior year funds, inflation reductions due to the Gramm- Rudman Act, and refinement of out-year projections. (Estimating)	-6.5 -12.5

(3) (U) MILCON: None

d. (U) References:

Development Estimate: Secretary Defense Memo dated February 20, 1979, subject, "Pershing II DSARG II Decision Memo"; Draft DCP 132A, 13 March 1979.

14. (U) Program Acquisition Unit Cost (PAUC) History: (Current (Then-Year) Dollars in Millions)

Initial SAR Estimate to Current Baseline Estimate:

PAUC (Initial SAR Est)	Changes								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
94.2	+17.9	-19.7	+14.3	+5.8	+39.7	+3.6	-1.8	+59.8	154.0

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PERSHING II, December 31, 1986

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDTE - Not applicable.

b. (U) Procurement

(1) (U) Production Buy IV:^{1/}

Martin Marietta Orlando Aerospace,
Orlando, Florida
DAAH01-85-C-A027, FFP
Award: December 7, 1984
Definitized: April 29, 1985

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
257.1	NA	70

<u>Target</u>	<u>Current Contract Price</u>		<u>Estimated Price at Completion</u>	
	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
263.5	NA	70	263.5	263.5

(2) (U) Production Buy V:^{1/}

Martin Marietta Orlando Aerospace,
Orlando, Florida
DAAH01-86-C-A017, FFP
Award: December 17, 1985
Definitized: August 22, 1986

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
71.8	NA	24

<u>Target</u>	<u>Current Contract Price</u>		<u>Estimated Price at Completion</u>	
	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
72.8	NA	24	72.8	72.8

(3) (U) Engineering Services:^{2/}

Martin Marietta Orlando Aerospace,
Orlando, Florida
DAAH01-86-C-0289, CPAF
Award: January 6, 1986
Definitized: January 6, 1986

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
29.3	NA	NA

<u>Target</u>	<u>Current Contract Price</u>		<u>Estimated Price at Completion</u>	
	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
44.7	NA	NA	44.7	44.7

^{1/} (U) Because this is a FFP contract, no CPR data including cost and schedule variances.

^{2/} (U) This is a level of effort contract; there are no cost and schedule variances available.

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PERSHING II, December 31, 1986

15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

(4) (U) Warhead Adaption Kits^{1/}

AVCO, Wilmington, MA		Initial Contract Price	
DAAK10-84-C-0069, FFP	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Award: March 8, 1984 (Basic)	18.0	NA	
Definitized: August 31, 1984 (Basic)	15.6		76
January 10, 1985 (Option FY 85)	9.5		76
February 24, 1986 (Option FY 86)	<u>43.1</u>		<u>70</u>
			<u>222</u>

<u>Target</u>	<u>Current Contract Price Ceiling</u>	<u>Qty</u>	<u>Estimated Price at Completion Contractor</u>	<u>Program Manager</u>
18.0	NA	76	18.0	18.0
15.6		54	15.6	15.6
9.5		25	9.5	9.5
<u>43.1</u>		<u>155</u>	<u>43.1</u>	<u>43.1</u>

16. (U) Program Funding Summary: Current Estimate in Millions of Dollars

a. (U) Program Status:

- (1) (U) Percent Program Completed: 57.1% (12 yrs/21 yrs)
- (2) (U) Percent Program Cost Appropriated: 95.8% (2459.6/2566.6)

^{1/} (U) Project Manager for this contract is Nuclear Munitions, Dover, NJ. Because this is an FFP contract, no CPR data including cost and schedule variances are computed.

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PERSHING II, December 31, 1986

16. (U) Program Funding Summary: Current Estimate in Millions of Dollars

b. (U) Appropriation Summary:

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY 75-87)</u>	<u>Budget Year (FY 88)</u>	<u>Balance to Complete FYDP (FY 89-92)</u>	<u>Complete Beyond FYDP (FY 93-TC)</u>	<u>Total</u>
RDTE	692.4	0.0	0.0	0.0	692.4
Procurement	1763.4	6.7	38.0	62.3	1870.4
MCA	3.8	0.0	0.0	0.0	3.8
Total	2459.6	6.7	38.0	62.3	2566.6

c. (U) Annual Summary:

<u>Fiscal Year</u>	<u>Qty</u>	<u>FY 79 Base-Year Dollars</u>			<u>Then-Year Dollars</u>			<u>Escl Rate (%)</u>
		<u>Flyaway</u>	<u>Rec</u>	<u>Total</u>	<u>Advance Debit</u>	<u>Proc Credit</u>	<u>Total</u>	
		<u>Nonrec</u>						
(I) (U) Appropriation: RDTE								
1975				2.7			2.0	10.9
1976				23.2			19.0	6.6
1977				7.1			6.0	2.9
1977				40.0			36.3	2.6
1978				32.1			29.6	6.8
1979				17.5			18.0	8.4
1980				137.2			145.4	9.3
1981				116.9			149.1	11.9
1982	8			112.0			154.5	7.6
1983	20			78.4			111.0	4.9
1984				14.7			21.5	3.8
Subtotal	28			581.8			692.4	NA

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PERSHING II, December 31, 1986

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

(b)(1)



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PERSHING II, December 31, 1986

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. (U) Obligations and Expenditures:

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
(1) (U)	Appropriation: RDTE		
1975	2.0	2.0	2.0
1976	19.0	19.0	19.0
1977	6.0	6.0	6.0
1977	36.3	36.3	36.3
1978	29.6	29.6	29.6
1979	18.0	18.0	18.0
1980	145.4	145.4	145.4
1981	149.1	149.1	148.9
1982	154.5	154.5	154.4
1983	111.0	111.0	109.1
1984	21.5	21.5	21.2
Subtotal	692.4	692.4	689.9
(2) (U)	Appropriation: Procurement		
1981	1.9	1.9	1.9
1982	243.9	243.9	243.7
1983	463.5	463.5	436.2
1984	428.7	428.7	417.5
1985	382.0	377.2	237.4
1986	212.8	182.7	41.2
1987	30.6	0.0	0.0
1988	6.7	0.0	0.0
1989	6.6	0.0	0.0
1990	6.5	0.0	0.0
1991	11.2	0.0	0.0
1992	13.7	0.0	0.0
1993	19.1	0.0	0.0
1994	21.3	0.0	0.0
1995	21.9	0.0	0.0
Subtotal	1870.4	1697.9	1377.9

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PERSHING II, December 31, 1986

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

(3) (U) Appropriation: Military Construction

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
1981	3.0	3.0	3.0
1982	0.0	0.0	0.0
1983	0.8	0.8	0.8
1984	0.0	0.0	0.0
1985	0.0	0.0	0.0
1986	0.0	0.0	0.0
Subtotal	3.8	3.8	3.8

(4) (U) Appropriation: Total

Total	2566.6	2394.1	2071.6
-------	--------	--------	--------

17. (U) Production Rate Data

a. (U) Annual Production Rates:

Production Rates (Quantity/Year)

Fiscal Year	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1982	55	33	21	29
1983	156	96	91	84
1984	156	96	72	84
1985	156	96	70	84
1986	156	96	24	84

b. (U) Cost Variance: (Dollars in Millions)

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	1723.7	-104.3	1618.9	+80.9	1538.0
(TY \$)	2312.4	-245.8	2566.6	+128.3	2438.3
PAUC (BY \$)	103.4	-6.3	97.1	+4.9	92.2
(TY \$)	168.7	-14.7	154.0	+7.7	146.3

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17. (U) Production Rate Data (Cont'd):

c. (U) Schedule Variance:

	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (Mo/Yr)	4/83	NA	4/83	NA	4/83
Duration (in months)	59	-5	54	+ 7	47
End Date (Mo/Yr)	3/88	NA	10/87	NA	3/87

d. (U) Deliveries (Plan/Actual):^{1/}

RDTE	<u>To Date</u>
Propulsion Section	28/28
Reentry Vehicle	28/28
Procurement	
Propulsion Section	205/211
Reentry Vehicle	208/213

18. (U) Operating and Support Costs: Not required.

^{1/} (U) Quantities shown are as of the end of October 1986 to agree with data presented in Section 15, Contract Information.

A-12 HELLFIRE ~~CONFIDENTIAL~~

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823) (U)

PROGRAM: HELLFIRE MODULAR MISSILE SYSTEM (HMMS)

AS OF DATE: DECEMBER 31, 1986

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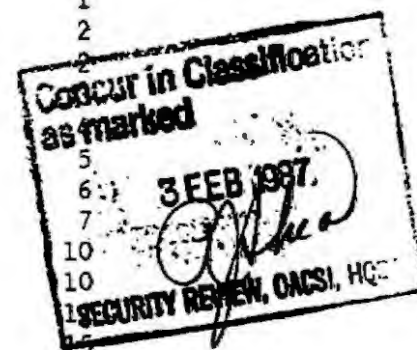
86-031

SUBJECT

Cover Sheet Information
Mission and Description
Program Highlights
DCP Threshold Breaches
Schedule
Technical/Operational Characteristics
Program Acquisition Cost
Unit Cost Summary
Cost Variance Analysis
Program Acquisition Unit Cost History
Contract Information
Program Funding Summary
Production Rate Data
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1. (U) Designation: Not applicable - subsystem of the AH-64 APACHE Weapon System.

Nomenclature: Armament System Helicopter: HELLFIRE

2. (U) DOD Component: Department of Army

3. (U) Responsible Office and Telephone Number:

HELLFIRE/GLD PM Office
RSA,AL 35898-5610

PM: COL W. J. Schumacher

Assigned: 5 Jul 84

AV 746-1365; COMM (205) 876-1365

CONCUR IN CLASSIFICATION
AS MARKED

FEB 25 1987

4. (U) Program Elements/Procurement Line Items:

RDTE: PE 64310 Project D074
MIPA: APPN 2032 SSN C70000
MILCON: None

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

5. (U) Related Programs: AH-64 APACHE Helicopter; UH-60 BLACK HAWK Helicopter;
Ground/Vehicular Laser Locator Designator

6. (U) Mission and Description: HELLFIRE is an air-to ground missile system designed to defeat individual hardpoint targets and to minimize exposure of the delivery vehicle to enemy fire. HELLFIRE utilizes semi-active laser terminal homing guidance and is designed to accept various other guidance packages. HELLFIRE can be employed in a wide variety of modes including autonomous, ground remote, airborne remote, direct or indirect fire, and rapid or ripple fire. HELLFIRE will be employed from helicopters against heavy armored vehicles at longer standoff ranges than missiles currently in the inventory. In addition, HELLFIRE is being considered for a surface-to-surface role as candidate to satisfy the close combat anti-armor mission element need. HELLFIRE does not replace another missile system in the air-to-ground role.

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87-0391
~~CLASSIFIED BY: HELLFIRE SCG
Aug 85
DECLASSIFY ON: OADR~~

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HELLFIRE, December 31, 1986

7. (U) Program Highlights:

a. (U) Significant Historical Development -- In 1972, the Army initiated an Advanced Development (AD) Program to demonstrate critical subsystems of the HELLFIRE Missile System. The AD Program included competitive contractor development of a modular missile, launcher, and control and display systems, including prototype hardware. It also included extensive technical and operational tests of the laser guided HELLFIRE Missile System, warhead development tests, and countermeasure tests. On 30 Mar 76, OSD approved entry into full-scale engineering development (ED) of HELLFIRE with fielding to be concurrent with the Advanced Attack Helicopter (AH-64). The ASARC directed that development of the fire and forget seekers applicable to the HELLFIRE Modular Missile be continued. Operational testing of HELLFIRE as a subsystem of the AH-64 Weapon System was completed in Aug 81. After successfully completing the ASARC III milestone decision review in Nov 81, the Army was delegated authority to approve production. The Vice Chief of Staff, Army granted approval for full scale production on 30 Mar 82 and FY 82 production contracts were awarded to Rockwell International Corporation and Martin Marietta Corporation.

b. (U) Significant Developments Since Last Report -- A contract for development of a digital autopilot (DAP) for the improved HELLFIRE missile was awarded to Rockwell International Corporation. The DAP will replace the analog autopilot and will enhance missile performance by providing greater angles of attack for improved armor penetration, improved minimum range performance and flexibility to shape flight trajectories.

Interoperability of HELLFIRE with the Remotely Piloted Vehicle (RPV) has been demonstrated with the successful engagement of four ground targets designated by the RPV.

The Swedish Government successfully completed operational testing of HELLFIRE in the anti-ship mode.

The HELLFIRE Missile System satisfies all mission requirements except missile weight. Weight reduction from the current nominal weight of 99.8 pounds to the required 95 pounds is not considered feasible without degrading system performance.

c. (U) Changes Since "As of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (DCP #118, dated 7 Jan 82) threshold breaches.

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HELLFIRE, December 31, 1986

9. (U) Schedule:

a. (U) Milestones --

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
Advanced Development		
Start	Dec 72/Dec 72	Dec 72
Complete	Oct 75/Oct 75	Oct 75
Competitive AD Contracts		
Start	Jun 74/Jun 74	Jun 74
Complete	Oct 75/Oct 75	Oct 75
Milestone II (ASARC/DSARC II)	Feb 76/Feb 76	Feb 76
ED Contract award	Oct 76/Oct 76	Oct 76
PQT-C (Contractor)		
Start	Mar 79/Mar 80	Mar 80
Complete	Aug 79/Mar 82	Mar 82
Operational Test (OT)(COBRA)		
Start	Aug 79/Apr 80	Apr 80
Complete	Dec 79/Jul 80	Jul 80
Milestone III (ASARC/DSARC III)	Feb 80/Mar 82	Mar 82
Production Contr Award	Apr 80/Mar 82	Mar 82
Prod Val Tests Complete	Oct 81/Oct 84	Oct 84
Milestone IIIA (ASARC/DSARC)	Nov 81/N/A	N/A
Full-Scale Production	Jan 82/Mar 82	Mar 82
Initial Operational Capability (IOC) (on AH-64)	May 83/Jul 86	Jul 86 (Ch-1)

b. (U) Previous Change Explanations --

The program experienced an accumulation of approximately 2 years in schedule slippage during full-scale development. Schedule changes resulted from reduction of RDTE funding, delays in procurement funding, and delays in testing caused by late delivery of hardware and correction of deficiencies revealed in earlier tests. The completion of production validation testing was delayed six months because of problems that occurred in production start-up. Initial operating capability (IOC) was changed from FY 85 to Aug 86 for synchronization with the APACHE program.

c. (U) Current Change Explanations --

(Ch-1) The AH-64 IOC is changed from Aug 86 to Jul 86 to reflect the actual date that the IOC was achieved.

d. (U) References --

Development Estimate: DCP #118, dated 12 Nov 76.

Approved Program: FY 88-89 President's Budget.

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HELLFIRE, December 31, 1986

10. (U) Technical/Operational Characteristics:

a. (U) Technical --	Dev Estimate/ <u>Appr Program</u>	<u>Demonstrated</u> <u>Performance</u>	<u>Current</u> <u>Estimate</u>
Missile Weight Maximum (lbs)	95/99.8	99.8	99.8

b. (U) Operational--

(b)(1)

(U) Reliability

(U) Missile (in-flight)	.92-.95/.92-.95	1.0 (Ch-1)	.92-.95
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(U) Launcher	.95-.99/.95-.99	1.0	.95-.99
--------------	-----------------	-----	---------

(U) Prob of Hit

(b)(1)

(U) NOTES:

1/ Direct fire launch mode.

2/ Probability of hit in the direct fire mode, given reliability.

c. (U) Previous Change Explanations --

(b)(1)

d. (U) Current Change Explanations --

(U) (Ch-1) Demonstrated performance for reliability is changed from .94 to 1.0 against stationary targets to reflect performance of last 50 rounds fired during the period ending 30 Sep 86.

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HELLFIRE, December 31, 1986

10. (U) Technical/Operational Characteristics (Cont'd):

e. (U) References --

(U) Development Estimate: Materiel Need (MN) for Advanced Antitank Missile, Air-to-Ground (HELLFIRE), Dec 72; Materiel Need (MN) for Advanced Attack Helicopter; DCP #118, 12 Nov 76

(U) Approved Program: FY 88-89 President's Budget.

11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

		Development		Current
a. (U) Cost --		<u>Estimate</u>	<u>Changes</u>	<u>Estimate</u>
Development 1/		\$ 211.9	\$+ 18.3	\$ 230.2
Procurement		276.7	+ 506.8	783.5
Missile Bus		(143.1)	(+ 278.6)	(+421.7)
Laser Seeker		(109.4)	(+ 232.0)	(+341.4)
Total Flyaway		(252.5)	(+ 510.6)	(+763.1)
Other Wea Sys Cost 2/		(4.0)	(+ 12.5)	(+ 16.5)
Initial Spares		(20.2)	(- 16.3)	(+ 3.9)
Construction		0.0	0.0	0.0
Total: Constant FY 75\$		488.6	+ 525.1	1013.7
Escalation		214.8	+1179.1	1393.9
Development		(54.3)	(+ 32.7)	(87.0)
Procurement		(160.5)	(+1146.4)	(1306.9)
Construction		(0.0)	(0.0)	(0.0)
Total Program Cost		\$703.4	\$1704.2	\$2407.6
b. (U) Quantities --				
Development				
Missile		241	-12	229
Laser Seeker		241	+140	381
Launcher		74		74
Procurement				
Missile		24,600	+24,096	48,696
Laser Seeker 3/		24,600		N/A
Total Missiles		24,841	+24,084	48,925
c. (U) Unit Cost --				
Procurement: Missile				
FY 75 Base-Year	\$	.011	\$ + .005	\$.016
Then-Year		.018	+ .025	.043
Program: Missile				
FY 75 Base-Year		.020	+ .001	.021
Then-Year	\$.028	+ .021	\$.049

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HELLFIRE, December 31, 1986

11. (U) Program Acquisition Cost (Cont'd): (Current Estimate in Millions of Dollars)

d. (U) Approved Design to Cost Goal --

(Average Flyaway Cost)

	Dev Est/ <u>Approved Program</u>	Current <u>Estimate</u>	Latest Approved <u>Threshold</u>
@Qty: 24,600			
@Peak Rate: 500/mo			
FY 75 Base-Year \$	10,264/18,050 4/	18,050	N/A
Then-Year \$	17,796/44,617	44,617	N/A

(U) NOTES:

1/ Development estimate revised from \$210.3 due to conversion of Pre-Base Year Actuals to Base Year 75.

2/ Other includes data, training, support and test equipment.

3/ Missiles are being procured as all-up-rounds. Seekers were not procured as a GFE item after the second buy.

4/ DCP Flyaway Cost, computed in accordance with DODI 5000.33, dated Aug 77, is revised from \$9,977 to \$10,264 for consistency with revision of HELLFIRE DE in Jun 84 SAR.

e. (U) Foreign Military Sales -- None

f. (U) Nuclear Costs -- None

12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

		<u>Current Year</u>		<u>Budget Year</u>
		<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
		<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a.	(U) Program Acquisition --			
(1)	(U) Cost	\$ 2,407.6	\$ 2,554.3	\$ 2,407.6
(2)	(U) Quantity	48,925	48,925	48,925
(3)	(U) Unit Cost	\$.049	\$.052	\$.049
b.	(U) Current Procurement	(FY 87)	(FY 87 APPN)	(FY 88)
(1)	(U) Cost	\$.1	0.0	\$ 168.9
	Less CY Adv Proc	0.0	0.0	0.0
	Plus FY Adv Proc	0.0	0.0	0.0
	Net Total	\$.1	0.0	\$ 168.9
(2)	(U) Quantity	0.0	0.0	5,000
(3)	(U) Unit Cost	0.0	0.0	\$.034

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HELLFIRE, December 31, 1986

13. (U) Cost Variance Analysis:

a.(U)Summary -- (Current (Then-Year) Dollars in Millions)

	DEV	PROC	MILCON	TOTAL
<u>Development Estimate</u>	<u>\$266.2</u>	<u>\$437.2</u>	<u>-</u>	<u>\$703.4</u>
Previous Changes:				
Economic	+8.1	+172.2	-0.4	+179.9
Quantity	-3.5	+465.8	-	+462.3
Schedule	+14.6	+431.7	+0.4	+446.7
Engineering	+14.2	+303.1	-	+317.3
Estimating	+13.9	+426.4	+2.0	+442.3
Other	-	-	-	-
Support	+4.1	-1.7	-	+2.4
Subtotal	+51.4	+1797.5	+2.0	+1850.9
Current Changes:				
Economic	-0.1	-47.9	-	-48.0
Quantity	-	-	-	-
Schedule	-	+8.8	-	+8.8
Engineering	-	-	-	-
Estimating	-0.3	-102.6	-2.0	-104.9
Other	-	-	-	-
Support	-	-2.6	-	-2.6
Subtotal	-0.4	-144.3	-2.0	-146.7
Total Changes	+51.0	+1653.2	-	+1704.2
Current Estimate	317.2	2090.4	-	2407.6

FY 1975 Constant (Base-Year) Dollars in Millions)

	DEV	PROC	MILCON	TOTAL
<u>Development Estimate</u>	<u>\$211.9</u>	<u>\$276.7</u>	<u>-</u>	<u>\$488.6</u>
Previous Changes:				
Quantity	-2.7	+153.6	-	+150.9
Schedule	+9.1	+53.5	-	+62.6
Engineering	+8.7	+119.0	-	+127.7
Estimating	+1.3	+215.8	+0.9	+218.0
Other	-	-	-	-
Support	+2.0	-3.0	-	-1.0
Subtotal	+18.4	+538.9	+0.9	+558.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+3.7	-	+3.7
Engineering	-	-	-	-
Estimating	-0.1	-35.0	-0.9	-36.0
Other	-	-	-	-
Support	-	-0.8	-	-0.8
Subtotal	-0.1	-32.1	-0.9	-33.1
Total Changes	+18.3	+506.8	-	+525.1
Current Estimate	230.2	783.5	-	1013.7

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HELLFIRE, December 31, 1986

13. (U) Cost Variance Analysis (Cont'd):

b(U) Previous Change Explanations --

(U) RDTE

Economic: Revised escalation indices.

Quantity: Decrease due to deletion of 12 practice missiles; changes in seeker quantity.

Schedule: Increase due to budget reduction in FY 78; slips in validation test.

Engineering: Increase due to addition of competitive low cost seeker program and autopilot improvements.

Estimating: Increase due to exercise of the metric option in the contract, additional effort for shelf life surveillance, CM/CCM analysis, and hardware improvements. Decreases due to reduction of FY 81 RDTE funding, and FY 83 Congressional decrement to TRACE. Removal of funds from Basic Laser Hellfire, FY 87 out. Funding established in new line for improved Hellfire system to meet an evolving threat.

Support: Decrease due to reduction in missile test requirement and FY 78 budget adjustment. Increase due to addition of two ATAFCS for use in DT/OT with Cobra, requirement for battlefield obscuration test, and requirement for use of AN/USM-410 test set.

(U) Procurement

Economic: Revised escalation indices.

Quantity: Addition of 24,096 missiles.

Schedule: Increase due to delays in start of production and impact of RDTE funding constraints. Program stretchout resulting from zeroing FY 87 procurement funds precipitated by production delays.

Engineering: Increase due to requirement changes in missile bus, warhead and seeker; incorporation of minimum smoke motor in FY 84. Provision for hardware improvements planned for cut in during FY 89 and subsequent buys. Incorporate Fire and Forget seeker into missile system.

Estimating: Revised production cost estimates. The major increases occurred prior to FY 84. Cost estimates decreased with introduction of competitive procurement strategy in FY 84. Revised estimates for outyear production costs based on actuals to date, largely due to increased savings from competition.

Support: Increase due to addition of training hardware, depot capital equipment, and changes in support hardware. Decreases due to reduction in initial spares requirement, and test set quantity. Addition of 10,000 deicing kits, 100 dummy missiles, and 30 training missiles to support APACHE program, and refinement of costs based on actuals.

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HELLFIRE, December 31, 1986

13. (U) Cost Variance Analysis (Cont'd):

(U) MILCON

Economic: Revised escalation indices.

Estimating: Addition of ammunition storage bunkers not in DE.

c. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base Year</u>	<u>Then Year</u>
(1) (U) <u>RDT&E</u>		
Revised Dec 86 economic escalation rates. (Economic)	N/A	-0.1
Deobligation of prior year (FY 84) funds. (Estimating)	0.0	-0.1
Gramm-Rudman budget cut in FY 86. (Estimating)	-0.1	-0.2
(2) (U) <u>Procurement</u>		
Revised Dec 86 economic escalation rates. (Economic)	N/A	-47.9
Reprofiling of missile procurement schedule. (FY 86-93) (Schedule)	3.7	8.8
Revised estimates for outyear production costs based on actuals to date. (Estimating)	-35.0	-102.6
Reductions due to downward revision of initial spares requirements. (Support)	-0.4	-1.3
Reduced estimate for deicing kits. (Support)	-0.4	-1.3
(3) (U) <u>MILCON</u>		
Revised Dec 86 economic escalation rates. (Economic)	N/A	--
MILCON determined to be not HELLFIRE System Specific. (Estimating)	-0.9	-2.0

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HELLFIRE, December 31, 1986

13. (U) Cost Variance Analysis (Cont'd):

d. (U) References --

(U) Development Estimate: DCP #118, dated 12 Nov 76.

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. (U) Initial SAR Estimate to Current Baseline Estimate --

PAUC		CHANGES							PAUC
(INITIAL									(REVISED DEV
SAR EST)1/	ECON	QTY	SCH	ENGR	EST	SPT	OTHER	TOTAL	ESTIMATE)2/
\$.029M	-	-	-	-	-	-	-.001	-.001	\$.028M

b. (U) Current Baseline Estimate to Current Estimate:

PAUC (REVISED DEV EST)2/	CHANGES								PAUC (CURRENT ESTIMATE)
ECON	QTY	SCH	ENGR	EST	SPT	OTHER	TOTAL		
\$.028M	+.003	-.004	+.009	+.006	+.007	-	-	+.021	\$.049M

NOTES:

1/ Initial SAR date: 30 Jun 76.

2/ Revision of HELLFIRE development estimate in the Jun 84 SAR transferring \$31.7M previously in the HELLFIRE DE for the HELLFIRE launcher to the APACHE program.

15. (U) Contract Information: (Then-Year Dollars In Millions)

a. (U) RDT&E -- None

(b)(4)

15. (U) Contract Information (Cont'd):

(b)(4)

<u>Third Production Buy</u>			<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Rockwell Int. Corp., Duluth, GA, DAAH01-84-C-A162, FFP, Award: June 29, 1984 Definitized: June 29, 1984			\$113.2	N/A	2651

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$116.6	N/A	2651	N/A	N/A
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			\$ 0.0	\$ 0.0
Cumulative Variances To Date (N/A)			\$ 0.0	\$ 0.0
Net Change			N/A	N/A

Explanation of Change: N/A on FFP contracts

<u>Third Production Buy</u>			<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Martin Marietta, Orlando, FL DAAH01-84-C-A163, FFP Award: June 29, 1984 Definitized: June 29, 1984			\$ 98.9	N/A	2000

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$100.2	N/A	2000	N/A	N/A

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HELLFIRE, December 31, 1986

15. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$ 0.0	\$ 0.0
Cumulative Variances To Date (N/A)	\$ 0.0	\$ 0.0
Net Change	\$ N/A	\$ N/A

Explanation of Change: N/A on FFP contracts

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>Fourth Production Buy</u>			
Martin Marietta, Orlando, FL,	\$126.2	N/A	4104
DAAH01-85-C-A041, FFP,			
Award: March 15, 1985			
Definitized: March 15, 1985			

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$137.8	N/A	4104	N/A	N/A
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			\$ 0.0	\$ 0.0
Cumulative Variances To Date (N/A)			\$ 0.0	\$ 0.0
Net Change			\$ 0.0	\$ 0.0

Explanation of Change: N/A on FFP contracts

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>Fifth Production Buy</u>			
Rockwell Int. Corp., Duluth, GA,	\$129.9	N/A	4500
DAAH01-86-C-0494, FFP			
Award: March 17, 1986			
Definitized: March 17, 1986			

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$132.7	N/A	4500	N/A	N/A
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			\$ 0.0	\$ 0.0
Cumulative Variances To Date (N/A)			\$ 0.0	\$ 0.0
Net Change			\$ N/A	\$ N/A

Explanation of Change: N/A on FFP contracts

16. (U) Program Funding Summary: (Current Est in Millions of Dollars)

a. (U) Program Status --

(1) (U) Percent Program Completed: 72.7% (16 yrs/22 yrs)

(2) (U) Percent Program Cost Appropriated: 56.4% (\$1358.1/\$2407.6)

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HELLFIRE, December 31, 1986

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs</u> (FY 72-87)	<u>Budget Year</u> (FY 88)	<u>Balance to Complete FYDP</u> (FY 89-92)	<u>Beyond FYDP</u> (FY 93)	<u>Total</u>
RDT&E	317.2	0	0	0	317.2
Procurement	1040.9	168.9	744.3	136.3	2090.4
MILCON	0	0	0	0	0
Total	1358.1	168.9	744.3	136.3	2407.6

c. (U) Annual Summary --

<u>Fiscal Year</u>	<u>Qty</u>	<u>FY 75 Base-Year Dollars</u>			<u>Then-Year Dollars</u>		<u>Escl Rate</u> (%)	
		<u>Flyaway</u>		<u>Total</u>	<u>Advance Proc</u>			
		<u>Nonrec</u>	<u>Rec</u>		<u>Debit</u>	<u>Credit</u>		
<u>Appropriation RDT&E</u>								
1972				5.9		4.9	5.5	
1973	14			5.7		5.0	6.1	
1974				6.5		6.1	7.9	
1975				13.6		14.0	8.4	
1976				3.6		3.9	5.4	
1977T				.6		.7	3.3	
1977	215			16.4		19.1	3.8	
1978				41.0		51.4	7.8	
1979				48.1		66.2	9.7	
1980				38.1		57.8	10.2	
1981				26.5		43.9	9.0	
1982				12.6		22.2	6.5	
1983				8.3		15.3	4.4	
1984				.8		1.5	3.7	
1985				.2		.5	3.4	
1986				2.3		4.7	2.9	
Subtotal	229			230.2		317.2		

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HELLFIRE, December 31, 1986

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

Fiscal Year	Qty	FY 75 Base-Year Dollars			Then-Year Dollars		Total	Escl Rate (%)
		Flyaway		Total	Advance Proc			
		Nonrec	Rec		Debit	Credit		
Appropriation: Procurement 1/								
1981	LLI	9.9	1.3	11.2		22.6	12.6	
1982	680	9.5	37.9	51.1		113.1	10.0	
1983	3971	3.3	98.1	105.1		247.1	6.2	
1984	4651		86.4	89.7		218.5	3.6	
1985	5780		85.7	88.8		224.5	3.4	
1986	6000		78.0	82.8		215.0	2.9	
1987	0		0	0		0.1	3.1	
1988	5000		60.6	61.0		168.9	3.5	
1989	4000	1.7	49.7	51.5		146.9	3.6	
1990	5000		61.5	61.6		180.4	3.3	
1991	5000		69.8	69.9		209.7	2.9	
1992	5000		67.4	67.5		207.3	2.4	
1993 2/	3614		42.3	43.3		136.3	2.4	
Subtotal	48696	24.4	738.7	783.5		2090.4		

1/ FY 86 and prior reflect actuals (except for spares).

2/ Proc objective is 48696. When FY 89 was cut from 5000 to 4000, extra 1000 was added to FY 93.

Appropriation: MILCON						
Subtotal				0.0		0.0
Total	48925	24.4	738.7	1013.7		2407.6

d. (U) Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1972	4.9	4.9	4.9
1973	5.0	5.0	5.0
1974	6.1	6.1	6.1
1975	14.0	14.0	14.0
1976	3.9	3.9	3.9
1977T	.7	.7	.7
1977	19.1	19.1	19.1
1978	51.4	51.4	51.4
1979	66.2	66.2	65.7
1980	57.8	57.8	57.6
1981	43.9	43.9	43.6
1982	22.2	22.2	21.3
1983	15.3	15.3	14.1
1984	1.5	1.5	1.5
1985	.5	.5	.5
1986	4.7	4.7	2.5
To Complete	-	-	-
Total	317.2	317.2	311.9

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HELLFIRE, December 31, 1986

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated ^{1/}	Expended ^{1/}
Appropriation: Procurement			
1981	22.6	22.6	22.6
1982	113.1	111.3	111.3
1983	247.1	246.0	224.3
1984	218.5	213.3	120.7
1985	224.5	210.8	44.8
1986	215.0	172.7	7.2
1987	.1	-	-
To Complete	1049.5	-	-
Total	2090.4	976.7	530.9

^{1/} PMO cannot account for obligation and expenditures for initial spares.

Appropriation: MILCON

To Complete	0.0	-	-
Total	2407.6	1299.6	842.8

17. (U) Production Rate Data:

a. (U) Annual Production Rates --(NOTE: The current estimate for production rates is equal to contractually required deliveries through FY 86 and projected deliveries thereafter. The funded delivery period for the FY 83 contract was 20 months, FY 85 and FY 86 is 14 months and FY 93 is seven months. The delivery period for all other buys is 12 months.)

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1980				
1981	140			
1982	860		680	
1983	4150		3971	
1984	6000	680	4651	680
1985	6000	3971	5780	19
1986	6000	6218	6000	2087
1987	1450	5683	0	6070
1988		6853	5000	8605
1989		6351	4000	8605
1990		6000	5000	8605
1991			5000	8605
1992			5000	8605
1993			3614	8605

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HELLFIRE, December 31, 1986

17. (U) Production Rate Data (Cont'd):

b. (U) Cost Variance -- (NOTE: The production estimate tracks to the 31 Dec 81 SAR which was the first SAR after the Milestone III production decision review. HELLFIRE launcher costs are excluded for the production estimate, because these costs were transferred to the APACHE program.)

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$M)	882.0	+131.7	\$1013.7	27.2	\$ 986.5
(TY \$M)	\$1953.4	+454.2	\$2407.6	138.9	\$2268.7
FAUC (BY \$M)	\$.025	\$- .004	\$.021	\$.001	\$.020
(TY \$M)	\$.054	\$- .005	\$.049	\$.003	\$.046

c. (U) Schedule Variance --

	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum Economic
Start Date (Mo/Yr)	2/82	N/A	2/82	N/A	2/82
Duration (in Months)	103	55	158	-33	125
End Date (Mo/Yr)	9/90	N/A	4/95	N/A	7/92

d. (U) Deliveries (Plan/Actual).

Missile	RDT&E	<u>To DATE</u>
	Procurement	229/229
		3844/3868

18. (U) Operating and Support Costs: N/A

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A-6 CH-47D

SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A) 823)

Program: CH-47D

86-026

AS OF DATE: December 31, 1986

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CLEARED
FOR OPEN PUBLICATION

FEB 25 1987

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): CH-47D/Medium Lift Helicopter
(CHINOOK)

2. DoD Component: Department of the Army

3. Responsible Office and Telephone Number

Project Manager's Office
CH-47D/Army V-22 Aircraft Programs
St. Louis, MO 63120-1798

PM: Colonel Michael B. Howe
Assigned: June 2, 1986
AUTOVON: 693-1411

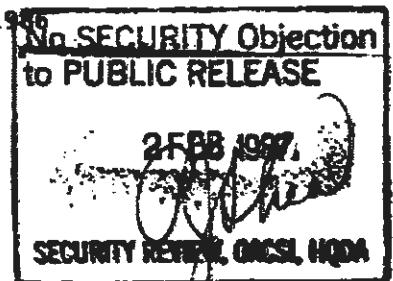
4. Program Elements/Procurement Line Items:

RDTEE: PE 64213A
PROCUREMENT: APPN 2031

Project DC37 (Sunk)
SSN AA0250
AA0960

5. Related Programs: None.

6. Mission and Description: The CH-47 is a transport helicopter used for artillery movement, missile transport, personnel movement, aircraft recovery, medical evacuation, transport of liquid and dry bulk cargo, etc. It has the capability of carrying cargo internally or externally depending on cargo configuration. Employment of 1950 technology and the age of current CH-47 fleet dictated modernization to sustain Army fleet capability. Modernization provides substantial improvements in reliability, availability and maintainability (RAM), productivity, flight safety and survivability. CH-47A, B, and C model airframes are updated and improved with seven newly designed and developed components. These systems include the Fiberglass Rotor Blades, Drive System, Hydraulic System, Auxiliary Power Unit (APU), Electrical System, Advanced Flight Control System (AFCS), and the Multi-Cargo Hook Load Suspension System. The modernized aircraft



CH-47D, December 31, 1986

6. Mission and Description (Cont'd):

have a lift capability of 15,000 lbs at design conditions of 4,000 feet/95°F. Fleet compatibility is improved, logistics support enhanced, maintenance support simplified, and operational costs reduced. The modernized CH-47 replaces the current CH-47 fleet on a one-for-one basis.

7. Program Highlights:

a. Significant Historical Developments--ASARC III, held at DA on 19 Aug 80, directed that the program enter production to modernize the current available fleet. The Council directed the aircraft be type classified standard. The SECDEF Decision Memorandum (SDDM) was signed 20 Oct 80. The quantity of aircraft to be modernized to CH-47Ds is 436 combined A, B, and C models.

b. Significant Developments Since Last Report--New CH-47D fieldings occurred during 1986 with aircraft deliveries to Fort Lewis, WA, in June 1986 and Fort Sill, OK in December 1986.

Since 31 December 1984, 145 production helicopters have been delivered to the Army.

The PM expects the CH-47 Modernization Program to meet all its current mission requirements.

c. Changes Since "As Of" Date-- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated 15 August 1980), or Secretary of Defense Decision Memorandum (SDDM) (dated 20 October 1980) threshold breaches. Average unit flyaway and procurement DCP thresholds were breached and reported in the Dec 83 SAR. Breach occurred as a result of program stretch-out caused by OSD and DA direction per PBD 102, dated 7 Dec 83, to reduce yearly procurement objective from 60 to 48 aircraft/year and pursue a 5-year MYP (FY 85-89) for 240 aircraft. Notification was made by the PM thru HQ, AMC to HQ, DA on 13 Feb 84.

9. Schedule:

a. Milestones --	Development Estimate/ <u>Approved Program</u>	Current <u>Estimate</u>
Milestone III (DSARC)	Sep 80/Oct 80	Oct 80
Initial Prod Contr Award	Sep 80/Oct 80	Oct 80

9. Schedule (Cont'd):

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
Prod Validation Testing		
(1) Start	Oct 81/May 82	May 82
(2) Complete	Mar 83/Aug 83	Aug 83
Initial Production		
Delivery	May 82/May 82	May 82
IOC (24th Aircraft 1st Unit)	Aug 83/Feb 84	Feb 84

b. Previous Change Explanations -- Initial Production Contract Award was changed to October 1980 because of the ASARC III decision scheduled in late FY 80. The IOC slipped under the present production buildup due to the restructuring of company TOE from 16 to 24 aircraft as changed by Aviation Requirements for Combat Structure of the Army (ARCSA) III and initial allocation of 4 CH-47D aircraft to test and training base TDA requirement. Current estimate for DSARC III changed from September 1980 as the SECDEF Decision Memorandum (SDDM) was signed 20 Oct 80.

c. Current Change Explanations -- None.

d. References --

Development Estimate: DCP, number 139, as revised 5 January 1977.

Approved Program: FY 88/89 President's Budget.

10. Technical/Operational Characteristics

	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. Technical --			
System Operational Reliability (SOR) (MTBF)			
(1) DSARC III Objective	.96/ 1.33	1.38 <u>2/</u>	1.33
(2) Maturity Objective (100K hrs)	1.4/ 1.33		1.33
Hardware System Reliability (MTBF)			
(1) DSARC III Objective	2.06/ 3.41	3.14 <u>1/</u>	3.41
(2) Maturity Objective (100K hrs)	3.0 / 3.58		3.58
Maintenance Man-Hour/Flight Hour	17.66/15.10	15.10 <u>1/</u>	15.10
b. Operational --			
Vertical Rate of Climb (fpm)	200/200	200 <u>2/</u>	200
Mission Radius (NM)	30/30	30 <u>2/</u>	30
Mission Payload (lb)	15,775/16,529	16,529 <u>2/</u>	16,529
Maximum Cruise Speed at Design Gross Weight (kt)	155/163	163 <u>2/</u>	163
Service Ceiling at Design Gross Weight (ft) (1 engine inoperative)	10,000/13,200	13,200 <u>2/</u>	13,200

10. Technical/Operational Characteristics (Cont'd):Footnotes:

1/ Demonstrated performance reflects prototype testing.

2/ Demonstrated performance reflects production testing.

c. Previous Change Explanations -- Reflects results of production testing vice prototype testing.

d. Current Change Explanations -- None.

e. References -- Same as 9d.

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Changes	Current Estimate
Development (RDT&E)	\$ 76.1	\$+ 10.2	\$ 86.3
Procurement (Initial Spares)	806.4 (26.0)	+ 440.5 (+ 18.8)	1246.9 (44.8)
Total FY 75 Base -Year\$	\$ 882.5	\$+ 450.7	\$1333.2
Escalation	680.3	+1057.1	1737.4
Development (RDT&E)	(22.5)	(+ 4.7)	(27.2)
Procurement	(657.8)	(+1052.4)	(1710.2)
Total Then-Year\$	\$ 1562.8	+1507.8	\$3070.6
b. Quantities --			
Development (RDT&E)	3	-	3
Procurement	361	+ 75	436
Total	364	+ 75	439
c. Unit Cost --			
Procurement:			
FY 75 Base-Year\$	\$ 2.23	\$ + .63	\$ 2.86
Then-Year\$	4.06	+2.72	6.78
Program:			
FY 75 Base-Year\$	2.42	+ .62	3.04
Then-Year\$	\$ 4.29	\$ +2.70	\$ 6.99

d. Approved Design-to-Cost Goal --
(Average Unit Flyaway Cost at a production rate of 5/month)

	Dev Estimate/ Appr Program	Current Estimate	Latest Approved Threshold
CH-47A			
Qty: 104			
Peak Rate: N/A			
FY 75 Base-Year\$	2.764/N/A	N/A	N/A
Then-Year\$	4.600/N/A	N/A	N/A

11. Program Acquisition Cost (Cont'd):

	<u>Dev Estimate/ Appr Program</u>	<u>Current Estimate</u>	<u>Latest Approved Threshold</u>
CH-47B			
Qty: 74			
Peak Rate: N/A			
FY 75 Base-Year\$	2.357/N/A	N/A	N/A
Then-Year\$	4.195/N/A	N/A	N/A
CH-47C			
Qty: 183			
Peak Rate: N/A			
FY 75 Base-Year\$	1.567/N/A	N/A	N/A
Then-Year\$	2.900/N/A	N/A	N/A
CH-47D			
Qty: 436			
Peak Rate: N/A			
FY 75 Base-Year\$	NA/2.65	2.65	2.63
Then-Year\$	NA/6.32	6.32	

e. Foreign Military Sales -- None.

f. Nuclear Costs -- None.

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>(Dec 86 SAR)</u>	<u>(Dec 85 SAR)</u>	<u>(Dec 86 SAR)</u>
a. Program Acquisition--			
(1) Cost	3070.6	3103.8	3070.6
(2) Quantity	439	439	439
(3) Unit Cost	6.99	7.07	6.99
b. Current Procurement--	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	262.0	262.0	237.4
Less CY Adv Proc	57.3	57.3	63.6
Plus PY Adv Proc	78.6	78.6	83.7
Net Total	283.3	283.3	257.5
(2) Quantity	48	48	48
(3) Unit Cost	5.90	5.90	5.37

13. Cost Variance Analysis:

CH-47D, December 31, 1986

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	98.6	1464.2	-	1562.8
Previous Changes:				
Economic	-	+191.4	-	+191.4
Quantity	-	+545.5	-	+545.5
Schedule	-	- 7.6	-	- 7.6
Engineering	-	-	-	-
Estimating	+14.9	+734.7	-	+749.6
Other	-	-	-	-
Support	-	+ 62.1	-	+ 62.1
Subtotal	+14.9	+1526.1	-	+1541.0
Current Changes				
Economic	-	- 40.0	-	- 40.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+ 7.6	-	+ 7.6
Other	-	-	-	-
Support	-	- .8	-	- .8
Subtotal	-	- 33.2	-	- 33.2
Total Changes	+14.9	+1492.9	-	+1507.8
Current Estimate	113.5	2957.1	-	3070.6

Cost Variance Analysis (Con't):

(FY 1975 Constant (Base Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	76.1	806.4	-	882.5
Previous Changes:				
Quantity	-	+ 154.7	-	+154.7
Schedule	-	+ 41.4	-	+ 41.4
Engineering	-	-	-	-
Estimating	+10.2	+ 208.9	-	+219.1
Other	-	-	-	-
Support	-	+ 32.5	-	+ 32.5
Subtotal	+10.2	+437.5	-	+ 447.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+ 3.8	-	+ 3.8
Other	-	-	-	-
Support	-	- .8	-	- .8
Subtotal	-	+ 3.0	-	+ 3.0
Total Changes	+ 10.2	+ 440.5	-	+ 450.7
Current Estimate	86.3	1246.9	-	1333.2

13. Cost Variance Analysis (Con't):

CH-47D, December 31, 1986

b. Previous Change Explanations --

(1) RD&E

Estimating: Reflects actual RD&E program.

(2) Procurement

Economic: Application of CH-47D historical, and OSD inflation guidance through February 1986.

Quantity: ASARC/DSARC III decision added 75 aircraft. Program quantity increased from 361 to 436.

Schedule: Increase in production rate from 3 to 4 aircraft per month.

Estimating: Refinement of estimate for production costs. Elimination of multiyear contingency funds for EPA and airframe preparation/Materiel Requirements List; elimination of small business set aside and ECPs.

Support: Refinement of prior estimate. Revised spares policy definition.

c. Current Change Explanations --

	(Dollars in Millions)	
	Base-Year \$	Then-Year \$
(1) <u>RD&E</u>	N/A	N/A
(2) <u>Procurement</u>		
Revised 12 Dec 86 economic escalation rates. (Economic)	N/A	- 40.0
Increase in Long Lead Time Items for follow-on multiyear contract. (Estimating)	+ 3.8	+ 7.6
Reduction in training components due to budget cuts. (Support)	- .8	- .8

d. References --

(1) Development Estimate: Same as 9d.

(2) Current Estimate: FY 88/89 President's Budget.

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year dollars).

Development Estimate to Current Estimate --

PAUC (Dev Estimate)	Changes (Then-Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
4.29	+ .35	+ .51	- .02	-	+ 1.72	+ .14	-	+ 2.70	6.99

CH-47D, December 31, 1986

15. Contract Information (Then-Year Dollars in Millions)

Airframe
Boeing Vertol Co., Ridley Park, PA,
DAAK50-85-C-A005, FFP,
5-year Multiyear Contract,
Award: April 8, 1985
Definitized: April 8, 1985

<u>Target Price</u>	<u>Ceiling</u>	<u>Qty</u>
\$1,172.7	N/A	240

<u>Current Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$1,177.9	N/A	240

<u>Estimated Price at Completion</u>	
<u>Contractor</u>	<u>Program Manager</u>
N/A	N/A

Previous Cumulative Variance
Cumulative Variance to Date
Net Change

<u>Cost Variance</u>	<u>Schedule Variance</u>
N/A	N/A
N/A	N/A
N/A	N/A

Engine
AVCO Lycoming Co., Stratford, CT,
DAAJ09-85-C-A485, FFP
Award: September 30, 1984
Definitized: September 30, 1984

<u>Initial Contract Price</u>		
<u>Target Price</u>	<u>Ceiling</u>	<u>Qty</u>
\$70.4	N/A	169

<u>Current Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$70.4	N/A	169

<u>Estimated Price at Completion</u>	
<u>Contractor</u>	<u>Program Manager</u>
N/A	N/A

Previous Cumulative Variance
Cumulative Variance to Date
Net Change

<u>Cost Variance</u>	<u>Schedule Variance</u>
N/A	N/A
N/A	N/A
N/A	N/A

NOTE: Airframe Contract DAAK50-84-C-0004 is not reported because all aircraft have been delivered and the contract was completed within target cost.

CH-47D, December 31, 1986

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 66.7% (12 yrs/18 yrs)

(2) Percent Program Cost Appropriated: 56.6% (1739.4/3070.6)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Years (FY76-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance FYDP (FY89-92)</u>	<u>To Complete Beyond FYDP</u>	<u>Total</u>
RDT&E	113.5	-	-	-	113.5
Procurement	1887.9	237.4	831.8	-	2957.1
MILCON	-	-	-	-	-
Total	2001.4	237.4	831.8	-	3070.6

16. Program Funding Summary (Cont'd):
 (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 75 Base-Year Dollars		Then-Year Dollars			Escal Rate (%) <u>1/</u>	
		Flyaway		Total	Advance Proc			Total
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1976				10.2			11.3	8.7
1977				2.1			2.4	2.2
1977				19.9			25.8	8.1
1978				24.2			32.0	8.5
1979				13.9			19.1	7.7
1980				15.7			22.4	7.7
1981				.4			.5	7.7
Subtotal	3 <u>2/</u>			86.3			113.5	

Appropriation: Procurement

1980		6.3	7.7	15.5	5.3	.0	28.6	13.4
1981	9	8.1	55.9	79.0	8.5	5.3	159.3	10.8
1982	19	1.6	91.8	104.2	21.3	8.5	219.0	7.9
1983	24	1.4	99.0	107.4	58.9	21.3	247.4	3.1
1984	36	1.4	126.1	136.0	26.4	18.0	316.4	4.0
1985	48	.6	145.7	162.2	82.3	67.3	385.1	3.1
1986	48		111.7	113.5	110.6	54.3	270.1	4.1
1987	48		107.0	110.8	57.3	78.6	262.0	3.1
1988	48		94.4	97.2	63.6	83.7	237.4	3.5
1989	48		103.8	106.1	83.8	85.7	267.1	3.5
1990	48		96.9	107.0	59.7	60.9	276.7	3.3
1991	48		76.5	80.1	10.9	68.8	212.3	2.9
1992	12		24.0	27.9	.0	36.2	75.7	2.4
Subtotal	436	19.4	1140.5	1246.9	588.6	588.6	2957.1	
Total	439	19.4	1140.5	1333.2	588.6	588.6	3070.6	

16. Program Funding Summary (Cont'd):d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended <u>3/</u>

Appropriation: RDT&E

1976	11.3	11.3	11.3
1977	2.4	2.4	2.4
1977	25.8	25.8	25.8
1978	32.0	32.0	32.0
1979	19.1	19.1	19.1
1980	22.4	22.4	22.4
1981	.5	.5	.5
Total	113.5	113.5	113.5

Appropriation: Procurement

1980	28.6	28.6	28.6
1981	159.3	159.3	159.3
1982	219.0	219.0	219.0
1983	247.4	247.4	247.4
1984	316.4	316.4	296.8
1985	385.1	360.7	312.6
1986	270.1	269.0	74.5
1987	262.0	220.0	-
To Complete	1069.2	N/A	N/A
Total	2957.1	1820.4	1338.2

1/ Since spend-out rates are not shown, the escalation rates cannot be used to verify the composite indices.

2/ Cannot be identified to a specific fiscal year, as these prototypes were worked simultaneously.

3/ Represents disbursements.

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1980	N/A	N/A	N/A	N/A
1981	9	9	9	9
1982	19	19	19	19
1983	24	24	24	24
1984	36	36	36	36
1985	36	48	48	48
1986	36	48	48	60
1987	36	48	48	60
1988	36	48	48	60
1989	36	48	48	60
1990	36	48	48	60
1991	36	48	48	-
1992	21	12	12	-

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PDE)	Current Estimate	Variance (CE less Max Econ)	Maximum Economic
Prog Acq Cost (BY \$)	1325.1	+ 8.1	1333.2	+ 60.6	1272.6
(TY \$)	3224.4	-153.8	3070.6	+ 73.1	2997.5
PAUC (BY \$)	3.02	+ 0.2	3.04	+ .14	2.90
(TY \$)	7.35	- 0.36	6.99	+ .11	6.88

17. Production Rate Data (Cont'd):

CH-47D, December 31, 1986

c. Schedule Variance --

	Development Estimate	Variance (CE vs DE)	Current Estimate	Variance (CE vs Max Econ)	Maximum Economic
Start Date	10/81	N/A	10/81	NA	10/81
Duration	168	-33	135	+24	111
End Date	9/94	N/A	12/92	NA	12/90

d. Deliveries (Plan/Actual) --

RDT&E
Procurement

To-Date
3/3
144/145

18. Operating and Support Costs: N/A

57K-86-009

N-7 C/MH-53E

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(O&A)823)
PROGRAM: C/MH-53E

AS OF DATE: December 31, 1986

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CLEARED
FOR OPEN PUBLICATION
FEB 27 1987 22
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): CH-53E Heavy Transport/Assault Helicopter (Super Stallion); MH-53E Airborne Mine Countermeasures/Vertical Onboard Delivery (Sea Dragon)

2. DoD Component: U.S. Navy

3. Responsible Office and Telephone Number:

H-53E Program Office
Naval Air Systems Command
Washington, DC 20361-1261

Col E. R. Seiffert
Assigned: August 27, 1986
AV 222-3151; COMM (202) 692-3151

4. Program Elements/Procurement Line Items:

RDT&E: PE 64260N
PE 64714N

PROCUREMENT: AFW: 1506 ICN 0148
PE 24453N, PE 26122M, PE 24303N, PE 24156N

MILCON: PE 26496M

5. Related Programs: SH-60B LAMPS MK III Sea Hawk; Army UH-60A Black Hawk; Air Force HH-60D Night Hawk.

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6. Mission and Description: The CH-53E is a shipboard-compatible helicopter configured for the lift and movement of cargo and troops/passengers internally, the tactical recovery of downed or damaged aircraft, including self-retrieval, the lift of heavy bulky equipment and supplies by external suspension from the aircraft, and the towing of craft, vehicles and mine countermeasures devices. The CH-53E is similar to the basic CH-53D with the following exceptions: three T-64-GE-416 turbine engines versus two T-64-GE-413 turbine engines; 79 ft. versus 72 ft. main rotor diameter; 7 titanium spar versus 6 aluminum spar main rotor blades; 20 ft. versus 16 ft. tail rotor diameter and canted 20 degrees; 13,140 SHP versus 7,560 SHP main gearbox and 40 inch extension in the transition section of the fuselage. Full provisions (weight, space and plumbing) for external auxiliary fuel tanks, fuel jettison, air-to-air refueling, and ship-to-air refueling are included.

7. Program Highlights:

a. Significant Historical Developments -- SOR 14-20 of 1967 established the requirement for a heavy lift helicopter (HLH). In May 1973, a DSARC I decision approved the fabrication and test of two development prototypes (YCH-53E). First flight of the YCH-53E occurred in March 1974. DSARC IIA decision of 14 May 1975 approved the engineering development phase to include fabrication and test of two production prototypes and one static test article. First flight of the production prototype was in December 1975. A DSARC III was held in January 1978 which approved procurement of the first twenty of forty-nine CH-53E production aircraft. The contract delivery schedule to provide the initial aircraft in May 1980 was not met; the Navy provisionally accepted the first production model in December 1980. The FY 82 President's Budget increased total procurement from 49 to 126 aircraft including seven (7) CH-53E Airborne Mine Countermeasure capable aircraft that would replace the RH-53D losses. The FY 83 President's Budget increased production aircraft from 126 to 160 which included 25 additional AMCM capable aircraft designated MH-53E. Multiyear procurement for C/MH-53E was approved for FY 86 through FY 89 in the FY 85 DOD Appropriations Acts and includes 56 C/MH-53E's. First flight of the MH-53E development prototype occurred in September 1983, DT-IIB testing was completed June 1984, and OT-IIA testing was completed in July 1984. The CH-53E final phase of FOT&E was completed 3 July 1985. The MH-53E was approved for limited production (ALP) in March 1985. Techeval was completed for the MH-53E 8 November 1985.

b. Significant Developments Since Last Report --

The C/MH-53E multiyear procurement contract was definitized in September 1986 for the period FY 86 through FY 89. Estimated savings to the government is \$92.8M. Increased procurement quantities will be addressed in POM 90.

The MH-53E was approved for a second limited production (ALP) in November 1986.

The C/MH-53E is expected to meet all mission requirements approved in Decision Coordinating Paper #94.

c. Changes Since "As of Date" --

On 14 February 1987 the Navy restricted the H-53E helicopter from flight until an inspection is performed on a gear assembly in the main transmission. The inspection is being performed as a safety precaution after manufacturing defects were discovered in used assemblies during overhaul of the transmission at Sikorsky Aircraft.

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C/MH-53E, December 31, 1986

8. Decision Coordinating Paper (DCP) Threshold Breaches: Schedule threshold for Approval for Service Use breached DCP #94 dated February 14, 1978.

9. Schedule:

a. Milestones --

	Development Estimate/ <u>Approved Program</u>	<u>Current Estimate</u>
CH-53E		
Program Initiation	NA/NA	Jun 69
First Navy Flight Development Prototype #1	Mar 74/Mar 74	Mar 74
Milestone II (DSARC II)	Oct 74/Apr 75	Apr 75
IOT&E Complete	Feb 76/Jul 78	May 79
BIS Initial Report	Mar 76/Mar 77	Jul 77
DSARC	NA/Jan 78	Jan 78
Milestone III (DSARC III)	Mar 76/Jan 78	Jan 78
Navy Technical Evaluation	NA/Dec 77	Jan 78
Approval for Service Use (ASU)	NA/Sep 79	Apr 80
Acceptance First Production Aircraft	Jun 77/May 80	Dec 80
Fleet Introduction	Jul 77/Sep 80	Jun 81
FOT&E	NA/FY 80	Apr 83
BIS-FTP	NA/FY 80	Dec 82
IOC	NA/FY 81	FY 82
Navy Support Date	NA/FY 83	FY 83
MH-53E		
First Flt Development Prototype	NA/Oct 83	Sep 83
OPEVAL	NA/Mar 85	Apr 86
AFP	NA/Dec 85	Nov 87 CH-1
Acceptance First Production Aircraft	NA/Nov 86	Jun 86 CH-2

b. Previous Change Explanations --

DSARC II was delayed due to loss of one of the first two prototypes in ground accident. IOT&E, BIS Initial Report, and DSARC III were delayed due to restructured program to evaluate all RDT&E improvements and rescheduling testing. Naval Technical Evaluation was delayed due to change in completion. Approval for Service Use (ASU) was delayed due to additional testing requirements and a delay in administrative ASU processing. Acceptance First Production Aircraft and Fleet Introduction were initially delayed due to a change in aircraft procurement and delivery schedule. FOT&E was delayed due to various flight restrictions imposed on the aircraft which precluded testing. BIS-FTP was delayed due to change in completion date of a flight test expansion to resolve YAW oscillation anomaly. Acceptance of First Production Aircraft, Fleet Introduction, FOT&E, BIS-FTP, and IOC were further delayed based on a new production schedule reflecting a long-term labor strike in the aerospace bearing and forging industry and restructuring of initial aircraft utilization. OPEVAL extended because of weather, unplanned maintenance delays, and administrative problems with the contractor. Approval for Full Production was delayed because of extended OPEVAL.

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C/MH-53E, December 31, 1986

9. Schedule (Cont'd):

c. Current Change Explanations --

(CH-1) AFP extended 17 months because of extended OPEVAL and second ALP decision.

(CH-2) Accepted aircraft 5 months early to reflect revised development schedule.

d. References --

Development Estimate: Development Concept Paper (DCP) #94, dated 25 April 1973, subject "CH-53E Prototype Development Approval" as amended by Decision Coordinating Paper (DCP) #94, dated 14 February 1978, subject "CH-53E Production Approval."

Approved Program: FY 1988/89 President's Budget

10. Technical/Operational Characteristics:

a. Technical --	Dev Estimate/ Amdr Program	Demonstrated Performance	Current Estimate
Weight (lbs)			
Maximum Gross Weight (lbs)			
Weight Empty (lbs)	34,000/34,000	33,226	33,226
w/Ext Payload, HIGE SL/90°F	73,500/73,500	75,100	73,500
Dimensions (Spread/Folded configuration)			
Length	*99.0/60.3	99.5/60.5	99.5/60.5
Width	*79.0/29.4	79.0/28.5	79.0/28.5
Height	*28.4/18.6	28.4/18.7	28.4/18.7

*Dev estimate same as Approved Program

Engine Maximum SHP, Sea Level Static (10 min)	4380/4380	4380	4380
---	-----------	------	------

b. Operational --

Speed (KTS)			
Vmax (KTS Level FLT, MAX continuous power S.L.)			
1. 46.5K lbs GW (Internal Load)	170/170	176	170
2. 56K lbs GW (Internal Load)	140/140	170	140
3. 70K lbs GW (External Load)	100/100	125	100
Rate of Climb (ft/min) One Engine			
Inop @ 69,750 lbs GW	150/150	400	200

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C/MH-53E, December 31, 1986

10. Technical/Operational Characteristics (Cont'd):

	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Radius/Range (NM)			
Range (NM)			
Internal payload (1000 cu. ft. cargo, not to exceed gross weight limits) with full internal and full external aux fuel tanks (10% reserve)	550/500	560	500
Payload (lbs)			
Payload (lbs)			
External, 50 NM radius.	32,000/32,000	32,000	32,000
S/L90 F, HIGE (20 min. fuel reserve)			
3000' MSL 91.5 F, HIGE			
Internal Payload (10% reserve)	20,000/16,000	16,000	16,000
500 NM Range			
Reliability (%)			
Mission reliability 1 hr mission @ 90% confidence	.93/.88	.94	.93
Aircraft MFHBA (1 hour mission)	13.7/7.82	16.8	13.8
Aircraft MFHBF	.77/.70	.97	.70
Maintainability			
Aircraft MMH/PH (org. corrective)	8.0/9.50	7.72	9.50
Availability	.85/.85	.93	.93
AMCM (MH-53E)			
Tow Tension (x 1,000 lbs.)	N/A	30.0 CH-1	30.0
Time on Station (hrs.)	N/A	3.2 CH-2	3.2 CH-2

c. Previous Change Explanations --

Based on demonstrated performance the following technical/operational characteristics have been changed: rate of climb, mission reliability, MFHBA, availability, and weight empty.

d. Current Change Explanations --

(CH-1) Demonstrated during DT-II A through D
(CH-2) Demonstrated during OT-IIB

e. References --

Development Estimate: Development Concept Paper (DCP) #94, dated April 25, 1973, subject "CH-53E Prototype Development Approval": as amended by Decision Coordinating Paper (DCP) #94, dated February 14, 1978, subject "CH-53E Production Approval".

Approved Program: FY 1988/89 President's Budget

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C/MH-53E, December 31, 1986

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Changes	Current Estimate
Development (RDT&E)	\$ 93.3	\$ +104.4	\$ 197.7
Procurement	371.1	+746.6	1117.7
Airframe	(250.2)	(+472.7)	(722.9)
Engine	(46.9)	(+72.4)	(119.3)
Avionics	(5.4)	(+10.2)	(15.6)
Other GFE	(1.9)	(+7.9)	(9.8)
Total Flyaway	(304.4)	(+563.2)	(867.6)
Other Wpn Sys Cost	(29.4)	(+122.6)	(152.0)
Initial Spares	(37.3)	(+60.8)	(98.1)
Construction (MILCON)	=	+3.0	3.0
Total FY 73 Base-Year \$	464.4	+854.0	1318.4
Escalation	114.0	+1748.7	1862.7
Development RDT&E	(7.0)	(+121.6)	(128.6)
Procurement	(107.0)	(+1622.9)	(1729.9)
Construction (MILCON)	=	(+4.2)	(4.2)
Total Then-Year \$	\$578.4	\$+2602.7	\$3181.1
b. Quantities --			
Development (RDT&E)	4	-	4
Procurement	70	+83	153
Total	74	+83	157
c. Unit Cost --			
Procurement:			
FY 73 Base-Year \$	\$5.3	\$+2.0	\$7.3
Then-Year \$	6.8	+11.8	18.6
Program:			
FY 73 Base-Year \$	6.3	+2.1	8.4
Then-Year \$	\$7.8	\$+12.5	\$20.3
d. Approved Design to Cost Goal --			
	(Average Unit Flyaway Cost)		
	Dev Estimate/ Appr Program	Current Estimate	Latest Approved Threshold
@ Qty: 49			
@ Peak Rate: 2/Mo			
FY 78 Base-Year \$	(1)/8.4	8.0(2)	9.3
Then-Year \$	(1)/9.9	14.3(2)	-
(1) D.E. established as 4.4 FY 73 \$ and 5.6 TY \$ at DSARC II for 70 aircraft but DCP not approved until DSARC III, which established approved program and threshold in FY 78 \$.			
(2) C.E. based on 153 aircraft program.			
e. Foreign Military Sales -- None			
f. Nuclear Cost -- None			

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C/MH-538, December 31, 1986

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition --			
(1) Cost	3181.1	3299.0	3181.1
(2) Quantity	157	164	157
(3) Unit Cost	20.3	20.1	20.3
b. Current Procurement --	<u>FY 1987 Appropriation Act</u>		
	<u>(FY 1987)</u>	<u>(FY 1987)</u>	<u>(FY 1988)</u>
(1) Cost	239.7	239.7	255.0
Less CY Adv Proc*	-40.4	-40.4	-21.8
Plus FY Adv Proc*	<u>+30.5</u>	<u>+30.5</u>	<u>+46.5</u>
Net Total	229.8	229.8	279.7
(2) Quantity	14	14	14
(3) Unit Cost	16.4	16.4	20.0

*Advance procurement in FY 85-FY 88 reflects multiyear procurement FY 86-FY 89.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDY&E	PROC	MILCON	TOTAL
Development Estimate	100.3	478.1	0.0	578.4
Previous Changes:				
Economic	+6.1	-134.0	-	-127.9
Quantity	-	+2545.2	-	+2545.2
Schedule	+1.5	+63.9	-	+65.4
Engineering	+162.7	+294.6	-	+457.3
Estimating	+14.0	-846.2	-	-832.2
Other	+3.0	-	-	+3.0
Support	+18.6	+584.0	+7.2	+609.8
Subtotal	+205.9	+2507.5	+7.2	+2720.6
Current Changes:				
Economic	-0.7	-29.1	-	-29.8
Quantity	-	-239.0	-	-239.0
Estimating	+20.8	+114.5	-	+135.3
Support	-	+15.6	-	+15.6
Subtotal	+20.1	-138.0	+0.0	-117.9
Total Changes	+226.0	+2369.5	+7.2	+2602.7
Current Estimate	326.3	2847.6	7.2	3181.1

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13. Cost Variance Analysis (Cont'd)

(FY 1973 Constant Dollars (Base-Year) in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	93.3	371.1	-	464.4
Previous Changes:				
Quantity	-	+694.9	-	+694.9
Schedule	+1.6	+33.2	-	+34.8
Engineering	+77.1	+96.1	-	+173.2
Estimating	+5.5	-225.8	-	-220.3
Other	+2.4	-	-	+2.4
Support	+10.5	+177.8	+2.6	+190.9
Subtotal	+97.1	+776.2	+2.6	+875.9
Current Changes:				
Quantity	-	-56.0	-	-56.0
Estimating	+7.3	+20.8	+0.4	+28.5
Support	-	+5.6	-	+5.6
Subtotal	+7.3	-29.6	+0.4	-21.9
Total Changes	+104.4	+746.6	+3.0	+854.0
Current Estimate	197.7	1117.7	3.0	1318.4

b. Previous Change Explanations --

RD&E

Economic: Revised escalation rates.
 Schedule: Extend RD&E beyond FY 76 and restructure development effort.
 Engineering: Increased requirement for Transmission Development Program, development of Digital Automatic Flight Control System, completion of developmental derived improvements, completion of design improvements, and design and development of AMCM configurations, development of all composite main rotor blades to replace titanium spar blades.
 Estimating: Refinement of R&D estimates and revised estimates for development of Composite Main Rotor Blade.
 Other: Cost overrun and award of contract incentive.
 Support: Increase in BIS and OPEVAL support, first article of OFT visual system and peculiar training equipment, and support of AMCM design, development and test and evaluation.

Procurement

Economic: Revised escalation rates.
 Quantity: Reduction of 70 to 49 aircraft, increase from 49 to 126 aircraft, increase from 126 to 160 aircraft.
 Schedule: Production delay resulting from development stretchout and numerous production changes with net result of stretchout of procurement.
 Engineering: Design changes to airframe, increase in production non-recurring costs, AMCM configuration changes and tooling refurbishment, configuration change for Helicopter Night Vision System.
 Estimating: Revised production estimates based on past experience and new data from contractors, revised estimates in flyaway to reflect multiyear procurement new vendor airframe estimates, and adjustments for changes in prior year escalation rates.

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13. Cost Variance Analysis (Cont'd)

Support: Increased support requirements for PGSE, training and other support and spares due to aircraft quantity changes, revised estimates in support and spares for Helicopter Night Vision Systems.

MILCON

Support: Construction of composite trainer buildings.

c. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base Year \$</u>	<u>Then Year \$</u>
(1)	<u>RDT&E</u>		
	Revised Dec 86 economic escalation rates. (Economic)	N/A	-0.7
	Revised estimates for development of Composite Main Rotor Blade and MH-53E development adjustments (Estimating)	+7.3	+20.8
(2)	<u>Procurement</u>		
	Revised Dec 86 economic escalation rates. (Economic)	N/A	-29.1
	Reduction in aircraft quantities (Then-year net -134.7 for seven aircraft)		
	Reduction of seven aircraft in FY 90 (Quantity)	-56.0	-239.0
	Estimating change since initial quantity increase (Estimating)	+14.5	+104.3
	Replacement and refurbishment of aircraft tooling. Revised flyaway estimates projected as a result of recent MYP negotiations and adjustments for prior year escalation. (Estimating)	+6.3	+10.2
	Revised estimates for support and spares (Support)	+5.6	+15.6
(3)	<u>MILCON</u>		
	Revised estimate for adjustment in prior year escalation. (Estimating)	+0.4	+0.0

d. References --

Development Estimate: Development Concept Paper (DCP) #94, dated 25 April 1973, subject "CH-53E Prototype Development Approval".

Approved Program: Decision Coordinating Paper (DCP) #94, dated 14 February 1978 subject "CH-53E Production Approval."

Current Estimate: FY 1988/89 President's Budget

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14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate--

(1) Same as Current Baseline Estimate.

b. Current Baseline Estimate to Current Estimate--

PAUC (Dev Est)	<u>Changes</u>								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
7.8	-1.0	+10.6	+0.4	+2.9	-4.4	0.0	+4.0	+12.5	20.3

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E--

MH-53E Airframe:

Initial Contract Price
Target Ceiling Qty

Sikorsky Aircraft, Stratford, CT.
N00019-82-C-0127, CPA/IF,
Award: February 26, 1982
Definitized: February 26, 1982

\$37.6 N/A -

Current Contract Price
Target Ceiling Qty
\$60.9 N/A --

Estimated Price At Completion
Contractor Program Manager
\$61.8 61.3

Previous Cumulative Variances
Cumulative Variances to Date (11/30/86)
Net Change

Cost Variance Schedule Variance
-3.9 -1.4
-6.3 -.6
-2.4 +.8

Explanation of Change: Current cost and schedule variances
are not significant.

b. Procurement --

Airframe:

Initial Contract Price
Target Ceiling Qty

Sikorsky Aircraft, Stratford, CT.
N00019-83-C-0308/FFP
Award: May 24, 1984
Definitized: March 30, 1986

\$105.0 N/A 10.0

Current Contract Price
Target Ceiling Qty
\$109.5 N/A 10.0

Estimated Price at Completion
Contractor Program Manager
\$111.0 \$111.0

FFP Contract - no variance analysis required

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15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
Sikorsky Aircraft, Stratford, CT.					
NO0019-85-C-0066/MYP/FFP	\$644.2	N/A	56.0		
Award: April 30, 1985					
Definitized: September 30, 1986					
Current Contract Price			Estimated Price at Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$644.2	N/A	56.0	\$644.2	\$644.2	

FFP Contract - no variance analysis required

<u>Engine</u>			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
General Electric Co., West Lynn, MA,					
F33657-82-C-0017/FFP	66.5	N/A	101.0		
Award: June 19, 1984					
Definitized: January 15, 1985					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$66.5	N/A	101.0	66.5	66.5	

FFP Contract - No variance analysis required

			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
General Electric Co., West Lynn, MA.					
NO0019-84-C-0158/FFP	\$81.6	N/A	121.0		
Award: July 31, 1986					
Definitized: December 31, 1986					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$81.6	N/A	121.0	\$81.6	\$81.6	

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 75.0% (15 yrs/20 yrs)
- (2) Percent Program Cost Appropriated: 76.5% (\$2432.4/\$3181.1)

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY 73-87)	Budget Year (FY88)	Balance to Complete FYDP (FY89-92)	Beyond FYDP	Total
RDT&E	253.7	20.1	52.5	-	326.3
Procurement	2174.5	255.0	418.1	-	2847.6
MILCON	4.2	3.0	-	-	7.2
Total	2432.4	278.1	470.6		3181.1

c. Annual Summary --

Fiscal Year	Qty	FY 73 Base-Year Dollars			Then-Year Dollars			Escl Rate(%)
		Flyaway		TOTAL	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1973			14.0			14.6	4.4
1974	2		26.8			30.3	8.0
1975	2		38.2			47.0	10.9
1976			9.6			12.5	6.6
1977			16.0			21.7	2.9
1977			8.6			11.9	2.6
1978			13.6			20.4	6.8
1979			0.2			0.4	8.4
1980			7.9			14.5	10.5
1981			4.7			9.4	10.6
1982			5.8			12.1	7.6
1983			6.9			15.2	4.9
1984			12.6			28.7	3.8
1985			4.9			11.5	3.4
1986			0.8			1.9	2.9
1987			0.6			1.6	3.1
1988			7.8			20.1	3.5
1989			3.4			9.2	3.5
1990			5.1			14.0	3.3
1991			5.1			14.5	2.9
1992			5.1			14.8	2.4
Subtotal	4		197.7			326.3	--

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16. Program Funding Summary (Cont'd) (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 73 Base-Year Dollars			Then-Year Dollars			Escl Rate(%)
		Flyaway			Advance Proc			
		Nonrec	Rec	Total	Debit	Credit	Total	

Appropriation: Procurement

1977	6	23.6	47.8	74.7	0.0	0.0	120.8	3.8
1978	0	0.0	0.0	0.0	0.0	0.0	0.0	6.8
1979	14	1.9	76.0	104.0	2.4	0.0	190.4	8.7
1980	13	0.0	82.5	104.8	1.9	2.4	211.0	11.8
1981	14	0.0	80.7	99.1	1.7	1.9	222.6	11.6
1982	14	0.0	71.8	91.3	6.5	1.7	227.7	14.3
1983	11	5.3	56.4	87.9	7.3	6.5	229.0	9.0
1984	11	2.2	51.7	73.7	9.3	7.3	202.0	8.0
1985	10	11.9	47.7	81.3	39.8	9.3	256.7	3.4
1986	14	1.0	69.1	87.7	42.8	20.0	274.6	2.9
1987	14	0.8	62.9	77.3	40.4	30.5	239.7	3.1
1988	14	2.9	67.4	91.0	21.8	46.5	255.0	3.5
1989	14	2.3	66.2	81.3	9.6	47.8	218.9	3.5
1990	4	3.8	27.2	43.0	0.0	9.6	130.6	3.3
1991	0	3.0	0.0	14.6	0.0	0.0	48.6	2.9
1992	0	1.5	0.0	6.0	0.0	0.0	20.0	2.4
Subtotal	153	60.2	807.4	1117.7	183.5	183.5	2847.6	--

Appropriation: MILCON

1983				0.4			0.8	4.9
1984				0.0			0.0	3.8
1985				0.0			0.0	3.4
1986				1.4			3.4	2.9
1987				0.0			0.0	3.1
1988				1.2			3.0	3.5
Subtotal				3.0			7.2	
Total	157			1318.4			3181.1	

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16. Program Funding Summary (Cont'd)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		Expended
	Total	Obligated	

Appropriation: RDT&E

1973	14.6	14.6	14.6
1974	30.3	30.3	30.3
1975	47.0	47.0	47.0
1976	12.5	12.5	12.5
1977	21.7	21.7	21.7
1977	11.9	11.9	11.9
1978	20.4	20.4	20.4
1979	0.4	0.4	0.4
1980	14.5	14.5	13.6
1981	9.4	9.4	8.9
1982	12.1	12.1	11.7
1983	15.2	15.2	14.6
1984	28.7	28.7	28.1
1985	11.5	11.5	10.6
1986	2.0	2.0	0.8
1987	1.6	1.2	0.0
To Complete	72.6	N/A	0.0
Subtotal	326.3	253.4	247.1

Appropriation: Procurement

1977	120.8	120.8	119.1
1978	0.0	0.0	0.0
1979	190.4	190.3	189.6
1980	211.0	210.9	206.7
1981	222.6	222.6	222.1
1982	227.7	227.1	217.6
1983	229.0	227.9	213.8
1984	202.0	195.9	174.6
1985	256.7	227.2	182.9
1986	274.6	227.3	188.1
1987	239.7	197.7	20.1
To Complete	673.1	N/A	N/A
Subtotal	2847.6	2047.7	1734.6

Appropriation: MILCON

1983	0.8	0.8	0.8
1984	0.0	0.0	0.0
1985	0.0	0.0	0.0
1986	3.4	0.0	0.0
1987	0.0	0.0	0.0
To Complete	3.0	N/A	N/A
Subtotal	7.2	0.8	0.8
Total	3181.1	2301.9	1982.5

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17. Production Rate Data:

a. Annual Production Rates -- (NOTE: The Maximum Economic Production Rate was not attained until August 1978 and substained at two per month until program completion.)

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1976	5			
1977	10	6	6	
1978	18	0	0	10
1979	20	14	14	24
1980	17	15	13	24
1981		14	14	24
1982			14	24
1983			11	24
1984			11	23
1985			10	
1986			14	
1987			14	
1988			14	
1989			14	
1990			4	

b. Cost Variance -- Dollars in Millions (NOTE: Subject to limitations on production rates above.)

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	476.0	+842.4	1318.4	+100.1	1218.3
(TY \$)	768.5	+2412.6	3181.1	+660.9	2520.2
PAUC (BY \$)	9.0	-0.6	8.4	+0.6	7.8
(TY \$)	14.5	+5.8	20.3	+4.2	16.1

c. Schedule Variance -- (NOTE: Subject to limitations on production rates above.)

	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum Economic
Start Date (Mo/Yr)	2/78	NA	2/78	0	2/78
Duration (in months)	44	101	145	+65	80
End Date (Mo/Yr)	9/81	NA	2/90	+65	9/84

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17. Production Rate Data (Cont'd):

d. Deliveries (Plan/Actual) --

RDT&E
Procurement

To Date
4/3*
99/99

*R&D prototype #1 lost in accident prior to delivery.

18. Operating and Support Costs: N/A

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A-7 COPPERHEAD

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DA'S SUBMISSION TO OSI
DATE 3 FEB 1997

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

PROGRAM: COPPERHEAD

AS OF DATE: December 31, 1986

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~~AS MARKED~~

1. (U) Designation/Nomenclature (Popular Name): M712/155MM Cannon Launched Guided Projectile (Copperhead)

2. (U) DoD Component: Department of the Army

3. (U) Responsible Office and Telephone Number:

Cannon Artillery Weapons Systems/
Joint Project Manager, Guided
Projectiles
Armament Research Center
Dover, New Jersey

PM: COL Joseph R. Cote

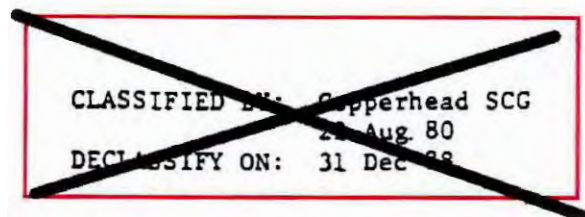
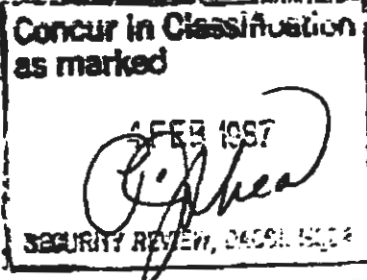
Assigned: July 1985

Autovon: 880-2572

4. (U) Program Elements:

RDTE: PE 64621 Project D073 (sunk)
Procurement: APPN 2034 SSN E67601

5. (U) Related Programs: Ground Laser Designator Program, Remotely Piloted Vehicle Program, AHIP, AH64 Designator and the Navy 5 Inch Guided Projectile Program



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QJSE/PA DCCIS. 87-0391-

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6. (U) Mission and Description: The 155mm Cannon Launched Guided Projectile Copperhead (CLGP) is an artillery projectile with terminal homing capability. It is compatible with current developmental 155mm Howitzers and uses standard propelling charges. This projectile is employed in indirect fire by 155mm (M198 and M109) units to destroy or neutralize moving and stationary hard-point targets such as armored and mechanized vehicles and field fortifications. Point targets illuminated with either a ground or airborne laser which will provide reflective energy to enable the projectile to home in on the target. The CLGP is included in the basic ammunition loads of appropriate field artillery units. The basic designator for the CLGP is the Ground Locator Laser Designator (GLLD) and the performance characteristics stated in the SAR relate to operation with that equipment. However, designation by other systems is envisioned, e.g., Remotely Piloted Vehicles, Airborne Designator, etc.). Designator developments are being accomplished under separate programs.

7. (U) Program Highlights:

a. (U) Significant Historical Developments - - The 155mm Cannon Launched Guided Projectile was formally assigned to the Project Manager, Cannon Artillery Weapons systems on 22 February 1971. Martin Marietta Aerospace and Texas Instruments Incorporated were selected in February 1972 for participation in Advanced Development (AD). The two contractors were authorized to enter into the Validation Phase of Advanced Development with different design concepts in September 1973. During the Validation Phase, each contractor built twelve projectiles for operational demonstration testing at White Sands Missile Range. DSARC II was held on 19 June 1975 resulting in authorization to enter Full Scale Engineering Development. Martin Marietta was awarded an Engineering Development Contract on 25 July 1975. DSARC III was held on 6 November 1979. Approval was received to enter production at a rate not to exceed 200 units per month until a threshold reliability of 0.8 had been demonstrated based on production validation test firings. Subsequently, OSD approved a request to substitute Lot Acceptance Test results as a more appropriate demonstration of COPPERHEAD Production Reliability in lieu of 75 round point estimate demonstration. The designator for COPPERHEAD is the Ground Laser Locator Designator (GLLD). The GLLD, managed by PM, HELLFIRE, was type classified in March 1979. Both the GLLD and COPPERHEAD were fielded concurrently in Jul 82 using a single Materiel Fielding Team. The First Unit Equipped (FUE) with COPPERHEAD/GLLDs was the 1st Battalion of the 73rd FA brigade at Ft. Bragg, North Carolina. COPPERHEAD/GLLD training at Ft. Bragg was completed in Aug 82. All required actions for the full release of COPPERHEAD were completed in July 1982 at which time the 1st Battalion 73rd FA Brigade became the first unit equipped with COPPERHEAD. The formal Full Release documentation was signed August 5, 1982.

b. (U) Significant Developments Since Last Report - - 3192 COPPERHEAD Projectiles were delivered by the contractor in the year ending 31 December 1985. Total delivery to date is 13687.

(1) (U) System weighted reliability is 93.2% based on 1986 calendar year Lot Acceptance Testing. The projectile reliability is defined as the probability that the projectile will function properly from the time of launch until it intercepts and impacts the target with the required accuracy. Cumulative reliability (pt. estimate) since LAT tracking began in July 1982 is 84%.

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(2) (U) Copperhead field firings confirm the Lot Acceptance Test results with a cumulative reliability (pt. estimate) since 1982 of 86.3%. The COPPERHEAD Projectile is expected to meet mission requirements.

(3) (U) Copperhead is also being utilized in on-going Aquila and RPY OT II.

c. (U) Changes Since "As Of" Date - - None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: None

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9. (U) <u>Schedule</u>	<u>Develop Estimate/ Approved Program</u>	<u>Current Estimate</u>
a. (U) Milestones		
(U) Award ED Contract	Jul 75/Jun 75	Jul 75
(U) Engineering Design Tests		
(1) Baseline Flight Test		
(A) Start	Apr 76/Mar 77	Mar 77
(B) Complete	Sep 76/Jul 78	Jul 78
(2) Safety/Warhead Fuze Qual		
(A) Start	Nov 76/Nov 76	Nov 76
(B) Complete	Mar 77/Nov 79	Jan 79
(3) System Qualification		
(A) Start	Oct 76/Apr 78	Apr 78
(B) Complete	Mar 77/Jan 79	Jan 79
(U) DT II/OT II		
(1) Start (DT II)	Jul 77/Mar 78	Mar 78
(OT II)	Sep 77/Feb 79	Feb 79
(2) Complete (DT II)	Jun 78/Dec 79	Dec 79
(OT II)	Nov 77/Jun 79	Jun 79
(U) Milestone IIIa (ASARC)	Feb 78/Sep 79	Sep 79
(DSARC)	(Feb 78/Nov 79)	Nov 79
(U) Initial Prod Deliveries	Mar 79/Oct 81	Oct 81
(U) Prod Validation Test		
(1) Start	Mar 79/Nov 81	Nov 81
(2) Complete	Aug 79/Aug 82	Aug 82
(U) Second Source Procurement	Nov 79/N/A	N/A
(U) Milestone IIIb (ASARC/DSARC)	Nov 79/N/A	N/A
(U) Initial Oper Capability (IOC)	Nov 79/Dec 82	Dec 82
b. (U) Previous Change Explanations - -		

The difference in schedule milestones is due to:
 restructuring of the program following congressional cuts in
 FY76 and FY77; correction of hardware deficiencies; delay
 in authority to obligate FY78 funds; problems in converting from
 hybrid to Large Scale Integrated Circuitry manufacture, design
 fixes of control actuating system problems; partial
 stop work order issues to the contractor on 11 Jul 78 to allow
 time to resolve technical problems and increase reliability of
 projectiles in subsequent tests; delay of DSARC (Milestone III)
 from Feb 78 to Nov 79; extended production lead times for critical
 components; DSARC III decisions; extended negotiations with con-
 tractor and subsequent delay in first year production contract
 award; late prove-out of production facility IPF rounds; correction
 of manufacturing difficulties discovered in IPF prove-out; problems
 in fabricating components and subassemblies causing the contractor
 to slip one month in the projectiles for FAT/IPF, resulting in a
 delay in IPT completion. Scheduling difficulties at WSMR caused an
 additional month's slippage in Production Validation Test comple-
 tion, and the combined COPPERHEAD/GLLD Systems' IOC was reforecasted
 based on the availability of GLLDs.

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c. (U) Current Change Explanations - -

None

d. (U) References - -

Developmental Estimate: DCP No. 119 dated Sep 1975

Approved Program: SDDM dated 15 Dec 1979

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10. (U) Technical/Operational Characteristics:

a. (U) Technical —	Dev Estimate/ Appr Program	Demonstrated Performance	Current Estimate
(U) Projectile Weight (lbs)	96-150/138	137.7	138
(U) Projectile Length (in) <u>3</u> /	43.5-68.0/62.6	62.4	62.6
(U) Warhead Weight (lbs)	28-54/54.2	54.2	54.2
(U) Explosive Weight (lbs)	71.1-137.2/137.7	137.7	137.7
(U) Projectile Weight (kg)	49.6/48.8	48.8	48.8
(U) Projectile Length (cm)	22.5/22.1	22.1	22.1
(U) Warhead Weight (kg)	14.0/14.0	14.0	14.0
(U) Explosive Weight (kg)	6.4/6.4	6.4	6.4

(b)(1)

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d. (U) Current Change Explanations - - None

e. (U) References - -

Development Estimate: DCP No. 119 dated September 1975

Approved Program: FY 88/89 President's Budget

FOOTNOTES:

- 1/ (U) Projectile Effectiveness P(E), is defined as: (Probability of a Reliable Round) x (Probability of a Hit, Given a Reliable Round), x (Probability of a Kill (M or F), Given a Hit, with a reliable round).
- 2/ (U) The Single Shot Kill Probability (SSKP) - The SSKP is calculated at: $SSKP = P(L) \times P(E) \times P(D)$ where P(L) = Operational Probability of Proper Launch, P(E) = Projectile Effectiveness, and P(D) = Operational Probability of Proper Designation.
- 3/ (U) Latest approved Materiel Need changes Projectile length to 54.5 in/ 138.4 cm.
- 4/ (U) P(D) and P(L) could not be determined from data collected during OT II. DT II provided instrumental data which resulted in the values stated.
- 5/ (U) The SSKP against a specified target and all other known potential targets exceeds the required minimum.

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11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. (U) Cost - -	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
Development (RDT&E)	109.3	+25.3	134.6
Procurement	738	+ 6.7	744.7
Total Flyaway	(731.6)	(-1.8)	(729.8)
Other Wpn Sys Cost	(6.4)	(+8.5)	(14.9)
Total: Const FY75 \$	847.3	+32.0	879.3
Escalation	393.4	(+388.3)	781.7
Development	(8.9)	(+6.9)	(15.8)
Procurement	(384.5)	(+381.3)	(765.9)
Total Then-Year \$	<u>1240.7</u>	<u>+420.3</u>	<u>1661.0</u>
b. (U) Quantities - -			
Development	408	-88	320
Procurement	132650	-93449	39201
Total	<u>133058</u>	<u>-93537</u>	<u>39521</u>
c. (U) Unit Cost - -			
Procurement:			
FY75 Base-Year	.0056	+.0134	.0190
Then-Year \$	.0085	+0.030	.0385
Program:			
FY75 Base-Year \$	.0064	+.0182	.0225
Then-Year \$	.0093	+.0307	.0420
d. (U) Approved Design to Cost Goal - -			

(Average Unit Flyaway Cost)		
<u>Dev Estimate/ Appr Program</u>	<u>Current Estimate</u>	<u>Latest Approved Threshold</u>

@ Qty:			
@ Peak Rate: 3000/mo			
FY75 Base-Year \$	.0055/.0186	.0186	.0225
Then-Year \$	.0082/.0385	.0385	.0490

e. (U) Foreign Military Sales - - Sales to date total 25 projectiles to Japan (all fired in test).

f. (U) Nuclear Costs - - None

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12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	Current Year Current Est Dec 86 SAR	UCR Baseline Dec 85 SAR	Budget Year UCR Baseline Dec 86 SAR
a. (U) Program Acquisition			
(1) Cost	1661.0	1420.6	1661.0
(2) Quantity	39521	32164	39521
(3) Unit Cost	.0420	.0442	.0420
b. (U) Current Procurement	(FY87)	(FY87 APPN) 1/	(FY88)
(1) Cost	17.9	18.2	100.6
Less CY Adv Proc	-	-	-
Plus PY Adv Proc	-	-	-
Net Total	17.9	18.2	100.6
(2) Quantity	300	305	2771
(3) Unit Cost	.0597	.060	.0363

1/ (U) IAW FY87 DOD Authorization Act, CPUC Baseline SAR value adjusted to reflect actual appropriation under FY87 Appropriation Act. An additional \$10M for developing a second source was added to the \$8.2M in the FY87 budget due to a Congressional act.

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13. (U) Cost Variance Analysis:

A. SUMMARY--(CURRENT (THEN YEAR) DOLLARS IN MILLIONS)

	RDTE	PROC	MILCON	TOTAL
DEVELOPMENT ESTIMATE	118.2	1122.5	-	1240.7
PREVIOUS CHANGES:				
ECONOMIC	-4.2	79.6	-	75.4
QUANTITY	-2.2	-688.8	-	-691.0
SCHEDULE	-9.6	280.3	-	270.7
ENGINEERING	25.5	1.3	-	26.8
ESTIMATING	6.5	470.5	-	477.0
OTHER	6.3		-	6.3
SUPPORT	10.0	4.7	-	14.7
SUBTOTAL	32.3	147.6	-	179.9
CURRENT CHANGES				
ECONOMIC		-24.3	-	-24.3
QUANTITY		71.8	-	71.8
SCHEDULE		60.0	-	60.0
ENGINEERING			-	0.0
ESTIMATING		132.9	-	132.9
OTHER			-	0.0
SUPPORT			-	0.0
SUBTOTAL	0.0	240.4	-	240.4
TOTAL CHANGES	32.3	388.0	-	420.3
CURRENT ESTIMATE	150.5	1510.5	-	1661.0

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13. (U) Cost Variance Analysis: (Cont'd) (FY75 CONSTANT (BASE YEAR) DOLLARS IN MILLIONS)

	RDTE	PRDC	MILCON	TOTAL
DEVELOPMENT ESTIMATE	109.3	738.0	-	847.3
PREVIOUS CHANGES:				
QUANTITY	-1.7	-452.9	-	-454.6
SCHEDULE	-8.8	134.8	-	126.0
ENGINEERING	15.4	0.8	-	16.2
ESTIMATING	7.8	215.6	-	223.4
OTHER	4.6		-	4.6
SUPPORT	8.0	2.9	-	10.9
SUBTOTAL	25.3	-98.8	-	-73.5
CURRENT CHANGES				
QUANTITY		44.0	-	44.0
SCHEDULE		23.4	-	23.4
ENGINEERING			-	0.0
ESTIMATING		38.1	-	38.1
OTHER			-	0.0
SUPPORT			-	0.0
SUBTOTAL	0.0	105.5	-	105.5
TOTAL CHANGES	25.3	6.7	-	32.0
CURRENT ESTIMATE	134.6	744.7	-	879.3

b. (U) Previous Change Explanations - -

() RDT&E

Economic: application of revised indices

Quantity: reduction of ED units to be manufactured to off-set contractor cost growth

Schedule: congressional reduction of FY76/77 funding and budget shortfall in FY78-80; OSD decrement to FY78 program and FY78 funding delay

Engineering: resolution of technical problems discovered during baseline firings and during fabrication and firings of DT II projectiles; establishment of backup/alternate designs for the fuze and components; enhanced warhead PIP; and DT II fixes

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13.b (U) Cost Variance Analysis (Cont'd):

- Estimating: additional DT III testing; Increased budgets to finance Congressional directed TDP validation; change from RDTE funded DT/OT to PAA funded PVT/FOE; Prior year programs adjusted to reflect actual costs; Elimination of 4th DTUPC award fee; deletion of \$.6M in FY82 and \$2.1M in FY83 for warhead enhancement
- Other: reprogrammed from M198 Howitzer and Ammunition Compatibility Program FY78\$ to fund a portion of ED contract cost growth due to technical problems FY78/79; provision for final DTUPC award fee
- Support: increased program in FY78 to include 8" CLGP and Army/Navy testing. (subsequently, this requirement was waived and funds reprogrammed have been utilized for basic program requirement).

(U) Procurement

- Economic: application of revised indices
- Quantity: reduction in quantity from 132,650 to 44,386 and approved quantity from 44,386 to 44,666 for FAT/IPT; elimination of FY83-87 buys (3671 rds); recomputation of quantity change after re-institution of program and reduction of 134 rounds from Sep 83 SAR due to constrained funding
- Schedule: elimination of educational buy and schedule adjustment; revised procurement strategy and additional escalation due to slip in targeted type classification data and budget constraints in FY80-83; stretchout of IPF contract and expand prove-out requirements; production cost increased because shared procurement plan was eliminated and unit cost estimate for projectiles was revised; increased costs due to budget constraints FY83-86 and subsequent stretchout of program; schedule adjustment required due to de-scoping FY80 contracts; FY83-87 program revised for economical rate production; finalized negotiations did not obtain full anticipated quantities, remaining quantities were not forecasted in FY84-87 and budget year quantities were shifted to provide an executable profile; change in delivery quantities for FY83 (from 5200 to 1100) and FY84 (from 7629 to 1414); recomputation of incorrect quantity change categorization.
- Estimating: revised production concept requires additional facilities/tooling; change from RDTE funded DT/OT II to PAA funded PVT/FOE; revised estimate of costs to complete based on increased costs in FY80 contract; prior year reprogramming to test IPF prove-out rounds; estimating change due to decrements resulting from a directed change in methodology for inflation computation and projected efficiencies from the use of the Ammunition Working Capital Fund; \$7.9M in FY81 funds were reprogrammed to partly cover FY81 cost growth; FY84-87 adjusted to reflect a viable program based on the contractor's proposal; reprogramming of

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13.b (U) Cost Variance Analysis (Cont'd):

\$5.4M FY80 and \$5.0M FY81 funds to partially cover contractor cost growth under Buys 1 and 2; increase in FY82 procurement funding; reprogrammed FY83 from \$15M to \$55M and \$75M stand alone funding for FY84 program. Re-estimation of procurement costs due to production rate change.

Support: Ancillary equipment for artillery battalions (M804 training round, extractors)

c. (U) Current Change Explanations --

	(Dollars in Millions)	
	FY75 Base-Year	Current Then-Year
(1)(U) <u>Development</u>	—	—
(2)(U) <u>Procurement</u>		
o Revised Dec 86 inflation indices (Economic)	—	-24.3
o Addition of 7357 projectiles <u>1/</u>	+105.5	+264.7
o Added quantity (Quantity)	(+44.0)	(+71.8)
o Final procurement in FY92 rather than FY89 (Schedule)	(+23.4)	(+60.0)
o Revised estimates (Estimating)	(+38.1)	(+132.9)

d. (U) References -- Development Estimate: DCP #119, dated Sep 75

1/Additional quantities do not include SDAF program requirements.

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14. (U) Program Acquisition Unit Cost (PAUC) History:

a. (U) Initial SAR estimate to Current Estimate

PAUC (Initial SAR Est)	Changes (Current (Then Year) Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
.0093	+.0013	+.0064	+.0084	+.0007	+.0154	+.0004	+.0001	+.0327	.0420

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E - None

(b)(4)



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16. (U) Program Funding Summary: (Current Estimate in Millions of Dollar)

a. (U) Program Status - -

(1) Percent Program Completed: 16/21 (76.2%)

(2) Percent Program Cost Appropriated: \$951.4/1661.0 (57.2%)

b. (U) Appropriation Summary - -

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY71-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Complete Beyond FYDP (FY93)</u>	<u>Total</u>
ROT&E	150.5	-	-	-	150.5
Procurement	969.3	100.6	440.6	-	1510.5
MILCON	-	-	-	-	-
Total	<u>1119.8</u>	<u>100.6</u>	<u>440.6</u>	<u>-</u>	<u>1661.0</u>

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. (U) Annual Summary - -

Fiscal Year	Qty	FY75 Base-Year Dollars			Then-Year Dollars		Esc1
		Flyaway		Total	Advance Proc	Total	
		Nonrec	Rec				Rate (%)

Appropriation: RDT&E

FY71				2.1		1.6	3.8
FY72				9.1		7.3	4.2
FY73				9.6		8	5.8
FY74	24			6.2		5.6	8.8
FY75				6.1		6.1	6.6
FY76				13.1		17	3.5
FY77				36.5		38	3.8
FY78				30		36	6.8
FY79	296			11.5		15	8.4
FY80				6.2		9	9.4
FY81				2.6		4.2	11.9
FY82				1.6		2.7	7.6
FY83				0		0	4.9
FY84				0		0	4.3
Subtotal	320	0	0	134.6		150.5	

Appropriation: Procurement 1/

FY78		22.2		22.2		27.2	6.6
FY79		15.9	1.5	17.4		23.2	3.7
FY80	1114		52.4	52.4		75.5	6.7
FY81	2624		79.9	79.9		130.4	10.1
FY82	3957		96.7	96.7		154.5	12.2
FY83	1220		27.1	27.1		55.0	4.5
FY84	1580		34.7	34.7		73.7	3.4
FY85	5250		93.0	93.0		200.4	3.8
FY86	5625		93.3	93.3		210.1	3.7
FY87	300		3.1	3.1		17.9	2.9
FY88	2771		44.1	44.1		100.6	3.6
FY89	2959		45.0	45.0		105.6	3.6
FY90	4343		53.5	53.5		129.2	3.5
FY91	4343		48.4	48.4		110.1	3.3
FY92	3115		33.3	33.3		65.2	2.1
Subtotal	39201	38.1	706.6	744.7		1517.5	

Total 39521 38.1 706.6 879.3 1661.0

1/ FY85 and prior quantities and dollars do not agree with the FY88 FYDP because of a previous data discrepancy in posting deliveries.

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16. (U) Program Funding Summary (Cont'd):

d. (U) Obligations and Expenditures - -

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

FY71	1.6	1.6	1.6
FY72	7.3	7.3	7.3
FY73	8	8	8
FY74	5.6	5.6	5.6
FY75	6.1	6.1	6.1
FY76	17	17	17
FY77	38	38	38
FY78	36	36	36
FY79	15	15	15
FY80	9	9	9
FY81	4.2	4.2	4.2
FY82	2.7	2.7	2.7
FY83	0	0	0
FY84	0	0	0
Total	150.5	150.5	150.5

Appropriation: Procurement

FY78	27.2	26.7	26.7
FY79	23.2	22.3	22.3
FY80	76.5	75.9	75.9
FY81	130.4	129.9	129.9
FY82	154.5	154.5	153.7
FY83	55.0	55.0	50.2
FY84	73.7	73.7	72.1
FY85	200.8	194.5	98.7
FY86	210.1	119.9	0.4
FY87	17.9		
FY88	100.6		
FY89	105.6		
FY90	129.2		
FY91	119.8		
FY92	86.0		
Total	1510.5	852.4	629.9

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17. (U) Production Rate Data

a. (U) Annual Production Rates:

Fiscal Yr	Production Rates/(Quantity/Year)			
	Dev Est	Prod Est	Current Estimate	Maximum Economic
78	7125			
79	3636			
80	9600	2100	1114	1114
81	21200	4300	2624	2624
82	24000	3900	3957	3957
83	36000	8400	1220	1220
84	31090	8400	1580	1580
85		8400	5250	5250
86		8886	5625	5625
87			300 ¹ / ₂	300 ¹ / ₂
88			2771	2771
89			2959	2959
90			4343	4343
91			4343	4343
92			3115	3115

¹/₂ USMC acquisition and/or combining of FY86/FY87 quantities should allow contractor to maintain production rate.

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17. (U) Production Rate Data (Cont'd)

b. (U) Cost Variance - - Dollars in Millions

Item	Prod Est	Variance (CE less PdE)	Current Est	Variance (CE less Max)	Max Econ
Prog Acq Cost					
BY \$	618.3	+261.0	879.3	-0-	879.3
TY \$	1114.9	+546.1	1661.0	-0-	1661.0
PAUC BY \$	.0139	+0.0083	.0225	-0-	.0225
TY \$	.0249	+0.0171	.0420	-0-	0.0420

c. (U) Schedule Variance - -

	Prod Est	Variance (CE less PdE)	Current Est	Variance (CE vs Max)	Max Econ
Start Date (mo/yr)	3/78	+33	12/80	N/A	12/80
Duration (months)	80	+71	151	-0-	151
End Date (mo/yr)	11/84	+104	7/93	N/A	7/93

d. (U) Deliveries (Plan/Actual) - -

RDT&E To Date
 320/320
 Procurement 15745/15745

18. (U) Operating and Support Costs: N/A

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SAR-86-080

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: DCS III (SPACE SEGMENT)

AS OF DATE: December 31, 1986

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 DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (OASD-PA)
 DEPARTMENT OF DEFENSE
 10

1.(U) Designation and Nomenclature (Popular Name): Defense Satellite Communications System Phase III/Super High Frequency (SHF) Space Segment (DCS III)

2.(U) DoD Component: U.S. Air Force

3.(U) Responsible Office and Telephone Number:

DCS Program Office
 Space Division
 Los Angeles AFS, CA 90009-2949

Colonel Glenn D. Rogers
 Assigned: June 13, 1986
 AV 833-2096; COMM (213) 643-2096

4.(U) Program Elements/Procurement Line Items:

RDT&E: PE 33110F (Shared funding)

PROCUREMENT: APPN 3020 ICN MS0777 (Shared funding)

5.(U) Related Programs: Air Force Satellite Communications Program (AFSATCOM), Space Boosters Program, Space Shuttle Operations Program, DoD and NASA Space Transportation System (STS) Programs, Communication Security Program.

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DSCS III, December 31, 1986

6.(U) Mission and Description: The Defense Satellite Communications System (DSCS III) provides super high frequency satellite communications for secure voice and high data rate transmissions. DSCS supports unique and vital national security requirements for worldwide military command and control, crisis management, wideband data relay, treaty monitoring and surveillance information, diplomatic and Presidential traffic. Operational DSCS III satellites will replace DSCS II satellites on a replenishment basis as the DSCS II satellites reach the end of their orbital lifetimes. DSCS III satellites operate in the 7/8 GHz frequency band from synchronous equatorial orbital positions. Four active satellites and two on-orbit spares will maintain the DSCS Space Segment at near 100% availability. Five active satellites and two on-orbit spares have been directed.

(b)(1)



b.(U) Significant Developments Since Last Report -- Storage and reactivation requirements continue due to Shuttle and Titan 34D launch vehicle failures. Attainment of a compatible launch configuration with the Titan IV as a back up launch vehicle has been directed. This report reflects funding for DSCS III Blocks A&B. Direction to initiate development of an enhanced DSCS satellite (Block-C) utilizing EHF Technology has been received. Reporting for the Block-C satellite effort will be separate from this SAR and will commence once the technical/operational characteristics, schedule milestones, and financial baseline are established. DSCS III Blocks A&B have completed all operational testing.

The DSCS Space Segment is expected to meet its current mission requirements.

c.(U) Changes Since "As Of" Date -- None.

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DSCS III, December 31, 1986

8.(U) Decision Coordinating Paper (DCP) Threshold Breaches: DCP #144, Revision 4, 8 May 1981. As directed by the DSCS III (DSARC) Production Program Review, updated DCP cost goals and thresholds for the SHF DSCS III satellite acquisition program were submitted in January 1982 and subsequently approved. There are currently no DCP threshold breaches.

9.(U) Schedule:

a.(U) Milestones --

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
(U) DSARC II (JRMB II, Full Scale Dev)	Dec 76/Dec 76	Dec 76
(U) Full-Scale Development (Phase 2)		
Contract Award	Feb 77/Feb 77	Feb 77
(U) Critical Design Review (CDR)	Apr 78/May 78	May 78
(U) First Development Flight		
Satellite (III-A1) Launch	Jul 79/Oct 82	Oct 82
(U) DSARC III (JRMB III, Production Dec)	Jan 80/Dec 81	Dec 81

(b)(1)

(U) First Production Satellite Delivery (III-B4)	Mar 82/Apr 85	Apr 85
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b.(U) Previous Change Explanations --

Satellite System level CDR was delayed one month to allow collection and analysis of test data from the Integrated Satellite Development Test Model. Delay in the delivery of A1 until June 1981 was caused by delays in design definition, parts and materials, and shared test equipment. A September 1982 launch was directed with an additional month delay due to nonavailability of an upper stage. The extended FSD program delayed DSARC III until December 1981 which approved the acquisition of two satellites (B4/B5) in FY82 and planned for two additional satellites in FY83 (B6/B7). The A1 delays impacted A2 availability. Contractual delivery dates were realigned to match Initial Launch Capability (ILC) of the Inertial Upper Stage (ILS). First Production satellite (B4) delivery delayed due to slip in the FSD program, revised production schedules, and a slip in DSARC III. By JCS direction, the second FSD launch was delayed due to nonavailability of boosters.

(b)(1)

d.(U) References --

Development Estimate:

Decision Coordinating Paper (DCP) #144, Revision 2, 17 Nov 1976.
Program Management Directive (PMD) R-S 2146-(6)/PE 33110F, 24 May 77

Approved Program:

Decision Coordinating Paper (DCP) #144, Revision 4, 8 May 1981.
Program Management Directive (PMD) R-S 2146-(23)/PE 33110F, 03 Sep 86

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DSCS III, December 31, 1986

10. ~~(U)~~ Technical/Operational Characteristics:

~~(U)~~ a. ~~(U)~~ Technical --

	Dev Estimate/ Appr Program	Demonstrated Performance /A	Current Estimate
(U) Frequency (GHz)	7.25-8.4/7.25-8.4	7.25-8.4	7.25-8.4
(U) Bandwidth (MHz) per channel	50-85/50-85	50-85	50-85
<div>(b)(1)</div> <div>(U) Effective Isotropic Radiated Power (ERP) (dBW) C/</div>			
<u>Channels</u>			
1 & 2 (EC:Spot:AC)	29:39:43/29:40:44	29:40:44	29:40:44
3 (EC:EC:Spot)	24:23:33/25:25:34	25:23:34 (Ch-1)	25:23:34 (Ch-1)
4 (EC:EC:Spot:AC)	24:23:33:37/25:24:35:38	25:23:35:38(Ch-1)	25:23:35:38(Ch-1)
5 & 6 (EC)	24/25	25	25
Beacons (EC)	11/12	12	12
<div>(U) Signal Gain to System Noise Temp Ratio (G/T) (dB/degrees K)</div>			
EC Horn	-15/-15	-13	-14
EC MBA	-16/-16	-15	-16
Spot MBA	-1/-1	-0.5	-1

b. (U) Operational --

(U) Quantities (per satellite)

40 Watt Channels (1&2)	2/2	2	2
10 Watt Channels (3-6)	4/4	4	4
SHF Command Links	2/2	2	2
Protected Beacons	2/2	2	2
(U) Satellite Reliability D/	.7/.7	N/A	.7
(U) Weight (lbs) E/	1650	N/A	1866
(U) Launch Vehicles (types)			
	Titan IIIC / T34D:Trnstg	N/A	T34D:Trnstg
	Titan IID: IUS / T34D: IUS	N/A	T34D: IUS
	STS: IUS / STS: IUS	N/A	STS: IUS
	N/A / Titan IV: IUS(Ch-2)	N/A	Titan IV: IUS (Ch-2)

A/ (U) Actual values observed during Qualification Test. (Maximum)

B/ (U) Based on single null anywhere in the satellite field of view created within a Multi-Beam Antenna (MBA) earth coverage pattern (db below EC reference)

C/ (U) EC - Earth Coverage: Spot - 1.0 degree minimum diameter; AC - Area Coverage (Dish) - 3.0 degree beam diameter switchable on orbit to desired channel

D/ (U) Probability of survival at 7 years

E/ (U) Satellite weight less expendables (dry weight)

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DSCS III, December 31, 1986

10.(U) Technical/Operational Characteristics (Cont'd):

c.(U) Previous Change Explanation --

ERP, Signal Gain to Signal Noise, and Nulling characteristics revised based upon A1 acceptance test data. Beacon ERP reflects DCA requested specification change to the SHF beacon power output. Launch vehicle types revised due to nonavailability. Net increases in satellite dry weight as a result of actual weight measurements superseding estimates of the weight of satellite components. Signal Gain to Signal Noise current estimate revised based upon analysis of the B4/B5 CDR data and resulting specification change. EC Horn improved from -13 to -14, EC MBA from -15 to -16, and the Spot MBA from -.5 to -1.

d.(U) Current Change Explanations --

(Ch-1) (U) Previous ERP values in error.

(Ch-2) (U) The DSCS Program has been directed to have a compatible launch configuration with the Titan IV.

e.(U) References --

Development Estimate:

Decision Coordinating Paper (DCP) #144, Revision 2, 17 Nov 1976.

DSCS III Space Segment Specification 07868 DSCS III-1, Rev 1, 1 Aug 1975

Approved Program:

Decision Coordinating Paper (DCP) #144, Revision 4, 8 May 1981.

Program Management Directive (PMD) R-S 2146-(23)/PE 33110F, 3 Sep 1986.

DSCS III Space Segment Specification 07868 DSCS III-1, Rev A, 19 Sep 1979

DSCS III Space Segment Specification SVS-8950-II-A, 2 Jul 84, SCN-5 Jun 85

11.(U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a.(U) Cost --	Development Estimate	Changes	Current Estimate
Development (RDT&E)	\$134.3	+\$145.6	\$279.9
Procurement	496.8	+123.3	620.1
Satellites	(313.1)	(+255.0)	(568.1)
Launch Vehicles	(183.7)	(-131.7)	(52.0)
Construction (MILCON)	---	---	---
Total FY 77 Base-Year \$	631.1	+268.9	900.0
 Escalation	262.5	+447.8	710.3
Development (RDT&E)	(17.5)	(+100.6)	(118.1)
Procurement	(245.0)	(+347.2)	(592.2)
Construction (MILCON)	---	---	---
 Total Then-Year \$	\$893.6	\$+716.7	\$1610.3

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DSCS III, December 31, 1986

11.(U) Program Acquisition Cost (Cont'd): (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
b.(U) Quantities --			
Development (RDT&E)	2	0	2
Procurement	12	0	12
Total	14	0	14
c.(U) Unit Cost --			
Procurement:			
FY 77 Base-Year \$	\$ 41.400	+10.275	\$ 51.675
Then-Year \$	61.817	+39.208	101.025
Program:			
FY 77 Base-Year \$	45.079	+19.207	64.286
Then-Year \$	\$ 63.829	\$+51.192	\$115.021
d.(U) Approved Design to Cost Goal -- (Average Unit Flyaway Cost)			
	Dev Estimate/ Appr Program	Current Estimate	Latest Approved Threshold
@ Qty: 12			
@ Peak Rate: .028/mo			
FY 77 Base-Year \$	20.000/49.058	47.342	56.417
Then-Year \$	28.500/97.900	94.467	112.585
e.(U) Foreign Military Sales -- None			
f.(U) Nuclear Costs -- None			

12.(U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current [Then-Year] Dollars in Millions)

	Current Year		Budget Year
	Current Est Dec 86 SAR	UCR Baseline Dec 85 SAR	UCR Baseline Dec 86 SAR
a.(U) Program Acquisition --			
(1) Cost	1610.3	1779.8	1610.3
(2) Quantity	14	15	14
(3) Unit Cost	115.021	118.653	115.021
b.(U) Current Procurement -- (FY 87)		*(FY 87)	(FY 88)
(1) Cost	110.5	110.5	75.9
Less CY Adv Proc	5.5	5.5	0.0
Plus FY Adv Proc	51.9	51.9	25.9
Net Total	156.9	156.9	101.8
(2) Quantity	2	2	1
(3) Unit Cost	78.450	78.450	101.800

* Differs from the December 85 SAR to reflect the FY 1987 Appropriations Act.

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IECS III, December 31, 1986

13.(U) Cost Variance Analysis:

a. Summary -- (Current [Then-Year] Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	151.8	741.8	--	893.6
Previous Changes:				
Economic	+1.2	+104.0	--	+105.2
Quantity	-	+51.5	--	+51.5
Schedule	+29.8	+93.9	--	+123.7
Engineering	+304.9	+77.8	--	+382.7
Estimating	+103.4	+25.4	--	+128.8
Other	-	+77.4	--	+77.4
Support	-	-	--	-
Subtotal	+439.3	+430.0	--	+869.3
Current Changes:				
Economic	-2.3	-17.2	--	-19.5
Quantity	-	-51.1	--	-51.1
Schedule	-	-	--	-
Engineering	-136.4	-20.8	--	-157.2
Estimating	-54.4	+129.6	--	+75.2
Other	-	-	--	-
Support	-	-	--	-
Subtotal	-193.1	+40.5	--	-152.6
Total Changes	+246.2	+470.5	--	+716.7
Current Estimate	398.0	1212.3	--	1610.3

(FY 77 Constant [Base-Year] Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	134.3	496.8	--	631.1
Previous Changes:				
Quantity	-	+21.3	--	+21.3
Schedule	+16.3	+34.0	--	+50.3
Engineering	+159.3	+33.8	--	+193.1
Estimating	+60.7	-26.8	--	+33.9
Other	-	+38.4	--	+38.4
Support	-	-	--	-
Subtotal	+236.3	+100.7	--	+337.0
Current Changes:				
Quantity	-	-21.3	--	-21.3
Schedule	-	-	--	-
Engineering	-64.9	-8.7	--	-73.6
Estimating	-25.8	+52.6	--	+26.8
Other	-	-	--	-
Support	-	-	--	-
Subtotal	-90.7	+22.6	--	-68.1
Total Changes	+145.6	+123.3	--	+268.9
Current Estimate	279.9	620.1	--	900.0

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13.(U) Cost Variance Analysis (Cont'd):

b. Previous Change Explanation —

RDT&E

Economic: Revised escalation indices
Schedule: Production extension, Launch delays, III-A1 Storage
Engineering: Jammer Location Electronics (JLE) upgrade, Traveling Wave
Tube Amplifier (TWT), Solid State Amplifier (SSA), Launch Vehicle (LV)
Integration costs, Transitional satellite and upper stage development
Estimating: Revised production costs, First time integration, Gramm-Rudman-
Hollings Bill

PROCUREMENT

Economic: Revised escalation indices
Quantity: Reflects addition of one satellite
Schedule: Revised buy strategy, one year production delay, three year
transitional satellite delay, Multiyear launch deferment
Engineering: 10 Watt SSA, Generic TWT, III-A3 STS compatibility
Estimating: FCRC requirements, LV integration, Production costs, Gramm-
Rudman-Hollings Bill, Non-awarded contingent liabilities
Other: Signal Channel Transponder (SCT) hardware funding transfer,
DBARC III (JRMB III) adjustment

c. Current Change Explanation --

(1) RDT&E

(Dollars in Millions)
Base-Year Then-Year

Revised economic escalation indices (Economic)	N/A	-2.3
Directed storage and sustained cost associated with III/A2 launch delays (Estimating)	+2.0	+3.7
Adjustment to prior years escalation (Estimating)	+.2	+.3
Removal of Block-C Satellite	-92.9	-194.8
Removal of Block-C Satellite (Engineering)	(-64.9)	(-136.4)
Removal of Block-C Satellite (Estimating)	(-28.0)	(-58.4)

(2) Procurement

Revised economic escalation indices (Economic)	N/A	-17.2
---	-----	-------

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DCS III, December 31, 1986

13.(U) Cost Variance Analysis (Cont'd):

(Dollars in Millions)

(2) Procurement

	<u>Base-Year</u>	<u>Then-Year</u>
Adjustment to prior years escalation (Estimating)	+4.3	+8.7
Directed storage and sustained cost associated with launch delays (Estimating)	+32.2	+78.5
Sustaining Integration and additional aerospace support caused by launch delays (Estimating)	+29.7	+72.0
Congressional Cut (-18.2M) and Supplemental (+1.0M) net decrease will eliminate ECOs (Estimating)	-8.2	-17.2
Non awarded contingent liabilities (Estimating)	-1.7	-3.5
Removal of FY91 satellite	-33.7	-80.8
Removal of FY91 satellite (Quantity)	(-21.3)	(-51.1)
Removal of FY91 satellite (Engineering)	(-8.7)	(-20.8)
Removal of FY91 satellite (Estimating)	(-3.7)	(-8.9)

d. References --

Development Estimate:

Decision Coordinating Paper (DCP) #144, Revision 2, 17 Nov 1976.

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

a. Initial SAR/Development Estimate to Current Estimate --

PAUC (Initial SAR/ Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
63.829	+6.121	+.028	+8.836	+16.107	+14.571	+5.529	-	+51.192	115.021

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DSCS III, December 31, 1986

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. RDT&E -- None.

b. Procurement --

Refurbishment of Qualification Satellite:

General Electric Co., King of Prussia, PA

FO4701-80-C-0058, PPIF,

Award: October 31, 1980

Definitized: October 31, 1980

Initial Contract Price		
Target	Ceiling	Qty
\$13.2	\$14.5	1

Current Contract Price		
Target	Ceiling	Qty
\$65.1	\$70.1	1

Estimated Price at Completion	
Contractor	Program Manager
\$59.2	\$65.1

Previous Cumulative Variances
Cumulative Variances To Date (11/02/86)
Net Change

Cost Variance	Schedule Variance
\$+7.5	\$-2.2
\$+7.9	\$-0.6
\$+0.4	\$+1.6

Explanation of Change: Change in the favorable cost variance is due to a favorable labor rate and efficiencies realized to date. Improvement in the schedule variance is due to milestone statusing associated with the completion of activities within spacecraft systems test. The program manager's estimate reflects the change in target cost and is within approved funding. These variances are not impacting the program. This effort is 99.7 percent complete, therefore, this is the last SAR submission for this contract.

Advance Buy B8-14:

General Electric Co., King of Prussia, PA

FO4701-84-C-0009, FFP,

Award: January 23, 1984

Definitized: December 31, 1983

Initial Contract Price		
Target	Ceiling	Qty
\$70.1	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$80.9	N/A	N/A

Estimated Price at Completion	
Contractor	Program Manager
\$80.9	\$80.9

CPR reporting is not required on this contract.

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DSCS III, December 31, 1986

15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

DSCS III Production B8-14: General Electric Co., King of Prussia, PA FO4701-84-C-0072, FFP, Award: November 16, 1984 Definitized: November 16, 1984	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$423.0	N/A	7

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$444.5	N/A	7	\$444.5	\$444.5

CPR reporting is not required on this contract.

Recurring Integration: General Electric Co., King of Prussia, PA FO4701-81-C-0004, CPFF, Award: August 1, 1985 Definitized: August 15, 1985	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$6.0	N/A	N/A

Deleted. FY 87 DoD Authorization Act requires reporting of six largest major contracts above \$40.0M.

+ = Favorable
- = Unfavorable

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DSCS III, December 31, 1986

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 63.2% (12yrs/19yrs)

(2) Percent Program Cost Appropriated: 81.5% (\$1312.7/\$1610.3)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY76-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance To Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93-94)</u>	<u>Total</u>
RDT&E	351.8	21.4	22.8	2.0	398.0
Procurement	960.9	75.9	111.3	64.2	1212.3
MILCON	—	—	—	—	—
Total	1312.7	97.3	134.1	66.2	1610.3

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)
c. Annual Summary -- *

Fiscal Year	Qty	FY 77 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec**		Debit	Credit		
Appropriation: RDT&E								
1976	-	-	-	11.3	-	-	10.5	7.0
1977	-	-	-	2.8	-	-	2.8	3.6
1977	-	-	-	28.1	-	-	28.7	4.7
1978	-	-	-	54.5	-	-	59.5	7.0
1979	-	-	-	24.3	-	-	29.3	8.4
1980	-	-	-	14.8	-	-	19.8	9.4
1981	-	-	-	19.6	-	-	29.0	11.9
1982	-	-	-	32.8	-	-	52.0	9.2
1983	-	-	-	23.9	-	-	39.7	4.9
1984	-	-	-	17.9	-	-	30.8	3.7
1985	-	-	-	14.5	-	-	25.8	3.4
1986	-	-	-	3.9	-	-	7.1	2.9
1987	-	-	-	8.9	-	-	16.8	3.1
1988	-	-	-	10.9	-	-	21.4	3.5
1989	-	-	-	4.3	-	-	8.8	3.5
1990	-	-	-	2.6	-	-	5.4	3.3
1991	-	-	-	2.6	-	-	5.5	2.9
1992	-	-	-	1.4	-	-	3.1	2.4
1993	-	-	-	0.4	-	-	1.0	2.4
1994	-	-	-	0.4	-	-	1.0	2.4
Subtotal	2	-	-	279.9	-	-	398.0	

** RDT&E Recurring Flyaway Not Available

Appropriation: Procurement								
1978	-	35.7	-	35.7	-	-	43.0	7.0
1979	-	.3	-	4.7	5.8	-	6.2	8.7
1980	-	.4	-	7.4	10.5	-	11.1	9.7
1981	1	.6	44.8	47.2	48.8	16.3	77.9	11.9
1982	2	.5	79.0	63.9	-	24.1	112.4	9.6
1983	2	.1	99.1	74.7	-	24.7	139.3	9.0
1984	-	1.3	-	53.3	81.6	-	103.9	8.0
1985	2	.5	105.7	113.3	52.4	23.2	227.6	3.4
1986	2	-	96.1	62.1	13.7	52.2	129.0	2.9
1987	2	-	91.7	51.5	5.5	51.9	110.5	3.1
1988	1	2.8	51.7	34.3	-	25.9	75.9	3.5
1989	-	4.9	-	9.2	-	-	21.1	3.5
1990	-	3.6	-	12.2	-	-	28.5	3.3
1991	-	1.3	-	12.4	-	-	29.8	2.9
1992	-	-	-	13.0	-	-	31.9	2.4
1993	-	-	-	12.3	-	-	30.9	2.4
1994	-	-	-	12.9	-	-	33.3	2.4
Subtotal	12	52.0	568.1	620.1	218.3	218.3	1212.3	
Total	14			900.0			1610.3	

* This Funding Summary reflects funding for DSCS III Blocks A & B.

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DSCS III, December 31, 1986

16. (U) Program Funding Summary (Cont'd):

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated /1	Expended /1

Appropriation: RDT&E

1976	10.5	10.5	10.5
1977	2.8	2.8	2.8
1977	28.7	28.7	28.7
1978	59.5	59.5	59.5
1979	29.3	29.3	29.3
1980	19.8	19.8	19.8
1981	29.0	29.0	29.0
1982	52.0	52.0	50.0
1983	39.7	39.7	37.2
1984	30.8	30.8	28.8
1985	25.8	25.1	23.3
1986	7.1	4.9	1.9
1987	16.8	.7	.4
To Complete	46.2	N/A	N/A
Total	398.0	332.8	321.2

Appropriation: Procurement

1978	43.0	43.0	43.0
1979	6.2	6.2	6.2
1980	11.1	11.1	11.1
1981	77.9	77.9	71.3
1982	112.4	112.4	108.6
1983	139.3	138.8	110.5
1984	103.9	103.9	84.6
1985	227.6	209.4	133.7
1986	129.0	111.8	18.1
1987	110.5	96.3	-
To Complete	251.4	N/A	N/A
Total	1212.3	910.8	587.1

/1 Reflects program office records as of 24 Dec 86

17. (U) Production Rate Data: No report. Production less than 6 per year.

18. (U) Operating and Support Costs: N/A

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: F-14D

AS OF DATE: December 31, 1986

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22
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation/Nomenclature (Popular Name): F-14D

2. DoD Component: U.S. Navy

3. Responsible Office and Telephone Number:

Naval Air Systems Command
PMA-241
Washington, D.C.

PM: CAPT W. C. Bowes
Assigned : December 16, 1983
COMM (202) 692-8284
AUTOVON 222-8284

4. Program Elements/Procurement Line Items:

RET&E: PE 25667N
PROCUREMENT: PE 24144N APPN 1506 ICN 0140
ICN 0141
MILCON: PE 24144N

5. Related Programs: F-14A, A-6E, EA-6B, E-2C, C-2 (All Grumman Aero Corp produced aircraft) and AIM-54 A/C PHOENIX Missile.

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6. MISSION AND DESCRIPTION: The F-14D is an all-weather, carrier-based, airborne weapon system capable of performing fleet air defense and air-to-ground missions. Air-to-ground capability is secondary and has never been fully developed. The F-14D is a twin-engine, two-place, tandem seat, variable-sweep-wing, supersonic fighter capable of engaging multiple targets simultaneously at altitudes from sea level to over 80,000 feet. The APG-71/ PHOENIX missile combination gives the F-14D the unique ability to prosecute the long-range, multiple-target, Outer Air Battle mission. The F-14D replaced the F-14A/A(PLUS) aircraft. It is a major upgrade to the F-14A weapon system in three areas: new engine, new digitized avionics and a new digital radar. In the engine area, existing TF30 engines will be replaced by a marinized version of the USAF F110 engine for improved reliability and operability throughout the entire operating envelope. In the area of avionics, the F-14D program will utilize a modern digital multiplex bus architecture and incorporate highly reliable, state-of-the-art avionics equipment such as JTIDS, ASPJ, andIRST. The upgraded AWG-9 radar, designated the APG-71, will retain the high peak power output of the AWG-9 radar and provide significant improvements in ECCM capability, reliability and maintainability. In addition, the F-14D will carry AIM-54C PHOENIX Missile as well as the AMRAAM, HARM, and HARPOON Missiles.

7. Program Highlights:

a. Significant Historical Developments -- This is the first submission of the F-14D SAR. On December 9, 1982, the Navy Defense Resource Board (DRB) determined an upgrade to the F-14A, to be designated the F-14D, to be the most cost effective solution for the Navy's anti-air warfare operational requirement. The decision was confirmed by a SECNAV memorandum of July 6, 1983, which delineated required capabilities for the upgraded F-14. The full scale development effort, which began on 31 July 1984, is being conducted under a firm-fixed price contract with Grumman Corporation. This program calls for production to commence on the F-14D in late 1988.

b. Significant Developments Since Last Report -- On 17 September 1986 the Secretary of the Navy directed that the procurement of new production F-14D's would be supplemented with the procurement of remanufactured F-14A's into F-14D's such that the total F-14D procurement quantity would increase from 304 to 527. To execute this direction in the most cost effective manner, the number of new production F-14D's was reduced from 304 to 127 and the number of remanufactured F-14D's will now be 400. Development/Operational Testing is scheduled to begin in December 1987. The remanufacture program will include all existing F-14A/A(PLUS) aircraft. These aircraft will have at least fifteen years (or more) of airframe life remaining. Therefore, the most cost-effective method for obtaining the required F-14D capability in the late 1990's and early 2000's is to build a minimum number of new production F-14D's and remanufacture the existing F-14A's and F-14A(PLUS)'s to full F-14D configuration.

The F-14D is expected to satisfy the mission requirement.

c. Changes Since "As Of" Date -- None

8. Decision Coordinating Paper (NDCP) Threshold Breaches: There are currently no NDCP (dated June 16, 1986) threshold breaches.

ScheduleDevelopment Estimate/
Approved ProgramCurrent
Estimate

a. Milestones --

FSD Contract Award	Jul 84/Jul 84	Jul 84
DNSARC Review milestone II	Mar 85/Mar 85	Mar 85
Critical Design Review (HDWR)	Jun 85/Jun 85	Jun 85
Critical Design Review (SFTWR)	Aug 85/Aug 85	Aug 85
First F110 Test Flight	Aug 86/Sep 86	Sep 86 Ch 1
F-14D Advance Acquisition Contract Award	Dec 86/Apr 87	Apr 87 Ch 2
First Avionics/Radar Flight	Mar 87/Jun 88	Jan 88 Ch 3
DNSARC III A (Pilot Production Approval)	Feb 88/Feb 88	Feb 88
DNSARC III B (Limited Production Approval)	Mar 89/Sep 88	Sep 88
Techeval	Apr 90/Apr 90	Apr 90 Ch 4
DNSARC III C (Limited Approval)	Mar 90/Sep 89	Sep 89
OPEVAL	Jun 90/Jun 90	Jun 90 Ch 4
DNSARC III D (Full Production Approval)	N/A /Oct 90	Oct 90
Deliver first production F-14D	Mar 90/Mar 90	Mar 90
BIS	Sep 90/Sep 90	Sep 90 Ch 4

(b)(1)

b. Previous Change Explanations--

Grumman has indicated an approximate six month extension to the FSD schedule due primarily to Hughes Aircraft APG-71 CFE hardware delivery delays, but also because of the Navy's delay in providing AYK-14 mission computer assets. Because of the extension to the test schedule, it is no longer possible to support a full production decision at Milestone III C. An additional production decision point, Milestone III D, has therefore been added and dates for Milestone III B and III C have been realigned. Delivery of the first F-14D, scheduled for March 1990, is not affected by the FSD schedule adjustment.

c. Current Change Explanations--

- (Ch-1) First F110 Test flight was rescheduled from Aug 86 to Sep 86 due to afterburner development problems.
- (Ch-2) Award of the FY-88 Advance Acquisition Contract was rescheduled from Dec 86 to Apr 87 due to delay in receipt of proposal, due to administrative backlog at Grumman.
- (Ch-3) First Avionics/Radar Flight rescheduled from Mar 87 to Jan 88 due to software development problems. These problems are being corrected and a independent software team has validated the corrective action. The delay to first flight will not impact OPEVAL or first delivery of the F-14D in March 1990.
- (Ch-4) Milestone added.

d. References --

Development Estimate: NDCP was approved by the Secretary of the Navy, 16 June 1986.

Approved Program: FY 1988 President's Budget.

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10.(U) Technical/Operational Characteristics:

(Fighter escort configuration with 0 PHOENIX, 4 SPARROW and 4 SIDEWINDER missiles unless otherwise indicated)

(U) a. Technical	Dev Estimate/ Appr Program	Demonstrated Performance	Current Estimate
(U) Weight			
Empty no stores (lb)	41,210/ 42,210	N/A	41,210
Max T/O	72,467/72,467	N/A	72,467
(U) Length/Height/Span (ft)	62/16/64.1/ 62/16/64.1	N/A	62/16/64.1
(U) Spotting Factor (A7=1.0)	1.55/1.55	N/A	1.55
(U) Direct Maintenance Manhours			
per flight hours	6.4/NA	N/A	6.4
(unscheduled)			
(U) SDLM Cycle (mo.)	44/NA	N/A	44

(b)(1)

- c. Previous Change Explanations - - None
- d. Current Change Explanations -- None
- e. References --

Development Estimate: NDCP was approved by the Secretary of the Navy, 16 June 1986
Approved Program: FY 1988 President's Budget.

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11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. Cost --			
Development (RDT&E)	1464.9	+231.6	1696.5
Procurement	13627.5	+2525.0	16152.5
Airframe	(7289.6)	(+71.8)	(7361.4)
Engine	(2144.6)	(+509.1)	(2653.7)
Avionics	(786.6)	(+698.2)	(1484.8)
Other Hardware	(836.2)	(+724.8)	(1561.0)
Total Flyaway	(11057.0)	(+2003.9)	(13060.9)
Other Wpn Sys Cost	(1884.0)	(+415.2)	(2299.2)
Initial Spares	(686.5)	(+105.9)	(792.4)
Construction (MILCON)	10.8	+1.0	11.8
Total FY 86 Base-Year \$	15103.2	+2757.6	17860.8
Escalation	4116.6	+962.6	5079.2
Development (RDT&E)	(104.2)	(+49.1)	(153.3)
Procurement	(4010.1)	(+913.8)	(4923.9)
Construction (MILCON)	(2.3)	(-0.3)	(2.0)
Total Then-Year \$	19219.8	+3720.2	22940.0
b. Quantities --			
Development (RDT&E)	-	-	-
Procurement	304	+223	527
Total	304	+223	527
c. Unit Cost --			
Procurement:			
FY 86 Base-Year \$	44.827	-14.177	30.650
Then-Year \$	58.018	-18.025	39.993
Program:			
FY 86 Base-Year \$	49.682	-15.791	33.891
Then-Year \$	63.223	-19.694	43.529
d. Approved Design to Cost Goal--N/A			
e. Foreign Military Sales -- None			
f. Nuclear Costs -- None			

12. Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then Year) Dollars in Millions)

	Current Year		Budget Year
	SAR Current	UCR Baseline	UCR Baseline
	Dec 86 SAR	Dec 85 SAR	Dec 86 SAR
a. Program Acquisition --			
(1) Cost	22940.0	19219.8	22940.0
(2) Quantity	527	304	527
(3) Unit Cost	43.5	63.2	43.5
b. Current Procurement -- (FY 1987)		(FY 1987)	(FY 1988)
(1) Cost	N/A	N/A	586.4
Less CY Adv Proc	N/A	N/A	84.3
Plus PY Adv Proc	N/A	N/A	80.7
Net Total	N/A	N/A	582.8
(2) Quantity	N/A	N/A	7
(3) Unit Cost	N/A	N/A	83.3

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13. Cost Variance Analysis:a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1569.1 ✓	17637.6 ✓	13.1 ✓	19219.8 ✓
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Support	-	-	-	-
Other	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-11.9	-29.6	-	-41.5 ✓
Quantity	-	+9561.8	-	+9561.8
Schedule	-	-859.2	-	-859.2
Engineering	+221.8	-	-	+221.8
Estimating	+70.8	-5925.4	+0.7	-5853.9
Support	-	+691.2	-	+691.2
Other	-	-	-	-
Subtotal	+280.7	+3438.8	+0.7	+3720.2
Total Changes	+280.7	+3438.8	+0.7	+3720.2
Current Estimate	1849.8	21076.4	13.8	22940.0

(FY 1986 Constant Dollars (Base Year) in Millions) 1/

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1464.9	13627.5	10.8	15103.2
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Support	-	-	-	-
Other	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	+6852.8	-	+6852.8 ✓
Schedule	-	-457.8	-	-457.8
Engineering	+174.4	-	-	+174.4
Estimating	+57.2	-4391.1	+1.0	-4332.9
Support	-	+521.1	-	+521.1
Other	-	-	-	-
Subtotal	+231.6	+2525.0	+1.0	+2757.6
Total Changes	+231.6	+2525.0	+1.0	+2757.6
Current Estimate	1696.5	16152.5	11.8	17860.8

	RDTE	Proc	Milcon	Total
1/ Development Estimate FY 1969 \$	505.9	4163.2	3.3	4,672.4
Current Estimate FY 1969 \$	589.8	5026.4	3.5	5619.7

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13. Cost Variance Analysis (Cont'd):

- b. Previous Change Explanations -- None
 c. Current Change Explanation --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised Jan 87 economic escalation rates. (Economic)	N/A	- 11.9
Operational Requirement increases including AMRAAM/HARM/HARPOON integration to meet F-14D IOC and to incorporate emerging technology, such as VHSIC insertion, automated multi-sensor correlation, etc. (Engineering)	+174.4	+221.8
Assessment of outyear funding requirements less Congressional reduction of 8.4M (FY-87). (Estimating)	+57.2	+70.8
(2) <u>Procurement</u>		
Revised Jan 87 economic escalation rates. (Economic)	N/A	-29.6
Increase in number of F-14D aircraft from 304 to 527. (Quantity)	+6,852.8	+9,561.8
Reduction in cost due to larger procurement lot size associated with increased quantity. (Schedule)	-457.8	-859.2
Revised estimate due to reduction of 177 new production F-14D's and addition of 400 remanufactured aircraft at significantly lower unit cost. (Estimating)	-4,391.1	-5,925.4
Revised estimates for support and spares. (Support)	+521.1	+691.2
(3) <u>MILCON</u>		
Revised Jan 87 economic escalation rates (Economic)	N/A	-
Reflects funding available for Maintenance Operational Training Bldg. (Estimating)	+1.0	+0.7

14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Estimate

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
63.2	-0.1	-8.6	-1.6	+0.4	-11.1	+1.3	-	-19.7	43.5

15. Contract Information: (Then-Year Dollars in Millions)

		Initial Contract Price		
		Target	Ceiling	Qty
FY-84-87 FSD				
Grumman Aerospace Corp				
Bethpage, NY N00019-84-C-0015, FFP		984.0	N/A*	0
Award: July 31, 1984				
Definitized: December 18, 1986				

Current Contract Price

Target	Ceiling	Qty
N/A	984.0	0

Estimated Price At Completion

Contractor	Program Manager
984.0	984.0

Cost VarianceSchedule Variance

Previous Cumulative Variances

N/A

N/A

Cumulative Variances to Date

N/A

N/A

Net Change

N/A

N/A

This contract is for Full Scale Development of the F-14D and therefore quantity is not applicable.

b. Procurement --N/A

c. MILCON--N/A

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 25% (4/16).

(2) Percent Program Cost Appropriated: 4.6% (1048.2/22940.0)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs	Budget Year	Balance to Complete		Total
	(FY83-87)	(FY 88)	FYDP (FY89-92)	Beyond FYDP (FY 93)	
RDT&E	934.9	184.8	550.1	180.0	1849.8
Procurement	112.8	586.4	5685.5	14691.7	21076.4
MILCON	0.5	6.5	6.8	-	13.8
Total	1048.2	777.7	6242.4	14871.7	22940.0

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)
 c. Annual Summary --

Fiscal Year	Qty	FY 86 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
			Flyaway	Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1983	-			7.0			6.5	4.90
1984	-			42.1			40.4	3.80
1985	-			279.4			276.1	3.40
1986	-			341.7			347.9	2.90
1987	-			251.0			264.0	3.10
1988	-			169.8			184.8	3.50
1989	-			127.9			143.9	3.50
1990	-			113.3			131.4	3.30
1991	-			114.1			135.8	2.90
1992	-			114.1			139.0	2.40
1993	-			24.0			30.0	2.40
1994	-			23.5			30.0	2.40
1995	-			22.9			30.0	2.40
1996	-			22.4			30.0	2.40
1997	-			21.9			30.0	2.40
1998	-			21.4			30.0	2.40
Subtotal	-			1696.5			1849.8	

Appropriation: APN

1987	-	25.9	-	101.3	80.7	-	112.8	3.10
1988	7	92.1	296.2	519.5	84.3	80.7	586.4	3.50
1989	12	65.3	506.6	809.4	137.2	84.3	940.9	3.50
1990	19	109.6	667.3	1044.7	184.3	137.2	1247.2	3.30
1991	30	111.6	849.1	1225.3	229.2	184.3	1498.5	2.90
1992	42	146.4	1055.9	1597.3	240.9	229.2	1998.9	2.40
1993	60	169.9	1327.2	1882.1	264.1	240.9	2410.9	2.40
1994	72	166.7	1535.2	2039.1	266.9	264.1	2674.0	2.40
1995	72	149.5	1522.5	2001.5	261.1	266.9	2687.6	2.40
1996	72	140.5	1477.4	1910.0	258.2	261.1	2626.4	2.40
1997	72	131.2	1410.5	1778.9	210.2	258.2	2504.2	2.40
1998	69	114.6	989.7	1243.4	-	210.2	1788.6	2.40
Subtotal	527	1423.3	11637.6	16152.5	2217.1	2217.1	21076.4	

Appropriation: MILCON

1987				0.5			0.5	3.10
1988				5.8			6.5	3.50
1989				-			-	3.50
1990				-			-	3.30
1991				2.8			3.4	2.90
1992				2.7			3.4	2.40
Subtotal				11.8			13.8	

RDT&E/APN/MILCON)

Subtotal	527	1423.3	11637.6	17860.8	2217.1	2217.1	22940.0
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16. Program Funding Summary (Con't):

d. Obligations and Expenditures -

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	TOTAL	Obligated	Expended

Appropriation: RDT&E

1983	6.5	6.5	5.9
1984	40.4	40.4	34.5
1985	276.1	271.6	242.5
1986	347.9	344.3	264.6
1987	264.0	208.3	39.3
To complete	914.9	N/A	N/A
Total	1,849.8	871.1	586.8

Appropriation: APN

1987	112.8	-	
To complete	20,963.6	N/A	N/A
Total	21,076.4	N/A	N/A

Appropriation: MILCON

1987	.5	-	-
To Complete	13.3	N/A	N/A
Total	13.8	N/A	N/A

17. Production Rate Data

a. Annual Production Rates -- F-14D program is in full scale development.
Production Rates (Quantity/Year)

Fiscal Year	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1988	7	N/A	7	1/ N/A
1989	18	N/A	12	N/A
1990	24	N/A	19	N/A
1991	36	N/A	30	N/A
1992	30	N/A	42	N/A
1993	30	N/A	60	N/A
1994	30	N/A	72	N/A
1995	30	N/A	72	N/A
1996	30	N/A	72	N/A
1997	30	N/A	72	N/A
1998	39	N/A	69	N/A

1/ F-14D is Milestone II FSD.

17. Production Rate Data (Cont'd):b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less Pd E)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	N/A	N/A	17860.9	0	N/A
(TY \$)	N/A	N/A	22940.0	0	N/A
PAUC (BY \$)	N/A	N/A	33.891	0	N/A
(TY \$)	N/A	N/A	43.529	0	N/A

c. Schedule Variance --

Item	Production Estimate	Variance (CE less Pd E)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (Mo/Yr)	N/A	N/A	4/1987	N/A	N/A
Duration (in Months)	N/A	N/A	161	N/A	N/A
End Date (Mo/Yr)	N/A	N/A	9/2000	N/A	N/A

Deliveries (Plan/Actual) --

	<u>To Date</u>
RD&E	0/0
PROCUREMENT	0/0

18. Operating and Support Costs:

a. Assumptions and Ground Rules -- The O&S cost elements required by the SAR are broken out to six major areas: Personnel, O&S Consumables, Direct Depot Maintenance, Sustaining Investment, Other Direct Costs, and Indirect Costs.

Personnel Costs are based on the quantity of military personnel required to operate and support a 12-aircraft squadron. The Squadron Manning Documents Standard Composite Rate was used to get a cost per person/rank for each support personnel. The F-14A enlisted rate varies from the F-14D due to different skill levels needed to support the upgraded aircraft.

O&S Consumables are those non-repairable items consumed at the O&I maintenance levels. Included here are pre-expended materials used in everyday maintenance of the aircraft such as oil, rags, and grease, items which do not pertain to a specific Work Unit Code. This cost was derived from VAMOS data base using the most current available.

Directed Depot Maintenance Costs are all the costs incurred at the depot maintenance level. They include personnel, material, overhead, modification, and installation costs. These costs are broken down into three categories: Engine, Airframe, and Component Rework. These costs are also gathered from the VAMOS data base using the most current available.

18. Operating and Support Costs: (Cont'd):

Sustaining Investment Costs are the costs of procuring replenishment spares for components of the weapon system which are no longer repairable at the I&D maintenance levels. This cost is also derived from the VAMOSC data base. The software support cost and support equipment costs are also included in the Sustaining Investment category, but are not predicated on the quantity of aircraft.

Other Direct Costs are not separately tracked in Navy accounting systems.

Indirect Costs are included into the personnel costs. Personnel included integrated services which covers indirect personnel support along with installation support personnel. Revision 035750 of the Navy Comptroller Manual, the manual of Navy Standard Composite Rates, defines PCOS, basic allowances, leaves, holidays, retirements, and personnel support rates, are all included into the cost per man per year.

18. Operating and Support Costs: (Cont'd)

b. Costs --

(FY-86 Constant (Base Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per F-14D Squadron	Avg Annual Cost Per F-14A Squadron (Antecedent)
Personnel	9.10	9.19
O&S Consumables	6.66	7.74
Direct Depot Maintenance	6.71	7.26
Sustaining Investments	3.72	3.84
Other Direct Costs	N/A	N/A
Indirect Costs	N/A	N/A
Total	26.19	28.03

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: F-15

AS OF DATE: December 31, 1986

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 FEB 4 1987 18
 DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (OASD-PAI)
 DEPARTMENT OF DEFENSE

1. (U) Designation/Nomenclature (Popular Name): F-15/Tactical Fighter (Eagle)

2. (U) DoD Component: U.S. Air Force

3. (U) Responsible Office and Telephone Number:

F-15 Program Office
 Aeronautical Systems Division
 Wright-Patterson AFB, OH 45433

Col M. Butchko
 Assigned: 4 Sep 84
 AV 785-3111; Comm (513)255-3111

4. (U) Program Elements:

RDT&E: PE 27130F
 PE 64739F (Shared Funding)
 PROCUREMENT: APPN 3010, ICN F015AD; PE 27130F

5. (U) Related Programs: F100 Engine, AMRAAM (Advanced Medium Range Air-to-Air Missile), JTIDS (Joint Tactical Information Distribution System), AIM-7, AIM-9, LANTIRN, Tactical Protective Systems, Simulator Development

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(F-15, December 31, 1986)

6. (U) Mission and Description: The F-15 is an advanced tactical fighter being developed and procured for the air superiority mission. It replaces the F-4 as the USAF's primary air superiority aircraft. It is a twin engine, single crew, fixed swept wing aircraft. It is characterized by high thrust to weight and low wing loading for maximum turnability, acceleration, and agility.

The F-15E is a two crewmember aircraft, designed to provide a long range, large payload capability to strike second echelon targets at night and under the weather while retaining superior theater air defense capability.

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- In December 1969, McDonnell Douglas Corporation was selected as prime contractor for development and production of the F-15 aircraft. In March 1970, Pratt and Whitney was selected to develop and produce an engine jointly for the Air Force F-15 and Navy F-14 Programs. The F-14 Program was redirected and the Navy did not exercise its production option. This caused a major restructuring of the engine program. Although the original F-15 Production Rate was scheduled to be 12 aircraft per month, actual procurement reached a high of nine aircraft per month. The FY 1978 procurement introduced the F-15 C/D models, which had an additional 2000 lbs of internal fuel capacity and provisions for Conformal Fuel Tanks (CFTs). The latest F-15 C/D models include the Programmable Signal Processor (PSP), allowing radar enhancement through software changes. This provides a less costly and faster radar upgrade capability. The first PSP equipped F-15 C/D aircraft were delivered to Camp New Amsterdam, NL (CNA) in June 1980. A new PSP software tape containing a Raid Assessment Mode (RAM) as well as a host of other improvements was fielded in Europe in May 1981. F-15 Program Management Directive (PMD) R-P2060(33)/27130F, dated 18 November 1981, directed initial planning for implementation of the Multistaged Improvement Program (MSIP). The F-15 MSIP provides a long range acquisition/modification plan to satisfy the all weather, day or night Air Defense, and Air Superiority requirements of the Tactical Air Forces. Major program elements include enhancements to Fire Control and Weapons Delivery Systems, Tactical Electronic Warfare Systems (TEWS), and secure Communications Systems. The contract for MSIP Phase I, involving the study effort for full scale development was awarded to McDonnell Douglas Corporation 13 August 1982. Planning for development of an F-15 derivative configuration with Air-to-Ground capability was also directed. On 1 October 1982, management responsibility for all fielded F-15 aircraft was transferred to AFLC under the F-15 Program Management Responsibility Transfer (PMRT) Agreement. AFSC still maintains responsibility for all production and R&D efforts on the F-15 Program.

F-15 PMD R-P2060(37)/27130F, dated 14 Apr 1983, directed a comparison be made between the derivative versions of the F-15 and F-16 as possible choices to meet the Tactical Air Force's need for a long-range dual-role fighter. Both aircraft demonstrated not only their ability to fulfill Air-to-Air combat requirements, but also Air-to-Ground mission capabilities. The flight demonstration was completed in July 1983.

The F-15E was selected as the new Dual Role Fighter for the Air Force in early CY 1984. The Pratt & Whitney F100-PW-220 engine has been incorporated into the F-15 C/D fleet beginning with the FY85 buy.

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(F-15, December 31, 1986)

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- (continued)

During the CY 1985, the F-15 MSIP Program experienced a number of successes, beginning with the delivery of the first MSIP aircraft in June 1985. Four MSIP aircraft participated in a two week Green Flag exercise at Nellis AFB in August, flying a total of 61 sorties. Of these 61 sorties, only 1 MSIP failure was noted, with 50 of the remaining 60 sorties having no write-ups at all.

Following this success, the program began flight testing the ALR-56C in October 1985. To date in testing the ALR-56C, no insurmountable problems have been noted. ASAT (Anti-Satellite Missile System) successfully tested in November 1985, hitting the targets designated. Additionally, the QRC (Quick Reaction Capability) ALQ-135 began flight testing in April 1986. The test program lost aircraft D-50 (MSIP test aircraft) in December 1985, however, it was replaced by D-54. The loss of D-50 caused only minor impacts to the F-15 test program.

The F-15E program completed its PDR (Preliminary Design Review) on 25 March 1985 and its CDR (Critical Design Review) on 4 November 1985. First production delivery of an F-15E is scheduled for early 1987. Incorporation of the Ring Laser Gyro Inertial Navigation Unit (INU) is expected to increase the MTBF (Mean Time Between Failure) of the INS system to 1300 hours versus 65 hours.

b. (U) Significant Developments Since Last Report -- The F-15 program experienced a number of successes in CY86, beginning with Flight Testing of AMRAAM (Advanced Medium Range Air-to-Air Missiles) on both MSIP and non-MSIP F-15 aircraft. To date, six (6) launches (all successful) have been accomplished: three (3) from non-MSIP F-15 aircraft (March, June & August); two (2) from MSIP F-15 aircraft (September & October), with the final launch accomplished with a MSIP F-15 using track-while-scan (TWS) (20 December 1986).

In the production environment, the ALE-45 began production installation during July, while the ALR-56C began field installation in December. Software qualification testing (SFQT) was completed on the ALQ-135, and Northrop began production on the Quick Reaction Capability (QRC) ALQ-135 in September 1986.

The F-15/F100-PW-100 DEEC (Digital Electronic Engine Control)/Gearpump Field Service Evaluation is a two year program using 17 F-15 C/D aircraft assigned to the 57th Fighter Weapons Wing at Nellis AFB, NV. Since the first flight in June 1985, the aircraft have flown over 4,800 sorties and accumulated more than 10,000 engine flight hours. This program has verified the new modular control system maintenance philosophy which permits the replacement of Shop Replaceable Units (SRUs) to expedite the engine repairs and improve the base level self-sufficiency. Over 2,800 pages of Tech data was verified, and this directly supported the Tech Order (TO) verification for the F100-PW-220 activation at Eglin AFB, FL. The Field Service Evaluation (FSE) identified several production problem areas that have been corrected prior to F100-PW-220 engine production.

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7. (U) Program Highlights:

b. (U) Significant Developments Since Last Report -- (continued)

The F100-PW-220 powered F-15 C/Ds began delivery to Eglin in July. The deployment began six (6) months ahead of schedule to ensure that all of the aircraft assigned to the 33rd Tactical Fighter Wing (TFW) would have one engine model. In addition, all of the I-Level (Intermediate Level) engine TOs and 95% of the O-Level (Operational Level) TOs were validated and verified prior to the first aircraft delivery.

All components used in F-15E No. 1 have completed flight worthiness testing. Reliability and qualification testing is currently in progress. The first flight of the F-15E successfully occurred on 11 December 1986 at the McDonnell Douglas facility in St. Louis, Missouri.

The F-15 currently satisfies its mission requirements.

c. (U) Changes Since "As Of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: DCP #19, Revision C, 5 May 1977, as amended 21 February 1980. DCP Procurement Cost Threshold has been breached.

9. (U) Schedule:

a. (U) Milestones

	Development Estimate/ Approved Program	Current Estimate
F-15A/B/C/D		
Award Total System Development Contract	Jan 70/Jan 70	Jan 70
Preliminary Design Review (PDR)	Sep 70/Sep 70	Sep 70
Critical Design Review (CDR)	Apr 71/Apr 71	Apr 71
Engine Preliminary Flight Rating Test (PFRT)	Feb 72/Feb 72	Feb 72
First Flight	Jul 72/Jul 72	Jul 72
Long Lead Release (Production Approval)	Oct 72/Oct 72	Oct 72
Engine Qualification Test (EQT)	Feb 73/Feb 73	Oct 73
First Wing Full Release	Feb 73/Feb 73	Feb 73
Fatigue Test - Three Life Times	Nov 73/Dec 73	Oct 73
Increase Production Rate	Jan 74/Jan 74	Jan 74
Begin AFDT&E Tests	Mar 74/Mar 74	Feb 74
Fatigue Test - Four Life Times	Jul 74/Oct 74	Feb 74
First Aircraft to TAC	Nov 74/Nov 74	Nov 74
Exercise Option for 2nd Wing	Dec 74/Dec 74	Oct 74
Initial Operational Capability (IOC) A/	Jul 75/Jul 75	Sep 75

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9. (U) Schedule (Continued):

a. (U) Milestones

Development
Estimate/
Approved
Program

Current
Estimate

F-15E

Contract Award (Letter Contract)	Apr 84/Apr 84	Apr 84
System Integration PDR	Mar 85/Mar 85	Mar 85
System Integration CDR	Nov 85/Nov 85	Nov 85
Begin Flight Test (F-15E)	Jan 87/Jan 87	Dec 86 (CH-1)
IOC (F-15E) <u>B/</u>	Jun 89/Jun 89	Sep 89 (CH-2)

A/ (U) IOC is the point at which the first squadron received over 50% of its primary aircraft authorization (PAA)

B/ (U) IOC occurs when the First Operational Squadron achieves mission readiness status.

b. (U) Previous Change Explanations --

(U) The Engine Qualification Test was reprogrammed for completion by October 1973 versus February 1973 by the Deputy Secretary of Defense in September 1973.

(U) The completion dates for Fatigue Test to Three and Four Life Times were rescheduled (from November 1973 and July 1974 to December 1973 and October 1974 respectively) to accommodate increased fatigue spectrum requirements identified by the Scientific Advisory Board. This rescheduling was accomplished in the spring of 1970. These two milestones were then successfully completed ahead of the revised schedule (October 1973 and February 1974 respectively) as no F-15 structural deficiencies were revealed which would require a major redesign and retesting.

(U) The initiation of Air Force Development, Test and Evaluation (DT&E) activities occurred ahead of schedule (February 1974 versus March 1974) because Contractor DT&E progressed satisfactorily, allowing aircraft and support resources to be available earlier than planned for the AF DT&E effort.

(U) The date to exercise Option for the Second Wing was rescheduled to October 1974 because the full funding date for the FY75 buy was 1 November 1974.

(U) The IOC for the first training squadron was delayed from July 1975 to September 1975 due to the strike at McDonnell Douglas.

(U) F-15E milestones were added to the SAR in December 1984.

c. (U) Current Change Explanations --

¹(U) (CH-1) The First Flight of the F-15E occurred on 11 December 1986 (vs Jan 87). The F-15E began flight testing the same month.

(CH-2) Reduced aircraft quantities in FY87/88 due to Congressional reductions, delays IOC(F-15E) by three months.

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9. (U) Schedule (continued)

d. (U) References --

(U) Development Estimate:

(1) F-15 A/B/C/D

DCP #19, 15 September 1968; modified by Program Schedule briefed to Secretary of Defense in 1969 and DCP #19B, 24 January 1973.

(2) F-15E

PMO R-P2060(43)/27130F/F-15, dated 19 September 1985.

(U) Approved Program:

(1) F-15 A/B/C/D

PMO R-P2060(43)/27130F/F-15, dated 19 September 1985 (as amended by PMO R-P 2060(44)/27130F/F-15, dated 24 March 1986) and DCP #19C, dated 5 May 1977 (as amended 21 February 1980).

(2) F-15E

PMO R-P2060(43)/27130F/F-15, dated 19 September 1985, as amended by message PMO R-P 2060(44)/27130F/F-15, dated 24 March 1986.

10. (U) Technical/Operational Characteristics:

	Development Estimate/ Approved Program	a/ Demonstrated Performance	Current Estimate
a. (U) <u>Technical</u>			
(U) F-15 A/B/C/D			
(U) Thrust to Weight Ratio Take-Off	1.17/ 1.17	1.15	1.15
(U) Take-Off Thrust Engine (lbs)			
(U) Max Rated	23470 /23470	23759	23759
(U) Mil Rated	14120 /14120	14626	14626
(U) Take-Off Gross Weight (lbs)	40000 /40000	41491	41500

(b)(1)

(U) F-15E AIR-TO-GROUND CONFIGURATION b/ e/

(U) Take-Off Gross Weight (lbs)	81000 /81000	81000	81000
(U) Mission Radius (NM)			

(b)(1)

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10. (U) Technical/Operational Characteristics:

	Development Estimate/ Approved Program	a/ Demonstrated Performance	Current Estimate
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a. (U) Technical

(U) F-15B AIR-TO-AIR CONFIGURATION: e/ f/

(U) Cruise Thrust per Engine 0.8M/SL (Lbs)			
(U) Mil Rated	12100/12100	N/A	12100
(U) Max Rated	25950/25950	N/A	25950
(U) Take-Off Gross Weight (lbs)	62500/62500	N/A	62500

(b)(1)

b. (U) Operational

(U) F-15 A/B/C/D

(U) Max Speed/Sea Level, Sustained (Mach)	1.2/ 1.2	1.16	1.2
(U) Max Speed/At Altitude, Sustained (Mach)	2.3/ 2.3	2.3	2.3
(U) Max Speed/Burst (Mach)	2.5/ 2.5	2.5	2.5
(U) Take-Off Distance: 50 ft Obstacle (Ft)	2500 /2500	2313	2313
(U) Landing Distance: 50 ft Obstacle (Ft)	3840 /3840	3773	3773
(U) System Serial Mean Time Between Failure (Hr)	3.5/ 3.5	3.8	3.8
(U) System Operationally Ready Rate (Z)	70 / 70	80	80
(U) Direct Maintenance Man-Hours Per Flight Hour (MMH/FH)	20.8/ 12.26	12.04	12.04

(b)(1)

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10. (U) Technical/Operational Characteristics:

	Development Estimate/ Approved Program	a/ Demonstrated Performance	Current Estimate
--	---	-----------------------------------	---------------------

b. (U) Operational

(U) F-15E AIR-TO-GROUND CONFIGURATION b/ e/

(U) Take-Off Roll (81000 Lbs Gross Weight (Ft))	3590	/3590	N/A	3590
(U) Max Speed/Sea Level, Sustained (Mach) <u>c/</u>	.97/	.97	N/A	.97
(U) Max Speed/Sea Level, Sustained (Mil Power) (Mach) <u>c/</u>	.84/	.84	N/A	.84

(b)(1)

(U) F-15E AIR-TO-AIR CONFIGURATION: e/ f/

(U) Max Speed/Sea Level, Sustained (Mach)	1.04/1.04	N/A	1.04	
(U) Max Speed at Altitude, Sustained (Mach)	1.76/1.76	N/A	1.76	
(U) Max Speed, Burst (Mach)	1.76/1.76	N/A	1.76	
(U) Thrust to Weight Ratio at Take-Off	.67/	.67	N/A	.67
(U) Take-Off Distance/50 Ft Obstacle (Ft)	3520	/3520	N/A	3520
(U) Landing Distance/50 Ft Obstacle (Ft)	5000	/5000	N/A	5000

(b)(1)

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10. (U) Technical/Operational Characteristics:

a/ (U) Best and/or most reliable estimate

b/ (U) F-15E Air-To-Ground Configuration: CFTs (Conformal Fuel Tanks), (6) CBU-87, (2) AIM-9, (2) AIM-120, (3) 610 Gal External Fuel Tanks, LANTIRN, Internal ECM.

c/ (U) Mid combat weight, stores on, tanks on

d/ (U) Mid combat weight, stores dropped, tanks dropped

e/ (U) Additional F-15E Operational/Technical Characteristics will be provided as they become available.

f/ (U) F-15E Air-To-Air Configuration: CFTs, (4) AIM-9L, (4) AIM-120, Full Ammo, 50% Internal Fuel, F100-PW-220 at Spec Levels

10. (U) Technical/Operational Characteristics:

c. (U) Previous Change Explanations --

(U) The current estimate and demonstrated performance for the F-15 A/B/C/D Thrust-to-Weight Ratio at Take-Off was revised from 1.17 to 1.15 to reflect data gathered from the DT&E Program. Basic Air Superiority take-off gross weights are estimated to fall within the weight range of 41,381 to 41,658 pounds.

(U) The demonstrated performance and current estimate for the F-15 A/B/C/D Take-Off Engine Thrust (lbs) and Take-Off and Landing Distances with a 50 Foot Obstacle favorably exceeded a conservative Development Estimate (DE).

(U) The current estimate and demonstrated performance for the F-15 A/B/C/D Take-Off Gross Weight (lbs) was revised from 40,000 to 41,491 and 41,500 respectively to reflect data gathered from the DT&E Program. Basic Air Superiority take-off gross weights are estimated to fall within the weight range of 41,381 to 41,658 pounds.

(U) The demonstrated performance and current estimate of the F-15 A/B/C/D Design Mission Radius (NM) favorably exceeded a conservative Development Estimate (DE).

(U) The demonstrated performance and current estimate for System Serial Mean Time Between Failures of 3.8 hours is based on field data of 18 months after IOC.

(U) System Operational Ready Rate of 70% for the F-15 A/B/C/D reflected in the DE was defined for the end of AF RDT&E. DCP #19, Revision C (5 May 1977) reflected the Air Force approved program of 80% at 18 months after IOC (March 1977). The demonstrated performance and current estimate were measured against the approved program.

(U) MMH/FH for the F-15 A/B/C/D of 20.8 hours reflected in the DE was defined for the end of AF RDT&E. Approved Program for MMH/FH from DCP #19, Revision C (5 May 1977) is 12.26 at 18 months after IOC (March 1977). The actual performance (12.04) measured against the approved program is reflected as the demonstrated performance and current estimate.

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10. (U) Technical/Operational Characteristics:

c. (U) Previous Change Explanations --

(U) The demonstrated performance and current estimate of the F-15 A/B/C/D Specific Excess Power Operational Characteristics in feet/second changed due to an increase in the weight of the aircraft.

(U) F-15E Operational/Technical Characteristics were added in the 31 December 1984 SAR.

(U) Correction of a typing error from the previous SAR submission (31 December 1984).

d. (U) Current Change Explanations -- NONE

e. (U) References --

(U) Development Estimate:

(1) F-15 A/B/C/D

DCP #19, 15 September 1968; modified by Program Schedule briefed to Secretary of Defense in 1969 and DCP #19B, 24 January 1973. Air Force Estimates as a result of Source Selection and Contract Definitization.

(2) F-15E

PMD R-P2060(43)/27130F/F-15, dated 19 September 1985. Air Force Estimates as a result of Source Selection and Contract Definitization.

(U) Approved Program:

(1) F-15 A/B/C/D

PMD R-P2060(43)/27130F/F-15, dated 19 September 1985 (as amended by message PMD R-P 2060(44)/27130F/F-15, dated 24 March 1986) and DCP #19C, dated 5 May 1977 (as amended 21 February 1980). Air Force Estimates as a result of Source Selection and Contract Definitization.

(2) F-15E

PMD R-P2060(43)/27130F/F-15, dated 19 September 1985 (as amended by message PMD R-P 2060(44)/27130F/F-15, dated 24 March 1986). Air Force Estimates as a result of Source Selection and Contract Definitization.

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11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E)	\$ 1657.8	+731.5	\$2389.3
Procurement	4333.2	+6305.4	10638.6
Airframe	(1679.1)	(+2663.1)	(4342.2)
Engines	(832.4)	(+1336.7)	(2169.1)
Electronics	(866.8)	(+871.9)	(1738.7)
Armament	(111.8)	(+5.8)	(117.6)
Other Hardware	(18.2)	(+43.2)	(61.4)
Total Flyaway	(3508.3)	(+4920.7)	(8429.0)
Peculiar Support	(449.2)	(+955.8)	(1405.0)
Initial Spares	(375.7)	(+428.9)	(804.6)
Construction (MILCON) 1/	--	--	--
Total: FY 70 Base-Year \$	5991.0	+7036.9	13027.9
Escalation	1364.2	+22678.1	24042.3
Development (RDT&E)	(120.8)	(+805.5)	(926.3)
Procurement	(1243.4)	(+21872.6)	(23116.0)
Total Then Year \$	7355.2	+29715.0	37070.2

1/ The F-15 Program has \$131.4M MILCON funding in the primary program PE.

b. (U) Quantities --

Development (RDT&E)	20	--	20
Procurement	729	+537	1266
Total	749	+537	1286

c. (U) Unit Cost --

Procurement:			
FY 70 Base-Year \$	\$ 5.944	\$+ 2.459	\$ 8.403
Then Year \$	7.650	+ 19.012	26.662
Program:			
FY70 Base-Year \$	7.999	+ 2.131	\$ 10.131
Then Year \$	9.820	+ 19.006	28.826

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11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

d. (U) Approved Design to Cost Goal -- None.

e. (U) Foreign Military Sales -- Sales to date total 127 aircraft at an estimated cost of \$4432.3M, broken out by country as follows:

Country	Quantity	Estimated Cost
Israel	51	\$1371.7M
Japan	14	292.6M
Saudi Arabia	62	2768.0M
Total	127	4432.3M

All FMS deliveries have been completed; therefore, there will be no further impact on USAF Costs or Schedule.

f. (U) Nuclear Costs -- None

12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. (U) Program Acquisition--			
(1) Cost	37070.2	37978.5	37070.2
(2) Quantity	1286	1286	1286
(3) Unit Cost	28.826	29.532	28.826
b. (U) Current Procurement--	(FY 1987)	(FY 1987)*	(FY 1988)
(1) Cost	1760.2	1770.2	1654.9
Less CY Adv Proc	- 139.4	- 139.4	- 154.2
Plus PY Adv Proc	+ 191.5	+ 191.5	+ 139.4
Net Total	1812.3	1822.3	1640.1
(2) Quantity	42	42	42
(3) Unit Cost	43.150	43.388	39.050

* Adjusted to reflect FY87 Appropriation Act in accordance with Congressional change to SAR law.

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13. (U) Cost Variance Analysis:

a. (U) Summary--(Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	TOTAL
Development Estimates	1778.6	5576.6	7355.2
Previous Changes			
Economic	- 5.1	+ 1159.1	+ 1154.0
Quantity	+ 0.0	+14749.2	+14749.2
Schedule	+ 0.0	+ 2850.5	+ 2850.5
Engineering	+ 1034.5	+ 2949.4	+ 3983.9
Estimating	+ 153.6	+ 715.8	+ 869.4
Other	+ 208.6	+ 559.1	+ 767.7
Support	+ 118.7	+ 6129.9	+ 6248.6
Subtotal	+ 1510.3	+29113.0	+30623.3
Current Changes			
Economic	- 7.4	- 489.4	- 496.8
Quantity	+ 0.0	+ 0.0	+ 0.0
Schedule	+ 0.0	+ 171.9	+ 171.9
Engineering	+ 40.4	+ 0.0	+ 40.4
Estimating	- 0.6	- 753.9	- 754.5
Other	+ 0.0	+ 0.0	+ 0.0
Support	- 5.7	+ 136.4	+ 130.7
Subtotal	+ 26.7	- 935.0	- 908.3
Total Changes	+ 1537.0	+28178.0	+29715.0
Current Estimate	3315.6	33754.6	37070.2

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13. (U) Cost Variance Analysis:

a. (U) Summary--(FY 1970 Constant Dollars (Base-Year) in Millions)

	RDT&E	PROC	TOTAL
Development Estimates	1657.8	4333.2	5991.0
Previous Changes			
Quantity	+ 0.0	+ 3365.7	+ 3365.7
Schedule	+ 0.0	+ 513.9	+ 513.9
Engineering	+ 475.4	+ 723.0	+ 1198.4
Estimating	+ 57.2	+ 15.3	+ 72.5
Other	+ 173.9	+ 445.2	+ 619.1
Support	+ 15.4	+ 1391.2	+ 1406.6
Subtotal	+ 721.9	+ 6454.3	+ 7176.2
Current Changes			
Quantity	+ 0.0	+ 0.0	+ 0.0
Schedule	+ 0.0	+ 0.0	+ 0.0
Engineering	+ 14.8	+ 0.0	+ 14.8
Estimating	+ 2.8	- 142.4	- 139.6
Other	+ 0.0	+ 0.0	+ 0.0
Support	- 8.0	- 6.5	- 14.5
Subtotal	+ 9.6	- 148.9	- 139.3
Total Changes	+ 731.5	+ 6305.4	+ 7036.9
Current Estimate	2389.3	10638.6	13027.9

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13. (U) Cost Variance Analysis:

b. (U) Previous Change Explanations --

(U) RDT&E

Economic: Revised Economic Escalation Indices

Engineering: Closeout engine development and system test and development. Requirements beyond baseline program. AMRAAM Integration, deletion of conformal fuel tanks (CFTs). Flight test and F-15 enhancements added. F-15E development, Augmented MSIP development and Advanced Derivative Engine (ADE) Integration effort added. MER-200P Rack. Fiscal Year (FY) 84 reprogrammings for increased air-to-ground capability for C/D aircraft and for incorporation of Very High Speed Integrated Circuitry (VHSIC). FY 83 reprogramming is based on a reduction in scope of the HAVE TALON program. Upgrade of radar capability to counter evolving Electronic Counter Measures (ECM) capabilities. Integration of a Common Data Transfer Module. Development of Advanced Avionics Software and Electronic Counter-Countermeasures (ECCM) compatibility.

Estimating: Reestimate of procurement program initial spares, engines, ECO, radar and Tactical Electronic Warfare Sets (TEWS). Withdrawal of Rapid Deployment Forces Funds. Revised estimating factors for Aerospace Ground Equipment (AGE) and training spares. Additional requirements for systems engineering/management, flight test, Government Furnished Equipment (GFE) to support testing and electronic warfare support. Adjustment for change in escalation indices of years prior to the budget year. Reestimate of Programmable Signal Processor (PSP) Improvements, Aircraft Structural Life Assessment Program, Empennage Improvement Program, and C/D MSIP efforts. Adjustments to current and prior years due to funding constraints and changes in escalation indices. Qualification of Second Source for the new Inertial Navigation System (INS). Revised Estimates for Flight Test, Mission Support, C/D Multi-Staged Improvement Program (MSIP) development, ECCM improvements and the Improved Performance Engine (IPE).

Other: Deletion of engine procurement by the Navy; Component Improvement Program (CIP) transferred from Procurement to Development; McDonnell Douglas Cost Overrun.

Support: Avionics Integrated TEWS RDT&E transferred to another program element. Initial Spares reduction. Additional Peculiar Support equipment (PSE). Definitization of training, PSE, engine and airframe spares. Additions for CFTs, Tangential Carriage CFTs, Electronic Warfare Support requirements, and C/D MSIP simulator changes. Development effort to support electronic module testing -- Memory Module Test Station (MMTS) and APG-70 Radar Module Test Station (RMTS). Revised estimate for TEWS Intermediate Support System (TISS) and C/D MSIP Simulators.

(U) Procurement

Economic: Revised Economic Escalation Indices.

Quantity: Changes in F-15 aircraft procurement quantities. Correcting entries due to the recalculation of the 31 December 1983 and 1984 SARs (Quantity, Schedule, and Quantity-related Changes).

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13. (U) Cost Variance Analysis:

b. (U) Previous Change Explanations --

Schedule: F-15 aircraft production rate changes. Rephasing of JTIDS (Joint Tactical Information and Distribution System) Program. Schedule changes associated with quantity changes. Correcting entries due to the recalculation of the 31 December 1983 and 1984 SARs (Quantity, Schedule, and Quantity-related Changes). Rephased schedule correcting entries due to recalculation of the 31 December 1983 and 1984 SARs. Schedule change to peak procurement rate of 48 aircraft/year in the FY87 PB.

Engineering: Closeout engine development and system test and development. Requirements beyond baseline program. AMRAAM (Advanced Medium Range Air-to-Air Missile) integration. Deletion of CFTs. Additional flight testing, addition of MER-200P Rack, F-15 Enhancements, Alternate Fighter Engine (APE), ADE, F-15E, Augmented MSIP, and Tangential Carriage CFTs. Engineering changes associated with quantity changes. Correcting entries due to the recalculation of the 31 December 1983 and 1984 SARs (Quantity, Schedule, and Quantity-related Changes). Transfer of JTIDS (Joint Tactical Information and Distribution System) procurement funding to retrofit. Addition of Linear Linkless Ammunition System and Tangential Carriage CFT (Conformal Fuel Tank) Ejector Units.

Estimating: Reestimate of procurement program, initial spares, engines, ECO, radar, TEWS, and Countermeasures Dispenser Sets (CMDs). Withdrawal of Rapid Deployment Forces Funds. Revised estimating factors for AGE and training spares. Reduced ECO for congressional reduction to fund Peacekeeper. OSD-directed reduction to engine ECO and warranty. Reestimate to reflect savings from CFT competition and Configured Engine Bay (CEB). Revised estimate of multiyear procurement estimate of requirements and savings. Adjustment for change in escalation indices for years prior to the budget year. Estimating changes associated with quantity changes. Correcting entries due to the recalculation of the 31 December 1983 and 1984 SARs (Quantity, Schedule, and Quantity-related Changes). Base Year only correction to the 31 December 1983 SAR for adjustment for prior year escalation and deescalation of Advance Buy Then Year \$ (TY\$). Recategorization associated with balancing the corrections made to the 31 December 1983 and 1984 SARs (revised estimate amount previously netted in the original cost changes). Propulsion Estimating Methodology Change. Augmented MSIP (Multi-Staged Improvement Program) and F-15E nonrecurring cost decrease due to actuals coming in at a lower than expected cost. Increase in F-15E CFT cost due to deletion of F-15 C/D CFTs. Withdrawal of Contingent Liability Funding by Higher Headquarters. Revision of F-15 Program Estimating methodology. Adjustment to refine the mix of previous support and estimating category changes primarily related to the impact of escalation changes on current and prior years.

Other: Deletion of engine procurement by the Navy. CIP (Component Improvement Program) transferred from avionics procurement to development. McDonnell Douglas Cost overrun.

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13. (U) Cost Variance Analysis:

b. (U) Previous Change Explanations --

Support: Avionics integrated TEWS RDT&E transferred to another program element. Initial Spares reduction. Additional PSE (Peculiar Support Equipment). Definitization of training, PSE and engine and airframe spares. Addition for CFTs, F-15E training, PSE, Data and Initial Spares requirements. Reprogrammings based on reductions in prior years to actual requirements and a reduction in management reserve. Adjustments for impact of inflation index changes on current and prior years. Initial Spares and other support requirement changes associated with quantity changes. PSE reduction. Correcting entry due to the recalculation of the 31 December 1983 SAR (Quantity, Schedule, and Quantity-related Changes). Deletion of AGETS (Automated Ground Engine Test Sets) and F-15 C/D CFTs. Revised Training requirement based on new schedule and additional requirements for the IPE (Improved Performance Engine). Revision of out-year estimate for PGSE (Peculiar Ground Support Equipment) and additional requirements for the IPE. Discrete estimate of out-year Data requirements. Revised Initial Spares requirements due to directed redefinition of the Initial Spares budgetary process. Adjustment to refine the mix of previous support and estimating category changes primarily related to the impact of escalation changes on current and prior years.

c. (U) Current Change Explanations--

	(Dollars in Millions)	
	Base-Year \$	Then-Year \$
(1) (U) <u>RDT&E</u>		
Revised economic escalation indices, (Economic)	\$ + 0.0	\$ - 7.4
Development costs to incorporate new capabilities in the F-15 (Engineering)	+ 14.8	+ 40.4
o Development effort for the Mission Support System (MSS) (Engineering)	(+ 4.1)	(+ 11.0)
o Development of HAVE QUICK Capability (Engineering)	(+ 2.2)	(+ 6.4)
o Development effort for Multi-Source Integration (Engineering)	(+ 5.6)	(+ 15.1)
o Development associated with integrating the Global Positioning System (GPS) into F-15 (Engineering)	(+ 2.9)	(+ 7.9)

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13. (U) Cost Variance Analysis:

c. (U) Current Change Explanations (continued) --

	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(1) (U) <u>RDT&E</u>		
Estimating offset for economic change in the current and prior years (Estimating)	+ 1.6	+ 4.0
Revised F-15 Program Estimating Methodology (Estimating)	+ 1.2	- 4.6
o Revised estimate for Mission Support (Estimating)	(+ 0.5)	(+ 1.1)
o Revised estimate for Flight Test (Estimating)	(+ 4.7)	(+ 14.6)
o Revised estimate for the F-15 C/D MSIP and Augmented MSIP Programs (Estimating)	(- 4.7)	(- 12.4)
o Revised estimate for the AN/ALQ-135 Update program (Estimating)	(+ 0.0)	(- 0.6)
o Revised estimate for the Operational Flight Program (OFF) Updates (Estimating)	(- 4.3)	(- 9.6)
o Revised estimate for the Radio Frequency (RF) Interoperability Program (Estimating)	(+ 5.4)	(+ 14.6)
o Revised estimate for Improved Performance Engine (IPE) Integration (Estimating)	(+ 3.1)	(+ 8.8)
o Revised estimate for the Inertial Navigation System (INS) Second Source Qualification (Estimating)	(- 1.2)	(- 3.0)
o Revised estimate for Very High Speed Integrated Circuitry (VHSIC) (Estimating)	(+ 0.2)	(+ 0.4)

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13. (U) Cost Variance Analysis:

c. (U) Current Change Explanations (continued) --

	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(1) (U) <u>RDTE</u>		
o Revision of F-15 Program RDTE Estimating Methodology (Estimating)	(- 2.5)	(- 18.5)
Support offset for economic change in the current and prior years (Support)	+ 0.3	+ 0.9
Development effort associated with providing Interim I-Level (Intermediate Level) support for the RWR (Support)	+ 5.3	+ 13.1
Revised Estimates for F-15 Support Equipment Development (Support)	- 13.6	- 19.7
Revised estimate for TEWS Intermediate Support System (TISS) (Support)	(- 15.1)	(- 23.8)
Revised estimate for Simulator Development (Support)	(+ 0.1)	(+ 0.3)
Revised estimate for Memory Module Test Station (MMTS) development (Support)	(+ 0.7)	(+ 1.9)
Revised estimate for Radar Module Test Station (RMTS) development (Support)	(+ 0.7)	(+ 1.9)
(2) (U) <u>Procurement</u>		
Revised economic escalation indices. (Economic)	+ 0.0	- 489.4
Schedule change to peak procurement rate of 42 aircraft/year in the FY88 President's Budget (PB) versus 48 aircraft/year in the FY87 PB (Schedule)	+ 0.0	+ 171.9

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(F-15, December 31, 1986)

13. (U) Cost Variance Analysis:

c. (U) Current Change Explanations (continued) --

	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(2) (U) <u>Procurement</u>		
Estimating offset for economic change in the current and prior years (Estimating)	+ 38.1	+ 148.5
Reprogrammings and Funding withdrawals (Estimating)	- 46.3	- 178.0
o Reprogramming to fund purchase of Avionics Systems (Estimating)	(+ 3.1)	(+ 11.0)
o Funds withdrawal for Contra Aid (Estimating)	(- 2.5)	(- 10.0)
o Turn-in of excess program funds (Estimating)	(- 22.9)	(- 84.4)
o F-15 share of the FY86 Gramm-Rudman reductions (Estimating)	(- 24.0)	(- 94.6)
Revised Program estimate based on "Should Cost" study (Estimating)	- 134.2	- 724.4
Support offset for economic change in the current and prior years (Support)	+ 14.4	+ 55.2
F-15 Share of the FY86 Gramm-Rudman reduction (Support)	- 11.1	- 42.1
F-15 Support Requirements	- 9.8	+ 123.3
o Revised estimate for the F-15E Simulators (Support)	(- 4.7)	(- 20.9)
o Revised estimate on the F-15E Cockpit/Egress Procedures Trainers (CPT/EPT) (Support)	(- 0.3)	(- 1.6)
o Refinement of F-15 Maintenance Training Equipment Requirements (MTE), for both Field and Residence Course use (Support)	(+ 8.2)	(+ 32.0)

(F-15, December 31, 1986)

13. (U) Cost Variance Analysis:

c. (U) Current Change Explanations (continued) --

	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(2) (U) <u>Procurement</u>		
o Revised estimate for training engines (Support)	(- 3.4)	(- 15.0)
o Refined definition of required Aerospace Ground Equipment (PAGELs) for the F-15E (Support)	(+ 39.4)	(+ 166.0)
o Restructure of TEWS Intermediate Support System (TISS) requirements (Support)	(- 82.0)	(- 206.2)
o Revised estimate for engine Aerospace Ground Equipment (AGE) (Support)	(- 10.2)	(- 44.5)
o Revised estimate for F-15 Sustaining Engineering requirements (Support)	(+ 2.5)	(+ 13.6)
o Revised estimate for TEWS Depot (Support)	(- 3.4)	(- 11.6)
o Revised estimate for Avionics Depot (Support)	(- 13.7)	(- 50.6)
o Reestimate of F-15 C/D MSIP Avionics Intermediate Shop (AIS) Mobile Shelter requirements (Support)	(+ 10.4)	(+ 46.7)
o Revised estimate for Avionics Intermediate Support Facility (AISF) (Support)	(+ 10.7)	(+ 47.5)
o Definition of the F-15E Mechanical Depot requirement (Support)	(+ 4.5)	(+ 19.5)
o Revised estimate for Avionics Intermediate Shop/Mobile Electronics Test Set (AIS/METS) (Support)	(+ 32.0)	(+ 140.5)

(F-15, December 31, 1986)

13. (U) Cost Variance Analysis:

c. (U) Current Change Explanations (continued) --

(Dollars in Millions)
Base-Year \$ Then-Year \$

(2) (U) Procurement

o Discrete estimate of out year Data requirements (Support)	(- 2.0)	(- 6.3)
o Revised Initial Spares requirements (Support)	(+ 2.2)	(+ 14.2)

d. (U) References --

(U) Development Estimate:
AF Form 1037 - Quarterly Review -- January 5, 1970.

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

(U) Initial SAR Estimate to Current Estimate

PAUC (Initial SAR/Dev Est)	Changes(Then-Year Dollars in Millions)								PAUC Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
9.820	+0.511	+7.369	+2.350	+3.129	+0.089	+4.961	+0.597	+19.006	28.826

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(F-15, December 31, 1986)

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Multi-Staged Improvement Program (MSIP) Phase II	\$ 341.8	\$ N/A	N/A
McDonnell Douglas, St. Louis, MO.			
F33657-83-C-0043/PZ0003, CPIF			
Award: February 2, 1983			
Definitized: December 2, 1983			

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 392.7	\$ N/A	N/A	\$ 406.1	\$ 407.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$ -18.8	\$ - 23.5
Cumulative Variances to Date (10/31/86)	-20.6	- 16.3
Net Change	- 1.8	+ 7.2

Explanation of Change:

(U) Cost and Schedule Variances are marginal. Major Subcontractor on FPI contract is going to ceiling.

Impact: APG-70 Radar Software will be one year late on delivery. Radar Hardware delivery will occur on schedule. Initial capability of the system will be no less than the APG-63.

b. (U) Procurement

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Band III, Internal Countermeasures Set	\$ 202.9	\$ 220.6	65
Northrop Corporation, Rolling Meadows, IL			
F33657-83-C-2149, FPIF			
Award: September 13, 1983			
Definitized: December 27, 1984			

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 220.6	\$ 220.6	65	\$ 220.6	\$ 220.6

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(F-15, December 31, 1986)

15. (U) Contract Information: (Then-Year Dollars in Millions)

b. (U) Procurement (continued)

Band III, Internal Countermeasures
Set _____ (continued)

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$ + 0.0	\$ + 0.0
Cumulative Variances to Date (10/31/86)	-18.6	-15.0
Net Change	-18.6	-15.0

Explanation of Change:

(U) Cost and Schedule variances are marginal. Previous Cumulative Cost and Schedule Variances are zero due to an Over-Target Baseline (OTB) which was implemented on this contract in November 1985. Since the implementation of the OTB, the cost and schedule variances are continuing. Slow Hardware and Software development is causing these variance Impact: Hardware deliveries are approximately twelve months late, and flight testing is approximately six months late.

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
FY83 Aircraft Buy	\$ 615.1	\$ N/A	39
McDonnell Douglas, St. Louis, MO			
F33657-83-C-2133, FFP A/			
Award: November 3, 1983 (CPR or C/SSR not required)			
Definitized: February 24, 1984			

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1166.1	\$ N/A	39	\$1166.1	\$1166.1

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(F-15, December 31, 1986)

15. (U) Contract Information: (Then-Year Dollars in Millions)

b. (U) Procurement (continued)

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>FY84 Aircraft Buy</u>	\$ 594.3	\$ N/A	36
McDonnell Douglas, St. Louis, MO			
F33657-84-C-2131, FFP A/			
Award: March 29, 1985 (CPR or C/SSR not required)			
Definitized: March 29, 1985			

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 730.3	\$ N/A	36	\$ 730.3	\$ 730.3

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>FY85 Aircraft Buy</u>	\$ 768.0	\$ N/A	42
McDonnell Douglas, St. Louis, MO			
F33657-85-C-2086, FFP A/			
Award: March 29, 1985 (CPR or C/SSR not required)			
Definitized: July 29, 1985			

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 869.4	\$ N/A	42	\$ 869.4	\$ 869.4

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>F-15E/AMSIP/Prod Nonrecurring</u>	\$ 373.4	\$ 416.3	N/A
McDonnell Douglas, St. Louis, MO			
F33657-84-C-2228, FPI			
Award: March 11, 1985			
Definitized: March 11, 1985			

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(F-15, December 31, 1986)

15. (U) Contract Information: (Then-Year Dollars in Millions)

b. (U) Procurement (continued)

F-15E/AMSIP/Prod Nonrecurring (continued)

Current Contract Price			Estimated Price at Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$ 429.0	\$ 548.0	N/A	\$ 533.0	\$ 556.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$ -12.7	\$ - 9.9
Cumulative Variances to Date (10/31/86)	-34.6	-14.7
Net Change	-21.9	- 4.8

Explanation of Change:

(U) Cost and schedule variances are marginal. We underestimated the structural changes required for Built-Up Low Cost Advanced Titanium Structure (BLATS) technology and the 9G wing loads. Contractor is spending at a greater-than-planned rate to protect first flight of F-15E No. 1 (Dec 86).

Impact: Increased cost due to changes for BLATS and 9G are nonrecoverable. The F-15E No. 1 flew on 11 December 1986.

A/ SAR requires reporting on the top six contracts for the program being reviewed. CPR data is not required on FFP Contracts.

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(F-15, December 31, 1986)

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

- (1) Percent Program Completed: 70.0% (21/30)
(Years Funds Appropriated/Total Program Years)
- (2) Percent Program Cost Appropriated: 62.6% (\$23214.8M/\$37070.2M)
(Funds Appropriated To Date in Millions/Total Program Funding in Millions)

b. (U) Appropriation Summary --

Appropriation	Current & Prior Years (FY67-87)	(Then Year Dollars in Millions)			Total
		Budget Year (FY88)	Balance to Complete FYDP (FY89-92)	Beyond FYDP (FY93-96)	
RDT&E	\$ 2947.4	\$ 118.6	\$ 201.3	\$ 48.3	\$ 3315.6
Procurement	\$ 20267.4	\$ 1654.9	\$ 6952.1	\$ 4880.2	\$ 33754.6
MILCON	\$ --	\$ --	\$ --	\$ --	\$ --
Total	\$ 23214.8	\$ 1773.5	\$ 7153.4	\$ 4928.5	\$ 37070.2

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(F-15, December 31, 1986)

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

c. (U) Annual Summary --

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESCL RATE %
		FLYAWAY (NONADD)		TOTAL	ADV PROCUREMENT		TOTAL	
		NONREC	REC		(DEBIT)	(CREDIT)		
APPROPRIATION: RDT&E								
1967	--	--	--	1.1	--	--	1.0	3.2
1968	--	--	--	1.1	--	--	1.0	3.7
1969	--	--	--	78.2	--	--	75.5	3.5
1970	--	--	--	175.1	--	--	175.1	3.6
1971	--	--	--	338.3	--	--	349.5	3.3
1972	--	--	--	397.1	--	--	422.9	3.1
1973	--	--	--	408.6	--	--	454.4	4.4
1974	--	--	--	223.8	--	--	258.0	3.7
1975	--	--	--	154.2	--	--	184.2	3.6
1976	--	--	--	28.2	--	--	34.9	3.6
1977	--	--	--	3.9	--	--	5.3	4.4
1977	--	--	--	43.3	--	--	59.6	4.6
1978	--	--	--	41.7	--	--	61.1	7.0
1979	--	--	--	7.2	--	--	11.7	8.4
1980	--	--	--	1.4	--	--	2.5	9.4
1981	--	--	--	5.8	--	--	11.6	11.9
1982	--	--	--	15.6	--	--	33.3	9.2
1983	--	--	--	50.8	--	--	114.0	4.9
1984	--	--	--	54.2	--	--	126.2	3.8
1985	--	--	--	79.3	--	--	190.8	3.4
1986	--	--	--	88.1	--	--	218.7	2.9
1987	--	--	--	60.9	--	--	156.1	3.1
1988	--	--	--	44.7	--	--	118.6	3.5
1989	--	--	--	25.3	--	--	69.3	3.5
1990	--	--	--	20.6	--	--	58.3	3.3
1991	--	--	--	12.7	--	--	36.9	2.9
1992	--	--	--	12.4	--	--	36.8	2.4
1993	--	--	--	8.1	--	--	24.6	2.4
1994	--	--	--	6.2	--	--	19.2	2.4
1995	--	--	--	1.4	--	--	4.5	2.4
1996	--	--	--	0.0	--	--	0.0	2.4
SUBTTL	20	-- 1/	-- 1/	2389.3	--	--	3315.6	

1/ Not Available

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(F-15, December 31, 1986)

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

c. (U) Annual Summary --

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESCL RATE %
		FLYAWAY (NONADD)		TOTAL	ADV PROCUREMENT		TOTAL	
		NONREC	REC		(DEBIT)	(CREDIT)		
APPROPRIATION: PROCUREMENT								
1973	30	3.3	269.6	344.5	--	--	478.1	7.9
1974	62	15.4	425.7	575.2	--	--	903.1	10.7
1975	72	1.6	434.4	542.1	30.9	--	927.0	13.8
1976	108	11.4	649.4	828.2	37.2	-30.9	1522.3	12.5
197T	24	4.8	135.1	163.1	--	--	322.2	5.3
1977	108	6.1	617.0	712.1	51.4	-37.2	1418.6	5.0
1978	97	3.5	598.3	711.6	69.6	-51.4	1517.2	7.4
1979	78	0.7	435.0	536.5	81.4	-69.6	1386.8	8.7
1980	60	--	330.6	365.1	77.9	-81.4	1056.6	9.7
1981	42	--	261.5	349.4	125.1	-77.9	1101.8	11.9
1982	36	--	260.4	346.5	109.2	-125.1	1148.5	9.6
1983	39	7.1	263.3	416.3	158.5	-109.2	1467.7	9.0
1984	36	33.0	272.1	392.6	144.0	-158.5	1446.0	8.0
1985	42	30.7	324.7	533.7	175.3	-144.0	2034.5	3.4
1986	48	16.1	329.4	450.9	191.5	-175.3	1776.8	2.9
1987	42	2.1	303.3	432.1	139.4	-191.5	1760.2	3.1
1988	42	9.1	282.7	393.6	154.2	-139.4	1654.9	3.5
1989	42	15.7	286.2	400.6	152.3	-154.2	1734.0	3.5
1990	42	5.6	292.4	417.4	153.3	-152.3	1854.8	3.3
1991	42	0.5	289.1	389.7	155.1	-153.3	1774.0	2.9
1992	42	0.4	285.2	340.9	155.7	-155.1	1589.3	2.4
1993	42	0.0	284.8	330.5	158.0	-155.7	1578.0	2.4
1994	42	0.0	282.7	323.9	160.6	-158.0	1583.4	2.4
1995	42	3.1	281.5	284.4	34.2	-160.6	1423.2	2.4
1996	6	8.3	56.1	57.7	--	- 34.2	295.6	2.4
SUBTTL	1266	178.5	8250.5	10638.6	2514.8	-2514.8	33754.6	
TOTAL	1286			13027.9			37070.2	

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16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

d. (U) Obligations and Expenditures --

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	Total	Obligated 1/	Expended 1/
Appropriation: RDT&E			
1967	1.0	1.0	1.0
1968	1.0	1.0	1.0
1969	75.5	75.5	75.5
1970	175.1	175.1	175.1
1971	349.5	349.5	349.5
1972	422.9	422.9	422.9
1973	454.4	454.4	454.4
1974	258.0	258.0	258.0
1975	184.2	184.2	184.2
1976	34.9	34.9	34.9
1977	5.3	5.3	5.3
1977	59.6	59.6	59.6
1978	61.1	61.1	61.1
1979	11.7	11.7	11.7
1980	2.5	2.5	2.5
1981	11.6	11.6	11.6
1982	33.3	33.3	33.3
1983	114.0	114.0	114.0
1984	126.2	126.2	124.9
1985	190.8	190.8	180.8
1986	218.7	205.9	115.6
1987	156.1	60.1	0.3
TO COMPLETE	368.2	N/A	N/A
TOTAL	3315.6	2838.6	2677.2

1/ Reflects Program Office records as of 31 December 1986.

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(F-15, December 31, 1986)

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

d. (U) Obligations and Expenditures --

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	Total	Obligated 1/	Expended 1/
Appropriation: Procurement			
1973	478.1	478.1	478.1
1974	903.1	903.1	903.1
1975	927.0	927.0	927.0
1976	1522.3	1522.3	1522.3
1977	322.2	322.2	322.2
1977	1418.6	1418.6	1418.6
1978	1517.2	1517.2	1517.2
1979	1386.8	1386.8	1386.8
1980	1056.6	1056.6	1056.6
1981	1101.8	1101.8	1101.8
1982	1148.5	1148.5	1148.5
1983	1467.7	1457.7	1429.5
1984	1446.0	1423.2	1233.9
1985	2034.5	1739.8	1006.2
1986	1776.8	814.3	47.7
1987	1760.2	32.1	0.0
TO COMPLETE	13487.2	N/A	N/A
TOTAL	33754.6	17249.3	15499.5

1/ Reflects Program Office records as of 31 December 1986.

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(F-15, December 31, 1986)

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate 1/	Current Estimate	Maximum
1973	30	30	30	30
1974	77	62	62	62
1975	144	72	72	72
1976	144	108	108	108
1977		24	24	24
1977	144	108	108	108
1978	144	97	97	97
1979	46	78	78	78
1980		60	60	60
1981		42	42	42
1982		36	36	36
1983		39	39	39
1984		36	36	36
1985		42	42	42
1986		48	48	48
1987		48	42	42
1988		48	42	42
1989		48	42	72
1990		48	42	136
1991		48	42	144
1992		48	42	144
1993		48	42	144
1994		48	42	144
1995			42	144
1996			6	144

1/ A Production Estimate Baseline was not required for SAR reporting at the time the F-15 Program completed the DSARC III process. As a result, the Production Estimate Baseline was established from the Current Program Estimate for the 31 December 1985 SAR.

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17. (U) Production Rate Data:

b. (U) Cost Variance -- Dollars in Millions

Item	Production Estimate	Change (Cur Est Less Prod Est)	Current Estimate	Change (Cur Est Less Maximum)	Maximum
Prog Acq Cost (BY\$)	13167.2	-139.3	13027.9	+ 317.9	12710.0
Prog Acq Cost (TY\$)	37978.5	-908.3	37070.2	+ 1932.7	35137.5
PAUC (BY\$)	10.239	-0.108	10.131	+ 0.248	9.883
PAUC (TY\$)	29.532	-0.706	28.826	+ 1.503	27.323

c. (U) Schedule Variance --

	Production Estimate	Change (Cur Est Less Prod Est)	Current Estimate	Change (Cur Est Less Maximum)	Maximum
Start Date (Mon/Yr)	Oct 1972	N/A	Oct 1972	N/A	Oct 1972
Duration (In Months)	284	14	298	50	248
End Date (Mon/Yr)	Apr 1996	N/A	Jul 1997	N/A	May 1993

Note: Start date for all estimates is defined as of the Production Approval Decision for the F-15A Program. The End Date is the month that the last delivery of aircraft will take place in.

d. (U) Deliveries (Plan/Actual) --

RDT&E
Procurement

To Date
20/20
815/815

18. (U) Operating and Support Costs:

Not Applicable.

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SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A) 823)

PROGRAM: F-16

AS OF DATE: December 31, 1986

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (DASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): F-16 Multimission Fighter (Fighting Falcon)

2. DoD Component: U.S. Air Force

3. Responsible Office and Telephone Number:

F-16 Program Office
Aeronautical Systems Division
Wright-Patterson AFB, OH

PM: Maj Gen Robert D. Eaglet
Assigned: July 14, 1986
AV 785-6151; COMM (513)255-6151

4. Program Elements/Procurement Line Items

EDT&E: PE27133F
PROCUREMENT: PE27133F APPN: 3010 ICN F016AD

5. Related Programs:

Advanced Medium Range Air-to-Air Missile (AMRAAM), Low Altitude Navigation and Targeting Infrared for Night (LANTIRN), Airborne Self-Protection Jammer (ASPJ), Global Positioning System (GPS).

6. Mission and Description:

The F-16 Multimission Fighter is a single engine, lightweight, high performance aircraft, powered by a 25,000 pound thrust class afterburning turbofan engine. It is a tactical fighter aircraft with an air-to-air and air-to-surface, multi-role capability that can be deployed from the continental U.S. to any possible trouble area of the world with minimum enroute support and with

SAF/PAS

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high reliability and simplified maintenance procedures to assure successful operations under austere conditions. The F-16 Program is part of the continuing modernization of U.S. tactical fighters to reverse the upward trend in higher total investment and operating and support costs. The F-16 is employed in a complementary role to the F-15 in counter air missions, and to supplement the surface attack capabilities of the F-4, F-111, and A-10.

7. Program Highlights

a. Significant Historical Developments--The F-16 received Secretary of Defense approval for program initiation in August 1971. DSARC I approval occurred in December 1974 and the full scale development contract was awarded in January 1975. The United States and four European countries (Belgium, Denmark, The Netherlands, and Norway) signed a memorandum of understanding for F-16 co-production in June 1975. Approval for long lead procurement was given at DSARC III A in January 1977 and production approval was given at DSARC III B in October 1977. The first aircraft delivery to Tactical Air Command occurred in September 1978 and Hill AFB activated the first F-16 squadron in February 1979. The USAF initial operational capability was reached in October 1980. In March 1985, the last of 785 F-16A/B aircraft were delivered to the USAF. Program management responsibility transfer (PMRT) from Air Force Systems Command to Air Force Logistics Command, for the F-16A/B aircraft, occurred on 1 October 1985. Air Force Systems Command retains responsibility for the continuing F-16C/D program.

b. Significant Developments Since Last Report--A total of 288 F-16C/D aircraft have been delivered by the end of CY86 and the F-16C/D is operational at four USAF bases. The one millionth flying hour in the USAF F-16 was flown in December 1986. The Multiyear II contract for 180 aircraft per year from 1986 to 1989 was definitized and signed.

The F-16 continues to meet its current mission requirements.

c. Changes Since "As of" Date -- None

8. Decision Coordinating Paper (DCP) Threshold Breaches:

There are currently no DCP (dated 10 March 1975) threshold breaches

9. Schedule:

a. F-16A/B Milestones	Development Estimate/ Approved Program	Current Estimate
Complete Competitive Flight Test	Dec 74/Dec 74	Dec 74
Award Development	Jan 75/Jan 75	Jan 75
DSARC II	Mar 75/Mar 75	Apr 75
Radar Contractor Selection	Jan 76/Jan 76	Nov 75
First FSD Flight	Dec 76/Dec 76	Dec 76

3. Schedule (Cont'd):

a. <u>F-16A/B</u> <u>Milestones</u>	<u>Development Estimate/</u> <u>Approved Program</u>	<u>Current</u> <u>Estimate</u>
DSARC IIIA	Jan 77/Jan 77	Jan 77
DSARC IIIB	Sep 77/Sep 77	Oct 77
First Flight, Production Aircraft	Aug 78/Aug 78	Aug 78
First Aircraft to TAC	Sep 78/Sep 78	Sep 78
Deliver 100th Production Aircraft to USAF	May 80/May 80	May 80
F-16A/B PMRT	N/A	Oct 85
 <u>F-16C/D</u> <u>Milestones</u>		
Begin MSIP I	Feb 80/Feb 80	Feb 80
Program Direction-MSIP II	Dec 80/Dec 80	Dec 80
Begin MSIP II	May 81/May 81	May 81
MSIP I First Delivery	Nov 81/Nov 81	Nov 81
Deliver First F-16C to USAF	Jul 84/Jul 84	Jul 84
Initial F-16C/D Delivery to TAF	Dec 84/Dec 84	Dec 84

b. Previous Change Explanation --

F-16A/B

Program Management Responsibility Transfer (PMRT) date.

F-16C/D

Integration of F-16C/D (MSIP) milestones into SAR.

c. Current Change Explanations -- None

d. References --

F-16A/BDevelopment Estimate - Decision Coordinating Paper (DCP) #143, 10 March 1975
(For Coordination - Revised)Approved Program - Decision Coordinating Paper (DCP) #143, 29 November 1977,
Aircraft Production Planning Schedule for USAF (WA 78-1)(January 1978); USAF Bases
Units and Priorities (PD 80-3) (May 1978)F-16C/DDevelopment Estimate and Approved Program - F-16 Multinational Staged
Improvement Program Baseline (December 1985)

10. Technical/Operational Characteristics:

	<u>Development Estimate</u>	<u>Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. Technical				
F-16A/B				
(1) Sustained Turn Rate, 30,000 ft.				
Mach 1.2 (Deg per sec/G)	6.5/4.3	6.5/4.3	6.4/4.3	6.0/4.0
Mach 0.9 (Deg per sec/G)	8.7/4.3	8.7/4.3	8.1/4.1	8.1/4.1
F-16C/D				
(2) Sustained Turn Rate, 30,000 ft., Air-to-Air.				
Mach 1.2 (Deg per sec)	5.1	5.1		5.1
Mach 0.9 (Deg per sec)	7.3	7.3		7.3
(3) Sustained Turn Rate, 200 ft., Air-to-Ground.				
500 KTAS (Deg per sec) [3] [5]	6.6	6.6		6.6
b. Operational				
F-16A/B				
(1) Mission Reliability (%)	85	90	91	91
(2) Mean Flight Time Between Failure (MFTBF) (Hrs.)	1.75	2.90	3.05	2.92
(3) Air-to-Air Mission				
No./wt. per Missile	2/169	2/195	2/195	2/195
No./wt. of Ammo	500/280	500/280	500/280	500/280
(4) Air-to-Ground Mission				
No./wt. of Weapon	2/2000	2/2000	2/1970	2/1970
No./wt. of ECM Pod	1/392	1/675		1/675
(5) Max Sustained Speed (Mach)				
Sea Level, Air-to-Air	1.2	1.2	1.2	1.2
(6) Max Sustained Speed (Mach)				
Altitude, Air-to-Air	2.0	2.0	2.0	2.0

10. Technical/Operational Characteristics (Cont'd):

		<u>Development Estimate</u>	<u>Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
	F-16C/D				
(7)	Design Mission Combat Radius				
	Air-to-Air (NM)	600	600	655	655
	Air-to-Ground (NM)	550	550	666	666
(8)	Mean Time Between Maintenance (Hrs.)	3.0	3.0		3.0
(9)	Air-to-Air Mission [1]				
	No./wt. per Missile	2/195	2/195		2/195
	No./wt. of Ammo	500/280	500/280		500/280
(10)	Air-to-Air Mission [2]				
	No./wt. per AIM-9L	2/195	2/195		2/195
	No./wt. per AMRAAM	2/328	2/328		2/345(Ch1)
	No./wt. of Ammo	500/280	500/280		500/280
(11)	Air-to-Ground Mission [3]				
	No./wt. of Weapon	2/1980	2/1980		2/1980
	No./wt. per Missile	2/195	2/195		2/195
	No./wt. of Ammo	500/280	500/280		500/280
(12)	Air-to-Ground Mission [4]				
	No./wt. of Weapon	4/1856	4/1856		4/1856
	No./wt. per Missile	2/195	2/195		2/195
	No./wt. of Ammo	500/280	500/280		500/280
(13)	Total Mission Radius (NM)				
	Air-to-Air [1] [5]	420	420		420
	Air-to-Ground: Hi-Lo-Lo-Hi [3] [5]	465	465		465
	Air-to-Ground: Lo-Lo-Lo-Lo [3] [5]	295	295		295
(14)	Max Speed, Air-to-Ground 200ft [3] [5]				
	with weapons (kts)	565	565		565
	without weapons (kts)	580	580		580

[1] Air-to-Air Loading 1: 2 AIM-9L, 500 Rounds Ammo, 2 370 Gal Tanks

[2] Air-to-Air Loading 2: 2 AIM-9L, 500 Rounds Ammo, 2 370 Gal Tanks, 2 AMRAAM

[3] Air-to-Ground Loading 1: 2 AIM-9L, 500 Rounds Ammo, 2 370 Gal Tanks, 2 Mk-84, 1 ALQ-131

[4] Air-to-Ground Loading 2: 2 AIM-9L, 500 Rounds Ammo, 2 370 Gal Tanks 4 AGM-65/TRL, LANTIRN Pods

[5] Threshold values for Loadings 2 and 4 to be determined upon completion of performance tests and analyses

10. Technical/Operational Characteristics (Cont'd):

c. Previous Change Explanations --

F-16A/B

(1) Technical Characteristic No. 10.a. changes are due to increase of maximum TOGW to accommodate an increase in payload requirements.

(2) Operational Characteristic No. 10.b.(1) changed to reflect decrease in average mission duration from 3.3 hours to 2.3 hours.

(3) Operational Characteristic No. 10.b.(2) changed to reflect improved hardware reliability from active program to minimize number of parts.

(4) Operational Characteristic No. 10.b.(3): Development Estimate of missile weight based on AIM-9J; current estimate based on AIM-9L.

(5) Operational Characteristic No. 10.b.(4): Development Estimate of weapon weight reflected nominal value; current estimate reflects measured weight. Development estimate of pod weight based on ALQ-119-3; current estimate based on ALQ-131.

(6) Operational Characteristic No. 10.b.(7): Current estimate and demonstrated performance exceed both air-to-air and air-to-ground DCP goals.

F-16C/D -- None.

d. Current Change Explanations

F-16A/B -- None.

(Ch1) F-16C/D -- 10.b.(10) AMRAAM weight is 345 for current estimate.

e. References -

F-16A/B

Development Estimate - Decision Coordinating Paper (DCP) #143, 10 March 1975 (For Coordination)

Approved Program - Decision Coordinating Paper (DCP) #143, 29 November 1977.

F-16C/D

Development Estimate and Approved Program - F-16 Multi-national Staged Improvement Program (F-16 C/D) Program Baseline (December 1985).

11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. (U) Cost --			
Development (RDT&E)	\$ 578.6	\$ +409.5	\$ 988.1
Procurement	3798.2	+14336.5	18134.7
Airframe	(1375.4)	(+ 4255.7)	(5631.1)
Engine	(911.3)	(+ 2541.3)	(3452.6)
Electronics	(539.6)	(+ 3104.6)	(3644.2)
Armament	(171.6)	(+ 433.0)	(604.6)
Sys/Proj Mgt	(33.8)	(+ 478.5)	(512.3)
Total Flyaway	(3031.7)	(+10813.1)	(13844.8)
Peculiar Support	(435.2)	(+ 2100.0)	(2535.2)
Other Weapon System Cost	(--)	(+ 124.1)	(124.1)
Initial Spares	(331.3)	(+ 1299.3)	(1630.6)
Construction (MILCON)	--	--	--
Total FY 75 Base-Year \$	\$ 4376.8	\$+14746.0	\$19122.8
Escalation	1677.7	+26728.3	28406.0
Development (RDT&E)	(80.5)	(+ 412.8)	(493.3)
Procurement	(1597.2)	(+26315.5)	(27912.7)
Construction (MILCON)	--	--	--
Total Then-Year \$	\$ 6054.5	\$+41474.3	\$47528.8
b. (U) Quantities --			
Development (RDT&E)	8	--	8
Procurement	650	+ 2079	2729
Total	658	+ 2079	2737
c. (U) Unit Cost --			
Procurement:			
FY 75 Base-Year \$	\$ 5.843	\$+ 0.802	\$ 6.645
Then-Year \$	8.301	+ 8.572	16.873
Program:			
FY 75 Base-Year \$	6.652	+ 0.335	6.987
Then-Year \$	\$ 9.201	\$+ 8.164	\$ 17.365

d. (U) Approved Design to Cost Goal -- None

e. (U) Foreign Military Sales --

- (1) *348 for European Participating Governments (EPG) Program for a total cost of \$5,385.2M (Then Year) which includes 116 @ \$1,646.0M for Belgium, 58 @ \$851.0M for Denmark, 102 @ \$1,614.2 for the Netherlands, and 72 @ \$1,274.0M for Norway.
- (2) *44 follow-on aircraft @ \$944.1M (Then Year) for Belgium

11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars) (Cont'd)

e. (U) Foreign Military Sales -- (Cont'd)

- (3) * 12 follow-on aircraft @ \$154.8M (Then Year) for Denmark
- (4) * 111 follow-on aircraft @ \$1,781.1M (Then Year) for the Netherlands
- (5) * 2 follow-on aircraft @ \$26.3M (Then Year) for Norway
- (6) 81 @ \$2,016.3M (Then Year) for Egypt
- (7) 150 @ \$3,216.6M (Then Year) for Israel
- (8) 36 @ \$927.1M (Then Year) for Korea
- (9) 40 @ \$1,004.5M (Then Year) for Pakistan
- (10) 160 @ \$4,158.2M (Then Year) for Turkey
- (11) 24 @ \$615.0M (Then Year) for Venezuela
- (12) 8 @ \$202.3M (Then Year) for Singapore
- (13) 12 @ \$337.1M (Then Year) for Thailand
- (14) 12 @ \$336.5M (Then Year) for Indonesia

f. Nuclear Costs -- None

* EPG procurements are technically not Foreign Military Sales, but constitute international cooperative program with the U.S. government.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u> <u>Dec 86 SAR</u>	<u>UCR Baseline</u> <u>Dec 85 SAR</u>	<u>UCR Baseline</u> <u>Dec 86 SAR</u>
a. (U) Program Acquisition --			
(1) Cost	47528.8	53335.9	47528.8
(2) Quantity	2737	3055	2737
(3) Unit Cost	17.365	17.459	17.365
b. (U) Current Procurement --	(FY 1987)	(FY 1987)*	(FY 1988)
(1) Cost	2952.0	2964.4	2885.2
Less CY ADV Proc	- 454.1	- 454.1	- 475.9
Plus FY Adv Proc	419.1	419.1	534.0
Net Total	2917.0	2929.4	2943.3
(2) Quantity	180	180	180
(3) Unit Cost	16.206	16.274	16.352

* Adjusted to reflect FY 87 Appropriation Act in accordance with Congressional Change to SAR law.

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	659.1	5395.4		6054.5
Previous Changes:				
Economic	+21.5	-1298.6		-1277.1
Quantity		+23539.1		+23539.1
Schedule	+0.1	+1142.1		+1142.2
Engineering	+582.2	+15522.8		+16105.0
Estimating	+53.9	-2842.9		-2789.0
Other	+20.6	+35.8		+56.4
Support	+154.9	+10349.9		+10504.8
Subtotal	+833.2	+46448.2		+47281.4
Current Changes:				
Economic	-2.5	-845.0		-847.5
Quantity		-3181.4		-3181.4
Schedule		+581.3		+581.3
Engineering	-39.6	-909.5		-949.1
Estimating	+31.2	-801.7		-770.5
Other				
Support		-639.9		-639.9
Subtotal	-10.9	-5796.2		-5807.1
Total Changes	+822.3	+40652.0		+41474.3
Current Estimate	1481.4	+46047.4		+47528.8

(FY 1975 Constant Dollars (Base-Year) in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	578.6	3798.2		4376.8
Previous Changes:				
Quantity		+8188.2		+8188.2
Schedule		+312.4		+312.4
Engineering	+299.0	+4970.4		+5269.4
Estimating	-0.3	-1163.2		-1163.5
Other	+15.5	+24.6		+40.1
Support	+101.0	+3760.6		+3861.6
Subtotal	+415.2	+16093.0		+16508.2
Current Changes:				
Quantity		-902.5		-902.5
Schedule		-15.1		-15.1
Engineering	-16.3	-334.1		-350.4
Estimating	+10.6	-267.6		-257.0
Other				
Support		-237.2		-237.2
Subtotal	-5.7	-1756.5		-1762.2
Total Changes	+409.5	+14336.5		+14746.0
Current Estimate	+988.1	+18134.7		+19122.8

13. (U) Cost Variance Analysis (Cont'd)

b. (U) Previous Change Explanations—

RDT&E

Economic: Revised escalation indices.
 Engineering: Added capability (Improved radar, Advanced IFF, AMRAAM integration).
 Estimating: Refinement of estimates.
 Other: Congressional action on ICS, CIP, and FOT&E Funding.
 Support: Development of AIS.

Procurement

Economic: Revised escalation indices.
 Quantity: Addition of 2397 aircraft.
 Schedule: Stretchout of FY82-85 procurements; acceleration of deliveries in FY88 from 15 aircraft to 18 aircraft per month.
 Engineering: Production incorporation of added capabilities (ASPJ, AMRAAM, LANTIRN, Improved RWR).
 Estimating: Flyaway cost re-estimates; two multiyear procurements.
 Other: Potential contract award fees.
 Support: Increased support for added aircraft and capability enhancements.

c. (U) Current Change Explanations—

(Dollars in Millions)
Base-Year \$ Then-Year \$

(1) (U) RDT&E

Revised economic escalation indices. (Economic)	N/A	- 2.5
Termination of F-16 Adaptive Targeting Data Link (ATDL) development. (Engineering)	-13.1	-29.1
Development of HARM/SHRIKE compatibility in F-16 aircraft. (Engineering)	+ 3.0	+ 4.8
Transfer of radar ECCM operational flight plan (OFP) task to procurement. (Engineering)	- 6.2	-15.3

13. (U) Cost Variance Analysis (Cont'd)

c. (U) Current Change Explanations (Cont'd)--

	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(1) (U) <u>RDT&E</u> (Cont'd)		
Re-estimate of test and mission support requirements. (Estimating)	+10.0	+30.1
Adjustment for prior year escalation. (Estimating)	+0.6	+1.1
(2) (U) <u>Procurement</u>		
Revised economic escalation indices. (Economic)	N/A	-844.8
Favorable currency exchange rate impact associated with multinational coproduction program. (Economic)	N/A	-0.2
Reduced F-16 aircraft procurement due to revised planned Force structure.	-1368.6	-4547.4
- Deletion of 318 aircraft. (Quantity)	(-902.5)	(-3181.4)
- Schedule change adjustment due to 318 fewer aircraft (schedule)	(-15.1)	(-49.6)
- Engineering change adjustment due to 318 fewer aircraft. (Engineering)	(-240.8)	(-673.5)
- Estimating change adjustment due to 318 fewer aircraft. (Estimating)	(+56.3)	(+123.4)
- Peculiar support reduction for 318 fewer aircraft. (Support)	(-102.5)	(-285.3)
- Initial spares reduction for 318 fewer aircraft. (Support)	(-164.0)	(-481.0)
Procurement schedule change due to decrease in production rate from 18 to 15 aircraft per month in FY87 through FY91; to 12.5 per month in FY92; and to 10 per month in FY93. (Schedule)	N/A	+630.9

13. (U) Cost Variance Analysis (Cont'd)

c. (U) Current Change Explanations (Cont'd) --

	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(2) (U) <u>Procurement</u> (Cont'd)		
Production incorporation of HARM/ SHRIKE capability in the F-16. (Engineering)	+10.0	+27.3
Transfer of radar ECCM OFP task from RDT&E. (Engineering)	+5.4	+15.3
Rescoping of Radar EECM OFP task. (Engineering)	-1.7	-4.7
Restructure of ASPJ program which defers full production capability from FY88 to FY90. (Engineering)	-73.5	-183.4
Delay in planned introduction of advanced radar warning receiver (ARWR) Group B hardware from FY87 to FY90. (Engineering)	-33.5	-90.5
Revised engine estimate based on more current cost data.	-434.1	-1270.8
- Flyaway re-estimate. (Estimating)	(-315.3)	(-921.1)
- Peculiar support re-estimate. (Support)	(-118.8)	(-349.7)
Estimated savings for a third F-16 multiyear contracting plan for 630 aircraft in FY90 through FY93. (Estimating)	-87.5	-262.0
Grassroots re-estimate of airframe cost. (Estimating)	-26.2	-8.5
Adjustment for prior year escalation.	+130.9	+331.0
- Adjustment for flyaway elements. (Estimating)	(+105.1)	(+266.5)
- Adjustment for support elements. (Support)	(+25.8)	(+64.5)

F-16, December 31, 1986

13. (U) Cost Variance Analysis (Cont'd)

c. (U) Current Changes Explanations--

	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(2) (U) <u>Procurement</u> (Cont'd)		
Grassroots estimate resulted in decreased peculiar support requirements (Support)	-60.2	-161.6
Re-estimate of initial spares requirements. (Support)	+182.5	+573.2

d. (U) References --

Development Estimate: President's FY 1977 budget dated 19 January 1976.

14. (U) Initial SAR/Development Estimate to Current Estimate

PAUC Initial SAR/ (Development Estimate)	Changes (Then Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
9.201	-0.776	+0.448	+0.630	+5.537	-1.300	+0.021	+3.604	+8.164	17.365

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E - None

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>

b. Procurement

\$144.0M	\$165.6M	N/A
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General Dynamics/Fort Worth Division, Fort Worth, Texas

F33657-82-C-2038 (MSIP), FPIF

Award: N/A (Follow-on effort)

Definitized: April 15, 1982

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$843.6M	\$939.7M	N/A	\$838.1M	\$833.1M
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			\$-29.5M	\$-18.2M
Cumulative Variances to date 10/31/86			\$-41.1M	\$-23.3M
Net Change			\$-11.6M	\$- 5.1M

Explanation of Change: The increase in the negative cum to date cost variance is \$11.6M. The most significant occurrences are: 1) Drawing updates and kit design changes for automatic test equipment. 2) Underestimate of the Harris computer. 3) Underestimate of 30G development tasks. The negative cost variance will not impact contract costs at completion because the cost variance is offset by a large management reserve (\$82.6M) which results in an undertarget at completion. The increase in the negative cum to date schedule variance is \$5.1M due to delays in tasks associated with Block 30G development and delays in efforts associated with the ASPJ test station design. The unfavorable schedule variance will not have an impact on the total program or MSIP contract. The program manager's estimate remains below contract target price and is within approved funding levels. We foresee no funding problem on this effort.

NOTE: Future Block configurations previously denoted as Block 30G and Block 30P will be denoted henceforth as Blocks 40 and 70, respectively.

F-16, 31 December 1986

F-16 Aircraft:

	<u>TARGET</u>	<u>CEILING</u>	<u>QTY</u>
General Dynamics/Fort Worth Division	\$715.8M	\$774.8M	120
Fort Worth, Texas			
F33657-82-C-2034 (FY83) FPIF			
Award: N/A (Follow on Effort)			
Definitized: 30 August 1983			

Reporting was discontinued in the 30 June 1986 unit cost report. Deliveries were complete and the contract was 95 percent complete.

P-16 Aircraft:

General Dynamics/Fort Worth Division
 Fort Worth, Texas
 F33657-82-C-2034 (FY84) FPIF
 Award: N/A (Follow on Effort)
 Definitized: 30 August 1983

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$669.6M	\$724.8M	144

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1,241.9M	\$1,341.7M	144	\$1,252.3M	\$1,251.0M

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-50.0M	\$-45.6M
Cumulative Variances to date 10/31/86	<u>\$-51.5M</u>	<u>\$-15.2M</u>
Net Change	\$- 1.5M	\$+30.4M

Explanation of Change: The increase in the negative cum to date cost variance since the 31 December 1985 SAR is \$1.5M. The increase is caused by late deliveries of flight control hardware associated with design changes causing workarounds to protect production rate. These variances will not impact the total program at completion. The decrease in the negative cum to date schedule variance of \$30.4M is the result of delivery of previously scheduled hardware for example: Sperry Flight Systems (Multifunction Display), GEC Avionics (F-16C/D Heads-up Display), Delco (Enhance Fire Control Computer), General Electric (Ammunition Handling, and Sunstrand (Engine Start System). No corrective action is required and no impact to the total program is anticipated. The Program Manager's estimate remains above contract target price but below approved funding levels. We foresee no funding problems on this effort.

F-16 Aircraft:

General Dynamics/Fort Worth Division
 Fort Worth, Texas
 F33657-82-C-2034 (FY85) FPIF
 Award: N/A (Follow on Effort)
 Definitized: 30 August 1983

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$697.4M	\$754.8M	150

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1,248.7M	\$1,350.8M	150	\$1,254.7M	\$1,270.3M
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			\$-14.6M	\$- 2.3M
Cumulative Variances to date 10/31/86			<u>\$-57.1M</u>	<u>\$-59.2M</u>
Net Change			\$-42.5M	\$-56.9M

Explanation of Change: The increase in the negative cum to date cost variance since the 31 December 1985 SAR is \$42.5M. The increase is caused by effort to achieve a total F-16 program rate acceleration. The contract delivery rate build-up began in the second quarter of 1986. The max contract rate of 25 aircraft per month is anticipated during December of 1986. As a result workarounds due to past shortages, inefficiencies associated with new hires and excessive overtime are causing cost variances. The variances will not impact the total program at completion. The negative cum to date schedule variance increased \$56.9M since the 31 December 1985 SAR. This reflects the difficulty the contractor is having achieving rate acceleration to meet total F-16 customers requirements. The FY85 program currently reflects a cumulative behind schedule position in the airframe WBS of \$33.4M and most of the variance has occurred during this period of rate acceleration. GD/FW is currently on the contract schedule but behind their internal schedules. We anticipate no impact to the total program at completion. The Program Manager's estimate at completion remains above contract target price but below approved funding levels. We foresee no funding problem on this effort.

F-16, 31 December 1986

F-16 Aircraft:

Westinghouse Electric Corporation
Harmans, Maryland
F33657-81-C-0641 (FY84) FPIF
Award: N/A (Follow on Effort)
Definitized: 31 October 1985

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$311.2M	\$354.5M	207

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$320.1M	\$ 364.7M	207	\$ 322.0M	\$ 330.6M
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			\$-13.7M	\$-15.9M
Cumulative Variances to date 10/31/86			<u>\$-20.7M</u>	<u>\$- 4.1M</u>
Net Change			\$- 7.0M	\$+11.8M

Explanation of Change: The increase in the negative cum to date cost variance since the 31 December 1985 SAR is \$7.0M. The increase is the result of the high failure rate of printed wire assemblies that are used in the Dual Mode Transmitter and the Programmable Signal Processor causing additional hours to be spent on rework and associated retesting. These variances will not cause an impact to the total program. The decrease in the negative cum to date schedule variance since the 31 December 1985 SAR is \$11.8M. The decrease is due to material scheduled in a previous period being delivered late. May 1986 marked the first month that WEC reached 100 percent first time through AFPRO inspection on all printed wire assemblies. There will be no total program impact as a result of the current cum to date schedule variance. The Program Manager's estimate remains above the contract target price but is within approved funding levels. We foresee no funding problem on this contract.

F-16 Aircraft:

Westinghouse Electric Corporation
 Harmans, Maryland
 F33657-81-C-0641 (FY85) FPIF
 Award: N/A (Follow on Effort)
 Definitized: January 1986

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$359.7M	\$386.1M	305

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$362.5M	\$ 389.1M	305

Estimated Price at Completion

<u>Contractor</u>	<u>Program Manager</u>
\$ 362.8M	\$ 370.4M

This contract was not among our six largest contracts as listed in the 31 December 1985 SAR.

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	0	0
Cumulative Variances to date 10/31/86	<u>\$- 4.6M</u>	<u>\$-19.3M</u>
Net Change	\$- 4.6M	\$-19.3M

Explanation of Change: This contract was not included in the 31 December 1985 SAR. The negative cum to date cost variance of \$4.6M is due to workarounds and overtime required to recover internal schedules. The cum to date cost variance will not impact the total program at completion. The negative cum to date schedule variance of \$19.3M is due to delays in completion of printed wire assemblies and slippage of major material items. The Program Manager's estimate at completion remains above the contract target price but is within approved funding levels. We foresee no funding problems on this contract.

F-16, 31 December 1986

Engines:

General Electric Corporation
Evendale, Ohio
F33657-84-C-2011 (FY85) FFP
Award: 3 February 1984
Definitized: 3 February 1984

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$522.7	\$522.7	126

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$556.6M	\$ 556.6M	126

Estimated Price at Completion

<u>Contractor</u>	<u>Program Manager</u>
\$ 558.5M	\$ 558.5M

Explanation of Change: CPR/CSSR is not available since firm fixed price (FFP) contracts do not require these reports. Contract C-2011 is the FY85 buy, we used the 4 November 1986 Contract Fund Status Report (CFSR) for the estimated price at completion and actual price of work performed. The cut off date for the report was 30 September 1986. The effort includes the Air Force buy of 110 installs plus 3 training engines and one additional engine for test. There are also 12 spare engines funded by Air Force Logistics Command.

F-16, December 31, 1986

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 61.9% (13 yrs/21 yrs)

(2) Percent Program Cost Appropriated: 48.5% (23034.4/47528.8)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY75-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance FYDP (FY89-92)</u>	<u>To Complete Beyond FYDP (FY93-95)</u>	<u>Total</u>
EDT&E	1328.7	36.5	116.2	-	1481.4
Procurement	21705.7	2885.2	13536.9	7919.6	46047.4
MILCON	-	-	-	-	-
Total	23034.4	2921.7	13653.1	7919.6	47528.8

F-16, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. (U) Annual Summary

Fiscal Year	Qty	FY75 Base-Year Dollars			Then-Year Dollars			Escal Rate (%) ★
		Flyaway		Totals	Advance Proc		Total	
		NonRec	Rec		Debit	Credit		

Appropriation: RDT&E

1975				31.2			32.0	--
1976				187.2			214.7	11.0
1977				57.7			69.0	5.4
1977T				211.9			256.4	2.1
1978				121.3			162.3	5.9
1979				65.8			93.6	8.4
1980				17.4			27.6	9.4
1981				24.6			43.1	11.9
1982				30.9			57.9	9.2
1983				36.2			70.9	4.9
1984				45.7			93.1	3.8
1985				43.2			90.9	3.4
1986				28.7			62.3	2.9
1987				24.5			54.9	3.1
1988				15.7			36.5	3.5
1989				9.8			23.6	3.5
1990				5.0			12.3	3.3
1991				15.6			39.6	2.9
1992				15.7			40.7	2.4
Subtotal	8			988.1			1481.4	

* Since outlay rates are not shown, the escalation rates cannot be used to verify the composite index.

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. (U) Annual Summary

Fiscal Year	Qty	FY75 Base-Year Dollars			Then-Year Dollars			Escl Rate (%) *
		Flyaway		Totals	Advance Proc		Total	
		NonRec	Rec		Debit	Credit		

Appropriation: Procurement

1977				182.2	174.9		257.6	6.2
1978	105	61.0	523.6	889.5	37.7	174.9	1385.9	6.6
1979	145	30.1	551.6	854.8	67.9	37.7	1434.4	8.7
1980	175	50.6	678.8	874.7	141.3	67.9	1641.9	9.7
1981	180	43.1	707.3	938.4	194.8	141.3	1918.0	11.9
1982	120	52.8	490.6	1025.9	545.5	166.8	2205.7	9.6
1983	120	187.2	527.0	895.3	218.6	372.3	2048.4	9.0
1984	144	69.1	642.7	966.5	339.1	313.1	2312.8	8.0
1985	150	116.5	714.7	1065.6	537.6	433.4	2640.6	3.4
1986	180	104.4	756.0	1135.2	488.3	369.1	2908.4	2.9
1987	180	95.7	794.9	1114.8	454.1	419.1	2952.0	3.1
1988	180	36.9	862.5	1055.7	475.9	534.0	2885.2	3.5
1989	180	70.9	926.1	1214.2	584.6	646.1	3416.7	3.5
1990	180	18.9	918.8	1329.3	721.4	453.4	3840.3	3.3
1991	180	18.2	903.4	1133.2	435.6	625.0	3353.2	2.9
1992	150	7.7	797.6	965.9	365.8	537.2	2926.7	2.4
1993	120	14.2	672.1	827.5	334.9	491.8	2567.8	2.4
1994	120	11.0	692.7	890.5	341.6	334.9	2829.0	2.4
1995	120	11.0	685.1	775.5		341.6	2522.8	2.4
Subtotal	2729	999.3	12845.5	18134.7	6459.6	6459.6	46047.4	
Total	2737			19122.8			47528.8	

* Since outlay rates are not shown, the escalation rates cannot be used to verify the composite index.

16. Program Funding Summary (Cont'd):

d. (U) Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated*	Expended*

Appropriation: RDT&E

1975	32.0	32.0	32.0
1976	214.7	214.7	214.7
1977	69.0	69.0	69.0
1978	256.4	256.4	256.4
1979	162.3	162.3	162.3
1980	93.6	93.6	93.6
1981	27.6	27.6	27.6
1982	43.1	43.1	43.1
1983	57.9	57.9	57.9
1984	70.9	70.9	70.9
1985	93.1	93.1	92.0
1986	90.9	90.9	82.9
1987	62.3	61.0	45.4
1988	54.9	7.4	.5
To Complete	152.7		
Total	1481.4	1279.9	1248.3

*Program Office records as of 31 December 1986

16. Program Funding Summary (Cont'd):

d. (U) Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated*	Expended*

Appropriation: Procurement

1977	257.6	257.6	257.6
1978	1385.9	1385.9	1385.9
1979	1434.4	1434.4	1434.4
1980	1641.9	1641.9	1641.9
1981	1918.0	1918.0	1918.0
1982	2205.7	2205.7	2205.7
1983	2048.4	2048.4	1802.2
1984	2312.8	2312.8	2041.8
1985	2640.6	2464.2	1512.6
1986	2908.4	2512.0	89.5
1987	2952.0	1048.3	
To Complete	24341.7		
Total	46047.4	19229.2	14289.6

*Program Office records as of 31 December 1986

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17. (U) Production Rate Data:

a. (U) Annual production rate can achieve a maximum of 27 (21 aircraft plus 6 aircraft equivalents) per month at General Dynamics with no additional tooling expense. This includes USAF as well as European Participating Government use and all current Foreign Military Sales.

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate *	Production Estimate	Current Estimate	Maximum
1987	N/A	216	180	180
1988	N/A	216	180	324
1989	N/A	216	180	324
1990	N/A	216	180	324
1991	N/A	216	180	258
1992	N/A	216	150	N/A
1993	N/A	216	120	N/A
1994	N/A	216	120	N/A
1995	N/A	N/A	120	N/A

* The production rate for the development estimate did not include years after 1982.

b. (U) Cost Variance - Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance CE less Max	Maximum *
Prog Acq Cost BY \$	N/A	N/A	9306.6	+725.9	8580.7
TY \$	N/A	N/A	27293.7	+3135.9	24157.8
PAUC BY \$	N/A	N/A	6.600	+.514	6.086
TY \$	N/A	N/A	19.357	+2.224	17.133

17. (U) Production Rate Data:

b. (U) Cost Variance - Dollars in Millions (Cont'd)

* Does not include inefficiencies of rapid production growth with resultant hiring of new and inexperienced personnel and the difficulty in the abrupt change in rate from 180 to 324 per year (15 per month to 27).

c. (U) Schedule Variance

	Production Estimate	Variance CE vs Pd E	Current Estimate	Variance CE vs Max	Maximum
Start Date (mo/yr)	2/87	--	2/87	N/A	2/87
Duration (in months)	112	--	124	54	70
End Date (mo/yr)	5/96	--	5/97	N/A	12/92

d. (U) Deliveries (Plan/Actual)

31 Dec 86

RDT&E

8/8

Procurement

A/B

785/785

C/D

291/288

18. Operating and Support (O&S) Costs -- N/A

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PROGRAM: F/A-18

AS OF 31 DECEMBER 1986

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1. (U) Designation/Nomenclature (Popular Name): F/A-18 Naval Strike Fighter (Hornet)
2. (U) DOD Component: U.S. Navy
3. (U) Responsible Office and Telephone Number:

F/A-18 Program Office
 Naval Air Systems Command
 Washington, D.C. 20361

PM: Captain J. A. Lockard
 Assigned: 30 September 1986
 Autovon: 222-7954
 POC: L. Parks
 AV: 222-9191 COMM (202) 692-9191

4. (U) Program Elements/Procurement Line Items:

RDT&E (5.4) Development - P.E. 64263N

PROCUREMENT: APPN: 1506; P.E. 24145N, 26492M, 25128M, 24159N,
 25134M, 24157N, 26493M, 24158N, 24136N, 25144M,
 24156N, 24662N, 52314X ICN 0144, 0145

MILCON: PE 24511N, 26496M

5. (U) Related Programs: AMRAAM, ASPJ, ALR-67, Laser and IR Maverick, NACES Ejection Seat, ALQ-126B, HARM, Harpoon, Sparrow, Sidewinder, Night Attack, RECCE, AV-9B

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Classified by: OPNAVINST CSS132.2A-25
 Declassify on: REVIEW ON 8 JAN 1995

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PROGRAM: F/A-18
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6. (U) Mission and Description: The F/A-18A Naval Strike Fighter is a twin engine, mid-wing, multi-mission tactical aircraft. Designed to replace the F-4 Phantom and A-7 Corsair, the F/A-18A is being employed in Navy strike fighter squadrons and Marine fighter/attack squadrons. The F/A-18B is the two seat version currently used only for training. The F/A-18A is missionized for traditional fighter and attack roles through selected use of external equipment to accomplish specific missions. Commonality provides several benefits. Any aircraft can quickly be configured to perform either fighter or attack missions, or both, offering the operational commander more flexibility in employing his tactical aircraft in a changing scenario. With the addition of a sensor pallet which replaces the gun, selected aircraft may be configured as a tactical reconnaissance platform.

The primary design mission for the fighter applications is fighter escort, with fleet air defense as a secondary role. The attack missions are interdiction and close air support. Since the same airframe, engine, flight controls, and weapon system are used for both fighter and attack missions, excellent fighter performance, self-defense capabilities and increased survivability are inherent.

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- In 1975 the Navy selected a carrier-capable variant of the YF-17 to satisfy its multimission strike fighter requirement, thereby complying with Congressional direction to consider only the two competitors (YF-17 and F-16) in the Air Force's lightweight fighter competition. The Secretary of Defense approved the F/A-18 development plan in December 1975, subsequent to the DSARC II review. Full scale development contracts were awarded to McDonnell Douglas for the airframe and General Electric for the engine. The first F/A-18 was flown in November 1978. Effective with the President's FY80 Budget (December 1978 SAR), the Navy increased the F/A-18 program from 811 to 1,377 aircraft. Low-rate production began in FY79 with a pilot run of nine aircraft and completed in FY80 with a limited run of 25 aircraft, and was followed by full-rate production commencing FY81 with 60 aircraft. After a successful Initial Operational Test and Evaluation of the weapon system completed in March 1980 and DSARC III (fighter) review completed in June 1981, the Secretary of Defense approved full production of the F/A-18 in its fighter role and directed implementation of cost reduction initiatives. These cost reduction efforts included breakout of contractor-furnished equipment to government-furnished equipment, second-sourcing of major end items and technology modernization. In November 1980 the Navy fleet replacement squadron, VFA-125 at Lemoore, California, commenced operations. In April 1982 a Navy Technical Evaluation in lieu of Board of Inspection and Survey initial trials was successfully completed, which permitted commencement of the formal Operational Evaluation in May 1982. In July 1982 the Chief of Naval Operations approved the F/A-18 as the Navy's tactical reconnaissance platform. As a result of the successful DSARC III (Attack) review completed in December 1982, the Secretary of Defense approved full production of the F/A-18 in its attack role (SDDM of 17 Mar 1983), but requested that additional operational testing be done to correct discrepancies noted during the operational evaluation and present the results to the DSARC principals within

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PROGRAM: F/A-18
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18 months. The first F/A-18 Marine Air Group (MAG-11) was fully equipped with aircraft in August 1983. Operational testing results as requested by the 17 March 1983 SDDM were presented to OUSDR&E in March 1985, which satisfied prior discrepancies (all requirements were met). Operational test of the F/A-18 integrated EW Suite/HARM missile was completed 9 August 1985. During February 1985 Carrier Wing 14 (CVW-14) deployed on the USS Constellation (CV-64) with two F/A-18 squadrons, VFA-125 and VFA-113, to the Western Pacific and the Indian Ocean. The maiden deployment of the F/A-18 was considered most successful. The F/A-18 proved to be the state-of-the-art aircraft with respect to operational capability and maintainability. VMFA-531 flew from MCAS El Toro to Hawaii for a "shoot on arrival" missile exercise successfully firing two AIM-7Fs and two AIM 9Ls. All aircraft arrived in an "up status" and could have been flown back to the mainland after servicing. Two Royal Australian Air Force F/A-18s established a world's distance record for tactical jets during transpac from Lemoore, CA to Australia. Ten MAG-11 F/A-18s participated in operation Bright Star after translat to Egypt flying 154 of 155 scheduled sorties in eight days.

b. (U) Significant Developments Since Last Report -- During April 1986, Carrier Wing (CVW-13) deployed on Coral Sea (CV-43) with four F/A-18 squadrons (two Navy and two Marine), and returned home after a seven month deployment to the Mediterranean. The F/A-18 squadrons led the highly successful strikes against Libya. The Navy Flight Demonstration Squadron (Blue Angels) will transition from the A-4 to the F/A-18 for the 1987 show season. Currently, eight F/A-18s and two F/A-18Bs are being modified for the Blue Angels.

c. (U) Changes Since "As Of" Date -- None.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated - 23 November 1982) or SDDM (dated 17 March 1983) threshold breaches.

9. (U) Schedule:

a. (U) Milestones	Development Estimate	Approved Program	Current Estimate
Release of RFP	Oct 74	Oct 74	Oct 74
Award of Advanced Engineering Contracts			
General Electric (Engine)	May 75	May 75	May 75
McDonnell Douglas (Airframe)	May 75	May 75	May 75
Award of Full Scale Development Contract to General Electric (Engine)	Nov 75	Nov 75	Nov 75
DSARC II	Dec 75	Dec 75	Dec 75
Award of Full Scale Development Contract to McDonnell Douglas (Airframe)	Jan 76	Jan 75	Jan 76
First Flight	Jul 78	Jul 78	Nov 78
DSARC III-A Redesignated	Mar 80	N/A	N/A
Program Review: OSD Program Review for DSARC principals	N/A	Mar 80	Apr 80

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Fighter Missions IOT&E	Oct 80	Nov 80	Feb 81
Begin Fighter Board of Inspection Survey Trials	Nov 80	Nov 80	Mar 82
DSARC IIIB	Nov 80	N/A	N/A
DSARC III (Fighter)	N/A	Feb 81	Jun 81
OSD Limited Program Review	N/A	Feb 81	Jun 81
DSARC III (Attack)	N/A	Fall 82	Dec 82
OPEVAL Completion	Dec 81	Dec 81	Oct 82
End Board of Inspection Survey Trials	May 82	May 82	Feb 83
IOC for first F/A-18 Squadron	Sep 82	Sep 82	Mar 83
Navy Support Date	TBD	TBD	Oct 83
Review for DSARC Principals	N/A	Oct 84	Mar 85

b. (U) Previous Change Explanations --

First flight: First flight rescheduled from Jul 78 to Sep 78 in accordance with contract definitization. First flight date delayed from Sep 78 to Nov 78 to permit thorough evaluation of the digital fly-by-wire flight control system. First flight occurred on 18 Nov 78.

DSARC IIIA - Redesignated Program Review: DSARC IIIA changed to OSD Program Review for DSARC Principals.

DSARC IIIB: DSARC IIIB redesignated DSARC III (Fighter) and rescheduled for Sep 80 with a limited Program Review scheduled for Feb 81 upon completion of IOT&E. DSARC III (Attack) was scheduled for Sep 82 upon completion of OPEVAL. Changes were made based upon OSD Program Guidance of 13 May 1980 and Program Review 19 Apr 80. Decision Memorandum of 17 December 1980 established the date of February 81 for a Limited Program Review which combined with the 5 Nov 1980 program review will constitute DSARC III (Fighter) (Dec 80 (SAR). The limited program review was scheduled and held on 17 Mar 1981. DSARC III (Fighter) completed as stated in 29 June 81 Decision Memorandum. DSARC III (Attack) was set for Fall 1982 by Decision Memorandum of 29 June 81 and completed in December 1982.

DSARC III Attack: DSARC III (Attack) was rescheduled for December 1982.

OPEVAL Completion: Concurrent fighter and attack systems OPEVALS have been rescheduled for the period September 1981 - February 1982 to accommodate delays in contractor and Navy DT&E. Results will contribute to an OSD Program Review scheduled for April 1982. OPEVAL completion has slipped until Aug 82 on the flight test schedule. Carrier portions of OPEVAL slipped to October due to carrier availability.

End Board of Inspection and Survey Trials: Combined Fighter and Attack BIS will complete August 82. BIS has been consolidated into the minimum number of flights. A Navy Technical Evaluation will be conducted in March and April in lieu of Initial BIS Trials. The Final Trials Phase of Service Acceptance Test was completed the second quarter of FY83 using production aircraft.

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IOC for first F/A-18 Squadron: Dec 77 SAR reported 6-month slip in IOC due to FY 79 budget decisions on procurement schedule. Congressional direction to purchase additional aircraft in FY 80 permits moving Mar 83 IOC date to Sep 82 IOC. Change to Dec 82 in accordance with Weapon System Planning Document dated 13 Jun 80. Aircraft delivery locations were rearranged so that all of VMFA-314 aircraft will be of the latest configuration coming off the production line.

Navy Support Date: Navy support for most items will begin in FY84.

Review for DSARC Principals: OSD Program Review previously scheduled for Apr 85 to allow inclusion of data on initial F/A-18 aircraft carrier workups occurred in March 1985. Operational testing results were presented to OUSDR&E in March 1985; all requirements were met.

(U) Current Change Explanations -- None.

d. (U) References -- Development Estimate: DCP #141 dated November 18, 1976; OSD Program Review Decision Memorandum, dated March 17, 1983, "Approved Program: FY 88-FY89 President's Budget

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PROGRAM: F/A-18
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b. Operational --

Development/Approved
Estimate /Program

Demonstrated
Performance

Current
Estimate

(U) Speed			
(U) At Altitude, Combat Weight (Mach)	1.7/ 1.7#/1/	1.7 (Ch-1)	1.7 (Ch-1)
(U) Radius (NM)			
(U) Fighter Escort, Internal Fuel	400/400	362	362
(U) Strike Mission	550/550	575	575

(b)(1)

(U) Mission Reliability, VF @ 2,500 Hr	0.7/0.7	.893/	0.93 (Ch-2)
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(U) System maintenance VF

Mean Flight Hours Between Failure, Fighter Configuration @ 2500 Hrs Organizational Level	1.4/1.7	2.774/ (Ch-3)	2.0 (Ch-4)
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Unscheduled Direct

Maintenance Manhours per

Flight Hour, VF @ 2500 Hrs	8/8	2.224/ (Ch-3)	122/ 5.8 (Ch-4)
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Maintenance Operating Factor

Maintenance Men per Aircraft

BIT Development Completion

N/A

100%

BIT False Indication Rate

N/A

28% (Ch-5)

(U) Standard Depot Level

Maintenance (Mos)	48/48#/		48
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Notes (U):

1/(U) For these data elements, initial Milestone II values were established as the Planning Estimate (PE) with the Development Estimate (DE) to be based on the design resulting from the Detail Design Review. This Review was held on 25 and 27 Oct 77 and the changes were incorporated in the subsequent SAR (Dec 77). There have been no other changes in these DE values.

2/(U) This reporting factor is no longer being used.

3/(U) Reliability demonstration 90% confidence; .96 actually demonstrated

4/(U) Measured at 9000 cumulative flight-hours, Maintainability Demonstration completed 4 May 1992.

#/(U) Items not required by DCP 141.

c. (U) Previous Change Explanations --

(U) Weight (Empty VF): +1355 lb - Fighter and attack commonality, initial estimated production weight adjusted for weight reduction program, actual FY79 production weight plus modifications, FY80 production weight involving changes, roll rate modification, and other minor changes.

(U) Weight (Empty VA): +1294 lb - Attack changes corresponding to 2.a(1) and the change to common VF and VA aircraft.

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(U) Take-off gross weight (Escort Mission): +1128 lb - Original DSARC II estimate VF and VA configurations commonality, final design review, Lot III production specification weight adjusted for weight reduction, actual production delivery weights, and modifications/changes.

(U) Max Take-off gross weight (Interdiction Mission): +4756 lb - Max take-off weight changes associated with above growth.

(U) Radius (Fighter Escort): -38 - Initial Design Reviews, engine performance estimates, and revisions to reflect demonstrated ranges on tests.

(U) Combat Ceiling (Military Thrust): -100 ft - Estimate based on flight test data in R&D aircraft.

(U) Mission Reliability: +.1 - Changed due to original DSARC II estimate and contract award (Mar 76 SAR).

(U) BIT Development Completion: BIT Development completed; follow-on testing for BIT enhancement for new system ongoing until approximately FY 88.

d. (U) Current Change Explanations --

- (Ch-1) 2.0 reflected in previous SAR in error; 2.0 is max speed in a dive and 1.7 is max at altitude
- (Ch-2) McDonnell Douglas Corp. Report A-8576 "F/A-19 Substantiating Performance Data" 31 Mar 84 (Rev 1 Oct 85)
- (Ch-3) Values in previous SAR in error, previous SAR reported fleet experience vice demonstrated performance as reflected in DCP #141
- (Ch-4) Operational Squadron 3M data May 86 - Oct 86
- (Ch-5) Lot VII Aircraft Fall 1984 - Spring 1986

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e. References -- Development Estimate: DCP #141 dated November 18, 1976, subject "Development Estimate"; OSD Program Review Decision Memorandum, dated March 17, 1983, Approved Program: FY1988/1989 President's Budget

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

COST	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
DEVELOPMENT	1437.7	+214.6	1652.3
PROCUREMENT	6560.9	+5970.3	12531.2
Airframe	(3599.6)	(3069.1)	(6568.7)
Engines	(1059.7)	(424.8)	(1484.5)
Avionics	(199.9)	(180.9)	(379.7)
Arms/Oth GF	(61.3)	(1252.4)	(1323.7)
Total Flyaway	(4919.4)	(4937.2)	(9355.5)
PGSE	(610.3)	(533.9)	(1144.2)
Trning/Oth	(517.5)	(404.7)	(922.2)
WEAPONS SYS COST	(6047.2)	(5975.8)	(11923.0)
INITIAL SPARES	(513.7)	(94.5)	(508.2)
Construction (MILCON)	18.0	+3.2	21.2
Total FY75 Base-Year \$	8015.5	+5188.1	14204.7
Escalation	4859.7	+18412.0	23270.7
Development (RDT&E)	(396.7)	(+354.5)	(751.3)
Procurement	(4451.7)	(+18048.7)	(22500.4)
Construction (MILCON)	(10.3)	(+8.7)	(19.0)
Total Then-Year \$	12875.3	+24600.0	37475.4
b. Quantities --			
Development (RDT&E)	11	0	11
Procurement	800	+357	1157
Total	811	+357	1159
c. Unit Cost --			
Procurement:			
FY75 Base-Year \$	8.2	+2.6	10.8
Then-Year \$	13.3	+16.5	30.3
Program:			
FY 75 Base-Year \$	9.9	+2.3	12.2
Then-Year \$	15.9	+16.2	32.1

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d. Approved Design to Cost Goal -- SECNAV directed that the total program cost for the F/A-18 not exceed \$10B.

e. Foreign Military Sales -- Sales to date total 147 F/A-18 aircraft. Sales to Spain total 72 aircraft for approximately \$2.339B (Total Program Cost). Sales to Australia total 75 aircraft for approximately \$2.598B (Total Program Cost). Canada currently expects to purchase from McDonnell-Douglas a total of 138 aircraft for a total contract cost of \$2.36B (Total Program Cost).

f. Nuclear Costs -- None

12. Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>
	<u>Dec 1986</u>	<u>Dec 1985</u>	<u>Dec 1985</u>
a. Program Acquisition --			
(1) Cost	37475.4	39322.9	37475.4
(2) Quantity	1168	1377	1168
(3) Unit Cost	32.1	28.6	32.1
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	2384.6	2384.6	2580.2
Less CY Adv Proc	-140.9	-140.9	-156.0
Plus PY Adv Proc	139.9	183.9	140.9
Net Total	2432.5	2432.5	2555.1
(2) Quantity	84	84	84
(3) Unit Cost	29.0	29.0	30.5

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a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1834.4	11012.6	28.3	12875.3
Previous Changes:				
Economic	+190.7	+6540.2	-1.2	+6729.7
Quantity	0.0	+6970.4	0.0	+6970.4
Schedule	+14.6	+3732.6	+1.6	+3748.8
Engineering	+55.6	+2254.5	0.0	+2310.1
Estimating	+293.3	+3508.1	+15.1	+3822.0
Other	+6.5	0.0	0.0	+6.5
Support	+3.0	+2958.5	-1.4	+2960.1
Subtotal	+569.2	+25864.3	+14.1	+26447.6
Current Changes:				
Economic	0.0	-697.9	0.0	-697.9
Quantity	0.0	-4398.7	0.0	-4398.7
Schedule	0.0	+1354.5	-2.2	+1352.3
Engineering	0.0	-39.7	0.0	-39.7
Estimating	0.0	+1040.3	0.0	+1040.3
Other	0.0	0.0	0.0	0.0
Support	0.0	+395.2	0.0	+395.2
Subtotal	0.0	-1945.3	-2.2	-1847.5
Total Changes	+569.2	+24019.0	+11.9	+24600.1
Current Estimate	2403.6	35031.6	40.2	37475.4

Cost Variance Analysis (FY 1975 (Base Year) Dollars in Millions)

Development Estimate	1437.7	5560.9	19.0	9015.5
Previous Changes:				
Economic	0.0	0.0	0.0	0.0
Quantity	0.0	+3079.6	0.0	+3079.6
Schedule	+9.4	+397.1	0.0	+406.5
Engineering	+37.8	+703.1	0.0	+740.9
Estimating	+151.4	+1335.5	+4.5	+1501.6
Other	+4.5	0.0	0.0	+4.5
Support	+1.5	+ 991.1	-0.5	+ 992.1
Subtotal	+214.6	+6505.5	+4.1	+6725.2
Current Changes:				
Economic	0.0	0.0	0.0	- 0.0
Quantity	0.0	-1311.5	0.0	-1311.5
Schedule	0.0	+378.7	-9.9	+377.8
Engineering	0.0	-14.6	0.0	-14.6
Estimating	0.0	+280.9	0.0	+280.9
Other	0.0	0.0	0.0	0.0
Support	0.0	+130.3	0.0	+130.3
Subtotal	0.0	-536.2	-0.9	-537.1
Total Changes	+214.6	+5970.3	+3.2	+6188.1
Current Estimate	1652.3	12531.2	21.2	14204.7

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13. Cost Variance Analysis (Cont'd):

b. Previous Change Explanations

Development

Economic: Revision to escalation rates
Schedule: Slower production build up and extension of the radar test bed aircraft usage
Engineering: Commonality of fighter and attack aircraft and extended testing requirements
Estimating: Revisions for budget changes, flight test costs, equipment price analysis, reprogramming of unobligated balances
Support: Additional operational test time supported
Other: Court ruling on previous year allowable cost to the Government

Procurement

Economic: Revisions to escalation rates/indices
Quantity: 556 additional aircraft and changes in annual procurement quantities
Schedule: Fluctuations in production rates and final year of production; Rephased and Accelerated Program (57 additional A/C to be procured 87-90)
Engineering: Commonality, additional equipment and correction of defects, changes and procurement of additional two-seaters
Estimating: Revised procurement Strategy and program estimates based on more current information, reduced profit in outyears
Support: Changes in projected sites, distribution of aircraft, increased aircraft quantity, decreased spares; Adjusted allocation for support due to change in aircraft procurement schedule

MILCON

Economic: Revisions to escalation rates
Schedule: Restructuring of facilities to meet changed aircraft deliveries
Estimating: Redistribution of requirements and updated estimates
Support: Realignment of facilities; changes in program allocation of MILCON funds

c. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>	0.0	0.0
(2) <u>Procurement</u>		
Revised Escalation Indices (Economic)	0.0	-597.9
★ Quantity Reduction from 1366 to 1157 (Quantity)	-1311.5	-4393.7
Program Stretchout (208 A/C Procured in FY 93-95 vice FY 87-92) (Schedule)	+ 378.7	+1854.5
Refinements to ECP-178 and Reduction in two seaters (Engineering)	- 14.5	- 39.7

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13. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --(Cont'd)

Revised Procurement Strategy, Removal of Multiyear Pricing Assumptions, (Estimating)	+ 280.9	+ 1040.3
Adjusted Allocation for Support due to change in aircraft procurement schedule (Support)	+ 130.3	+ 395.2
TOTAL Procurement Cost Change	- 535.2	1945.3

(3) MILCON

Revised Escalation Indices (Economic)	N/A	-.2
Restructuring of facilities to meet changed aircraft deliveries (Schedule)	- .9	-2.0
TOTAL MILCON Cost Change	- .9	-2.2

c. References -- DSARC II Decision Memorandum Dated December 22, 1976,
Subject Development Estimate.

14. Program Acquisition Unit Cost (PAUC) History: (Then-year dollars in millions)

Current Baseline Estimate to Current Estimate

PAUC (Development Estimate)	Changes (Then Year Dollars in Millions)							PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total
15.875	+5.164	-2.736	+4.795	+1.944	+4.153	+0.095	+2.874	+15.209 32.085

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

Airframe:

McDonnell Douglas

N00019-83-C-0272 ✓

Award Date: Oct 31, 1983

Definitized Date: Jun 15, 1984

Explanation of Change: Not reported on FFP Contracts

Current Contract Price		
Target	Ceiling	Qty
\$1380.1	N/A	84

Estimated Price at Completion	
Contractor	
\$1380.1	

McDonnell Douglas

N00019-84-C-0063 ✓

Award Date: Feb 29, 1984

Definitized Date: May 31, 1986

Explanation of Change: Not reported on FFP Contracts

Current Contract Price		
Target	Ceiling	Qty
\$1400.0	N/A	84

Estimated Price at Completion	
Contractor	
\$1400.0	

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15. Contract Information (Cont'd): (Then-Year Dollars in Millions)Airframe:

McDonnell Douglas ✓

N00019-84-C-0063

Award Date: Feb 29, 1984

Definitized Date: May 31, 1986

Explanation of Change: Not reported on FFP Contracts

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$1400.0	N/A	84

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$1400.0	N/A	84

Estimated Price at Completion

<u>Contractor</u>
\$1400.0

McDonnell Douglas

N00019-84-C-0270

Award Date: Dec 31, 1984

Definitized Date: (Est) Jun 30, 1987

Explanation of Change: Not reported on FFP Contracts

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$1234.8	N/A	84

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$1234.8	N/A	84

Estimated Price at Completion

<u>Contractor</u>
\$1234.8

Engine:

General Electric

N00019-83-C-0086/FFP

Award Date: Feb 3, 1984

Definitized Date: Jan 31, 1985

Explanation of Change: Not reported on FFP Contracts

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$ 307.8	N/A	186

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$ 307.8	N/A	186

Estimated Price at Completion

<u>Contractor</u>
\$ 307.8

General Electric

N00019-84-C-0140/FFP

Award Date: Aug 10, 1984

Definitized Date: Aug 22, 1985

Explanation of Change: Not reported on FFP Contracts

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$ 309.9	N/A	199

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$ 309.9	N/A	199

Estimated Price at Completion

<u>Contractor</u>
\$ 309.9

General Electric

N00019-85-C-0129/FFP ✓

Award Date: Mar 25, 1985

Definitized Date: Jan 30, 1986

Explanation of Change: Not Reported on FFP Contracts

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$ 234.2	N/A	158

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$ 234.2	N/A	158

Estimated Price at Completion

<u>Contractor</u>
\$ 234.2

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16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 55.5% (13 yrs/23 yrs)
(2) Percent Program Cost Appropriated: 55.6%
(\$20844.1/37475.4)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs	Budget Year (88)	FYDP (89-92)	Balance To Complete Beyond FYDP (93-97)	Total
RDT&E	2403.5	0.0	0.0	0.0	2403.6
Procurement (APN)	13403.4	2580.2	10368.9	3679.1	35031.6
MILCON	37.1	.0	3.1	.0	40.2
Total	20844.1	2580.2	10372.0	3679.1	37475.4

c. Annual Summary --

Fiscal Year	Qty	FY 75 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway			Advance Proc			
		Nonrec	Rec	Total	Debit	Credit	Total	
Appropriation: RDT&E								
1975	0	N/A	N/A	19.5	N/A	N/A	20.0	
1976	0	N/A	N/A	100.1	N/A	N/A	110.4	7.5
1977	0	N/A	N/A	19.9	N/A	N/A	22.2	6.5
1977	0	N/A	N/A	271.3	N/A	N/A	341.9	7.3
1978	1	N/A	N/A	462.8	N/A	N/A	525.9	7.5
1979	8	N/A	N/A	335.3	N/A	N/A	496.1	8.9
1980	2	N/A	N/A	192.8	N/A	N/A	314.8	10.7
1981	0	N/A	N/A	96.5	N/A	N/A	173.2	9.8
1982	0	N/A	N/A	100.1	N/A	N/A	190.5	6.2
1983	0	N/A	N/A	53.9	N/A	N/A	107.7	5.1
Subtotal	11	N/A	N/A	1552.3	N/A	N/A	2403.6	

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Fiscal Year	Qty	FY 75 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway Nonrec	Rec	Total	Advance Proc Debit	Credit	Total	
Appropriation: Procurement (APN)								
1978	0	0.0	0.0	19.8	34.1	0.0	34.1	
1979	9	22.3	201.2	332.4	59.6	-34.1	580.8	10.9
1980	25	32.5	378.7	598.2	127.9	-59.6	1185.9	13.6
1981	60	.3	670.9	969.0	114.3	-117.8	2116.8	10.9
1982	63	14.8	599.2	1040.3	187.9	-124.4	2472.1	8.8
1983	84	51.2	694.5	1026.5	247.6	-187.9	2593.5	6.4
1984	84	0.0	646.6	927.1	216.6	-247.6	2436.1	3.4
1985	84	62.3	582.7	882.0	205.9	-216.6	2389.3	3.4
1986	84	14.4	550.5	790.0	188.9	-205.9	2210.2	2.9
1987	84	14.0	562.6	824.9	140.9	-188.9	2384.6	3.1
1988	84	28.5	556.7	863.9	156.0	-140.9	2580.2	3.5
1989	72	11.7	479.5	760.6	138.6	-156.0	2340.5	3.5
1990	72	3.2	470.1	655.9	146.8	-138.6	2073.2	3.3
1991	72	2.3	460.4	572.7	150.1	-146.8	1855.0	2.9
1992	72	1.5	458.4	598.2	153.4	-150.1	1983.9	2.4
1993	72	0.0	446.1	622.8	216.3	-153.4	2116.3	2.4
1994	72	0.0	439.6	581.5	196.0	-216.3	2023.1	2.4
1995	64	0.0	392.1	465.4	0.0	-196.0	1656.0	2.4
Subtotal	1157	259.1	8589.9	12531.2	2680.9	-2680.9	35031.6	

Appropriation: MILCON

1977	N/A	N/A	N/A	0.8	N/A	N/A	1.0	
1978	N/A	N/A	N/A	0.0	N/A	N/A	0.0	
1979	N/A	N/A	N/A	0.0	N/A	N/A	0.0	
1980	N/A	N/A	N/A	3.8	N/A	N/A	6.5	
1981	N/A	N/A	N/A	0.2	N/A	N/A	0.4	5.6
1982	N/A	N/A	N/A	6.8	N/A	N/A	12.8	5.6
1983	N/A	N/A	N/A	2.9	N/A	N/A	5.6	3.6
1984	N/A	N/A	N/A	4.7	N/A	N/A	9.4	3.4
1985	N/A	N/A	N/A	0.4	N/A	N/A	.8	3.4 2.4
1986	N/A	N/A	N/A	0.3	N/A	N/A	.6	2.9 3.1
1987	N/A	N/A	N/A	0.0	N/A	N/A	0.0	3.1 3.5
1988	N/A	N/A	N/A	0.0	N/A	N/A	0.0	3.5
1989	N/A	N/A	N/A	0.0	N/A	N/A	0.0	3.3
1990	N/A	N/A	N/A	1.3	N/A	N/A	3.1	2.9
1991	N/A	N/A	N/A	0.0	N/A	N/A	0.0	2.4
1992	N/A	N/A	N/A	0.0	N/A	N/A	0.0	2.4
Subtotal	N/A	N/A	N/A	21.2	N/A	N/A	40.2	
Total	1168	259.1	8589.9	14204.7	+2680.9	-2680.9	37475.4	

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d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1975	20.0	20.0	20.0
1976	110.4	110.4	110.4
1977	22.2	22.2	22.2
1977	341.9	341.9	341.9
1978	525.8	525.8	525.8
1979	495.1	495.1	495.1
1980	314.8	314.8	314.8
1981	173.2	173.2	168.2
1982	190.5	190.5	185.7
1983	107.7	107.7	98.5
To Complete			
Total	2403.5	2403.6	2384.5

Appropriation: Procurement			
1978	34.1	34.1	33.0
1979	580.8	579.4	553.9
1980	1185.9	1177.0	1105.4
1981	2115.8	2077.6	1936.1
1982	2472.1	2451.5	2275.1
1983	2593.5	2591.9	2340.5
1984	2436.1	2345.5	2016.8
1985	2389.3	2241.2	2812.4
1986	2210.2	1953.4	1955.2
1987	2384.5	581.6	40.0
To Complete	15628.2	N/A	N/A
Total	35031.6	16034.2	14169.4

Appropriation: MILCON			
1977	1.0	1.0	1.0
1978	0.0	0.0	0.0
1979	0.0	0.0	0.0
1980	5.5	5.5	5.5
1981	.4	.4	.4
1982	12.8	12.8	12.8
1983	5.5	4.5	4.5
1984	9.4	5.7	5.6
1985	.8	.9	.9
1986	.5	0.0	0.0
1987	0.0	0.0	0.0
To Complete	3.1	N/A	N/A
Total	40.2	32.9	32.8

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17. Production Rate Data:

a. Annual Production Rates -- (Note: The maximum Production Rate shown below includes all customers)

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic*
1978	1		1	
1979	3	5	17	9
1980	2	15	27	25
1981	0	48	50	78
1982	0	96	53	97
1983	0	108	84	126
1984	0	132	84	135
1985	0	132	34	146
1986	0	132	34	139
1987	0	132	84	109
1988	0	0	84	32
1989	0	0	72	84
1990	0	0	72	72
1991	0	0	72	72
1992	0	0	72	72
1993	0	0	72	72
1994	0	0	72	72
1995	0	0	64	64
Total	11	900	1168	1454

Total current estimate includes eleven R&D aircraft.

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	8015.6	6189.1	14204.7	0	14204.7
(TY \$)	12975.3	24500.1	37475.4	0	37475.4
PAUC (BY \$)	9.9	+2.3	12.2	0	12.2
(TY \$)	15.9	+15.2	32.1	0	32.1

c. Schedule Variance --

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (Mo/Yr)	11/79	0	11/78	0	11/78
Duration (in Months)	132	72	204	0	204
End Date (Mo/Yr)	11/99	72	11/95	0	11/95

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31 DECEMBER 1986

17. Production Rate Data: (Cont'd)

d. Deliveries (Plan/Actual) --

RD&E
Procurement

To Date
11/11
357/355

18. Operating and Support Costs:

a. Not Applicable.

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Program: FFG 7 Class

AS OF DATE: December 31, 1986

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- (U) Designation/Nomenclature (Popular Name): FFG 7 Class/Guided Missile Frigate (OLIVER HAZARD PERRY Class)
- (U) DoD Component: U.S. Navy
- (U) Responsible Office and Telephone Number:
Guided Missile Frigate Ship Acquisition PM: CAPT R.B. Woodruff, USN
Program Office (PMS399) Assigned: November 30, 1984
Washington, D.C. 20362-5101 AV 222-2922, COMM (202) 692-2922
- (U) Program Elements/Procurement Line Items:
RDT&E: 63509N (S4627-024 only) (shared funding)
63564N (S4627-024 only)
64567N (SSL 67-024, S0408-024, and S0857-024)
PROCUREMENT: APPN 1611 ICN 14010
- (U) Related Programs: LAMPS MK III, TACTAS, CIWS

AS AMENDED
CLEARED
FOR OPEN PUBLICATION

FEB 2 1987 9

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OASQ(PA) REVIEW 87-T-0178

6. (U) Mission and Description: To provide self-defense and effectively supplement planned and existing escorts in the protection of underway replenishment groups, amphibious forces, and military shipping against sub-surface, air and surface threats.

The FFG 7 Class Guided Missile Frigate will displace approximately 3900 tons in the full load condition when remaining space and weight margins are used. The propulsion plant utilizes a single controllable, reversible pitch propeller powered by two gas turbines. CIWS is provided commencing with the FY 78 ships. FY 78 and prior year ships delivered with an overall length of 445 ft., accommodations for 185 officers and enlisted men, and hangar facilities for two LAMPS MK I helicopters. FY 79 and subsequent year ships are provided with fin stabilizers, and configured to accept TACTAS, LAMPS MK III helicopters, and the Helicopter Landing System (HLS). These ships have an overall length of 453 ft (ship length at the waterline remains unchanged), and accommodations for 217 men. The helicopter landing area for all ships is capable of accommodating a helo as large as the SH-3.

7. (U) Program Highlights:

a. Significant Historical Developments - Studies were conducted in late 1970 to examine the feasibility of a new class of ships to counter the ASW, AAW, and surface warfare threats. The Guided Missile Frigate (FFG) Program entered the Conceptual Phase in January 1971 to develop the FFG mission and design in detail. Ship System Design started in April 1972 and completed in April 1973. Contracts for detail design and construction of the lead ship were awarded to Bath Iron Works in May and October 1973, respectively. The lead ship of the class (USS OLIVER HAZARD PERRY) was delivered to the Navy in November 1977, and successfully completed her Post Delivery Test and Trials, including a full-scale shock test. An approximate two year gap between the lead and first follow ship allowed feedback of experience from the lead to follow ship programs. In addition, the propulsion and combat systems were developed and evaluated at land-based test sites. Improvement items planned for FY 79 and later year ships are being incorporated after their effectiveness and suitability have been demonstrated through test and evaluation.

b. Significant Developments Since Last Report --

FFG 57, sixteenth ship at Todd, Los Angeles, was delivered to the Navy March 3, 1986.

FFG 58, twenty-second follow ship at Bath Iron Works, was delivered to the Navy April 1, 1986.

Total program costs are estimated herein to be \$9,447.9M of which \$8,983.0M are sunk costs (obligations through December 31, 1986) and \$464.9M are considered costs to complete.

FFG 7 Class ships will fulfill their mission requirements of supplementing other escorts in the protection of underway replenishment groups, amphibious forces, and military shipping.

c. Changes Since "As of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches:

There are currently no DCP (approved December 11, 1975) threshold breaches.

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FFG 7 Class, December 31, 1986

9. (U) Schedule:

a. (U)	Milestones	Development Estimate/ Approved Program	Current Estimate
(U)	Characteristics Approved	Oct 72/Oct 72	Oct 72 ^{1/}
(U)	Complete Lead Ship Contract Design	Apr 73/Apr 73	Apr 73
(U)	Complete OPEVAL/IOT&E in Major Ship Systems		
(U)	(1) SPS-49	Aug 74/Aug 75	Aug 75
(U)	(2) Sonar	Oct 74/Aug 75	Aug 75
(U)	Complete Follow Ship Contract Design	Nov 74/Nov 74	Nov 74
(U)	Complete IOT&E for Combat System Equipments	Feb 75/Aug 75	Aug 75
(U)	Milestone III (DSARC III)	Mar 75/Dec 75	Dec 75
(U)	Production Contract Award		
(U)	(1) Lead Ship	Jun 73/Oct 73	Oct 73
(U)	(2) Follow Ships, First Increment	Apr 75/Feb 76	Feb 76
(U)	(3) Follow Ships, Second Increment	N/A / Feb 77	Feb 77
(U)	(4) Follow Ships, Last Increment	Jun 77/Nov 84	Nov 84
(U)	Launch - Lead Ship	Mar 76/Sep 76	Sep 76
(U)	Delivery		
(U)	(1) Lead Ship	Jun 77/Nov 77	Nov 77
(U)	(2) Last Ship	Dec 82/Nov 88	Nov 88
(U)	IOC ^{2/}	Jul 77/Mar 79	Mar 79
(U)	Final Contract Trial		
(U)	(1) Lead Ship	Dec 77/Jul 78	Jul 78
(U)	(2) Last Ship	Jun 83/May 89	May 89
(U)	Ready for Operational Deployment		
(U)	(1) Lead Ship	May 78/Mar 79	Mar 79

(b)(1)

^{1/} Ship Characteristics (Oct 72) were repromulgated in the PF Top Level Requirements (TLR) (Feb 3, 1975), and updated in the FFG TLR (Apr 9, 1982).

^{2/} Initial Operational Capability is defined as completion of the Post Shakedown Availability for the lead ship of the Class.

b. (U) Previous Change explanations -

Complete IOT&E of AN/SPS-49 Radar was first delayed six months because of Navy decision to expand the test program. A further delay of six months was due to technical problems encountered during system testing and ship operation schedule changes.

Complete AN/SQS-56 Sonar IOT&E changed from October 1974 to August 1975 to allow for correction of discrepancies discovered during technical evaluation and to allow for additional submarine services.

Complete IOT&E for combat system equipment changed from February to August 1975 because of late delivery of the MK 92 FCS and AN/SPS-49 Radar to the Combat System Test Center.

Milestone III (DSARC III) changed from March to November 1975 reflecting extensions of the overall IOT&E schedule. The DSARC requirement was met with approval of DCP 97 on December 11, 1975.

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9. (U) Schedule (Cont'd):

Contract award date for lead ship construction changed from June to September 1973 to allow for further purification of the Navy contracting package. The contract was awarded in October due to difficult negotiations.

Contract award for first increment of follow ships changed to February 1976 to allow more time for administrative purposes, the reduction in FY 75 from 7 to 3 ships, extensions of the IOT&E effort, and extended negotiations.

The follow ship procurement strategy was previously altered to reduce cost risk to the shipbuilders in view of the unstable inflationary state of the economy. Three contract awards were planned, each spanning 2 program years, vice the two contract awards originally planned, each spanning 2 1/2 years; i.e., the FY 76 ships were to be options to the FY 75 contract, the FY 78 ships are options to a FY 77 contract, etc. Award of contracts for the last increment of these three follow ship procurements previously changed to April 1979. Subsequent changes in succeeding years reflected revised ship quantities which resulted from the annual budget process. Current estimate of November 1984 reflects contract award of the FY 84 ship.

Lead ship launch changed from March to September 1976 because of changes, strut misalignment and a strike.

Lead ship delivery changed from June to November 1977 because of construction problems, strut misalignment, a strike and changes.

Last ship delivery previously changed from December 1982 to January 1985 to accommodate the FY 74 and FY 75 Defense Appropriation Acts, and the considerably longer lead times experienced by the shipbuilding industry for material and equipment. Subsequent changes reflected revised ship quantities which resulted from the annual budget process. Current estimate of November 1988 reflects the planned delivery of the FY 84 ship. Dates for Final Contract Trial, Last Ship and Ready for Operational Deployment, Last Ship changed accordingly.

IOC initially changed from July to December 1977 to reflect change in lead ship delivery. IOC changed from December 1977 to March 1979 because the definition of IOC for a shipbuilding program was changed in October 1980 from the commissioning date for the lead ship of the Class to completion of the Post Shakedown Availability in order to provide uniformity among the shipbuilding programs.

Final Contract Trial, Lead Ship changed from December 1977 to July 1978 because of change in ship delivery and revised schedule for test activities.

Ready for Operational Deployment, Lead Ship changed from May 1978 to March 1979 due to change in ship delivery, revision of schedule for test activities, and extension of Post Shakedown Availability.

c. Current Change Explanations -- None

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FFG 7 Class, December 31, 1986

9. (U) Schedule (Cont'd):

d. References --

Development Estimate: DCP #97, dated April 24, 1974

Approved Program: FY 88 President's Budget, dated January 5, 1987

10. (U) Technical/Operational Characteristics:

a.(U) Technical	Dev Estimate/ Appr Program	Demonstrated Performance	Current Estimate
Length, Overall (ft)	440/445/453 ^{1/}	445/453 ^{1/}	445/453 ^{1/}
Beam, Max. @ W.L. (ft)	45/45	45	45
Navigational Draft (ft)	24/25.4	25.4	25.4
Displacement, Full Load (tons)	3400/3900	3882	3900
Propulsion			
(1) Gas Turbine (2 ea)	LM-2500/LM-2500	LM-2500	LM-2500
(2) Shaft Horsepower	40,000/40,000	40,000	40,000

b.(U) Operational

(U) Speed, Sustained (kts)	28/28.4	28.5	28.4
(U) Endurance			
(b)(1)			
(U) (2) Stores (days)			
(a) Fresh Provisions	30/30	35	30
(b) Dry Provisions	45/45	81.9	45
(U) Fire Control System	MK-92 Mod 2/MK-92 Mod 2	MK-92 Mod 2	MK-92 Mod 2 ^{2/}
(U) Fire Control Panel, Torpedo	MK-309/MK-309	MK-309	MK-309
(U) Launcher, Missile	MK-13 Mod 4/MK-13 Mod 4	MK-13 Mod 4	MK-13 Mod 4
(U) Launcher, Torpedo (2 ea)	MK-32/MK-32	MK-32	MK-32
(U) Gun (76mm) ^{3/}	MK-75/MK-75	MK-75	MK-75
(U) Acoustic Countermeasures	NIXIE/NIXIE	NIXIE	NIXIE
(U) Sonar ^{4/}	AN/SQS-505 Type/AN/SQS-56	AN/SQS-56	AN/SQS-56
(U) Radar, Air Search	AN/SPS-49/AN/SPS-49	AN/SPS-49	AN/SPS-49
(U) Radar, Surface Search	AN/SPS-55/AN/SPS-55	AN/SPS-55	AN/SPS-55

^{1/} FY 78 and prior/FY 79 and later ships.

^{2/} The MK-92 Mod 2 Fire Control System (FCS) is installed in all but the last ship. This FY 84 ship (FFG 61) will incorporate the MK-92 FCS Phase II upgrade, designated MK-92 Mod 6.

^{3/} CIWS installed in FY 78 and subsequent ships in addition to MK-75.

^{4/} In addition to AN/SQS-56, FY 79 and later ships are configured to accept TACTAS (AN/SQR-19) when available.

c.(U) Previous Change Explanations --

- (U) Current estimate of 445 feet for Length, Overall for FY 78 and prior year ships was due to the addition of a bulwark (bow spray shield) on the bow to minimize deck wetness. The Overall Length for FY 79 and subsequent year ships was increased to 453 feet to retain the warping capstan capability with a stern approach of a LAMPS MK III helicopter. Length at the waterline is the same for all ships.

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10. (U) Technical/Operational Characteristics (Cont'd):

- (U) Current estimate of 25.4 feet for Navigational Draft reflects FFG 36 inclining data and anticipated displacement growth for remaining space and weight items.
- (U) Full Load Displacement previously changed to 3740 tons based upon the final results of the FFG 7 inclining experiment, revised estimates for space and weight items, and the addition of 24 accommodations for enlisted men, including fresh water stowage capacity. Current estimate of 3900 tons was based on FFG 36 inclining data and current estimate for remaining space and weight items.
- (U) Sustained Speed previously increased to 28.2 kts based on final FFG 7 trial data and anticipated displacement growth for space and weight items. Current estimate of 28.4 kts was based on FFG 36 trial data and anticipated displacement growth for remaining space and weight items.

(b)(1)

- (U) "SQS-505 Type" defined economic constraint, performance capability desired, and physical envelope for competitive procurement. The selected system was designated AN/SQS-56.

d. (U) Current Change Explanations -- None

e. (U) References --

Development Estimate: DCP #97, dated April 24, 1974

Approved Program: FY 88 President's Budget dated January 5, 1987

11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate (FY 71-84)	Changes	Current Estimate (FY 71-89)
Development (RDT&E)	\$14.1 ^{1/}	\$+5.6	\$19.7
Procurement (SCN)	2606.3	+1727.6	4333.9
Basic Ship Costs	(1557.5)	(+857.9)	(2415.4)
Gov't Furnished Eqmt Costs	(860.2)	(+768.9)	(1629.1)
Other Costs	(17.6)	(+85.1)	(102.7)
Total Production	(2435.3)	(+1711.9)	(4147.2)
Outfitting & Post Delivery	(171.0)	(+15.7)	(186.7)
Construction (MILCON)	--	--	--
Total FY 73 Base-Year \$	2620.4	+1733.2	4353.6

^{1/} Includes \$1.1 in FY 71 and \$11.4 in FY 72 actuals. \$0.3 must be added to raise total pre-base year actuals to FY 73\$.

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FFG 7 Class, December 31, 1986

11. (U) Program Acquisition Cost (Cont'd): (Current Estimate in Millions of Dollars)

	Development Estimate (FY 71-84)	Changes	Current Estimate (FY 71-89)
Escalation	624.1	+4470.2	5094.3
Development (RDT&E)	--	(+3.3)	(3.3)
Procurement (SCN)	(624.1)	(+4466.9)	(5091.0)
Construction (MILCON)	(--)	(--)	(--)
Total Then-Year \$	\$3244.5	\$+6203.4	\$9447.9
b. Quantities --			
Development (RDT&E)	-	-	-
Procurement (SCN)	50	+1	51
Total	50	+1	51
c. Unit Cost --			
Procurement:			
FY 73 Base-Year \$	\$52.1	\$+32.9	\$85.0
Then-Year \$	64.6	+120.2	184.8
Program:			
FY 73 Base-Year \$	52.4	+33.0	85.4
Then-Year \$	\$64.9	\$+120.4	\$185.3
d. Approved Design to Cost Goal --			
	(Average Unit Sailaway Cost)		
	Dev Estimate/ Appr Program ^{2/}	Current Estimate	Latest Approved Threshold ^{3/}
Qty: 49 ^{1/}			
FY 73 Base-Year \$	\$45.7/45.0	\$71.0	\$50.0
Then-Year \$	\$57.2/57.0	\$154.6	\$62.0

^{1/} Average unit cost in FY 73 base-year dollars for identical follow ships, excluding space and weight items and outfitting/post delivery requirements. The 49 follow ships were to be procured in FY 75 through FY 79.

^{2/} An average follow ship goal of \$71.3 in FY 73 base year dollars, excluding space and weight items and outfitting/post delivery requirements, is under review by OSD. The estimate shown in the current estimate column, which represents the average cost of all authorized follow ships, is to be compared to this \$71.3 goal.

^{3/} An average follow ship threshold of \$97.0 in FY 73 base-year dollars, excluding outfitting/post delivery requirements, is under review by OSD.

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11. (U) Program Acquisition Cost (Cont'd): (Current Estimate in Millions of Dollars)

e. Foreign Military Sales - Four ships have been acquired by Australia; two in FY 75/76 buy, one in FY 78 and one in FY 80 at a current total value of \$729.7 excluding FMS administrative cost. There are two In Country Support cases in support of the four RAN FFGs with a current value of \$73.6 excluding FMS administrative cost. Australia is constructing two FFGs in Australia under auspices of the Australian Frigate (AF) Project. There is a FMS Case to provide material, documentation, and services to support the AF Project which totals \$263.7, excluding the FMS administrative cost.

f. Nuclear Costs -- None

12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	UCR Baseline (Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	9447.9	9534.3	9447.9
(2) Quantity	51	51	51
(3) Unit Cost	185.3	186.9	185.3
b. Current Procurement -	(FY 87)	(FY 88 Pres Bud) (FY 87)	(FY 88)
(1) Cost	17.6	17.6	7.4
Less CY Adv Proc	-	-	-
Plus PY Adv Proc	-	-	-
Less OF/PD on PY progs	-17.6	-17.6	-7.4
Net Total	-	-	-
(2) Quantity	-	-	-
(3) Unit Cost	-	-	-

13. (U) Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	RD&E	PROC	TOTAL
Development Estimate	14.1	3230.4	3244.5
Previous Changes:			
Economic	-	+2269.4	+2269.4
Quantity	-	+307.6	+307.6
Schedule	-	+1601.1	+1601.1
Engineering	+25.3	+880.1	+905.4
Estimating	-16.4	+990.2	+973.8
Support	-	+232.5	+232.5
Subtotal	+8.9	+6280.9	+6289.8
Current Changes:			
Economic	-	-80.9	-80.9
Estimating	-	+6.1	+6.1
Support	-	-11.6	-11.6
Subtotal	-	-86.4	-86.4
Total Changes	+8.9	+6194.5	+6203.4
Current Estimate	23.0	9424.9	9447.9

13. (U) Cost Variance Analysis (Cont'd):

(FY 1973 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	TOTAL
Development Estimate	14.1	2606.3	2620.4
Previous Changes:			
Quantity	-	+104.4	+104.4
Schedule	-	+210.3	+210.3
Engineering	+16.9	+476.0	+492.9
Estimating	-11.3	+838.4	+827.1
Support	-	+100.6	+100.6
Subtotal	+5.6	+1729.7	+1735.3
Current Changes:			
Estimating	-	+2.6	+2.6
Support	-	-4.7	-4.7
Subtotal	-	-2.1	-2.1
Total Changes	+5.6	+1727.6	+1733.2
Current Estimate	19.7	4333.9	4353.6

b. Previous Change Explanations --

RD&E

Engineering: Increased for integration of space and weight items into FFG design.

Estimating: Decreased due to revised estimates for integration of space and weight items into FFG design and to reflect actual funding levels.

Procurement

Economic: Revised escalation indices.

Quantity: Addition of one ship in accordance with FY 84 Appropriation Act.

Schedule: Restructuring of follow ship program schedule to accommodate Congressional actions, longer lead times, alteration of follow ship procurement strategy, revised ship quantities resulting from the annual budget process and earlier deliveries.

Engineering: Incorporation of changes resulting from design development and IOT&E effort and provision of funds for selected characteristics changes.

Estimating: Revised production estimate based on shipbuilders' proposals for FY 75/76 program ships, refined estimates for Government Furnished Equipment and Outfitting/Post Delivery requirements, quantity related changes, Congressional actions, and other revised estimates.

Support: Preparation of more comprehensible technical manuals, MK-92 FCS program quality assurance measures, expanded RMA test and evaluation effort, and procurement of selected equipments as battle spares.

13. (U) Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

(Dollars in Millions)
Base Year \$ Then Year \$
-- --(1) RD&E(2) ProcurementRevised Jan 87 economic escalation rates. -- -80.9
(Economic)Refined estimates. +2.6 +6.1
(Estimating)Decrease reflects reduced cost estimates -4.7 -11.6
for battle spares.
(Support)

d. References --

Development Estimate: DCP #97, dated April 24, 197414. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate --

PAUC in Initial SAR Estimate is same as Current Baseline Estimate.

b. Current Baseline Estimate to Current Estimate --

PAUC (Dev Est)	Changes (Then Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
64.9	+42.9	+4.7	+31.4	+17.8	+19.2	+4.4	-	+120.4	185.3

(b)(4)

(b)(4)

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status -

(1) Percent Program Completed: 89.5% (17yrs/19yrs)

(2) Percent Program Cost Appropriated: 99.9% (\$9,439.8/\$9,447.9)

(All 51 ships appropriated; remainder is outfitting and post delivery requirements for prior year ships).

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY 71-87)	Budget Year (FY 88)	Balance to Complete FYDP (FY 89)	Beyond FYDP	Total
RD&E	23.0	-	-	-	23.0
Procurement (SCN)	9416.8	7.4	0.7	-	9424.9
MILCON	-	-	-	-	-
TOTAL	9439.8	7.4	0.7	-	9447.9

c. Annual Summary --

Fiscal Year	Qty	FY 73 Base-Year Dollars			Then-Year Dollars			Esc1 Rate (%)
		Safeway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RD&E

1971				1.2			1.1	5.1
1972				11.6			11.4	4.6
1973				1.4			1.5	4.4
1974								8.0
1975								10.9
1976				.1			.1	6.6
1977								2.9
1978				.7			1.0	2.6
1979				1.0			1.5	6.8
1980				2.4			4.0	8.4
1980				1.3			2.4	10.5
Subtotal				19.7			23.0	

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

Fiscal Year	Qty	FY 73 Base-Year Dollars			Then-Year Dollars			Esc1 Rate (%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement (SCN)

1973	1		192.8	152.6		61.7	204.6	5.3
1974				7.4	11.0		11.0	9.0
1975	3		240.3	115.8		212.4	189.2	14.1
1976	6		399.1	470.7	170.5	21.0	828.9	11.5
1977				.2	.4		.4	2.0
1977	8		541.1	566.5	126.4	42.7	1105.5	6.2
1978	8		544.4	533.2	61.3	37.7	1135.6	8.2
1979	8		731.1	683.0	23.3	54.2	1485.3	9.6
1980	5		389.6	410.6	74.8		967.8	9.8
1981	6		569.4	573.9	58.0		1397.5	9.6
1982	3		302.5	348.4	100.1		874.0	7.5
1983	2		237.2	276.4	124.0		705.6	3.8
1984	1		145.4	157.2	87.4	40.0	414.9	3.0
1985				22.5	60.4		60.4	2.1
1986				6.7	18.5		18.5	1.2
1987				6.1	17.6		17.6	3.1
1988				2.5	7.4		7.4	3.5
1989				.2	.7		.7	3.5
Subtotal	51		4292.9	4333.9	941.8	469.7	9424.9	
Total	51		4292.9	4353.6	941.8	469.7	9447.9	

d. Obligation and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1971	1.1	1.1	1.1
1972	11.4	11.4	11.4
1973	1.5	1.5	1.5
1974	--	--	--
1975	--	--	--
1976	0.1	0.1	0.1
1977	--	--	--
1977	1.0	1.0	1.0
1978	1.5	1.5	1.4
1979	4.0	4.0	3.8
1980	2.4	2.4	2.3
Subtotal	23.0	23.0	22.6

16. (U) Program Funding Summary (Cont'd):

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: Procurement (SCN)

1973	204.6	204.6	203.0
1974	11.0	11.0	11.0
1975	189.2	189.2	186.3
1976	828.9	828.9	812.8
1977	.4	.4	.4
1977	1105.5	1101.3	1083.9
1978	1135.6	1126.2	1102.3
1979	1485.3	1461.2	1413.9
1980	967.8	947.1	891.8
1981	1397.5	1367.6	1280.5
1982	874.0	796.7	706.6
1983	705.6	553.1	477.3
1984	414.9	307.0	142.3
1985	60.4	53.4	39.9
1986	18.5	12.3	3.8
1987	17.6	--	--
To Complete	8.1	N/A	N/A
Subtotal	9424.9	8960.0	8355.8
Total	9447.9	8983.0	8378.4

17. (U) Production Rate Data:

- a. Annual Rate Data -- N/A
- b. Cost Variance -- N/A
- c. Schedule Variance -- N/A
- d. Deliveries (Plan/Actual) --

	<u>To Date</u>
RDT&E	0/0
Procurement	48/48

18. (U) Operating and Support Costs: Not applicable because the initial SAR for this program was submitted prior to first quarter of FY 1985.

A-5 BRADLEY FVS

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(QAA)823)

PROGRAM: BRADLEY FIGHTING VEHICLE SYSTEMS (BFVS)

AS OF DATE: December 31, 1986

86-025

INDEX

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1. (U) Designation/Nomenclature (Popular Name): Bradley Infantry Fighting Vehicle (IFV), M2A1 , Bradley Cavalry Fighting Vehicle (CFV), M3/M3A1 (Bradley Fighting Vehicles)

2. (U) DoD Component: U.S. Army

3. (U) Responsible Office and Telephone Number:

PM, Bradley Fighting Vehicle Systems
U.S. Army Tank-Automotive Command
6501 E. 11 Mile Road
Warren, MI 48397-5000

PM: COL William O. Coomer
Assigned: July 1, 1985
AUTOVON 786-5909
Commercial: (313) 574-5909

~~Classified by: [redacted] SCG MSR 03783004~~

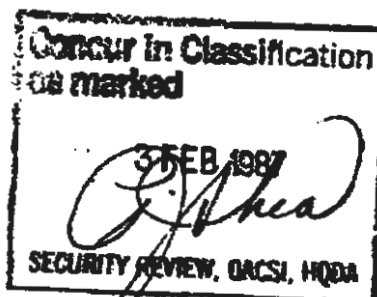
~~Declassify on: OADR~~

~~CONCUR IN CLASSIFICATION
AS MARKED~~

FEB 25 1987

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EXEMPT FROM FREEDOM OF INFORMATION
AND SECURITY REVIEW (GASB-PN)
DEPARTMENT OF DEFENSE



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4. (U) Program Elements/Procurement Line Items:

RDTE:

PE 6.36.25.A	Project DH65 (sunk)
PE 6.46.16.A	Project D258 (sunk)
PE 6.46.17.A	Project D340 (sunk)
PE 6.46.16.A	Project D460 (sunk)

PROCUREMENT:

APPN 2033	SSN G80702
APPN 2033	SSN G21100
APPN 2033	SSN G15100 (sunk)
APPN 2033	SSN GA0153

MILCON:

APPN 2050	PE 22393A (sunk)
APPN 2050	PE 85796A (sunk)
APPN 2050	PE 84731A (sunk)

5. (U) Related Programs: M790 Family of 25mm Ammunition; Training Devices; M2A1/M3A1 Modification Program; Multiple Launch Rocket System (MLRS)

6. (U) Mission and Description: The IFV and CFV are fully tracked, lightly armored fighting vehicles which provide protected cross-country mobility, vehicular mounted firepower, communication and protection to mechanized infantry units, armored cavalry units, and maneuver battalion scout squads. The Bradley IFV/CFV have an inherent swimming capability (with barrier erected) and are air transportable in the C141 and C5A aircraft. The IFV carries a nine-man infantry squad, while the CFV carries a five-man scout section. The product-improved IFV/CFV versions retain the cross country mobility and major performance characteristics of the current vehicles and incorporate improvements in missile performance, operations in an NBC environment, fightability, survivability, and in other functions. The Bradley introduces a formidable fighting vehicle into the Army forces that causes a concomitant re-distribution of some M113 Armored Personnel Carriers.

(U) Vehicle armament consists of a fully stabilized, dual-feed, externally powered M242 25mm automatic gun as its primary weapon, a two-tube TOW missile launcher, and a M240C, 7.62mm coaxially-mounted machinegun. Supplementary armament for the IFV is the M231 firing port weapon. In the combined arms task force and armored cavalry organization, the Bradley will be the primary companion to the M1 Abrams main battle tank.

7. (U) Program Highlights:

a. (U) Significant Historical Developments:

The Bradley Fighting Vehicles are an outgrowth of the plan to develop and test the predecessor Mechanized Infantry Combat Vehicle (MICV). The MICV entered engineering development in September 1972. Special studies were conducted at the

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7. (U) Program Highlights (Cont'd.)

request of Congress and OSD which resulted in the termination of the MICV/20mm but which supported the requirement for IFV/CFV (25mm/TOW) program. In January 1979, the Hughes Helicopter Inc. (HHI) externally powered 25mm Gun was competitively selected as the primary weapon system for the Bradley. The IFV/CFV was type classified as a result of ASARC III in December 1979. Secretary of Defense Decision Memorandum (SDDM) was issued on February 1, 1980, approving full production of the current design, with basic TOW. An initial production contract for 75 IFV's and 25 CFV's was awarded to FMC Corporation in February 1980. In October 1980, OSD guidance was received to initiate a TOW 2 development program. The government accepted the first production IFV on May 8, 1981. IFV/CFV fielding to FORSCOM units began in March 1983 with the 2nd Armored Division (AD) at Ft. Hood. A comprehensive block modification program was initiated in July 1983 to produce an improved IFV/CFV (M2A1/M3A1) with greater performance capability than the basic vehicle. The M2A1/M3A1 was type classified in April 1985, and the VCSA approved vehicle production the following month. The M2A1/M3A1 improves basic IFV's/CFV's in missile performance (TOW 2 subsystem), operations in a biochemical environment, fightability, survivability, and in other functions. A1 prototype vehicles passed Prototype Qualification Test-Government (PQT-G). Vehicle reliability (mean miles between failures) for the basic vehicle increased from 419 to 580, based upon Production Reliability Verification Test (PRVT) results established in August 1985. A high survivability improvement development program was initiated in October 1985.

b. (U) Significant Developments Since Last Report:

1) The Bradley Fighting Vehicles exceeded scheduled production in the report period. The first A1 vehicle was delivered in May 1986. The shortage of Integrated Sight Units (ISU's), Digital Command Guidance Electronics (DCGE's), and Launchers caused some vehicles to be built and then parked without TOW subsystems. Impact of the T2SS shortfall is projected to continue until first quarter CY1990.

2) Major test activities since the last report include: A1 vehicles are currently being tested; PQT-G test results at the APG for the A1 configuration indicate that, as expected, reliability will decrease slightly, due to the introduction of new components, such as TOW-2; BFVS A1 Preproduction Test-Contractor (PPT-C) was completed in September 1986, with no significant problems; live fire vulnerability testing of both basic and high survivability configured vehicles began at APG in October 1986.

3) BFVS fieldings continued on schedule in 1986. Fielding was accomplished to the 2AD Forward BDE (USAREUR), Mississippi ARNG, and Texas ARNG. Operational Readiness (OR) rates for CONUS remain near the DA goal, while OR rates for OCONUS exceed the goal.

4) The BFVS Block II Modification Program to provide increased survivability changes into production vehicles progressed according to schedule. An effort is ongoing to upgrade the power package to 600 HP.

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7. (U) Program Highlights (Cont'd):

() All seventh year (FY86) major production contracts were awarded as fixed price type. The transmission and turret drive contracts for FY87 were awarded in November 1986. The turret drive contract is the third increment of a three year multiyear.

() The Bradley Fighting Vehicle System meets the critical mission requirements.

c. (U) Changes Since "As of" Date -- None.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: The approved program is in MICV DCP No. 30, April 1972, with Cover Sheet Revision, September 1972, and the SDDM, February 1, 1980 for BFVS. No DCP thresholds were breached during the current reporting period.

9. (U) Schedule

a. (U) Milestones

	<u>Development Estimate/ Approved Program 1/</u>	<u>Current Estimate</u>
(1) (U) Concept Formulation Complete	Apr 72/Apr 72	Apr 72
(2) (U) Engineering Development Contract Awarded 1/	Nov 72/Nov 76	Nov 76
(3) (U) Prototype Qualification Test - Contractor (PQT-C) 2/ Start	N/A/Dec 78	Dec 78
Complete	N/A/Jun 79	Jun 79
(4) (U) Development Test II (PQT-G) 1/ Start	Dec 74/Jun 79	Jun 79
Complete	Nov 75/Jun 80	Jun 80
(5) (U) Operational Test II (IFV) 2/ Start	N/A Oct 79	Oct 79
Complete	N/A/Nov 79	Nov 79
(6) (U) Milestone III (ASARC/DSARC) 2/	N/A/Dec 79/Jan 80	Dec 79/ Jan 80
(7) (U) First Production Contract Award 1/	Oct 76/Feb 80	Feb 80
(8) (U) Production (1st Delivery) 1/	Oct 77/May 81	May 81
(9) (U) Development Test III (FVT-G) Start	Oct 77/N/A 3/	N/A 3/
Complete	Jun 78/N/A 3/	N/A 3/
(10) (U) Initial Production Testing 2/ Start	N/A/Jun 82	Jun 82
Complete	N/A/May 83	May 83
(11) (U) Type Classification Standard 2/ IFV	Aug 78/Dec 79	Dec 79
CFV	Aug 78/Dec 79	Dec 79
(12) (U) Initial Operational Capability (IOC) IFV 4/	Aug 78/Dec 83	Dec 83 4/

b. (U) Previous Change Explanations -- See Footnotes below

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9. (U) Schedule (Cont'd):

c. (U) Current Change Explanation -- None

d. (U) References -

(U) Development Estimate: Development Concept Paper (DCP) No. 30, April 1972, with Cover Sheet Revision September 1972.

(U) Approved Program: FY 88/89 President's Budget

e. (U) Footnotes --

1/ (U) Engineering development, PQT-G test, Operational Test II, first production contract award, type classification standard, and first production vehicle delivery were all delayed due to DA decision to terminate the MICV program and begin IFV/CFV program development.

2/ (U) Dates for these milestones are not reflected in the MICV DCP but reflect Army approved milestones.

3/ (U) Milestone deleted in accordance with AR 1000-1, basic policy for system acquisition.

4/ (U) Development Estimate IOC was based on MICV program. Actual IOC occurred later due to Army redefinition of IOC. The Commander FORSCOM determined that the IOC for IFV/CFV occurred in December 1983.

10. (U) Technical/Operational Characteristics: 1/

	<u>Development Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. (U) Technical			
(1) (U) Weight (Combat loaded) - lbs.	35-38,000/43-50,000	49,987	50,000

(b)(1)

b. (U) Operational

(1) (U) Firepower
25mm Gun

(a) (U) Stabilization	80 to 90/80 to 90	94.5	94.5
Accuracy on a 4 mil. Target (% of Time Target)			

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10. (U) Technical/Operational Characteristics (Cont'd):

	Development Estimate/ <u>Approved Program</u>	Demonstrated <u>Performance</u>	Current <u>Estimate</u>
(b) (U) Single Shot Accuracy to 1,000M (rd. to rd. std. dev.) (Stat) (Mils.) (AP)	.50/.50	.50	.50
(c) (U) Dispersion:			
(U) HE (Mils.) (500 rds/min)	.97/.97	.97	.97
(U) AP (Mils.) (100 rds/min)	.59/.59	.59	.59
(U) Receiver Life (rds.)	25,000/25,000	30,000	30,000
(U) Barrel Life (rds.)	3,750/13,000	13,000	13,000

(b)(1)

(2) (U) Reliability			
(a) (U) System (MMBF)	330/240	580	580
(b) (U) 25mm Gun (MRBS)	2,000/6,000	9,021	9,021
(3) (U) Maximum Speed (MPH)			
(a) (U) Land	40-45/40-45	42.0	42.0
(b) (U) Water	3.6/4.5	4.4	4.4
(4) (U) Acceleration 0-30 (MPH (sec))	18-22/18-22	18.5	18.5
(5) (U) Ground Pressure (p.s.i.)	7.0/7.6	7.8	7.8(50K lbs)
(6) (U) Maintenance Ratio (Manhours/Oper. Hours)	.60/.60	.40	.60

c. (U) Previous Change Explanations -

Vehicular data in column 1, Development Estimate, reflects the 20mm MICV program. Vehicular data in column 1, Approved Program, shows the basic Fighting Vehicle System. Armament data for Development Estimate shows the 25mm VRFWS-S program, whereas the armament data for approved program is based upon the QMR for 25mm weapon system. Column 2 reflects data in the Materiel Need (MN) for the IFV/CFV. Columns 3 and 4 depict the current M2/M3 program.

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10. (U) Technical/Operational Characteristics (Cont'd):

(U) Operational Characteristics for the Bradley changed in both demonstrated performance and current estimate as follows:

(U) Based upon the M2/M3 MN and system specification requirement, the M242 production gun single shot accuracy changed to .50 (rd. to rd. std. dev) (AP), HE dispersion changed to .97 (mils), and AP dispersion data changed to .59 (mils); reliability (MMBF) for the basic vehicle changed to 580, based upon Production Reliability Verification Test (PRVT) final scoring; maximum land speed changed to 42.0 MPH and acceleration changed to 18.5 seconds, both based on average test results of PRVT test vehicles.

d. (U) Current Change Explanations -- None

e. (U) References -

(U) Development Estimate: Development Concept Paper (DCP) No. 30, April 1972, with Cover Sheet Revision, September 1972

(U) Approved Program: Materiel Need (MN) for an IFV/CFV, March 2, 1978, with changes through April 13, 1979, and MN Annex May 25, 1982; FY88-89 President's Budget Supporting Documents.

f. (U) Footnotes -

1/ (U) Technical/Operational Characteristics reflect the basic vehicle.

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11. (U) Program Acquisition Cost (Dollars in Millions)

	(1) Development <u>Estimate</u> (FY66-FY80)	(2) <u>Changes</u>	(3) Current <u>Estimate</u> (FY66-FY91)
a. (U) Cost			
Development (RDT&E)	\$98.3	\$+209.2	\$307.5
Vehicles	(34.3)	(+204.3)	(238.6)
25mm Weapon/Ammo	(64.0)	(+4.9)	(68.9)
Procurement (WTCV)	227.3	+2653.8	2881.1
IFV/CFV	(170.6)	(+2439.5)	(2610.1)
FPW	(N/A)	(+8.8)	(8.8)
25mm Wpn	(54.2)	(+53.1)	(107.3)
Initial Spares	(2.5)	(+152.4)	(154.9)
Military Construction (MILCON)	N/A	+9.9	9.9
TOTAL: Constant FY72 \$	325.6	+2872.9	3198.5
Escalation	111.3	+6408.3	6519.6
Development (RDT&E)	(23.8)	(+183.0)	(206.8)
Procurement (WTCV)	(87.5)	(+6209.3)	(6296.8)
Construction (MILCON)	(N/A)	(+16.0)	(16.0)
TOTAL: Then Year \$	\$436.9	+9281.2	9718.1
b. (U) Quantities			
Development	15	+6	21
Procurement	1190	+5692	6882
Total	1205	+5698	6903
c. (U) Unit Cost			
Procurement:			
FY72 Base-Year \$	\$.191	+.228	.419
Then-Year \$	.265	+1.069	1.334
Program:			
FY72 Base-Year \$	.270	+.193	.463
Then-Year \$	.363	+1.045	1.408
d. (U) Approved Design to Cost Goal			
	(Average Unit Flyaway Cost)		
	Dev Estimate/ <u>Appr Program</u>	Current <u>Estimate</u>	Latest Approved <u>Threshold</u>
@ Qty: 6882			
@ Peak Rate: 60/mo	1/		
FY80 Constant \$	2/ .543	.692	.597
Then-Year \$	2/ .818	1.141	.877

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11. (U) Program Acquisition Cost (Cont'd):

e. (U) Foreign Military Sales --- None

f. (U) Nuclear Costs --- None

Footnotes -

1/ Based on current approved program of 716 vehicles per year (716 vehicles - FY86 only)

2/ Cover sheet amendment to SEP 72 MICV DCP did not contain a rollaway cost goal.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. (U) Program Acquisition			
(1) (U) Cost	9718.1	10513.1	9718.1
(2) (U) Quantity	6903	6903	6903
(3) (U) Unit Cost	1.408	1.523	1.408
b. (U) Current Procurement (FY 1987)		(FY 1987) (FY87 APPN)	(FY 1988)
(1) (U) Cost	903.4	972.7	791.4
Less CY Adv Proc	13.5	13.8	39.2
Plus PY Adv proc	30.6	30.6	19.4
Net Total	920.5	989.5	771.6
(2) (U) Quantity	662	720	616
(3) (U) Unit Cost	1.390	1.374	1.252

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13. (U) Cost Variance Analysis:

a. (U) Summary --

(1) (U) Current (Then-Year) Dollars in Millions

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Baseline Estimate	122.1	314.8	-	436.9
Previous Changes:				
Economic	-1.2	-285.2	-1.7	-288.1
Quantity	+18.0	+2648.1	-	+2666.1
Schedule	+22.1	+592.9	-	+615.0
Engineering	+166.9	+1280.6	-	+1447.5
Estimating	+33.4	+4262.8	+31.5	+4327.7
Other	+17.9	-	-	+17.9
Support	+135.6	+1154.5	-	+1290.1
Subtotal	+392.7	+9653.7	+29.8	+10076.2
Current Changes:				
Economic	-.3	-167.2	-.5	-168.0
Quantity	-	-	-	-
Schedule	-	+71.8	-	+71.8
Engineering	-	+310.1	-	+310.1
Estimating	-.2	-784.8	-3.4	-788.4
Other	-	-	-	-
Support	-	-220.5	-	-220.5
Subtotal	-.5	-790.6	-3.9	-795.0
Total Changes	+392.2	+8863.1	+25.9	+9281.2
Current Estimate	514.3	9177.9	25.9	9718.1

(2) (U) FY 1972 Constant Dollars (Base Year) in Millions

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Baseline Estimate	98.3	227.3	-	325.6
Previous Changes:				
Quantity	+11.1	+905.8	-	+916.9
Schedule	+13.8	+59.4	-	+73.2
Engineering	+82.1	+403.8	-	+485.9
Estimating	+26.3	+1132.7	+11.1	+1170.1
Other	+11.0	-	-	+11.0
Support	+65.1	+347.0	-	+412.1
Subtotal	+209.4	+2848.7	+11.1	+3069.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+86.0	-	+86.0

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13. (U) Cost Variance Analysis (Cont'd):

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Estimating	-.2	-220.3	-1.2	-221.7
Other	-	-	-	-
Support	-	-60.6	-	-60.6
Subtotal	-.2	-194.9	-1.2	-196.3
Total Changes	+209.2	+2653.8	+9.9	+2872.9
Current Estimate	307.5	2881.1	9.9	3198.5

b. (U) Previous change explanations -

RDT&E

Economic: revised escalation indices.

Quantity: addition of six prototype vehicles to support the IFV/CFV Dev Phase.

Schedule: delays due to redirection of program from one-man weapon station with 20MM Gun/25MM Gun (MICV configuration) to two-man weapon station with 25MM Gun and TOW Subsystem (IFV/CFV configuration) which caused complete restructuring of R&D effort.

Engineering: design effort associated with redirection of program to IFV/CFV configuration; additional design effort of A1 configuration.

Estimating: revised estimate for government and contractor engineering; program adjusted to reflect contract deobligation, AMC decisions to withdraw funds, OSD inflation cut, and congressional action.

Other: engineering contractor over-runs.

Support: revised requirements for TMDE and "New Look" manuals.

Procurement

Economic: revised escalation indices.

Quantity: addition of 5,692 vehicles with associated increase in gun quantity.

Schedule: production delay due to extension of R&D effort and stretch-out of production to permit delivery of additional vehicles; reschedule of production rates during FY88 thru FY90.

Engineering: design changes to IFV/CFV configuration and A1 configuration. Addition of high survivability requirements.

Estimating: revised production cost estimates based on more current data; application of revised historical escalation indices; revision of acquisition plan to include competition and multiyear procurement.

Support: changes in initial spares, peculiar support equipment, TMDE requirements, and classroom spares.

MILCON

Economic: revised escalation indices.

Estimating: MILCON changes to cover BFVS unique sites.

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13. (U) Cost Variance Analysis (Cont'd):

c. (U) Current changes -

(Dollars in Millions)
Base Year Then Year

(1) (U) RDTE

Revised Dec 86 economic escalation rates (Economic)	N/A	-.3
Deobligation of -.1M in FY83 and -.1M in FY 85 (Estimating)	<u>-.2</u>	<u>-.2</u>
Total RDT&E Change	<u>-.2</u>	<u>-.5</u>

(2) (U) Procurement

Revised DEC 86 economic escalation rates (Economic)	N/A	-167.2
Reschedule of production rates during FY87 thru FY91 (Schedule)	0	+71.8
Revisions to High Survivability requirements (Engineering)	+86.0	+310.1
Changes to vehicle and 25mm Gun estimates, based on latest contractual data and revision of BFVS Acquisition Plan to include competition and Multiyear Procurement (Estimating)	-220.3	-784.8
Reductions in support:	-60.6	-220.5
O Initial Spares Requirements	(-36.8)	(-136.3)
O TMDE	(-23.4)	(- 82.5)
O Other Peculiar Spt Equipment	(-.4)	(-1.7)

(3) (U) MILCON

(Dollars in Millions)
Base Year Then Year

Revised DEC 86 economic escalation rate (Economic)	N/A	-.5
Facility at Ft. Knox, Kentucky was changed from fielding to sustainment PDIP and is no longer a Bradley unique site (Estimating)	<u>-1.2</u>	<u>-3.4</u>
Total MILCON Change	<u>-1.2</u>	<u>-3.9</u>

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14. (U) Program Acquisition Unit Cost (PAUC) History: Development Estimate to Current Estimate

PAUC Development Estimate	Changes (Then Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
.363	-.066	+.086	+.099	+.255	+.513	+.155	+.003	+1.045	1.408

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E -

None.

b. (U) Procurement -

IFV/CFV/MLRS Production
(7th Year Production)

Initial Contract Price
Target Ceiling Qty

FMC
San Jose, California
DAAEO7-86-C-A047, FFP
Award: JULY 31, 1986
Definitized: Not yet definitized

\$339.2 N/A 779

Current Contract Price
Target Ceiling Quantity

Estimated Price at Completion
Contractor Program Manager

\$340.6 N/A 779

\$340.6 \$340.6

Cost Variance

Schedule Variance

Previous Cumulative Variance
Cumulative Variance To Date

N/A
N/A

N/A
N/A

Net Change

N/A

N/A

Explanation of Change Not yet definitized FFP type contract. Cost/Performance/
C/SSR reporting is not a contract requirement.

IFV/CFV/MLRS Production
(6th Year Production)

Initial Contract Price
Target Ceiling Qty

FMC
San Jose, California
DAAEO7-85-C-A016, FFP
Award: JULY 3, 1985
Definitized: July 3, 1985

\$315.3 N/A 725 *

* Corrects previously reported quantity of 715 which was in error.

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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	<u>Contractor</u>	<u>Program Manager</u>
\$322.2	N/A	725	\$322.2	\$322.2
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance			N/A	N/A
Cumulative Variance To Date			<u>N/A</u>	<u>N/A</u>
Net Change			N/A	N/A

Explanation of Change: Not applicable. FFP type contract. Cost/Performance/C/SSR reporting is not a contract requirement.

Transmission Production
(FY's 83/84/85)

<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$ 45.0 **	N/A	607**

GEOS
Pittsfield, Massachusetts
DAAEO7-83-G-A054, FFP
Award: NOVEMBER 15, 1983
Definitized: JULY 31, 1984

** Corrects previously reported target costs of \$227.0M and quantity of 2,114 which was in error.

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	<u>Contractor</u>	<u>Program Manager</u>
\$247.3	N/A	2504	\$247.3	\$247.3
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance			N/A	N/A
Cumulative Variance To Date			<u>N/A</u>	<u>N/A</u>
Net Change			N/A	N/A

Explanation of Change: Not applicable. FFP type contract. Cost/Performance/C/SSR reporting is not a contract requirement.

Transmission Production
(FY's '86/'87)

<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$123.4	N/A	1524

GEOS
Pittsfield, Massachusetts
DAAEO7-86-C-A023, FFP
Award: JANUARY 10, 1986
Definitized: Not yet definitized

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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	<u>Contractor</u>	<u>Program Manager</u>
\$182.9	N/A	2261	\$182.9	\$182.9

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance	N/A	N/A
Cumulative Variance To Date	N/A	N/A
Net Change	N/A	N/A

Explanation of Change: Not yet definitized FFP type contract. Cost/Performance/C/SSR reporting is not a contract requirement.

Turret Drive System

GEOS

Pittsfield, Massachusetts

DAAA09-85-C-0396, FFP

Award: JANUARY 31, 1985

Definitized: July 30, 1985

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	<u>Contractor</u>	<u>Program Manager</u>
\$162.6	N/A	2,046	\$162.6	\$162.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance	N/A	N/A
Cumulative Variance To Date	N/A	N/A
Net Change	N/A	N/A

Explanation of Change: Not applicable. Level of effort type contract. Cost/Performance/C/SSR is not a contract requirement.

Bradley STS VI

FMC CORP

San Jose, California

DAAEO7-86-C-R128, CPFF

Award: SEPTEMBER 29, 1986

Definitized: N/A

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 41.4	N/A	0.0	\$ 41.4	\$ 41.4

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance	N/A	N/A
Cumulative Variance To Date	N/A	N/A
Net Change	N/A	N/A

Explanation of Change: Not applicable. Level of effort type contract. Cost/Performance/C/SSR is not a contract requirement.

c. (U) Military Construction --
None.

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16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) (U) Percent Program Completed: 85.2% (23 yrs/27 yrs)

(2) (U) Percent Program Cost Appropriated: 68.7% (6678.7/9718.1)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY66-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93)</u>	<u>Total</u>
RDT&E	514.3	-	-	-	514.3
Procurement	6138.5	791.4	2248.0	-	9177.9
MIL CON	25.9	-	-	-	25.9
	-----	-----	-----	-----	-----
TOTAL	6678.7	791.4	2248.0		9718.1

c. (U) Annual Summary ---

<u>FISCAL YEAR</u>	<u>QTY</u>	<u>FY72 BASE-YEAR DOLLARS</u>		<u>THEN YEAR DOLLARS</u>			<u>(%) ESCL RATE</u>
		<u>FLYAWAY</u>	<u>TOTAL</u>	<u>ADVANCE PROC</u>	<u>TOTAL 1/</u>		
		<u>NONREC</u>	<u>REC</u>	<u>PROGRAM</u>	<u>DEBIT</u>	<u>CREDIT</u>	

APPROPRIATION: RDT&E

1966			1.5		1.2	2.7
1967			6.5		5.3	3.2
1968			2.8		2.4	3.6
1969			5.4		4.8	4.7
1970			1.9		1.8	5.5
1971			5.3		5.2	5.1
1972			2.1		2.2	4.6
1973			9.2		10.1	4.3
1974	3		16.9		20.1	8.0
1975	3		12.9		16.6	10.9
1976	7		24.2		32.8	6.6
197T			5.8		8.2	2.9
1977			39.5		57.5	2.6
1978	8		31.8		49.9	6.8
1979			25.3		43.5	8.4

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of \$)

FISCAL YEAR	QTY	FY72 BASE-YEAR DOLLARS			THEN YEAR DOLLARS			ESCL RATE	
		FLYAWAY		TOTAL PROGRAM	ADVANCE PROC		TOTAL		
		NONREC	REC		DEBIT	CREDIT			
1980				20.4			38.7	10.6	
1981				20.1			41.5	10.6	
1982				40.2			88.5	7.6	
1983				20.3			46.8	4.9	
1984				11.0			26.3	3.8	
1985				4.4			10.9	3.4	
TOTAL	21			307.5			514.3		

FISCAL YEAR	QTY	FY72 BASE-YEAR DOLLARS			THEN YEAR DOLLARS			ESCL RATE	
		FLYAWAY		TOTAL PROGRAM	ADVANCE PROC		TOTAL 1/		
		NONREC	REC		DEBIT	CREDIT			

APPROPRIATION: PROCUREMENT

VEHICLES

1969		.5		.5			.4	2.7
1979		16.2	2.6	18.8			39.2	8.9
1980	100	13.7	81.2	99.1			231.6	11.8
1981	400	9.9	201.8	234.2			612.9	11.6
1982	600	1.3	264.6	282.7	59.0		792.5	14.3
1983	600		211.0	234.7	49.1	59.0	697.6	9.0
1984	600	12.2	211.8	245.9	29.6	39.5	762.3	8.0
1985	655	.6	230.7	243.1	24.9	39.2	772.2	3.4
1986	716	4.5	204.3	222.5	24.2	20.4	732.4	2.9
1987	662	1.8	244.1	245.9	10.3	27.5	837.1	3.1
1988	616	2.0	197.6	209.5	37.1	9.3	736.5	3.5
1989	618	1.4	188.6	197.3	42.8	31.8	714.0	3.5
1990	624		183.8	191.2	38.2	41.6	710.2	3.3
1991	691		177.8	184.7		46.9	702.5	2.9
TOTAL	6882	64.1	2399.9	2610.1	315.2	315.2	8341.4	

FIRING PORT WEAPON

1980	1600	1.1	1.2	2.3			5.4	11.8
1981	4000	.2	1.7	1.9			5.1	11.6
1982	19400	.1	4.4	4.6			12.8	14.3
TOTAL	25000	1.4	7.3	8.8			23.3	

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of \$)

FISCAL YEAR	QTY	FY72 BASE-YEAR DOLLARS			THEN YEAR DOLLARS			ESCL RATE
		FLYAWAY		TOTAL PROGRAM	ADVANCE PROC		TOTAL 1/	
		NONREC	REC		DEBIT	CREDIT		

APPROPRIATION: PROCUREMENT

GUN

1980	310	2.7	10.8	13.5			31.6	11.8
1981	480		7.5	7.9			20.8	11.6
1982	720		9.7	10.2			28.6	14.3
1983	532	1.7	8.4	10.2			30.2	9.0
1984	630		9.9	9.9			30.8	8.0
1985	690		11.0	11.0			35.0	3.4
1986	715		13.2	13.2	13.1		43.5	2.9
1987	947		10.8	10.8	3.2	3.1	36.8	3.1
1988	947		7.9	7.9	2.1	10.1	27.9	3.5
1989	948		9.6	9.6	2.4	3.1	34.9	3.5
1990	465		3.1	3.1	0	4.5	11.6	3.3
TOTAL	7384	4.4	101.9	107.3	20.8	20.8	331.7	

FISCAL YEAR	QTY	FY72 BASE-YEAR DOLLARS			THEN YEAR DOLLARS			ESCL RATE
		FLYAWAY		TOTAL PROGRAM	ADVANCE PROC		TOTAL 1/	
		NONREC	REC		DEBIT	CREDIT		

APPROPRIATION: PROCUREMENT

SPARES

1980			3.5		8.1	11.8
1981			17.1		44.7	11.6
1982			19.9		55.9	14.3
1983			22.0		65.4	9.0
1984			24.8		77.0	8.0
1985			22.3		70.8	3.4
1986			8.6		28.3	2.9
1987			8.7		29.5	3.1
1988			7.7		27.0	3.5
1989			8.4		30.4	3.5
1990			7.1		26.2	3.3
1991			4.8		18.2	2.9
TOTAL			154.9		481.5	

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of \$)

FISCAL YEAR	QTY	FY72 BASE-YEAR DOLLARS		TOTAL PROGRAM	THEN YEAR DOLLARS		TOTAL	ESCL RATE
		FLYAWAY NONREC	REC		ADVANCE PROC DEBIT	CREDIT		

APPROPRIATION: PROCUREMENT

TOTAL BEVS

1969		.5		.5			.4	2.7
1979		16.2	2.6	18.8			39.2	8.9
1980		17.5	93.2	118.4			276.7	11.8
1981		10.1	211.0	261.1			683.5	11.6
1982		1.4	278.7	317.4	59.0		889.8	14.3
1983		1.7	219.4	266.9	49.1	59.0	793.2	9.0
1984		12.2	221.7	280.6	29.6	39.5	870.1	8.0
1985		.6	241.7	276.4	24.9	39.2	878.0	3.4
1986		4.5	217.5	244.3	37.3	20.4	804.2	2.9
1987		1.8	254.9	265.4	13.5	30.6	903.4	3.1
1988		2.0	205.5	225.1	39.2	19.4	791.4	3.5
1989		1.4	198.2	215.3	45.2	34.9	779.3	3.5
1990			186.9	201.4	38.2	46.1	748.0	3.3
1991			177.8	189.5		46.9	720.7	2.9
TOTAL		69.9	2509.1	2881.1	336.0	336.0	9177.9	

FISCAL YEAR	QTY	FY72 BASE-YEAR DOLLARS		TOTAL PROGRAM	THEN YEAR DOLLARS		TOTAL	ESCL RATE
		FLYAWAY NONREC	REC		ADVANCE PROC DEBIT	CREDIT		

APPROPRIATION: MILITARY CONSTRUCTION

1983				3.7			9.4	4.9
1984				2.1			5.5	3.8
1985				4.1			11.0	3.4
TOTAL				9.9			25.9	

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of \$)

d. (U) Obligations and Expenditures --

THEN YEAR DOLLARS (CURRENT ESTIMATE IN MILLIONS)			
FISCAL YEAR	TOTAL PROGRAM 1/	OBLIGATED	EXPENDED
APPROPRIATION: RDT&E			
1966	1.2	1.2	1.2
1967	5.3	5.3	5.3
1968	2.4	2.4	2.4
1969	4.8	4.8	4.8
1970	1.8	1.8	1.8
1971	5.2	5.2	5.2
1972	2.2	2.2	2.2
1973	10.1	10.1	10.1
1974	20.1	20.1	20.1
1975	16.6	16.6	16.6
1976	32.8	32.8	32.8
1977	8.2	8.2	8.2
1977	57.5	57.5	57.5
1978	49.9	49.9	49.9
1979	43.5	43.5	43.5
1980	38.7	38.7	38.7
1981	41.5	41.5	40.1
1982	88.5	88.5	86.7
1983	46.8	46.8	43.6
1984	26.3	26.3	19.4
1985	10.9	10.9	5.2
TOTAL	514.3	514.3	495.3

THEN YEAR DOLLARS (CURRENT ESTIMATE IN MILLIONS)			
FISCAL YEAR	TOTAL PROGRAM	OBLIGATED	EXPENDED
APPROPRIATION: PROCUREMENT			
VEHICLE			
1969	.4	.4	.4
1979	39.2	39.2	39.2
1980	231.6	231.6	231.3
1981	612.9	612.9	605.7
1982	792.5	792.5	781.0
1983	697.6	697.6	658.3
1984	762.3	762.3	660.1
1985	772.2	678.2	417.3
1986	732.4	657.9	34.2
1987	837.1	129.0	0
1988	736.5	0	0
1989	714.0	0	0
1990	710.2	0	0
1991	702.5		
TOTAL	8341.4	4601.6	3427.5

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of \$)

THEN YEAR DOLLARS (CURRENT ESTIMATE IN MILLIONS)

<u>FISCAL YEAR</u>	<u>TOTAL PROGRAM</u>	<u>OBLIGATED</u>	<u>EXPENDED</u>
--------------------	----------------------	------------------	-----------------

APPROPRIATION: PROCUREMENT

FIRING PORT WEAPON (FPW)

1980	5.4	5.4	5.1
1981	5.1	5.1	5.0
1982	12.8	12.8	12.6
TOTAL	23.3	23.3	22.7

THEN YEAR DOLLARS (CURRENT ESTIMATE IN MILLIONS)

<u>FISCAL YEAR</u>	<u>TOTAL PROGRAM 1/</u>	<u>OBLIGATED</u>	<u>EXPENDED</u>
--------------------	-------------------------	------------------	-----------------

GUN

1980	31.6	31.6	31.0
1981	20.8	20.8	20.7
1982	28.6	28.6	28.5
1983	30.2	30.2	30.2
1984	30.8	30.8	30.3
1985	35.0	33.6	20.6
1986	43.5	37.9	3.2
1987	36.8	29.6	0
1988	27.9	0	0
1989	34.9	0	0
1990	11.6	0	0
TOTAL	331.7	243.1	164.5

THEN YEAR DOLLARS (CURRENT ESTIMATE IN MILLIONS)

<u>FISCAL YEAR</u>	<u>TOTAL PROGRAM</u>	<u>OBLIGATED 2/</u>	<u>EXPENDED 2/</u>
--------------------	----------------------	---------------------	--------------------

APPROPRIATION: PROCUREMENT

SPARES 2/

1980	8.1
1981	44.7
1982	55.9
1983	65.4
1984	77.0
1985	70.8

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

<u>THEN YEAR DOLLARS (CURRENT ESTIMATE IN MILLIONS)</u>			
<u>FISCAL YEAR</u>	<u>TOTAL PROGRAM</u>	<u>OBLIGATED 2/</u>	<u>EXPENDED 2/</u>
1986	28.3		
1987	29.5		
1988	27.0		
1989	30.4		
1990	26.2		
1991	18.2		
TOTAL	481.5		

<u>THEN YEAR DOLLARS (CURRENT ESTIMATE IN MILLIONS)</u>			
<u>FISCAL YEAR</u>	<u>TOTAL PROGRAM 1/</u>	<u>OBLIGATED</u>	<u>EXPENDED</u>
<u>TOTAL BEVS</u>			
1969	.4	.4	.4
1979	39.2	39.2	39.2
1980	276.7	268.6	267.4
1981	683.5	638.8	631.4
1982	889.8	833.9	822.1
1983	793.2	727.8	688.5
1984	870.1	793.1	690.4
1985	878.0	711.8	437.9
1986	804.2	695.8	37.4
1987	903.4	158.6	
1988	791.4		
1989	779.3		
1990	748.0		
1991	720.7		
TOTAL	9177.9	4868.0	3614.7

<u>THEN YEAR DOLLARS (CURRENT ESTIMATE IN MILLIONS)</u>			
<u>FISCAL YEAR</u>	<u>TOTAL PROGRAM</u>	<u>OBLIGATED 3/</u>	<u>EXPENDED 3/</u>

APPROPRIATION: MILITARY CONSTRUCTION 3/

1983	9.4
1984	5.5
1985	11.0
1986	0
1987	0
TOTAL	25.9

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Bradley Fighting Vehicle Systems

DECEMBER 31, 1986

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of \$)

Footnotes -

- 1/ Prior year program adjusted to obligation level when obligational authority has expired.
- 2/ Obligation and expenditures for initial spares not available to the reporting PM. MSCs budget execution system does not provide obligation and expenditure data by system.
- 3/ Obligations and expenditures for system - specific MILCON projects are not available to the reporting PM. Army Corps of Engineers budget execution methodology does not provide obligation and expenditure data by system.

17. (U) Production Rate Data

a. (U) Annual Production Rates -

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1977	59	N/A		
1978	79	N/A		
1979	465	N/A		
1980	587	100	125	
1981		350	300	
1982		829	600	
1983		1080	600	
1984		1080	600	
1985		1080	655	
1986		1080	716	
1987		1283	662	792
1988			616	792
1989			618	792
1990			624	792
1991			691	792

FY86 & Prior production procurement are considered sunk; therefore, costing and scheduling for maximum economic production rate is only feasible for FY87 subsequent procurements.

b. (U) Cost Variance -- Dollars in Millions (NOTE: Subject to limitations on Production rates above.)

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY\$)	2374.4	+824.1	3198.5	+21.4	3177.1
(TY\$)	6959.1	+2759.0	9718.1	+123.2	9594.9
PAUC (BY\$)	.344	+.119	.463	+.003	.460
(TY\$)	1.008	+.400	1.408	+.018	1.390

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Bradley Fighting Vehicle Systems

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17. (U) Production Rate Data (Cont'd):

c. (U) Schedule Variance -- (Note: Subject to the limitations on production rates above.)

	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (MO/YR) 1/	2/80	0	2/80	0	2/80
Duration (in Months)	118	+41	159	+11	148
End Date (Mo/Yr) 1/	12/89	+40	4/93	+12	5/92

d. (U) Deliveries (Plan/Actual) --

	<u>To Date</u>
RDT&E	21/21
PROCUREMENT	2718/2724

Footnotes -

1/ Represents production vehicle deliveries only.

18. (U) Operating and Support Costs:

N/A

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AF-14 GLCM

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SAR-86-115

SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A)) (U)

Program: Ground Launched Cruise Missile, BGM-109G (U)

AS OF DATE: December 31, 1986

INDEX (U)

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1. (U) <u>Designation and Nomenclature (GLCM):</u>	BGM-109G/Ground Launched Cruise Missile (TOMAHAWK)
2. (U) <u>DOD Component:</u>	U.S. Air Force
3. (U) <u>Responsible Office and Telephone Number:</u>	
	Ground Launched Cruise Missile Program Office Aeronautical Systems Division Wright-Patterson AFB, OH 45433-5000
	Col T. Sinclair Assigned: 18 Nov 86 AUTOVON: 785-7636 COMM: (513)255-7636
4. (U) <u>Program Elements:</u>	
	RDT&E: PE 64362F Procurement: APPN 3020; ICN MGLCMO; PE 27314F MILCON: PE 27314F
5. (U) <u>Related Programs:</u>	Air Launched Cruise Missile (ALCM) and Sea Launched Cruise Missile (SLCM)

~~Classified by: BGM-109G GLCM Classification
Security Guide (15 Aug 86)~~

(THIS PAGE IS UNCLASSIFIED)

~~Declassify on: OADR~~

SAF/PAS

87-0054-T

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87-0271

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R3

~~SECRET~~

GLCM, December 31, 1986

6. (U) Mission and Description: The GLCM system is being developed to provide increased theater firepower. The system will also raise the theater nuclear threshold by releasing nuclear loaded aircraft for conventional tasks and increasing the survivability of the theater nuclear force. The primary elements of the GLCM system are the missile itself, a Transporter Erector Launcher (TEL) and a Launch Control Center (LCC). The missile is a variation of the Tomahawk (BGM-109) cruise missile developed by the U.S. Navy. It is jet engine powered and makes use of an inertial guidance system aided by Terrain Contour Matching (TERCOM) position updates. A solid propellant booster is used to obtain cruise speed. The TEL consists of a launcher containing four missiles which, along with associated electronic and power production equipment, is mounted on a semi-trailer. The LCC shelter, also mounted on a semi-trailer, houses the missile launch crew and the equipment necessary for communications, missile status monitoring and missile launch. The GLCM system is air transportable. It does not replace any existing USAF weapon systems.

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- The GLCM program resulted from the January 1977 DSARC II decision authorizing the development of the Sea Launched Tomahawk Cruise Missile. The decision also established the Joint Cruise Missile Project Office, with the Navy designated as lead service, to develop the Air, Ground and Sea Launched Missiles with maximum commonality. In February 1977, the GLCM Required Operational Capability (ROC) document was published, followed in April 1977 by the Operational Concept for GLCM. The program began funded activities in October 1977 by contract go-ahead to General Dynamics. During 1978, conceptual trade studies were performed to establish configuration and technical requirements. In January 1979, a special AFSARC was held to review GLCM communications, mobility, and hardened shelter requirements. In August 1979, missile procurement was reduced from 696 to 560. In December 1979, the NATO Foreign and Defense Ministers endorsed deployment of 464 U.S. GLCM's in five European countries with a late 1983 IOC. The first flight of a Tomahawk missile from an engineering model of the TEL was successfully conducted in May 1980. In June 1980, Britain announced that GLCM would be deployed at two bases near London: Greenham Common and Molesworth, resulting in direction to plan for six Main Operating bases (MOBs) versus five. In August 1981, Italy announced GLCMs would be deployed at an inactive airfield near Comiso on Sicily. In September 1981, the first German made M.A.N. tractor was delivered for testing at Aberdeen Proving Grounds. As a result of a November 1981 program the Air Force provided special thresholds were not breached. From February 1982 to December 1982, six flights were conducted. Four were successful. One was partially successful and one was a failure. Mobility testing was completed at Aberdeen Proving Grounds during this timeframe. In January 1983, a 30 day realistic field exercise was conducted at Ft. Lewis, Washington. In December 1983, GLCM IOC was achieved on schedule at RAF Greenham Common, UK. Also, IOC at Comiso AS, Italy, was attained on schedule in March 1984. Two additional GLCM flights reached operational capability at RAF Greenham Common, UK on schedule in September and December 1984. Both bases demonstrated their capability during the year by successfully completing NATO tactical evaluations.

(b)(1)

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7. (U) Program Highlights (Cont'd):

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(U) GLCM will meet mission requirements.

d. (U) Changes since as of date -- None.

8. (U) Decision Coordination Paper (DCP) Threshold Breaches: In lieu of a DCP, an Executive Program Summary was submitted in August 1981. No thresholds have been scheduled.

9. (U) Schedule

a. (U) Milestones --	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
1. DSARC I (JRMB)	NA/NA	NA
2. First Flight	NA/NA	NA
3. First Guided Flight	NA/NA	NA
4. DSARC II (JRMB)	Jan 77/Jan 77	Jan 77
5. First FSD Flight	Apr 78/Mar 80	May 80
6. IOT&E Start (First Flight)	Sep 80/Dec 81*	May 82
7. First Operational Platform Launch	Jan 80/Dec 81	Feb 82
8. IOT&E Complete	Apr 81/Feb 83	Jul 83
9. AFSARC III	NA/NA	Oct 83
10. Initial Operational Capability (IOC)**	May 82/Dec 83	Dec 83

(U) *The approved program milestone is start of DT&E/IOT&E which is in advance of first flight.

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9. (U) Schedule (cont'd):

b. (U) Previous change explanations --

Schedule Milestone No. 5 - Adjusted due to test missile diversion for higher priority survivability tests, availability of refurbished missile assets from SLCM test program, and IOC decision during FY80 budget cycle. Revised due to late TEL engineering test unit.

Schedule Milestone No. 6, 7, 8 - Adjusted to reflect IOC decision during FY80 budget cycle. Revision in January 1981 due to six month slip in delivery of total Weapon Control System (WCS) software. Revision in Fall of 1981 due to several month slip in WCS software delivery. Milestone No. 8 also revised to satisfy DOE warhead test requirements to allow time for Quick Reaction Alert (QRA) testing, and to allow for slips due to climatic testing.

Schedule Milestone No. 8 - Revised to reflect actual completion of IOT&E flight tests. Deleted "Attack (Block II A)" erroneously reported in Dec 84 SAR.

Schedule Milestone No. 9 - Revised to reflect directed activity to revise availability/reliability results and projections.

Schedule Milestone No. 10 - Revised to reflect IOC decision during FY80 budget cycle, 29 August 1979 Amended Program Decision Memorandum.

c. (U) Current Change Explanations -- None.

d. (U) References --

Development Estimate: FY 1979 RDT&E Descriptive Summary (PE 64362F).

Approved Program: HQ USAF Program Management Directive for BGM-109G Ground Launched Cruise Missile PMD No. R-P8010(15)/64362F, 11 Mar 86.

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10. (U) Technical/Operational Characteristics:

a. (U) Technical --	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance*</u>	<u>Current Estimate</u>
---------------------	---------------------------------------	--------------------------------------	-----------------------------

(b)(1);(b)(3):42 USC §2168(a) (1)(C)--(FRD)

3. (U) Air Vehicle:

Weight (lbs)	NA/NA	2643	2650
Length (in)	NA/NA	219	219
Diameter (in)	NA/NA	20.4	20.4

b. (U) Operational --

1. (U) Range:

Operational (KM)	2500/2500	2882	2500
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(b)(1);(b)(3):42 USC §2168(a) (1)(C)--(FRD)

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10. (U) Technical/Operational Characteristics (cont'd):

c. (U) Previous Change Explanations --

Operational Characteristic Nos. 2 to 5 - Operational parameters in the Current Estimate were adjusted to values the contractor can be expected to achieve.

Technical Characteristic No. 1 - Current Estimate of warhead mid-life yields based on results of November 1980 Executive Session of the W84 Warhead Project Officer's meeting.

Technical Characteristic No. 3 - Current weight estimate based on calculation using actual weights of 94% of the production configuration components. Length and diameter are actuals.

Operational Characteristic No. 2a and 3 - Demonstrated performance value previously shown reflected performance demonstrated by a SLCM. Value now shown reflects a GLCM demonstrated value. Current estimate value previously shown reflected estimated performance at maturity in 1988. Value shown now is estimate as of 31 December 1983.

Operational Characteristic No. 4 - Demonstrated performance reflects value demonstrated by additional GLCM flight-testing.

Operational Characteristic No. 5 - Demonstrated performance value is as of 31 December 1985. The .80 values are at maturity in 1988.

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e. (U) References --

Development Estimate: GLCM System Specification No. SS07878 GLCM 001A, 20 February 1979; TAF ROC 304-77, 14 February 1977.

Approved Program: HQ USAF Program Management Directive for BGM-109G Ground Launched Missile PMD No. R-P8010(15)/64362F, 11 March 1986, USDR&E Letter to Department of Energy, 1 September 1978.

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11. (U) Program Acquisition Cost (Current Estimates in Millions of Dollars)

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a.(U) Cost --			
Development (RDT&E)	74.8	188.9	263.7
Procurement	927.6	538.3	1465.9
Airframe	(646.9)	(-83.5)	(563.4)
Launch Equipment	(131.8)	(458.6)	(590.4)
Total Flyaway	(778.7)	(375.1)	(1153.8)
Peculiar Support	(129.0)	(135.7)	(264.7)
Initial Spares	(19.9)	(27.5)	(47.4)
Construction	51.2	146.4	197.6
Total Constant FY77 \$	1053.6	873.6	1927.2
Escalation	473.6	1195.9	1669.5
Development	(13.9)	(112.4)	(126.3)
Procurement	(437.8)	(936.4)	(1374.2)
Construction	(21.9)	(147.1)	(169.0)
Total Program Cost	1527.2	2069.5	3596.7
b.(U) Quantities			
Development (RDT&E)	6	-1	5
Procurement	696	-99	597
Total	702	-100	602
c.(U) Unit Cost			
Procurement:			
FY77 Base Year \$	1.333	+1.122	2.455
Then Year \$	1.962	+2.795	4.757
Program:			
FY77 Base Year \$	1.501	+1.700	3.201
Then Year \$	2.175	+3.800	5.975
d.(U) Approved Design to Cost Goal -- None			
e.(U) Foreign Military Sales -- None			

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12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then Year) Dollars in Millions)

	Current Year Current Est Dec 86 SAR	UCR Baseline Dec 85 SAR	Budget Year UCR Baseline Dec 86 SAR
a.(U) Program Acquisition --			
(1) Cost	3596.7	3673.9	3596.7
(2) Quantity	602	602	602
(3) Unit Cost	5.975	6.103	5.975
b.(U) Current Procurement --	(FY 1987)	(FY 1987)*	(FY 1988)
(1) Cost	123.8	123.8	77.3
Less CY Adv Proc	-4.5	-4.5	0.0
Plus PY Adv Proc	8.9	8.9	4.5
Net Total	128.2	128.2	81.8
(2) Quantity	76	76	37
(3) Unit Cost	1.687	1.687	2.211

* Adjusted to reflect FY87 Appropriation Act in accordance with Congressional change to SAR law.

13.(U) Cost Variance Analysis:

a.(U) Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	88.7	1365.4	73.1	1527.2
Previous Changes:				
Economic	+17.7	+320.2	-25.7	+312.2
Quantity	-13.9	-154.1	0.0	-168.0
Schedule	+29.1	+102.9	+6.6	+138.6
Engineering	+4.6	+57.3	0.0	+61.9
Estimating	+252.6	+726.2	+139.9	+1118.7
Other	0.0	+160.8	-28.0	+132.8
Support	+12.3	+304.2	+234.0	+550.5
Subtotal	+302.4	+1517.5	+326.8	+2146.7
Current Changes:				
Economic	-0.1	-27.6	-2.3	-30.0
Quantity	0.0	0.0	0.0	0.0
Schedule	0.0	-2.2	0.0	-2.2
Engineering	0.0	0.0	0.0	0.0
Estimating	+3.1	-32.7	-31.0	-60.6
Other	0.0	0.0	0.0	0.0
Support	-4.1	+19.7	0.0	+15.6
Subtotal	-1.1	-42.8	-33.3	-77.2
Total Changes	+301.3	+1474.7	+293.5	+2069.5
Current Estimate	390.0	2840.1	366.6	3596.7

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13.(U) Cost Variance Analysis (cont'd):

a. (U) Summary (FY77 Constant (Base Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	74.8	927.6	51.2	1053.6
Previous Changes:				
Quantity	-9.4	-98.6	0.0	-108.0
Schedule	+18.0	-1.8	0.0	+16.2
Engineering	+3.5	+32.3	0.0	+35.8
Estimating	+167.0	+367.8	+60.6	+595.4
Other	0.0	+90.8	-16.9	+73.9
Support	+10.4	+155.4	+118.2	+284.0
Subtotal	+189.5	+545.9	+161.9	+897.3
Current Changes:				
Quantity	0.0	0.0	0.0	0.0
Schedule	0.0	0.0	0.0	0.0
Engineering	0.0	0.0	0.0	0.0
Estimating	+1.5	-15.4	-15.5	-29.4
Other	0.0	0.0	0.0	0.0
Support	-2.1	+7.8	0.0	+5.7
Subtotal	-0.6	-7.6	-15.5	-23.7
Total Changes	+188.9	+538.3	+146.4	+873.6
Current Estimate	263.7	1465.9	197.6	1927.2

b. (U) Previous Change Explanations --

RDT&E:

Economic: Revised economic escalation indices.
Quantity: Reduction of one development missile.
Schedule: Delays/slips in IOC.
Engineering: Increased effort due to unique GLCM warhead decision.
Estimating: TEL/LCC design more complex than originally envisioned. Reduced test requirements; increased requirements for Regency Net, EMP testing, and reliability/maintainability. Transfer of procurement funds to continue Material Improvement Program in FY86 and FY87. Reprogramming from 3020 for Operational Test Launch Payload (OTLP). Adjustment for prior year escalation.
Support: Support equipment requirements greater than expected.

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13. b. (U) Previous Change Explanations (cont'd) --

Procurement:

- Economic:** Revised economic escalation indices.
- Quantity:** Reduction of 99 missiles.
- Schedule:** Delays/slips in IOC. Deferral of 25 backup GLCM missiles from FY86 to FY87 to rephase training assets and maintenance missiles. Deferral of backup (5) TELs and (7) LCCs from FY86 to FY87 in order to align with GLCM missile delivery schedule. Replace FY87 TELs/LCCs to earlier years to support Regency Net Retrofit and deployment.
- Engineering:** Due to unique warhead and different tractor for adequate mobility. Engineering changes applicable to 37 GLCMs.
- Estimating:** Revised TEL/LCC estimates. Composite effect of rephasing 689 Navy missiles from FY85 through FY87 to the outyears due to Navy restructure of TOMAHAWK program. Composite effect of amortization funding of tooling and test equipment in FY84 through FY87 as directed by Congress; Air Force distribution of Congressional adjustment to FY83 Air Force procurement; and other Air Force FY85 budget decisions. Also includes revised estimate of missiles, TEL and LCC cost based upon current contract experience and recent proposals. Effect on GLCM program due to TOMAHAWK (SLCM) schedule rephasing from FY89-92 to FY86-88. Reduction in missile recurring flyaway costs due to effects of contract competition. Reduction in backup TEL (1) and LCCs (2) due to reduction in requirements. No program impact anticipated. Congressional FY85 action reduced full funding. No program impact anticipated. Transfer of funds to RDT&E to continue Material Improvement Program (MIP). Reestimate of flyaway costs to cover rephase of Support Equipment. Classified program increase in FY85. Estimating changes applicable to 37 GLCMs. Reestimate of FY85 Adv Proc. ECO funds transferred to RDT&E for Operational Test Launch Payload. ECO funds reduction. Dual source competition savings. Reduction of classified program funds. Adjustment for prior year escalation.
- Other:** Reduction in SLCM quantities.
- Support:** Increased support equipment due to increase of bases from 3 to 6. Change in estimate of GLCM support requirements to capture actual experience of prior years; also captures effect of rephasing TEL and LCC procurements. Rephasing of support equipment due to deferral of missile buys. Reduction in FY86 initial spares due to across the board budget cuts.

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13. b. (U) Previous Change Explanations (cont'd) --

MILCON:

Economic: Revised economic escalation indices.

Estimating: Revised estimate due to increased MOB's from 3 to 6. Adjustment of construction requirements to reflect Congressional decision in the FY84 Authorization/Appropriation Acts to delete non-appropriated fund (NAF) facilities. Congressional action in FY85 to reduce funds for Main Operating Base (MOB 3) activation resulted in tighter FY86-88 construction schedule. Reestimate of requirements in FY86-88. No impact to activation date. Adjustment for prior escalation.

Other: NATO infrastructure funding allowed MILCON reductions.

13. c. (U) Current Change Explanations --

(Dollars in Millions)

(1) RDT&E

Revised economic escalation indices (Economic)	NA	-0.1
--	----	------

Reduction to actual funding in prior year (Estimating)	-0.3	-0.5
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Addition of Nuclear Safety Cross-Check Analysis (NSCCA) (Estimating)	+1.3	+2.5
--	------	------

Adjustment for prior year escalation (Estimating)	+0.1	0.0
---	------	-----

Adjustment for site activation activities (Estimating)	+0.4	+1.1
---	------	------

Deletion of Regency Net Upgrade in Missile Procedure Trainer (MPT)(Support)	-2.1	-4.1
--	------	------

(2) Procurement

Revised economic escalation indices (Economic)	NA	-27.6
--	----	-------

Correction of error in 31 Dec 85 SAR (Schedule)	0.0	-2.2
--	-----	------

Reduction due to dual source competition savings (Estimating)	-6.0	-12.9
---	------	-------

Reestimate of Advance Procurement requirements (Estimating)	-0.2	-0.6
---	------	------

Adjustments for prior year escalation (Estimating)	+3.9	+18.3
---	------	-------

Reestimate of ECO flyaway funds (Estimating)	-5.8	-11.9
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13. c. (U) Current Change Explanation (cont'd) --

(2) <u>Procurement (cont'd)</u>	(Dollars in Millions)	
	<u>Base Year</u>	<u>Then Year</u>
Deletion of 2nd GLCM Unique Turbine System (GUTS) procurement (Estimating)	-12.3	-25.6
Reestimate of support requirements (Support)	-14.0	-28.8
Adjustment to Initial Spares (Support)	+6.2	+13.0
Additional European Repair Facility (ERF) requirements (Support)	+15.6	+35.5
(3) <u>MILCON</u>		
Revised economic escalation indices (Economic)	NA	-2.3
Deletion of Community Support Facilities (Estimating)	-3.1	-6.3
Deletion of mission support facilities (Estimating)	-12.9	-26.2
Adjustment for prior year escalation (Estimating)	+0.5	+1.5

d. (U) References --

Development Estimates: January 1978 Five Year Defense Plan (FYDP)

14. (U) Program Acquisition Unit Cost (PAUC) History: (TY \$ in millions)

a. Initial SAR/Development Estimate to Current Estimate --

PAUC (Initial SAR/Dev Est)	Changes								PAUC (Cur Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
2.175	+0.469	+0.083	+0.226	+0.103	+1.758	+0.221	+0.940	+3.800	5.975

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15. (U) Contract Information: (Then Year Dollars in Millions)

- a. (U) RDT&E -- NA
- b. (U) PROCUREMENT --

<p><u>All-Up-Round Missile (FY84)</u></p> <p>General Dynamics/Convair, San Diego CA N00032-83-C-3339, FFP Award: 15 Mar 84 Definitized: 15 Mar 84</p>	<table border="0" style="width: 100%;"> <tr> <th colspan="3" style="text-align: center;"><u>Initial Contract Price</u></th> </tr> <tr> <th style="text-align: center;"><u>Target</u></th> <th style="text-align: center;"><u>Ceiling</u></th> <th style="text-align: center;"><u>Qty</u></th> </tr> <tr> <td style="text-align: center;">187.2</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">208</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <th colspan="2" style="text-align: center;"><u>Estimated Price at Completion</u></th> </tr> <tr> <th style="text-align: center;"><u>Contractor</u></th> <th style="text-align: center;"><u>Program Mgr</u></th> </tr> <tr> <td style="text-align: center;">187.2</td> <td style="text-align: center;">187.2</td> </tr> </table> <p><u>Cost Variances:</u> NA</p>	<u>Initial Contract Price</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	187.2	N/A	208	<u>Estimated Price at Completion</u>		<u>Contractor</u>	<u>Program Mgr</u>	187.2	187.2
<u>Initial Contract Price</u>																
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>														
187.2	N/A	208														
<u>Estimated Price at Completion</u>																
<u>Contractor</u>	<u>Program Mgr</u>															
187.2	187.2															

Firm Fixed Price Contract. Cost Performance Reporting not required. This contract is over 95% complete and will no longer be reported in the SAR.

<p><u>All-Up-Round Missile (FY85/86)</u></p> <p>General Dynamics/Convair, San Diego CA N00032-84-C-4484, FFP Award: 19Dec84 Definitized: 19 Dec 84</p>	<table border="0" style="width: 100%;"> <tr> <th colspan="3" style="text-align: center;"><u>Initial Contract Price</u></th> </tr> <tr> <th style="text-align: center;"><u>Target</u></th> <th style="text-align: center;"><u>Ceiling</u></th> <th style="text-align: center;"><u>Qty</u></th> </tr> <tr> <td style="text-align: center;">164.2</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">180</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <th colspan="2" style="text-align: center;"><u>Estimated Price at Completion</u></th> </tr> <tr> <th style="text-align: center;"><u>Contractor</u></th> <th style="text-align: center;"><u>Program Mgr</u></th> </tr> <tr> <td style="text-align: center;">455.0</td> <td style="text-align: center;">455.0</td> </tr> </table> <p><u>Cost Variances:</u> NA</p>	<u>Initial Contract Price</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	164.2	N/A	180	<u>Estimated Price at Completion</u>		<u>Contractor</u>	<u>Program Mgr</u>	455.0	455.0
<u>Initial Contract Price</u>																
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>														
164.2	N/A	180														
<u>Estimated Price at Completion</u>																
<u>Contractor</u>	<u>Program Mgr</u>															
455.0	455.0															

Firm Fixed Price Contract. Cost Performance Reporting not required.

<p><u>All-Up-Round Missile (FY85/86)</u></p> <p>McDonnell Douglas, St. Louis MO N00032-84-C-4485, FFP Award: Feb 84 Definitized: Dec 84</p>	<table border="0" style="width: 100%;"> <tr> <th colspan="3" style="text-align: center;"><u>Initial Contract Price</u></th> </tr> <tr> <th style="text-align: center;"><u>Target</u></th> <th style="text-align: center;"><u>Ceiling</u></th> <th style="text-align: center;"><u>Qty</u></th> </tr> <tr> <td style="text-align: center;">176.7</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">120</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <th colspan="2" style="text-align: center;"><u>Estimated Price at Completion</u></th> </tr> <tr> <th style="text-align: center;"><u>Contractor</u></th> <th style="text-align: center;"><u>Program Mgr</u></th> </tr> <tr> <td style="text-align: center;">404.7</td> <td style="text-align: center;">404.0</td> </tr> </table> <p><u>Cost Variances:</u> NA</p>	<u>Initial Contract Price</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	176.7	N/A	120	<u>Estimated Price at Completion</u>		<u>Contractor</u>	<u>Program Mgr</u>	404.7	404.0
<u>Initial Contract Price</u>																
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>														
176.7	N/A	120														
<u>Estimated Price at Completion</u>																
<u>Contractor</u>	<u>Program Mgr</u>															
404.7	404.0															

Firm Fixed Price Contract. Cost Performance Reporting not required.

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15. b. (U) Contract Information (cont'd): (Then Year Dollars in Millions)

<p><u>All-Up-Round Missile (FY86/87)</u></p> <p>General Dynamics/Convair, San Diego CA N00032-86-C-6126, FFP Award: Apr 86 Definitized: 12 Dec 86</p>	<table border="0" style="width: 100%;"> <tr> <th colspan="3" style="text-align: center;">Initial Contract Price</th> </tr> <tr> <th style="text-align: center;"><u>Target</u></th> <th style="text-align: center;"><u>Ceiling</u></th> <th style="text-align: center;"><u>Qty</u></th> </tr> <tr> <td style="text-align: center;">170.2</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">26</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <th colspan="2" style="text-align: center;">Estimated Price at Completion</th> </tr> <tr> <th style="text-align: center;"><u>Contractor</u></th> <th style="text-align: center;"><u>Program Mgr</u></th> </tr> <tr> <td style="text-align: center;">170.2</td> <td style="text-align: center;">170.2</td> </tr> </table> <p><u>Cost Variances:</u> NA</p>	Initial Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	170.2	N/A	26	Estimated Price at Completion		<u>Contractor</u>	<u>Program Mgr</u>	170.2	170.2
Initial Contract Price																
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>														
170.2	N/A	26														
Estimated Price at Completion																
<u>Contractor</u>	<u>Program Mgr</u>															
170.2	170.2															

Firm Fixed Price Contract. Cost Performance Reporting not required.

<p><u>Launch Equipment (FY84)</u></p> <p>General Dynamics/Convair, San Diego CA N00032-84-C-4120, FFP Award: Mar 84 Definitized: Mar 84</p>	<table border="0" style="width: 100%;"> <tr> <th colspan="3" style="text-align: center;">Initial Contract Price</th> </tr> <tr> <th style="text-align: center;"><u>Target</u></th> <th style="text-align: center;"><u>Ceiling</u></th> <th style="text-align: center;"><u>Qty</u></th> </tr> <tr> <td style="text-align: center;">111.5</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">48</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <th colspan="2" style="text-align: center;">Estimated Price at Completion</th> </tr> <tr> <th style="text-align: center;"><u>Contractor</u></th> <th style="text-align: center;"><u>Program Mgr</u></th> </tr> <tr> <td style="text-align: center;">162.5</td> <td style="text-align: center;">162.5</td> </tr> </table> <p><u>Cost Variances:</u> NA</p>	Initial Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	111.5	N/A	48	Estimated Price at Completion		<u>Contractor</u>	<u>Program Mgr</u>	162.5	162.5
Initial Contract Price																
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>														
111.5	N/A	48														
Estimated Price at Completion																
<u>Contractor</u>	<u>Program Mgr</u>															
162.5	162.5															

Firm Fixed Price Contract. Cost Performance Reporting not required.
This contract is over 95% complete and will no longer be reported in the SAR.

<p><u>Launch Equipment (FY85)</u></p> <p>General Dynamics/Convair, San Diego CA N00032-85-C-5154, FFP Award: Jan 85 Definitized: Jan 85</p>	<table border="0" style="width: 100%;"> <tr> <th colspan="3" style="text-align: center;">Initial Contract Price</th> </tr> <tr> <th style="text-align: center;"><u>Target</u></th> <th style="text-align: center;"><u>Ceiling</u></th> <th style="text-align: center;"><u>Qty</u></th> </tr> <tr> <td style="text-align: center;">156.6</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">49</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <th colspan="2" style="text-align: center;">Estimated Price at Completion</th> </tr> <tr> <th style="text-align: center;"><u>Contractor</u></th> <th style="text-align: center;"><u>Program Mgr</u></th> </tr> <tr> <td style="text-align: center;">156.6</td> <td style="text-align: center;">163.9</td> </tr> </table> <p><u>Cost Variances:</u> NA</p>	Initial Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	156.6	N/A	49	Estimated Price at Completion		<u>Contractor</u>	<u>Program Mgr</u>	156.6	163.9
Initial Contract Price																
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>														
156.6	N/A	49														
Estimated Price at Completion																
<u>Contractor</u>	<u>Program Mgr</u>															
156.6	163.9															

Firm Fixed Price Contract. Cost Performance Reporting not required.

<p><u>Weapon Control System (FY85)</u></p> <p>McDonnell Douglas, St. Louis MO N00032-84-C-4266 Award: 1 Jul 85 Definitized: 1 Jul 85 No longer one of the top six contracts.</p>	<table border="0" style="width: 100%;"> <tr> <th colspan="3" style="text-align: center;">Initial Contract Price</th> </tr> <tr> <th style="text-align: center;"><u>Target</u></th> <th style="text-align: center;"><u>Ceiling</u></th> <th style="text-align: center;"><u>Qty</u></th> </tr> <tr> <td style="text-align: center;">108.5</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">50</td> </tr> </table>	Initial Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	108.5	N/A	50
Initial Contract Price										
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>								
108.5	N/A	50								

c. (U) MILCON -- NA

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GLCM, December 31, 1986

16. (U) Program Funding Summary: (Current Estimates in Millions of Dollars)

a. (U) Program Status --

- (1) Percent Program Completed: 76.9% (10 yrs/13 yrs)
(Years Funds Appropriated/Total Program Years)
- (2) Percent Program cost Appropriated: 96.0% (\$3451.7/\$3596.7)
Funds Appropriated To Date in Millions/Total Program Funding in Millions)

b. (U) Appropriate Summary -- (Then Year Dollars in Millions)

Appropriation	Current \$ Prior Yrs (FY78-87)	Budget Year (FY88)	Balance FYDP (FY89-92)	To Complete Beyond FYDP (FY93)	Total
RDT&E	383.7	5.3	1.0	--	390.0
Procurement	2743.2	77.3	19.6	--	2840.1
MILCON	324.8	41.8	0.0	--	366.6
Total	3451.7	124.4	20.6	--	3596.7

c. (U) Annual Summary --

Fiscal Year	Qty	FY77 Base Year Dollars			Then Year Dollar			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1978	0	NA	NA	17.0	NA	NA	18.7	7.6
1979	0	NA	NA	28.8	NA	NA	34.9	8.4
1980	0	NA	NA	44.1	NA	NA	59.4	9.4
1981	0	NA	NA	72.2	NA	NA	107.6	11.9
1982	0	NA	NA	50.3	NA	NA	80.1	9.2
1983	0	NA	NA	16.5	NA	NA	27.6	4.9
1984	0	NA	NA	20.6	NA	NA	35.6	3.8
1985	0	NA	NA	10.0	NA	NA	17.9	3.4
1986	0	NA	NA	1.0	NA	NA	1.9	2.9
1987	0	NA	NA	0.0	NA	NA	0.0	3.1
1988	0	NA	NA	2.7	NA	NA	5.3	3.5
1989	0	NA	NA	0.5	NA	NA	1.0	3.5
1990	0			0			0	
Subtotal	5	NA	NA	263.7	NA	NA	390.0	

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GLCM, December 31, 1986

16. (U) Program Funding Summary (cont'd): (TY \$ in Millions)

c. (U) Annual Summary --

Fiscal Year	Qty	FY77 Base Year Dollars			Then Year Dollar			Esc1 Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: PROCUREMENT

1979	0	0.0	0.0	15.2	20.2	0.0	20.2	8.7
1980	0	0.0	0.0	5.4	8.2	0.0	8.2	9.7
1981	11	7.9	45.5	98.9	13.9	-28.4	164.1	11.9
1982	54	6.8	129.0	198.5	29.8	-13.9	350.5	9.6
1983	84	5.7	197.4	243.0	21.5	-29.8	455.4	9.0
1984	120	6.2	234.1	299.8	23.0	-21.5	587.6	8.0
1985	120	3.1	242.1	281.8	21.5	-23.0	568.7	3.4
1986	95	2.9	190.1	222.8	8.9	-21.5	464.7	2.9
1987	76	1.7	54.7	57.4	4.5	-8.9	123.8	3.1
1988	37	0.0	26.6	34.7	0.0	-4.5	77.3	3.5
1989	0	0.0	0.0	4.8	0.0	0.0	11.1	3.5
1990	0	0.0	0.0	3.6	0.0	0.0	8.5	3.3
Subtotal	597	34.3	1119.5	1465.9	151.5	-151.5	2840.1	

Appropriation: MILCON

1981	NA	NA	NA	2.3	NA	NA	3.8	12.9
1982	NA	NA	NA	43.3	NA	NA	74.5	9.2
1983	NA	NA	NA	42.0	NA	NA	75.0	4.9
1984	NA	NA	NA	40.6	NA	NA	74.5	3.8
1985	NA	NA	NA	10.0	NA	NA	19.0	3.4
1986	NA	NA	NA	22.3	NA	NA	43.5	2.9
1987	NA	NA	NA	17.1	NA	NA	34.5	3.1
1988	NA	NA	NA	20.0	NA	NA	41.8	3.5
1989				0.0			0.0	
1990				0.0			0.0	
Subtotal	NA	NA	NA	197.6	NA	NA	366.6	
Total	602	34.3	1119.5	1927.2	151.5	-151.5	3596.7	

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GLCM, December 31, 1986

16. (U) Program Funding Summary (cont'd):

d. (U) Obligations and Expenditures --

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	Total	Obligated(1)	Expended(1)

Appropriation: RDT&E

1978	18.7	18.7	18.7
1979	34.9	34.9	34.9
1980	59.4	59.4	59.4
1981	107.6	107.6	107.6
1982	80.1	80.1	80.1
1983	27.6	27.6	27.6
1984	35.6	35.2	23.9
1985	17.9	17.8	8.0
1986	1.9	1.6	1.3
1987	0	0	0
To Complete	6.3	NA	NA
Total	390.0	382.9	361.5

Appropriation: Procurement(2)

1979	20.2	20.2	20.2
1980	8.2	8.2	8.2
1981	164.1	164.0	164.1
1982	350.5	344.5	350.5
1983	455.4	445.4	415.0
1984	587.6	586.2	449.6
1985	568.7	498.2	324.0
1986	464.7	308.3	52.5
1987	123.8	6.3	0.0
To Complete	96.9	NA	NA
Total	2840.1	2389.8	1784.1

Appropriation: MILCON(3) (4)

1981	3.8	3.8	3.8
1982	74.5	67.0	47.7
1983	75.0	52.2	21.5
1984	74.5	48.1	11.4
1985	19.0	9.8	5.0
1986	43.5	27.6	0.0
1987	34.5	0.0	0.0
To Complete	41.8	NA	NA
Total	366.6	208.5	89.4

- (1) Reflects Program Office records as of 31 December 1986.
- (2) Reflects Procurement funding but not Initial Spares Expenditures.
- (3) Reflects Air Staff obligation records as of 30 November 1986.
- (4) Reflects Air Staff Expenditure records as of 30 November 1985.

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17. (U) Production Rate Data:

a. (U) Annual Production Rates -- (Note: Current Estimate is equal to Maximum Economic data because FY88 buy of 37 missiles will complete PMD direction.)

Fiscal Year	Development Estimate	Production Estimate	Current Estimate	Maximum
1980	45	--	--	--
1981	120	11	11	11
1982	120	54	54	54
1983	120	120	84	84
1984	120	120	120	120
1985	120	120	120	120
1986	51	120	95	95
1987	--	15	76	76
1988	--	--	37	37

b. (U) Cost Variance -- Dollars in Millions (Note: Current Estimate is equal to Maximum Economic data because FY88 buy of 37 missiles will complete PMD direction).

Item	Production Estimate	Variance (CE less DE)	Current Estimate	Variance (CE less MAX)	MAX Econ
Prog Acq Cost (BY\$)	1780.0	+132.7	1912.7	0	1912.7
(TY\$)	3307.8	+288.9	3596.7	0	3596.7
PAUC (BY\$)	3.150	+.027	3.177	0	3.177
(TY\$)	5.854	+.121	5.975	0	5.975

c. (U) Schedule Variance -- (Note: Current Estimate is equal to Maximum Economic data because FY88 buy of 37 missiles will complete PMD direction).

	Production Estimate	Variance (CE less DE)	Current Estimate	Variance (CE less MAX)	MAX Econ
(1)					
Start Date (Mo/Yr)	4/82	NA	4/83	NA	4/83
Duration (In Mos)	61	+16	77	NA	77
End Date (Mo/Yr)	5/87	NA	9/89	NA	9/89

(1) Start Date is the first month delivered; end date is last month delivered.

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17. (U) Production Rate Data (cont'd):

d. (U) Deliveries (Plan/Actual) --

RDT&E

Procurement:

All-Up-Round

TEL

LCC

MILCON

To Date

5/5

362/365

94/94

53/53

N/A

18. (U) Operating and Support Costs: NA

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A-15 MLRS

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: MULTIPLE LAUNCH ROCKET SYSTEM (MLRS)

86-033

AS OF DATE: December 31, 1986

INDEX

SUBJECT	PAGE
Cover Sheet Information	1
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DCP Threshold Breaches	4
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Technical/Operational Characteristics	5
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Unit Cost Summary	8
Cost Variance Analysis	8
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Contract Information	12
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CONCUR IN CLASSIFICATION
AS MARKED ABOVE

FEB 26 1987

12 DIRECTORATE FOR FREEDOM OF INFORMATION
16 AND SECURITY REVIEW (DASO-PA)
18 DEPARTMENT OF DEFENSE

1. (U) Designation/Nomenclature (Popular Name): HC/Armored Vehicle - Mounted Rocket Launcher: M270 (Multiple Launch Rocket System (MLRS))

2. (U) DoD Component: Department of the Army

3. (U) Responsible Office and Telephone Number:

MLRS Project Office
Program Management Division
Redstone Arsenal, AL 35898-5700

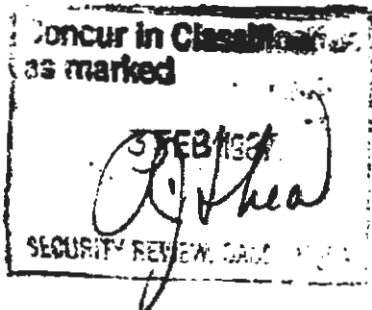
PM: COL Nicholas Hurst
Assigned: 7 January 1985
AUTOVON: 746-1195
Commercial: 205-876-1195

4. (U) Program Elements:

RDT&E: PE 64314A Project D564 (SUNK)
PROCUREMENT: PE 2032 SSN C67600/CA0257
MILCON: Project Codes (FY86, FY89, and FY90) 446, 447, 763, 448, 445

5. (U) Related Programs: M77 Munitions, Bradley Fighting Vehicle, Battery Computer System, TACFIRE, 10-Ton Truck/Trailer, Scatterable Mine Warhead (German development), Terminal Guidance Warhead, Field Artillery Meteorological Data System, Test Set AN/USM-410, Binary Chemical Warhead, and Army Tactical Missile System.

~~CLASSIFIED BY: MLRS with XM77 Warhead
Security Classification Guide
dated 6 February 1986
DECLASSIFY BY: OADR~~



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6. (U) Mission and Description:

a. (U) The MLRS is a multiple launch rocket system designed to supplement cannon weapons available to U.S. division and corps commanders for the delivery of a large volume of firepower in a very short time against critical, time-sensitive targets. The MLRS with a dual-purpose improved conventional submunition warhead will provide an all-weather, indirect fire capability to attack the enemy's indirect fire weapons, air defense systems, and light materiel and personnel targets, especially during surge conditions when the threat's forces present targets in sufficient quantities and density to saturate available cannon weapon fire support. The system has the growth potential to adapt follow-on warheads such as terminal homing munitions, scatterable antitank mines, and chemical.

b. (U) The system consists of a self-propelled launcher loader (SPLL), two disposable pods containing six rockets each, fire control system, and an azimuth/position reference unit. Rockets are loaded in the launch pods at the factory, shipped and stored in the pods, and fired from the pods. Fuze settings are accomplished automatically by the fire control system. The carrier is a derivative of the Bradley Fighting Vehicle (BFV) which uses the same engine, transmission, and other mechanical systems. The carrier, when configured for MLRS, is designated M993.

(b)(1)

7. (U) Program Highlights:

a. (U) Significant Historical Developments --

(1) (U) The Department of the Army (DA) approved a letter of agreement (LOA) for MLRS in September 1975. The Defense System Acquisition Review Council I (DSARC I) was held in January 1977 with a decision that MLRS would enter validation with two competitive contractors and an option to later enter maturation/low rate production (LRP) with either one or two primes. The validation phase consisted of competitive development contracts signed in September 1977 with Boeing, Seattle and Vought, Dallas for 29 months competitive development efforts. This phase was extended to a 32-month effort with the Secretary of the Army authorization in January 1978 to incorporate design changes so that the MLRS could satisfy the German requirement for a scatterable mine warhead. In July 1979, a memorandum of understanding (MOU) on a cooperative program was signed by France, Germany, United Kingdom, and the United States. In 1982, Italy was admitted as an associate member of the basic MLRS program. The validation phase of the program successfully completed on schedule, within cost, and within DCP development test (DT)/operational test (OT) thresholds. The DSARC III held in May 1980 gave approval for MLRS to proceed into maturation/LRP with Vought as the prime contractor. Contracts were signed

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MLRS, December 31, 1986

with Vought Corporation in April 1980 for continued development/maturation, LRP, and initial production facilitization. This was a 35-month phase leading to a full-scale production decision in March 1983. The terminal guidance warhead and binary chemical warhead follow-on programs were initiated with approved LOA's October 1980 and March 1981, respectively.

(2) (U) A General Officer Program Review (GOPR) conducted in March 1983 led to a full-scale production decision in April 1983. MLRS was also type classified Standard in April 1983. The initial operational capability (IOC) MLRS battery was fielded in March 1983 at Fort Riley, KS. The first overseas unit was deployed to Europe in September 1983 at Baumholder, Germany. The MLRS multiyear contract was awarded in September 1983 to LTV Aerospace and Defense Company (LTVAD). The contract was a 5-year firm fixed price contract (with economic price adjustment clause) with negotiated two years options (FY88/FY89). The multiyear contract, with options, covers all SPILL's and rockets for the life of the program which were approved at that time.

(3) (U) The Comptroller General issued a decision dated 21 December 1984 prohibiting the Army from exercising the MLRS Multiyear Contract (FY85 Option) to provide advance materials without specific enabling legislation. The enabling legislation was developed by the Army General Counsel's Office and transmitted to the Office of Management and Budget (OMB) from the Deputy Secretary of Defense. The enabling legislative language was included in the Fiscal FY86 DOD Authorization Act and allowed execution of the FY85 procurement obligation plan for the \$56.6M advance materials.

b. (U) Significant Developments Since Last Report --

(1) (U) The United Auto Worker (UAW) Local Union #2216 went on strike against LTV Aerospace and Defense Company (LTVAD) on 22 June 1986. The strike is still in effect; however, the impact has been minimized by selective hiring of new employees and limited third shift operation on problem area items. The production rate of rockets, previously reduced by the UAW strike, is now achieving the rate prior to the strike.

(2) (U) The fly-to-buy program continued to assure that only rockets meeting required MLRS system reliability were delivered to the field during 1986. Production and quality corrective actions in the areas of rocket ballast weight installation, motor case propellant weight variability and fin restraint crimping directly resulted from analysis of fly-to-buy results. Overall reliability demonstrated during 1986 was .96.

(3) (U) MLRS fieldings are being accomplished on schedule. Ten batteries were fielded in FY86: six tactical (Conus-3; Europe-3), three POMCUS in Europe, and one Headquarters, Headquarters, and Service Battery in Europe.

(4) (U) Present data available indicate that all mission requirements can be achieved.

c. (U) Changes Since "As of" Date -- None.

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8. (U) Decision Coordinating Paper (DCP) Threshold Breaches:

(U) There are currently no DCP (dated 15 May 1979) or SDDM (dated 14 April 1983) threshold breaches.

9. (U) Schedule:

a. (U) Milestones --	Planning Estimate/ Approved Program	Current Estimate
Milestone I (DSARC)	Jan 77/Jan 77	Jan 77
Validation Contract Awards (2)	Sep 77/Sep 77	Sep 77
DT/OT I (Government)		
Start	Nov 79/Nov 79	Nov 79
Complete	Feb 80/Feb 80	Feb 80
Milestone III (DSARC)	May 80/May 80	May 80
Maturation Contract Award	May 80/Apr 80	Apr 80
Low Rate Production Contract Award	May 80/Apr 80	Apr 80
Initial Production Delivery		
(Rocket)	Jan 82/May 82	May 82
(SPLL)	Feb 82/Aug 82	Aug 82
Production Qualification Test		
Start	Jan 82/May 82	May 82
Complete	Sep 82/Feb 82	Feb 82
OT III		
Start	Jun 82/Oct 82	Oct 82
Complete	Sep 82/Mar 83	Mar 83
Milestone III b (ASARC)	Nov 82/NA	NA
Milestone III b (DSARC)	Nov 82/NA	NA
Milestone III b (GPR)	NA/Mar 83	Mar 83
Initial Operational Capability (IOC)	Nov 82/Mar 83	Mar 83
(nine launchers fielded with 60 rockets per launcher)		

b. (U) Previous Change Explanations --

(1) (U) The maturation and LRP contracts were awarded 1 month earlier than planned. The schedule variances for milestones Initial Production Delivery through IOC are due to the FMC strike which resulted in a 4 month slip in the MLRS program schedule.

(2) (U) Army delegated management review authority of MLRS. ASARC IIIa downgraded to a GPR, which satisfied Milestone IIIa requirements.

(3) (U) Schedule Milestone Initial SPLL Delivery was 1 month later than planned due to problems encountered with production start-up.

c. (U) Current Change Explanations -- None.

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d. (U) References --

Planning Estimate: DCP No. 165, 15 May 1979.

Approved Program: FY 1988 - 1989 President's Budget.

10. (U) Technical/Operational Characteristics:

	<u>Plng Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
--	--	-------------------------------------	-----------------------------

a. (U) Technical --

(b)(1)

b. (U) Operational --

(U) Reliability

Rocket Preflight, Launch, & Inflight Launcher (SPLL)	.97/.96 .92/.87	.94 .87	.96 .87
--	--------------------	------------	------------

Mean Fire Cycle Between Failure (MFCBF)	250/NA	NA	NA
---	--------	----	----

Mean Kilometers Between Failure (MKBF)	750/NA	NA	NA
--	--------	----	----

(U) Maintainability

SPLL (Mean Time to Repair (MTTR))			
Organizational	1.0/2.3	2.3	2.3
Direct/General Support	4.0/2.4	2.4	2.4

(U) Availability

Operational	NA/.78	.78	.78
-------------	--------	-----	-----

Essential Unscheduled Maintenance Actions Per 1000 Hours of Launcher Module Operation	NA/23	23	23
---	-------	----	----

Percent of Items Removed with no Evidence of Failure	NA/7%	7.2%	7%
--	-------	------	----

(b)(1)

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MLRS, December 31, 1986

c. (U) Previous Change Explanations --

(b)(1)

(2) (U) Demonstrated performance data based upon DT/OT III results. System accuracy changed from 7.5 to 9.0 based on test data acquired through 1984.

d. (U) Current Change Explanations -- None.

e. (U) References --

Planning Estimate: Draft DCP, 15 May 1979.

Approved Program: FY 1988 -1989 President's Budget.

11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E) 1/	261.0	+6.5	267.5
Procurement	1,971.3	+324.0	2295.3
M77	(1,624.6)	(-136.4)	(1488.2)
Practice Rounds	(97.9)	(+28.7)	(126.6)
SPLL	(118.9)	(+463.3)	(582.2)
Total Flyaway	(1,841.4)	(+355.6)	(2197.0)
Other Weap Sys Cost	(123.0)	(-104.0)	(19.0)
Initial Spares	(6.9)	(72.4)	(79.3)
Construction (MILCON)	0	+42.1	42.1
Total FY78 Base Year \$	2,232.3	+372.6	2604.9
Escalation	1,221.7	+1354.3	2576.0
Development (RDT&E)	(39.2)	(+28.1)	(67.3)
Procurement	(1,182.5)	(+1287.7)	(2470.2)
Construction (MILCON)	(0)	(+38.5)	(+38.5)
Total Then-Year \$ 2/	3,454.0	+1726.9	5180.9

1/ Does not include \$37.6 (escalated) funding by MOU participants.

2/ FYDP (President's Budget) includes dollars for BCW and dollars and quantities for SADARM. The SAR matches the FYDP with the exception that the BCW and SADARM quantities and dollars were deleted.

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11. (U) Program Acquisition Cost (Cont'd)

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
b. (U) Quantities --			
Development (RDT&E)			
Rounds	654	-150	504
SPLL	10	0	10
Procurement			
M77 Rounds	362,832	+77490	440,322
Practice Rounds	27,648	+17412	45,060
SPLL	173	+419	592
Total			
Rounds	391,134	+94752	485,886
SPLL	183	+419	602

c. (U) Unit cost --

Procurement:			
M77 Rd: FY78 Base Year \$	0.004	-0.001	0.003
Then-Year \$	0.007	-0-	0.007
Pract Rd: FY78 Base Year \$	0.004	-0.001	0.003
Then-Year \$	0.006	-0-	0.006
SPLL: FY78 Base Year \$	1.388	-0.253	1.135
Then-Year \$	1.931	+0.315	2.246
Program (per SPLL):			
FY78 Base-Year \$	12.2	-7.9	4.3
Then-Year \$	18.9	-10.3	8.6

d. (U) Approved Design to Cost Goal --

(Average Unit Flyaway Cost)

	<u>Plng Estimate (FY78 \$)</u>	<u>/Approved / Program (FY 80 \$)</u>	<u>Current Estimate (FY 80 \$)</u>	<u>Latest Approved Threshold (FY80 \$)</u>
Qty Total:	M77 Rd 362,832	Pract Rd 27,648	SPLL 393	
Peak Rate:	6,000	330	10	
M77 Rd: Constant \$	0.005/0.004	0.004	0.007	
Then-Year \$	0.008/0.007	0.007		
Pract Rd: Constant \$	0.004/0.003	0.003		
Then-Year \$	0.006/0.006	0.006		
SPLL: Constant \$	0.687/1.178	1.178	1.499	
Then-Year \$	1.089/1.912	1.912		

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e. (U) Foreign Military Sales -- Sales to date to co-development partners, Netherlands, NATO Maintenance and Supply Agency (NAMSA) and Special Defense Acquisition Fund (SDAF) equal \$279,702,821.

f. (U) Nuclear Costs -- None.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Current (Then Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	UCR Baseline (Dec 86 SAR)
a. (U) Program Acquisition --			
(1) Cost	5180.9	4246.2	5180.9
(2) Quantity	602	501	602
(3) Unit Cost	8.6	8.5	8.6
b. (U) Current Procurement -- (FY 1987)		(FY 1987 APPN)	(FY 1988)
(1) Cost	465.9	474.2	474.4
Less CY Adv Proc	0.0	0.0	-22.7
Plus PY Adv Proc	+ 67.8	+ 67.8	+ 82.7
Net Total	533.7	542.0	534.4
(2) Quantity	44	44	24
(3) Unit Cost	12.1	12.3	22.3

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	300.2	3153.8	0	3454.0
Previous Changes:				
Economic	+ 18.2	+ 788.6	+ 2.7	+ 809.5
Quantity	-	+ 503.5	-	+ 503.5
Schedule	-	- 2.0	-	- 2.0
Engineering	-	-	-	-
Estimating	+ 6.9	- 618.6	+83.7	- 528.0
Other	+ 9.5	+ 9.1	-	+ 18.6
Support	-	- 9.4	-	- 9.4
Subtotal	+ 34.6	+ 671.2	+86.4	+ 792.2
Current Changes:				
Economic		- 60.0	- 0.5	- 60.5
Quantity		+ 888.6		+ 888.6
Schedule				
Engineering				
Estimating		+ 127.9	- 5.3	+ 122.6
Other				
Support		-16.0		-16.0
Subtotal	0	+ 940.5	- 5.8	+ 934.7
Total Changes	+34.6	+1611.7	+80.6	+1726.9
Current Estimate	334.8	4765.5	80.6	5180.9

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13. (U) Cost Variance Analysis (Cont'd):

(FY 1978 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	261.0	1971.3	0	2,232.3
Previous Changes:				
Quantity	-	+ 232.3	-	+232.3
Schedule	-	-27.5	-	-27.5
Engineering	-	-	-	-
Estimating	+2.6	- 290.3	+44.3	-243.4
Other	+3.5	+6.5	-	+10.0
Support	-	-20.5	-	-20.5
Subtotal	+6.1	- 99.5	+44.3	- 49.1
Current Changes:				
Quantity		+366.5		+366.5
Schedule				
Engineering				
Estimating	+0.4	+64.0	-2.2	+62.2
Other				
Support		- 7.0		- 7.0
Subtotal	+0.4	+423.5	-2.2	+421.7
Total Changes	+6.5	+324.0	+42.1	+372.6
Current Estimate	267.5	2295.3	42.1	2604.9

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices through January 1986.

Estimating: Increase in cost based on validation phase (VP) program; deletion of RDTE effort funded by MOU contribution; adjustment in prior year escalation and deletion of anticipated reprogramming. Residual RDTE requirements resulting from operational testing and development of test program sets for system automatic test equipment. Conversion of prior base year dollars to base year and cost growth on finalization of R&D contract.

Other: 11-week strike at FMC resulting in 4-month slip in the program schedule.

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13. (U) Cost Variance Analysis (Cont'd):

Procurement

Economic: Revised escalation indices through January 1986.

Quantity: + 103 SPL's for force structure changes;
+ 57 SPL's for POMCUS; + 60 SPL's for POMCUS, net
reduction of 45 SPL's in FY86 budget +143 SPL's for
expanded MLRS force structure.

Schedule: Restoration of production rate; establishment of
multiyear procurement.

Estimating: Revised round and SPL cost based on VP program. Revised
cost estimate for maturation phase changes to LRP hardware.
Adjustment in prior year escalation; deletion of antici-
pated reprogramming. Increase in base year dollars;
realignment of advanced materials funding. Estimate
associated with quantity changes and reduction of
administrative services; reduction in cost of sub-
munitions and revised EPA forecast for multiyear contract.

Other: 11-week strike at FMC resulting in 4-month slip in the
program schedule.

Support: Refinement of funding requirement for initial spares.

MILCON

Economic: Revised escalation indices through January 1986.

Estimating: Addition of MCA funding requirements to SAR reporting;
revised estimate, increase in construction requirements.

c. (U) Current Change Explanations --

(Dollars in Millions)

(1) <u>RDT&E</u>	<u>Base-Year</u>	<u>Then-Year</u>
Correction of previous error in deescalating from escalated to base year dollars (ESTIMATING)	+0.4	0
(2) <u>Procurement</u>		
Revised December 1986 economic escalation rates. (ECONOMIC)	N/A	- 60.0

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13. (U) Cost Variance Analysis (Cont'd):

c. (U) Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year
Expanded Force Structure	+399.7	+946.7
o Additional 101 Launchers	(+ 35.3)	(+101.8)
Additional 77490 Tact Rkts	(+283.8)	(+674.1)
Additional 17412 Pract Rkts	(+ 47.4)	(+112.7)
(QUANTITY)		
o Estimating changes applicable to expanded force structure	(+33.2)	(+58.1)
(ESTIMATING)		
Additional Funds for Competition-Qualification	+ 30.8	+ 69.8
(ESTIMATING)		
Reduction of initial spares	-7.0	-16.0
(SUPPORT)		
(3) MILCON		
Revised December 1986 economic escalation rates. (ECONOMIC)	N/A	-0.5
Refinement of MILCON requirements (ESTIMATING)	-2.2	-5.3

d. (U) References -- DCP, No. 165, 15 May 1979.

14. (U) Program Acquisition Unit Cost (PAUC) History:

(U) Planning Estimate to Current Estimate

PAUC (Planning Est)	Changes (Then Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
\$18.9	+1.244	-10.857	-.003	-	-.673	-.042	+.031	-10.3	\$8.6

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15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDTE -- Contracts complete.

b. (U) Procurement --

SPLL's/RP/C's/Tact/Prac	Initial Contract Price		
	Target	Ceiling	Qty
LTV Aerospace & Defense Co., Dallas, TX	MYP-1 \$ 89.9	N/A	0/229/110
DAAH01-83-C-A107, FFP	MYP-2 \$415.0	N/A	76/6000/658
Award: September 1983	MYP-3 \$260.3	N/A	44/8412/658
Definitized: September 1983	MYP-4 \$294.7	N/A	29/12000/658
	MYP-5 \$229.0	N/A	0/12000/658

	Current Contract Price			Estimated Price At Completion	
	Target	Ceiling	Qty	Contractor	Program Manager
MYP-1	\$ 89.7	N/A	0/229/110	\$ 89.7	\$ 89.7
MYP-2	403.6	N/A	76/6000/658	403.6	403.6
MYP-3	305.4	N/A	44/8412/658	305.4	305.4
MYP-4	294.0	N/A	29/12000/658	294.0	294.0
MYP-5	229.0	N/A	01/12000/658	229.0	229.0

Firm Fixed price contract. Cost and schedule variances are not applicable.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) (U) Percent Program Completed: 76% (13 yrs/17 yrs)

(2) (U) Percent Program Cost Appropriated: 63.0% (\$3261.9/\$5180.9)

b. (U) Appropriation Summary --

Appropriation	Current + Prior Yrs (FY76-87)	Budget Year (FY88)	Balance FYDP (FY88-92)	to Complete Beyond FYDP	TOTAL
RDT&E 1/	334.8	0	0	0	334.8
Procurement	2851.9	474.4	1439.2	0	4765.5
MILCON	75.6	0	5.0	0	80.6
TOTAL	3262.3	474.4	1444.2	0	5180.9

1/ Does not include \$37.6 (escalated) funding by MOU participants.

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16. (U) Program Funding Summary: (Continued) (Current Estimate in Millions of Dollars)

c. (U) Annual Summary --

Fiscal Year	Qty Rnds/ SPLL's	FY Base-Year Dollars			Then-Year Dollars			Esc1 Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1976				1.1			1.0	6.60
1977				0.4			0.4	2.90
1977				7.1			6.9	2.60
1978				44.4			46.4	7.0
1979				62.3			70.9	8.40
1980				54.3			67.8	9.4
1981				50.4			70.0	11.9
1982				27.4			40.2	7.60
1983				17.0			26.1	4.90
1984				2.0			3.2	3.80
1985				1.1			1.9	3.4
Subtotal	504/10			267.5			334.8	

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16. (U) Program Funding Summary: (Continued) (Current Estimate in Millions of Dollars)

c. (U) Annual Summary (Continued)--

Fiscal Year	Qty Rnds/ SPLL's	FY Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement 1/ 2/

1980	1374/ 12	14.7	33.1	49.0			66.9	9.70
1981	2340/ 32	16.4	59.2	77.4			117.9	11.90
1982	2496/ 68	10.0	90.1	112.4			197.2	14.30
1983	23640/ 72	11.6	211.5	234.9	53.2		443.5	9.00
1984	36000/ 76		265.9	275.8	114.1	11.7	544.3	8.00
1985	50472/ 44		250.9	260.9	137.4	55.2	524.3	3.40
1986	72000/ 44		227.5	238.6	41.0	71.7	491.9	2.90
1987	72000/ 44		213.9	218.5		67.8	465.9	3.10
1988	72000/ 24		203.0	215.4	22.7	82.7	474.4	3.50
1989	36000/ 44		174.4	178.6		56.6	405.0	3.50
1990	24000/ 44		143.5	143.5			333.7	3.30
1991	24000/ 44		144.7	144.7			345.0	2.90
1992	24000/ 44		145.6	145.6			355.5	2.40
TOTAL	440,322/ 592	52.7	2163.3	2295.3	368.4	345.7	4765.5	

1/ Includes initial spares.2/ FY DP (President's Budget) includes dollars for BCW and dollars and quantities for SADARM. The SAR matches the FYDP with the exception that the BCW and SADARM quantities and dollars were deleted.

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary (Cont'd) --

Fiscal Year	Qty	FY Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: MILCON

1982				11.6			20.4	7.6
1983				14.1			26.6	4.9
1984				3.6			7.1	3.8
1985				4.7			9.4	3.40
1986				5.9			12.1	2.90
1987				0.0			0.0	3.10
1988				0.0			0.0	3.50
1989				1.6			3.6	3.50
1990				0.6			1.4	3.30
Subtotal				42.1			80.6	
Total	440826/602	52.7	2163.3	2604.9	368.4	345.7	5180.9	-

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1976	1.0	1.0	1.0
1977	0.4	0.4	0.4
1977	6.9	6.9	6.9
1978	46.4	46.4	46.4
1979	70.9	70.9	70.9
1980	67.8	67.8	67.5
1981	70.0	70.0	70.0
1982	40.2	40.0	39.9
1983	26.1	25.9	25.4
1984	3.2	3.2	3.1
1985	1.9	1.8	1.1
Total	334.8	334.3	332.6

Note: FY85 was last year for receipt of RDT&E funds.

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)d. (U) Obligations and Expenditures (Cont'd) --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: Procurement 1/			
1980	66.9	65.5	65.3
1981	117.9	114.3	113.6
1982	197.2	173.0	169.7
1983	443.5	421.4	359.7
1984	544.3	514.6	357.0
1985	524.3	492.7	33.4
1986	491.9	463.4	126.5
1987	465.9	-	-
To Complete	1913.6	-	-
Total	4765.5	2244.9	1225.2

1/ Obligated and expended amount exclude initial spares.

Appropriation: MILCON

1982			
1983	26.6		
1984	7.1		
1985	9.4		
1986	12.1		
1987	0.0		
To Complete	5.0		
Total	80.6		

17. (U) Production Rate Data:a. (U) Annual Production Rates (SPLL) --

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1980	36	12	12	36
1981	48	32	32	48
1982	68	68	68	68
1983	72	72	72	72
1984	76	76	76	72
1985	48	44	44	72
1986	70	29	44	72
1987		0	44	72
1988		33	24	72
1989		27	44	72
1990			44	72
1991			44	72
1992			44	72

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17. (U) Production Rate Data: (cont'd)

a. (U) Annual Production Rates (M77 Rounds) --

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1980	1832	1374	1374	1832
1981	2552	2340	2340	2552
1982	3328	2496	2496	3328
1983	21821	23640	23640	23640
1984	33230	36000	36000	36000
1985	50472	50472	50472	50472
1986	72000	72000	72000	72000
1987	72000	72000	72000	72000
1988	72000	72000	72000	72000
1989	61020	30510	36000	72000
1990			24000	72000
1991			24000	72000
1992			24000	72000

b. (U) Cost Variance -- Dollars in Millions

Item - SPL	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	2216.0	+389.0	2604.9	+109.6	2495.3
(TY \$)	4302.7	+878.2	5180.9	+290.1	4890.8
PAUC (BY \$)	5.5	- 1.2	4.3	+ 0.2	4.1
(TY \$)	10.7	- 2.1	8.6	+ 0.5	8.1

c. (U) Schedule Variance --

Item - SPL	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum Economic
Start Date (Mo/Yr)	4/80	N/A	4/80	N/A	4/80
Duration (in Months)	92	+60	152	+14	138
End Date (Mo/yr)	12/87	N/A	12/93	N/A	10/91

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17. (U) Production Rate Data (Cont'd)c. (U) Schedule Variance (Cont'd)

Item - M77 Rounds	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum Economic
Start Date (Mo/Yr)	4/80	N/A	4/80	N/A	4/80
Duration (in Months)	114	+38	152	+18	134
End Date (Mo/yr)	10/90	N/A	12/93	N/A	6/91

d. (U) Deliveries (Plan/Actual) --

RDT&E

(U) Rockets

(U) SPL

To Date504/470 1/

10/10

Procurement

(U) Tactical Rockets

(U) Practice Rockets

(U) SPL

93264/91410

10194/10182

290/296

1/ LTV deleted 17 rockets from their program due to cost ceiling placed on Contract on 10 April 1979 (validation phase). An additional 17 rockets were deleted from maturation phase in June 1981 due to restructuring of the test program.

18. (U) Operating and Support Costs: N/A

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: HARM (AGM-88A)

AS OF DATE: (December 31, 1986)

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 FOR OPEN PUBLICATION

THIS AMEND. IS AMENDED
 FEB 27 1987

DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (DASD-PA)
 DEPARTMENT OF DEFENSE

1. Designation/Nomenclature (Popular Name): AGM-88A/High Speed
 Anti-Radiation Missile (HARM)

2. DoD Component: U. S. Navy

3. Responsible Office and Telephone Number:

Defense Suppression Systems
 Program Office
 Naval Air Systems Command
 Washington, D.C. 20361

PM: CAPT L. E. Kaufman, USN
 Assigned: 25 May 83
 AUTOVON 222-7563
 Commercial: (202) 692-7563

4. Program Elements:

RDTE: 63313N (W1188, W1189); 63363N (WSH07)
 64360N (W0553, W1240); 25601N (W1780)
 Procurement: 24162N 1CN 30227 APPN: 1507

~~Classified by: OPNAVINST 5810.2A-30~~
~~Review and: OADR~~

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5. Related Programs: The WGU-2A/B/Guidance Section/Low Cost Anti-Radiation Seeker (popular name, HARM Low Cost Seeker or LCS) Program, currently in the engineering development phase under NAVAIRSYSCOM management (with Naval Weapons Center, China Lake (NWC) as lead field activity), is intended to impact HARM production beginning in FY 1990.

6. Mission and Description: HARM is an air-to-surface missile designed to suppress or destroy land and sea based radars which direct enemy air defense systems. HARM is a design evolution of current ARM weapons (SHRIKE and STANDARD ARM) and is replacing them in the Navy and Air Force inventory. HARM is fully operational on the A-7E, EA-6B, F/A-18, and F-4G aircraft, and will be integrated on the F-16, A-6E/F, and F-14A/D aircraft. Performance characteristics include: high speed, large footprint, high sensitivity to weak signals, and software intensity so as to adapt to the constantly changing threat. HARM weighs 807 lbs, is 164 inches long and 10 inches in diameter.

7. Program Highlights:

a. Significant Historical Developments --

(U) DCP 93 dated July 1972 recommended development of the HARM Weapon System. A DSARC I Management Review in October 1972 authorized Advanced Development. In May 1974, Texas Instruments (TI), Dallas, TX, was awarded a contract through a competitive source selection for integration of the weapon system which included some government furnished equipment (GFE). Twenty-nine Advanced Development missiles were tested and all test objectives were met. At a HARM DSARC II in January 1977 the program was directed to remain in Advanced Development to prototype an expanded capability (EXCAP) in frequency and aerodynamic maneuverability. A DSARC IIA in February 1978 directed the HARM program to proceed to Full Scale Engineering Development with the EXCAP version. The engineering development prototype program was successfully completed in October 1980 with thirteen successes in eighteen firings. The Secretary of Defense notified Congress of readiness for production on 8 December 1980.

(b)(1)

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a. Significant Historical Developments (Cont'd) --

(U) The results of operational testing together with a plan for bringing on a second production source for HARM were presented to a DSARC III on 30 March 1983. Based on this review the Secretary of Defense on 20 April 1983 approved full-scale production for the HARM missile program, directed a single source acquisition strategy to include implementation of vendor-level competition, and directed that the HARM production program be complemented with an accelerated RDT&E effort to develop a lower cost seeker for HARM, through unconstrained competition. FY 84 Congressional action affirmed the SECDEF position.

(U) Developmental testing for the "FY 84 Software Update" has been successfully completed with the upgrade incorporated in all production deliveries. The Block III Upgrade is half complete and will begin flight tests in late 1987. A hardware change to incorporate reprogrammable memory was initiated to enhance tactical capability, update ELINT software, and provide field software reprogrammability.

b. Significant Developments Since Last Report --

(U) HARM missiles were first used in combat against Libya in March/April 1986. A total of 40 HARMs were fired with very successful results.

(U) Congressional language directed that NAVAIRSYSCOM assume the program management of the HARM Low Cost Seeker (LCS) program, which was previously under NWC management. The LCS program is now under PMA-242 cognizance and technical management remains at NWC. Congressional direction requires competing the LCS program with two contractors other than the current HARM prime contractor (TI).

c. Changes Since "As Of" Date -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches:

a. (U) DCP 93 was approved on 19 July 1972. It was revised on 10 July 1978 as DCP 93A to reflect the HARM DSARC II guidance and was forwarded to OSD for approval on 30 August 1978. DCP 93 Revision B was forwarded to OSD for approval on 1 December 1982. DSARC III guidance was provided by Secretary of Defense Decision Memoranda of 20 April 1983 and 16 June 1983.

b. (U) The currently approved design to cost (DTC) threshold is \$200K for the flyaway unit cost based upon the average cost in FY78 dollars of the first 5000 missiles produced after the initial production of 80 missiles and according to the production profile established in DCP 93B.

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9. Schedule:

a. Milestones -- (U)	Development Estimate/ <u>Approved Program</u>	<u>Current Estimate</u>
DSARC I	Oct 72/Oct 72	Oct 72
Weapon Systems Integration		
Contract Award	May 74/May 74	May 74
Contractor Initial Guided		
Missile Firing	Oct 76/Oct 76	Oct 76
DSARC II	Feb 78/Feb 78	Feb 78
Demonstrate Increased Maneuverability	Feb 79/Feb 79	Feb 79
Prototype Phase DT&E		
Start	Mar 78/Mar 78	Mar 78
Complete	Dec 79/Dec 79	Oct 80
DSARC IIB	Sep 79/Sep 79	Nov 80
NTE		
Start	Apr 80/Feb 81	May 81
Complete	Sep 80/Jun 81	Oct 81
Joint Navy OPEVAL/Air Force IOT&E		
Start	Dec 80/Nov 81	Nov 81
Complete	Jul 81/Apr 82	Nov 82
Initial Production Contract (Definitized)	N/A/N/A	Dec 81
Full-Scale Production Contract (Definitized)	N/A/N/A	Sep 82
DSARC III (Full Rate Production)	Sep 81/Apr 82	Mar 83
Navy IOC (A-7E)	Oct 81/Oct 83	Nov 83
Air Force IOC (F-4G)	Aug 82/Aug 84	Sep 84
IOC on F/A-18 Aircraft (Navy)	Sep 84/Jan 85	Jan 85
IOC on EA-6B Aircraft (Navy)	Aug 86/Aug 86	Aug 86

b. Previous Change Explanations -- None.

c. Current Change Explanations -- None.

d. References --

Development Estimate: DCP 93A dated 10 July 1978.

Approved Program: FY 1988/89 President's Budget.

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10. Technical/Operational Characteristics:

	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. Technical --			
(U) Length (ft)	13/13	13.7	13.7
(U) Weight (lbs)	780/800	807	796
(U) Diameter (in)	10/10	10	10

(b)(1)

b. Operational --

(b)(1)

Reliability

(U) Missile Free Flight	.95/.85	.91	.95
(U) MTBF Missile Captive Carry (Hrs)	125/125	170	508
(U) MTBF Navy Avionics (AWG 25)	351/351	311	700
(U) MTBF Navy Avionics (CP-1001)	351/351	270	351
(U) Missile Storage (5 yrs/90% conf)	.90/.90	TBD	.90
(U) Probability of fault detection using BIT (BIT Circuitry only) (98% conf)			
(U) Avionics and missile	.95/.95	.95	.95

Maintainability

(U) Mean time to fault locate using BIT (sec)	20/30	14	14
(U) Mean time to repair (min)			
(U) Avionics "O" Level	55/60	30	30
(U) Avionics "I" Level	60/60	TBD	60
(U) Missile "O" Level	20/20	20	20
(U) Missile "I" Level	60/60	55	55

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c. Previous Change Explanations --

Technical --

(U) Weight (lbs), Demonstrated Performance: Change 780 to 807.
Incorporation of hardware to facilitate DSARC II direction to expand capability (EXCAP) in frequency and aerodynamic maneuverability.

(U) Diameter (in), Demonstrated Performance: Change 10.5 to 10.
Demonstrated diameter of prototype missiles.

(U) Frequency Coverage (Band): Changed "Frequency Coverage (GHz)" to "Frequency Coverage (Band)." Downgrades the classification of the SAR to ~~CONFIDENTIAL~~ in lieu of ~~SECRET~~.

(U) Changes to approved program are the approved program changes reflected in DCP 93B of 1 December 1982 and approved at DSARC III on 30 March 1983. Changes to Demonstrated Performance and Current Estimate are demonstrations from NTE or OPEVAL/IOT&E and estimated performance which is expected to be demonstrated during FOT&E.

Operational --

(b)(1)



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c. Previous Change Explanations --

Operational (Cont'd)

(b)(1)

(U) Reliability: Missile captive MTBF previously reported in percentiles is now converted to hours to reflect the basis for warranty effectivity.

(U) Reliability, Missile Free Flight, Demonstrated Performance: Change TBD to .75. Interim results of operational testing. Change .75 to .91. Interim results of operational testing.

(U) Reliability, MTBF Navy Avionics (AWG 25), Demonstrated Performance: Change TBD to 550. Extrapolated from performance demonstrated in laboratory tests. Change 550 to 311. Interim results of operational testing.

(b)(1)

(U) Reliability, MTBF Missile Captive Carry (Hrs) (Current Estimate): CE revised on basis of Production Reliability Assessment Test (PRAT) data through December 1985.

(U) Reliability, MTBF Navy Avionics (AWG 25) (Current Estimate): CE reflects current actual experience in fleet.

(U) Maintainability, Mean time to fault locate using BIT (sec), Demonstrated Performance: Change TBD to 14. Current Estimate: Change 20 to 14. Interim results of operational testing indicates Demonstrated Performance and Current Estimate of performance is better than Development Estimate.

(U) Maintainability, Mean time to repair (min), Avionics "O" level, Demonstrated Performance: Change TBD to 30. Current Estimate: Change 55 to 30. Interim results of operational testing indicated Demonstrated Performance and Current Estimate of performance is better than Development Estimate.

(U) Maintainability, Mean time to repair (min), Missile "O" level, Demonstrated Performance: Change TBD to 20. Extrapolated from performance of Maintainability Demonstration testing.

(U) Maintainability, Mean time to repair (min), Missile "I" level, Demonstrated Performance: Change TBD to 55. Extrapolated from performance of Maintainability Demonstration testing.

(U) Maintainability, Mean time to repair (min), Missile "I" level, Current Estimate: Change 60 to 55. Interim results of operational testing indicates Current Estimate of performance is better than Development Estimate.

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10. Technical/Operational Characteristics (Cont'd)

d. Current Change Explanations --

None

e. References --

Development Estimate: DCP 93A dated 10 July 1978.

Approved Program: FY 1988/89 President's Budget.

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	\$ 216.5	\$ +79.8	\$ 296.3
Procurement	761.3	+339.2	1100.5
Hardware	(523.1)	(+353.2)	(876.3)
Prod Support	(108.4)	(+30.0)	(138.4)
Total Flyaway	(631.5)	(+383.2)	(1014.7)
Fleet Support	(54.3)	(+2.5)	(56.8)
Initial Spares	(75.5)	(-46.5)	(29.0)
Construction (MILCON)	0.0	0.0	0.0
Total FY 78 Base-Year \$	977.8	+419.0	1396.8
Escalation	380.1	+850.2	1230.3
Development (RDT&E)	(10.9)	(+48.0)	(58.9)
Procurement	(369.2)	(+802.2)	(1171.4)
Construction (MILCON)	0.0	0.0	0.0
Total Then-Year \$	\$1357.9	\$+1269.2	\$2627.1
b. Quantities --			
Development (RDT&E)	99	0	99
Procurement	6636	+869	7505
Total	6735	+869	7604
c. Unit Cost --			
Procurement:			
FY 78 Base-Year \$	\$0.115	\$+0.032	\$0.147
Then-Year \$	0.170	+0.132	0.303
Program:			
FY 78 Base-Year \$	\$0.145	\$+0.039	0.184
Then-Year \$	0.202	+0.144	0.345

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11. Program Acquisition Cost (Cont'd):

d. Approved Design to Cost Goal --

	(Average Unit Flyaway Cost)		
	<u>Dev Estimate/ Appr Program</u>	<u>Current Estimate</u>	<u>Latest Appr Threshold</u>
@ Qty: 5000			
@ Peak Rate: 185/mo			
FY 78 Base-Year \$	93.3/198.3	191.5	200.0
Then-Year \$	127.8/372.1	369.4	375.2

e. Foreign Military Sales --

Contracts: 1) FMS contract with Texas Instruments, Inc. N00019-84-C-0341 was delivered for 27 test and training missiles. Contract type, FFP; \$5,466,000. 2) FY 86 purchase of 180 tactical missiles, spares, and ground support equipment under Texas Instruments, Inc. contract N00019-86-RQ66765 (FFP).

Letters of Offer and Acceptance (LOA). Federal Republic of Germany DD Form 1513 awarded on 6 December 1985 for 368 tactical missiles. Amendment no. 1 to the LOA signed 11 November 1986 provides for an additional 576 tactical missiles. Estimated total FMS cost is \$306,639,485. The first 180 of the missiles was procured under the FY 86 contract shown above.

f. Nuclear Costs -- None.

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est (Dec 86 SAR)</u>	<u>UCR Baseline (Dec 85 SAR)</u>	<u>UCR Baseline (Dec 86 SAR)</u>
a. Program Acquisition --			
(1) Cost	2627.1	2667.8	2627.1
(2) Quantity	7604	7672	7604
(3) Unit Cost	.345	.348	.345
b. Current Procurement --	(FY87)	(FY87)	(FY88)
(1) Cost	254.3	254.3	205.0
Less CY Adv Proc	-	-	-
Plus PY Adv Proc	-	-	-
Net Total	254.3	254.3	205.0
(2) Quantity	1078	1078	766
(3) Unit Cost	.236	.236	.268

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13. Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	227.4	1130.5	-	1357.9
Previous Changes:				
Economic	-2.8	+421.8	-	+419.0
Quantity	-	+113.0	-	+113.0
Schedule	+20.0	+749.0	-	+769.0
Engineering	+14.0	-	-	+14.0
Estimating	+110.5	-87.2	-	+23.3
Other	-	-	-	-
Support	0.0	-28.4	-	-28.4
Subtotal	+141.7	+1168.2	-	+1309.9
Current Changes:				
Economic	-4.6	-55.3	-	-59.9
Quantity	-	-12.4	-	-12.4
Schedule	-	+30.0	-	+30.0
Engineering	-	-	-	-
Estimating	-9.3	+24.5	-	+15.2
Other	-	-	-	-
Support	-	-13.6	-	-13.6
Subtotal	-13.9	-26.8	-	-40.7
Total Changes	+127.8	+1141.4	-	+1269.2
Current Estimate	355.2	2271.9	-	2627.1

(FY 1978 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	216.5	761.3	-	977.8
Previous Changes:				
Quantity	-	+82.0	-	+82.0
Schedule	+14.1	+204.0	-	+218.1
Engineering	+12.0	-	-	+12.0
Estimating	+59.1	+65.9	-	+125.0
Other	-	-	-	-
Support	-	-20.9	-	-20.9
Subtotal	+85.2	+331.0	-	+416.2
Current Changes:				
Quantity	-	-5.4	-	-5.4
Schedule	-	+8.9	-	+8.9
Engineering	-	-	-	-
Estimating	-5.4	+10.1	-	+4.7
Other	-	-	-	-
Support	-	-5.4	-	-5.4
Subtotal	-5.4	+8.2	-	+2.8
Total Changes	+79.8	+339.2	-	+419.0
Current Estimate	296.3	1100.5	-	1396.8

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13. Cost Variance Analysis (Cont'd):b. Previous Change Explanations --RDT&E

Economic: Revised escalation indices.

Schedule: Increase in initial manufacturing cost due to delay in prototype effort; increased hardware lead times, and delay of A-6E/HARM integration by one year.

Engineering: FY 80 thru FY 82 cost increase for A-6E/HARM integration and FY 80 cost increase for HARM design improvements.

Estimating: Increased contractor costs for prototype development; deletion of FY 80 Initial Production funds; increased cost for 45 pilot production missiles; Congressional addition to start second source development; funding of operational deficiencies in FY 84 thru FY 86; transfer of Project W1240 (A-6E) FY 83 program to airframe program manager; Congressional adjustments and escalation reductions; additional funds for deficiency corrections through FYDP; transfer of project W1780 (\$47.2M) to Low Cost Seeker program; correction to the base year \$ calculation of prior year's SAR baseline.

Procurement

Economic: Revised escalation indices.

Quantity: Changes to program objective: FY 81/FY 82, -463 missiles; FY 83, +1782 missiles; FY 84, -1002 missiles; FY 86, +551 missiles.

Schedule: One year delay in initial production; stretch out of Navy procurement offset by approval of second source allowing larger annual procurement quantities, and one year less stretch in program; and Congressional action on FY 83 appropriations; program rephasing in January FY 85 FYDP; decrease in rate tooling.

Estimating: Increases in estimate to adjust for actual cost data derived from contract negotiations; funds for second source development; 1982 cost study revised estimate; deletion of second source fund coincident with Congressional direction to continue as sole source program; decrease in unit cost trend attributable to credible threat of competition (dual source initiative) and other cost reduction initiatives; multiyear procurement savings.

Support: Decrease in PGSE and ILS requirements associated with decrease in 1002 missiles and implementation of a comprehensive warranty.

MILCON

None

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13. Cost Variance Analysis (Cont'd):a. Current Change Explanations --(Dollars in Millions)
Base Year \$ Then Year \$(1) RD&E

Revised escalation rates. (Economic)	N/A	-4.6
Elimination of RD&E funds from FY88 through FY91 and reduction of FY87 funds by \$1.7M (TY\$) to address Low Cost Seeker development. (Estimating)	-5.4	-9.3

(2) Procurement

Revised escalation rates. (Economic)	N/A	-55.3
Deletion of 68 missiles reflecting recalculation of inventory requirement.	-6.7	-15.6
o Baseline (DE) value of deleting 68 missiles. (Quantity)	(-5.4)	(-12.4)
o Balance of quantity change allocable to schedule. (Schedule)	(-1.0)	(-2.4)
o Balance of quantity change allocable to estimating. (Estimating)	(-0.3)	(-0.8)
Increase results from schedule change as follows. (Schedule)	+9.9	+32.4

	<u>FY85</u>	<u>FY86</u>	<u>FY87</u>	<u>FY88</u>	<u>FY89</u>	<u>FY90</u>
Prior	813	825	1110	1492	2452	205
New	813	757	1078	766	1766	1649

Multi-year procurement savings from prior report not implemented, \$9.5M (BY\$)/\$23.2M (TY\$); higher cost estimates due to reductions of Air Force quantities, \$.9M (BY\$)/\$.21M (TY\$). (Estimating)	+10.4	+25.3
Reduction resulted from decrease of spares requirements in FY91. (Support)	-5.4	-13.6

c. References -- DCP 93A dated 10 July 1978.

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14. Program Acquisition Unit Cost (PAUC) History: (Then Year Dollars in Millions)

a. Development Estimate to Current Baseline Estimate

PAUC (Initial SAR/DE)	Changes								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
.202	+.047	-.010	+.105	+.001	+.006	-.006	.000	+.143	.345

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E -- None.

b. Procurement --

HARM All-Up-Round

Texas Instruments, Inc.
Lewisville, TX
N00019-85-C-0044, FFP
Award: May 31, 1985

Contract Price: \$565.2
Firm Fixed Price
(Variances not applicable)

Texas Instruments, Inc.
Lewisville, TX
N00019-85-C-0447, FFP
Award: June 9, 1986

Contract Price: \$654.5
Firm Fixed Price
(Variances not applicable)

16. Program Funding Summary:

a. Program Status --

- (1) Percent Program Completed: 80.0% (16 yrs/20 yrs)
(2) Percent Program Cost Appropriated: 61.7% (\$1621.7/2627.1)

b. Appropriation Summary --

<u>Appropriation</u>	<u>Current & Prior Yrs</u>	<u>Budget Year</u>	<u>Balance to Complete</u>		<u>Total</u>
	<u>(FY77-87)</u>	<u>(FY88)</u>	<u>FYDP</u>	<u>Beyond FYDP</u>	
			<u>(FY89-92)</u>	<u>(FY93)</u>	
RDT&E	355.2	0.0	0.0	0	355.2
Procurement	1266.5	205.0	800.4	0	2271.9
MILCON	-	-	-	-	-
Total	1621.7	205.0	800.4	0	2627.1

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16. Program Funding Summary (Cont'd):

c. Annual Summary --

Fiscal Year	Qty	FY 78 Base-Year Dollars		Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		
		Nonrec	Rec		Debit	Credit	
Appropriation: RDT&E							

Appropriation: RDT&E

1972				2.1			2.1	4.6
1973				6.7			6.7	4.4
1974				9.7			9.7	8.0
1975				14.3			14.3	10.9
1976	13			27.4			27.4	6.6
1977				3.9			3.9	2.9
1977	16			31.4			31.4	2.6
1978	25			28.5			29.7	6.8
1979				38.8			44.6	8.4
1980	45			50.2			63.8	10.5
1981				52.4			72.6	10.6
1982				15.2			22.2	7.6
1983				3.7			5.7	4.9
1984				5.5			8.7	3.8
1985				2.8			4.6	3.4
1986				2.7			5.6	2.9
1987				1.0			2.2	3.1
1988				0.0			0.0	3.5
1989				0.0			0.0	3.5
1990				0.0			0.0	3.3
1991				0.0			0.0	2.9
Subtotal	99			296.3			355.2	

Appropriation: Procurement

1981	80	7.8	31.1	74.9			120.3	11.6
1982	118	10.5	14.8	63.3			110.3	14.3
1983	160	0.0	11.6	47.8			88.2	9.0
1984	318	18.5	10.9	101.6			195.9	8.0
1985	813	10.8	3.6	142.5			282.1	3.4
1986	757	1.0	4.0	105.3			215.4	2.9
1987	1078	0.7	3.6	120.2			254.3	3.1
1988	766	0.5	3.3	93.9			205.0	3.5
1989	1766	0.6	1.4	182.4			410.6	3.5
1990	1649	1.4	2.3	168.4			389.3	3.3
1991	0	0.0	0.0	0.2			0.5	2.9
Subtotal	7505	51.8	86.6	1100.5			2271.9	
TOTAL	7604			1396.8			2627.1	

MILCON: None

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16. Program Funding Summary (Cont'd):

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1983 & Prior	334.1	334.1	333.1
1984	8.7	8.7	8.5
1985	4.6	4.6	4.6
1986	5.6	2.5	0.3
1987	2.2	0.0	0.0
To Complete	0.0	N/A	N/A
Total	355.2	349.9	346.7

Appropriation: Procurement

1983 & Prior	318.8	318.2	315.5
1984	195.9	195.9	168.6
1985	282.1	281.0	118.9
1986	215.4	203.4	13.4
1987	254.3	0.2	0.0
To Complete	1005.4	N/A	N/A
Total	2271.9	998.7	616.4

MILCON: None

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate(1)	Production Estimate	Current Estimate(2)	Maximum(3)
1981		80	80	80
1982		236	236	236
1983		289	283	283
1984		722	635	635
1985		1674	1684	1684
1986		2461	2141	2141
1987		3275	2462	2462
1988		3761	2514	2514
1989		3084	2659	2659
1990		1778	1925	1925

Note (1) -- Not Available.

Note (2) -- Current estimate includes Navy and Air Force approved program FYDP quantities.

Note (3) -- Production is already at maximum economic rate (two shifts, eight hours per shift, five days per week).

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b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BY \$)	3211.1	-694.6	2516.5	0	2516.5
(TY \$)	6363.4	-1558.4	4805.0	0	4805.0
PAUC (BY \$)	183.2	-12.2	171.0	0	171.0
(TY \$)	363.0	-36.5	326.5	0	326.5

c. Schedule Variance --

	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Start date (Mo/Yr)	11/82	0	11/82	0	11/82
Duration (in Months)	120	0	120	0	120
End date (Mo/Yr)	11/92	0	11/92	0	11/92

d. Deliveries (Plan/Actual) --

RD&E
Procurement

To Date

99/99
1383/1402

18. Operating and Support Costs: N/A

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AF-15 HARM

50R-86-083

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: HARM (AGM-88A)

AS OF DATE: December 31, 1986

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1. Designation and Nomenclature (Popular Name): AGM-88A/High Speed Anti-Radiation Missile (HARM).

2. DoD Component: U.S. Air Force (Navy is Executive Service)

3. Responsible Office and Telephone Number:

Defense Suppression Systems
Program Office
Naval Air Systems Command
Washington, D.C. 20361-1242

PM: CAPT L. E. Kaufman, USN
Assigned: 25 May 1983
AUTOVON 222-7551
COMMERCIAL (202) 692-7551

Deputy Project Manager for HARM
Naval Air Systems Command
Washington, DC 20361-1242

LTCOL E. F. O'Keefe, Jr., USAF
Assigned: 15 June 1985
AUTOVON 222-7551
COMMERCIAL (202) 692-7551

4. Program Elements/Procurement Line Items:

RDT&E: PE 27162F

PROCUREMENT: PE 27162F APPN 3020 ICN M88AAG

MILCON: None

5. Related Programs: The WGU-2A/B/Guidance Section/Low Cost Anti-Radiation Seeker (popular name, HARM Low Cost Seeker or LCS) Program.

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (DAND-PA)
DEPARTMENT OF DEFENSE

87-0153

7. Program Highlights:

a. Significant Historical Developments -- HARM development began in 1972 as a Navy program. The inability of current anti-radiation missiles to successfully defeat increasingly sophisticated and lethal enemy anti-aircraft systems threatened tactical aviation's ability to accomplish its mission and survive combat. HARM was initiated to address these deficiencies. The Air Force joined the HARM program in 1975 after a memorandum of agreement was signed designating the Navy as the executive service and the Air Force as the participating service. DSARC III(JRMB) was successfully completed in March 1983. Initial Air Force operational capability occurred on 27 September 1984 at George AFB, California. In response to early 1985 Congressional direction requiring certification of the HARM weapon system, a complete audit of HARM including teardown of a missile was completed in August 1985. On the basis of this review the Secretaries of the Navy and Air Force certified to the Congress on 31 October 1985 that HARM satisfies the mission requirement.

b. Significant Developments Since Last Report --

Developmental testing for the "FY 84 Software Update" has been successfully completed and this software upgrade is now incorporated in all production deliveries. The next software upgrade (Block III) is now approximately fifty percent complete and will begin flight tests in late 1987. A hardware change to incorporate reprogrammable memory has been initiated to enhance tactical capability and update ELINT software and to provide reprogrammability of software in the field without necessitating further hardware changes.

HARM missiles were first used in combat against Libya in March/April 1986. A total of 40 HARMs were fired with very successful results.

Congressional language directed that NAVAIRSYSCOM take over as the program manager of the HARM Low Cost Seeker (LCS) program which was previously under NWC China Lake management. The LCS program is now under PMA-242 cognizance and technical management remains at NWC. Congressional direction requires competing the LCS program with two contractors other than the current HARM prime contractor (Texas Instruments (TI)). TI may propose a Block IV upgrade (hardware and software) as a competitor to the LCS in order to meet the Navy/Air Force cost and performance objectives.

The HARM system is meeting mission requirements and replaces the AGM-45 SHRIKE missile.

c. Changes since As-of Date: None

11. Program Acquisition Cost (Current Estimate in Millions of Dollars):

	Development Estimate	Changes	Current Estimate
a. Cost --			
Development (RDT&E)	\$ 10.3	+15.6	\$25.9
Procurement	693.7	+400.2	1093.9
Airframe	(654.1)	(+373.8)	(1027.9)
Total Flyaway	(654.1)	(+373.8)	(1027.9)
Peculiar Support	(26.2)	(+9.2)	(35.4)
Initial Spares	(13.4)	(+17.2)	(30.6)
Construction (MILCON)	0.0	0.0	0.0
Total FY78 Base Year \$	704.0	+415.8	1119.8
Escalation	348.0	+710.0	1058.0
Development (RDT&E)	(1.2)	(+9.0)	(10.2)
Procurement	(346.8)	(+701.0)	(1047.8)
Construction (MILCON)	0.0	0.0	0.0
Total Then-Year \$	1052.0	+1125.8	\$2177.8
b. Quantities --			
Development (RDT&E)	0	0	0
Procurement	7118	-4	7114
Total	7118	-4	7114
c. Unit Cost --			
Procurement:			
FY78 Base-Year \$	0.097	+\$0.057	\$0.154
Then-Year \$	0.146	+0.155	0.301
Program:			
FY78 Base-Year \$	0.099	+\$0.058	\$0.157
Then-Year \$	0.148	+0.156	0.306
d. Approved Design to Cost Goal -- See Navy SAR			
e. Foreign Military Sales -- See Navy SAR			
f. Nuclear Costs -- None.			

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	Current Estimate	UCR Baseline	UCR Baseline
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition --			
(1) Cost	2177.8	2279.5	2177.8
(2) Quantity	7114	7821	7114
(3) Unit Cost	.306	.291	.306
b. Current Procurement -- (FY 1987)		(FY 1987)*	(FY 1988)
(1) Cost	373.7	373.7	432.2
Less CY Adv Proc	-	-	-
Plus PY Adv Proc	-	-	-
Net Total	373.7	373.7	432.2
(2) Quantity	1384	1384	1748
(3) Unit Cost	.270	.270	.247

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Development Estimate	11.5	1040.5	-	1052.0
Previous Changes:				
Economic	+0.7	-0.4	-	+0.3
Quantity	-	+101.4	-	+101.4
Schedule	+8.5	+1165.2	-	+1173.7
Engineering	-	-	-	-
Estimating	+17.0	-102.3	-	-85.3
Other	-	-	-	-
Support	-	+37.4	-	+37.4
Subtotal	+26.2	+1201.3	-	+1227.5
Current Changes:				
Economic	-0.2	-18.0	-	-18.2
Quantity	-	-101.9	-	-101.9
Schedule	-	-116.2	-	-116.2
Engineering	-	-	-	-
Estimating	-1.4	+134.5	-	+133.1
Other	-	-	-	-
Support	-	+1.5	-	+1.5
Subtotal	-1.6	-100.1	-	-101.7
Total Changes	+24.6	+1101.2	-	+1125.8
Current Estimate	36.1	2141.7	-	2177.8

* Adjusted to reflect FY87 Appropriations Act in accordance with Congressional change to SAR law.

13. Cost Variance Analysis (Cont'd):

(FY 1978 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	10.3	693.7	-	704.0
Previous Changes:				
Quantity	-	+61.3	-	+61.3
Schedule	+5.9	+415.7	-	+421.6
Engineering	-	-	-	-
Estimating	+10.5	-69.6	-	-59.1
Other	-	-	-	-
Support	-	+25.6	-	+25.6
Subtotal	+16.4	+433.0	-	+449.4
Current Changes:				
Quantity	-	-61.6	-	-61.6
Schedule	-	-37.4	-	-37.4
Engineering	-	-	-	-
Estimating	-0.8	+65.4	-	+64.6
Other	-	-	-	-
Support	-	+0.8	-	+0.8
Subtotal	-0.8	-32.8	-	-33.6
Total Changes	+15.6	+400.2	-	+415.8
Current Estimate	25.9	1093.9	-	1119.8

b. Previous Change Explanations --

(1) RD&E

Economic: Revised economic escalation indices.
 Schedule: Increase in cost due to delay in production.
 Estimating: Increase due to Pre-Planned Product Improvement program; addition of Launcher development effort; adjustment to breakout SIDEARM 1 program from HARM report; impact of Congressional cut on corrections to IOT&E deficiencies; correction of operational test deficiencies; reduced scope correction of deficiencies resulting from Air Force and Congressional Reductions.

(2) Procurement

Economic: Revised economic escalation indices.
 Quantity: Changes to procurement quantity: FY 82 & Prior, +7213 missiles; FY 83, -5325 missiles; FY 84, +399 missiles; FY 85, -238 missiles; FY 86 -1346 missiles.

13. Cost Variance Analysis (Cont'd):

Schedule: One year delay in initial production; schedule decrease associated with decreased quantity in FY 83; accelerated procurement of missiles in FY 89 vs FY 91 due to reassessment of USAF HARM inventory requirements; program rephasing of 154 missiles in FY 90 vs FY 89 and accelerated procurement in FY 87/88; rephasing of production schedule FY86-90; balance of change associated with quantity assignable to schedule.

Estimating: Program repricing based on negotiated contract cost data; estimating decrease associated with reduced quantity; 1982 cost study revised estimate; decrease in unit cost trend attributable to credible threat of competition (arising from Navy second sourcing initiative); introduction of cost reducing producibility changes; repricing associated with rephasing of program profile; adjustment for prior year escalation; deletion of tooling and test equipment; Multi-year procurement and contract negotiation savings; balance of change associated with quantity assignable to estimating; adjustment to refine the mix of previous support and estimating changes related to impact of escalation.

Support: Decrease in support requirements associated with reduction of 238 missiles; revised estimate of spares requirements; increased estimate for peculiar support equipment; revised estimate of peculiar support equipment based on reduced cost; revised estimate of spares based on reduced unit cost; increase in spares and PGSE; adjustment to refine the mix of previous support and estimating changes related to impact of escalation.

(3) MILCON -- Nonec. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(1) <u>RDI&E</u>		
Revised economic escalation indices. (Economic)	--	-.2
Reduced scope of correction of deficiencies resulting from Air Force and Congressional reductions. (Estimating)	-0.8	-1.4
(2) <u>PROCUREMENT</u>		
Revised economic escalation indices. (Economic)	--	-33.8

13. Cost Variance Analysis (Cont'd):

Reduction of 707 missiles.	-31.0	-67.5
o Value of deleting 707 missiles from program. (Quantity)	(-44.5)	(-93.8)
o Balance of change assignable to schedule. (Schedule)	(-37.4)	(-104.9)
o Balance of change assignable to estimating. (Estimating)	(+50.9)	(+131.2)
Rephrasing of schedule due to Congressional budget reductions. (Schedule)	-	+4.5
Refinement of Estimate associated with schedule change. (Estimating)	-7.4	-13.8
Adjustment for prior years escalation. (Estimating)	+4.8	+9.0
Increase in Spares Cost. (Support)	+0.8	+1.5
Adjustment to refine the mix of previous quantity changes.	0.0	0.0
o Reduction to quantity to balance the mix. (Quantity)	(-17.1)	(-8.1)
o Addition to the estimating category to balance the mix. (Estimating)	(+17.1)	(+8.1)
o Addition to the economic category adjustment associated with decreases in Quantity. (Economic)	(0.0)	(+15.8)
o Reduction to the schedule category to balance previous changes. (Schedule)	(0.0)	(-15.8)

d. References--

Development Estimate: Draft Decision Coordination Paper (DCP) #93A, 10 July 1978.

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. Initial SAR/Development Estimate to Current Estimate:

PAUC (Initial SAR/ Development Estimate)	Changes								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
.148	-.002	-	+.148	-	+.007	+.005	-	+.158	.306

15. Contract Information: See Navy SAR

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 78.6% (11 YRS/14 YRS)
 (2) Percent Program Cost Appropriated: 66.8% (\$1455.7/2177.8)

b. Appropriation Summary --

Appropriation	(Then-Year Dollars in Millions)				Total
	Current & Prior Yrs (FY77 - 87)	Budget Year (FY88)	FYDP (FY89-92)	Balance to Complete Beyond FYDP	
RDT&E	33.8	2.3	-	-	36.1
Procurement	1421.9	432.2	287.6	-	2141.7
MILCON	-	-	-	-	-
Total	1455.7	434.5	287.6	-	2177.8

c. Annual Summary --

Fiscal Year	Qty	FY78 Base-Year Dollars			Then-Year Dollars			Esc1 Rate %
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

AGM-88A, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

Appropriation: RDT&E

1977				0.5			0.5	7.3
1978				3.9			4.0	9.2
1979				2.0			2.3	8.4
1980				1.5			1.9	9.4
1981				7.0			9.7	11.9
1982				2.9			4.3	9.2
1983				3.1			4.8	4.9
1984				1.0			1.6	3.8
1985				1.1			1.9	3.4
1986				1.1			1.8	2.9
1987				0.5			1.0	3.1
1988				1.3			2.2	3.5
Subtotal				25.9			36.1	

Appropriation: Procurement

1982	118	10.1	42.8	60.8			99.8	9.6
1983	123	3.2	33.7	43.5			75.7	9.0
1984	317	17.9	68.9	96.6			174.6	6.0
1985	871	13.7	139.5	163.9			305.1	3.4
1986	1384	10.0	188.0	204.4			393.0	2.9
1987	1384	1.1	169.7	180.3			373.7	3.1
1988	1748	1.1	200.3	209.7			432.2	3.5
1989	893	0.5	99.9	104.4			221.6	3.5
1990	276	0.2	27.3	30.3			66.0	3.3
Subtotal	7114	57.8	970.1	1093.9			2141.7	
Total	7114			1119.8			2177.8	

Appropriation: Milcon (None)

d. Obligations and Expenditures -- *

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

Appropriation: RDT&E

1977	0.5	0.5	0.5
1978	4.0	4.0	3.5
1979	2.3	2.3	1.9
1980	1.9	1.8	1.7
1981	9.7	9.7	8.5
1982	4.3	1.8	1.7
1983	4.8	4.7	4.5
1984	1.6	1.6	1.6
1985	1.9	1.8	1.5
1986	1.8	1.5	1.4
To Complete	3.3	N/A	N/A
Total	36.1	28.7	26.8

Appropriation: Procurement

1982	99.8	94.1	85.5
1983	75.7	69.8	68.8
1984	174.6	167.3	162.6
1985	305.1	293.8	124.5
1986	393.0	370.4	3.0
To Complete	1093.5	N/A	N/A
Total	2141.7	995.4	443.7

Appropriation: Construction (None)

* Reflects program office records as of 31 Dec 1986.

17. Production Rate Data: See Navy SAR

18. Operating and Support Costs: N/A

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SAR-86-042

~~CONFIDENTIAL~~ N-21 HARPOON

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: HARPOON (AGM/RGM/UGM-84A/C/D)

AS OF DATE: DECEMBER 31 1986

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FOR OPEN PUBLICATION

FEB 27 1987

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation/Nomenclature (Popular Name) AGM-84A,C,D/RGM-84A,C,D/UGM-84A,C,D/Harpoon

2. DoD Component: U.S. Navy

3. Responsible Office and Telephone Number:

Anti-Ship Weapon System Program Office
PMA-258
Naval Air Systems Command
Washington, DC 20361

PM: CAPT D. L. Finch
Assigned: June 18, 1986
Telephone: (202) 692-3340
Autovon: 222-3340

4. Program Elements:

RDT&E,N: P.E. 63312N, P.E. 64364N - development of AGM-84/RGM-84
P.E. 63364N - Development of UGM-84
P.E. 25603N - Harpoon Improvements (FY 79 only)
P.E. 63306N - Standoff Land Attack Missile (SLAM); Project
1958. (Shared Funding)

PROCUREMENT: APPN 1507 ICN 2224 P.E. 24229N
P.E. 24271N
P.E. 24284N

5. Related Programs TOMAHAWK

~~Classified by: OPNAVJAG S5513.2(31)
Declassify on: OADR~~

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Harpoon(84A/C/D) December 31, 1986

6. Mission and Description: Ship/Air/Submarine launched all-weather anti-ship missile effective against enemy destroyers, light cruisers, surfaced submarines, patrol craft and other (e.g., merchant, surveillance etc.) enemy shipping. The stand-off land attack missile (SLAM) is effective against fixed targets and ships in harbor.

The Harpoon utilizes altitude reference mid-course guidance with an active or passive seeker for target acquisition and terminal guidance. Missile is capable of being launched from the following platforms:

Ships: FF-1052, DDG, CG, CGN, PEM, DD-963, FFG-7, BB.

Air: P-3, A-6, F-18, S-3, B-52 (USAF)

Submarine: SSN-594/637/688 Class

7. (C) Program Highlights:

a. (U) Significant Historical Developments - - The Weapon System Development phase was completed in July 1975. The OPEVAL phase was completed March 1977 and PASU was granted 18 July 1977. DNSARC reviewed the program July 1977 resulting in the approval to procure 225 U.S. plus 229 FMS missiles in FY 1977, not to exceed production of 40 missiles per month. DT&E of seeker changes (Block 1A) that improve performance against countermeasures was completed January 1978. OPEVAL (OT&E) was completed June 1978 with successful results and the final report was released by OPTEVFOR in August 1979.

(b)(1)

(U) Test and evaluation of Block 1C has been completed and Approval for Limited Production (ALP) was received June 83. A second Approval for Limited Production (ALP) of Block 1C was Received September 1984. Approval for full production will be granted upon successful completion of full system tests aboard the various launch platforms.

(U) The Harpoon Missile has met or exceeded all mission requirements.

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b. (U) Significant Developments Since Last Report: Block 1C missile tests aboard a surface platform with the improved command and launch system (AN/SWG-1A) were completed Oct 1986. A seeker product improvement effort to improve performance in passive and active countermeasure environments has been started. Also, an advanced Strike Weapon System based on the Harpoon airframe will be initiated this fiscal year to provide stand-off, land attack capability.

c. (U) Changes Since "As Of" Date - None

8. NDCF Threshold Breaches - There are currently no NDCF (dated May 13, 1978) threshold breaches.

9. Schedule:

a. Milestones

	Development/Estimated Approved Program	Current Estimate
Initiate Development (Validation Phase)	Mar 70/Mar 70	Mar 70
Award Engine Advanced Develop. Contract	Feb 71/Feb 71	Feb 71
Award Design Phase Contract	Jun 71/Jun 71	Jun 71
First Control Test Vehicle Launches	Aug 72/Aug 73	Oct 73
Complete 4 Successful Guidance Test Vehicle Launches	Mar 73/Mar 73	Mar 73
Award Weapon System Development Contract	Jun 73/Jun 73	Jun 73
First Prototype Missile Launch	Feb 74/Mar 74	Mar 74
Award Pilot Line Production Contract	Jun 74/Jul 74	Jul 74
Start Navy Technical Evaluation	Dec 74/Nov 74	Nov 74
Start OPEVAL (Mal, P-3 & FF-1052)	Jul 75/Aug 75	Aug 75
Complete OPEVAL (P-3 & FF-1052)	Dec 75/Mar 77	Mar 77
Approval for Service Use for	Dec 75/Feb 81	Feb 81
First Delivery to Fleet	Dec 75/Jul 77	Jul 77
IOC (FF-1052)	Jun 76/Jul 77	Jul 77
Definitization First Production Contract	Mar 76/Nov 76	Nov 76
IOC (Submarine)	Apr 76/Jul 77	Jul 77
Accept First Production Missile	Feb 77/Feb 77	Feb 77
IOC (P-3 Aircraft)	Jun 76/Aug 79	Aug 79
IOC (A-6 Aircraft)	Oct 81/Oct 81	Oct 81
Block 1C Missile - Approval for Limited Production	Nov 82/Jun 83	Jun 83
Block 1C Missile - Approval for Full Production	Jun 87/Jun 87	Jun 87

b. Previous Change Explanations - - Integration testing at the section and assembly level required more time than planned. Incorporation of design improvements for the engine, fuel control and electrical power delayed sustainer delivery.

c. Current Change Explanations - - None

d. References - -

Development Estimate - Decision Coordinating Paper (DCP) No. 77 dated May 16, 1973 Amended by DSARC IIB, June 25, 1974.

Approved Program: Navy Decision Coordinating Paper (NDCP) W0555SH dtd May 13, 1978. FY 88 President's Budget.

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Harpoon (84A/C/D) December 31, 1986

10. ~~CONFIDENTIAL~~ Operational Characteristics:

a. CONFIDENTIAL Operational	Development Estimate/ <u>Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
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(b)(1)

(U) Reliability

Missile (free flt %)	90	91.9	90
Missile (Ready storage, ship 6 mos)	0.90	0.90	0.90
A/C C&L sys (MTBF hrs)	150	251	251
ShipC&Lsys (MTBF hrs)	150	500.5	500.5 (CH-1)
Missile (air carry MTBF hrs)			
P-3	250	381	250
A-6	250	148	250

(b)(1)

b. (U) Previous Change Explanations - - Variances are due to results of captive-carry program, other tests, and actual fleet experience.

c. (U) Current Change Explanations - -

(CH-1) Change from 537 to 500.5 due to updated results of captive - carry program.

d. (U) References --

Development Estimate: Decision Coordinating Paper No. 77 dated May 16, 1973 Amended by DSARC IIB, June 25, 1974.

Approved Program: NDCP #W0555SH dtd May 13, 1978
FY 88 President's Budget

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Harpoon (84A/C/D) December 31, 1986

PROGRAM ACQUISITION COSTS
SYSTEM: HARPOON (AGM/RGM/UGM-84A/C/D)

11. <u>PROGRAM ACQUISITION COST</u>	(1) <u>DEVELOPMENT ESTIMATE</u>	(2) <u>CHANGES</u>	(3) <u>CURRENT ESTIMATE</u>
a. Cost			
Development	272.0	+14.3	286.3
Field Stations	(55.9)	—	(55.9)
Ordnance Section	(11.2)	—	(11.2)
Contract (GFE Engine)	(28.2)	—	(28.2)
Contract (Prime)	(176.7)	+14.3	(191.0)
Procurement (Missile)	523.0	+743.6	1266.6
Fly-A-Way	(457.6)	(+583.0)	(1040.6)
Fleet Support	(31.4)	(+117.3)	(148.7)
Initial Spares	(34.0)	(+ 43.3)	(77.3)
Construction	—	+.3	0.3
Total: Constant FY 70\$	795.0	+758.2	1553.2
Escalation	236.8	+1991.3	2228.1
Development	(43.9)	(+59.0)	(102.9)
Procurement	(192.9)	(+1931.9)	(2124.8)
Construction	—	(+.4)	(0.4)
Total Program Cost	1031.8	2749.5	3781.3
b. Quantities			
Development	52	0	52
Procurement	2870	+1101	3971
Total	2922	+1101	4023
c. Unit Cost			
Procurement			
FY 70 Base Year	\$.182	+ \$.137	\$.319
Then-Year \$	\$.249	+ \$.605	.854
Program			
FY 70 Base-Year \$	\$.272	+ \$.114	\$.386
Then-Year \$.353	+ .587	.940

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Harpoon (84A/C/D) December 1986

d. Approved Design to Cost Goal

(Average Unit Fly Away Cost)

	Dev Estimate/ Appr Program	Current Estimate	Latest Approved Threshold
@ QTY: 2870			
@ Peak Rate: 46/MO			
FY 70 Base-Year \$	.159/.159	.262	.159
Then Year	.218/.218	.696	.218

(b)(1)

f. Nuclear Costs - - None

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current, (Then Year) Dollars in Millions)

	Current Year Current Estimate (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	Budget Year UCR Baseline (Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	3,781.3	4,002.0	3,781.3
(2) Quantity	4,023	4,103	4,023
(3) Unit Cost	.940	.975	.940

FY 1987 Appropriation Act

	(FY 1987)	(FY 1987)	(1988)
b. Current Procurement --			
(1) Cost	135.7	135.7	172.0
Less CY Adv Proc	N/A	N/A	-31.0
Plus FY Adv Proc	N/A	N/A	N/A
Net Total	N/A	N/A	141.0
(2) Quantity	96	96	124
(3) Unit Cost	1.414	1.414	1.137

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Harpoon (84A/C/D) December 31, 1986

13. Cost Variance Analysis:a. Summary — (Current (Then Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Baseline Estimate (DE)	315.9	715.9		1031.8
Previous Changes				
Economic		+127.2		+ 127.2
Quantity		+ 838.4		+ 838.4
Schedule				
Engineering	+69.1			+ 69.1
Estimating		+1412.3		+1412.3
Other				
Support		+ 522.5	+ .7	+ 523.2
Subtotal	+69.1	+2900.4	+ .7	+2970.2
Current Changes				
Economic		- 7.3		- 7.3
Quantity		+ 14.1		+ 14.1
Schedule				0.0
Engineering	+ 4.2			+ 4.2
Estimating		-227.5	0.0	-227.5
Support		- 4.2		- 4.2
Subtotal	+ 4.2	-224.9	0.0	-220.7
Total Changes	+73.3	+2675.5	+0.7	+2749.5
Current Estimates	389.2	3391.4	0.7	3781.3

(FY 1970 Constant Dollars (Base Year) in Millions)

	RD&E	PROC	MILCON	TOTAL
Baseline Estimate (DE)	272.0	523.0		795.0
Previous Changes				
Quantity		+ 262.3		+ 262.3
Schedule				
Engineering	+ 13.2			+ 13.2
Estimating		+ 348.7		+ 348.7
Other				
Support		+ 173.4	+ .3	+ 173.7
Subtotal	+ 13.2	+ 784.4	+ .3	+ 797.9
Current Changes				
Quantity		+ 18.1		+ 18.1
Schedule				
Engineering	+ 1.1			+ 1.1
Estimating		- 58.1		- 58.1
Other				
Support		- 0.8		- 0.8
Subtotal	+ 1.1	- 40.8	-0.0	- 39.7
Total Changes	+ 14.3	+ 743.6	+0.3	+ 758.2
Current Estimate	286.3	1266.6	0.3	1553.2

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Harpoon (84A/C/D) December 31, 1986

b. Previous Change Explanations -

RDTE

Engineering: Revised escalation rates.
 Estimating: Prior Yr. Funding Adjustment.

PROCUREMENT

Economic: Revised escalation rates.
 Quantity: Addition of 754 missiles.
 Engineering: Added Reliability/Quality Assurance Requirements.
 Increased Seeker Complexity.
 Implemented Product Improvements.
 Estimating: Increase because of underestimation of Rate Tooling,
 Engineering Change Proposals and Government In-house
 Costs.
 Support: Prior year funding adjustments.
 Increase spares requirements due to increased missile
 requirements.
 Increase out year support cost due to program stretch.
 Decrease due to revision of Fleet Support/Spares
 Requirement.
 Milcon: Building modification at NWS, Concord

c. Current Change Explanations - -

	<u>Base Year</u>	<u>Then Year</u>
(1) <u>RDTE</u>		
Additional ASWS funding - SECNAV direction (Engineering)	+ 1.1	+ 4.2
(2) <u>Procurement</u>		
Net decrease (-80) in Quantity (FY86-23; FY87+2; FY88-80; FY89-120; FY90-145; FY91+31; FY92+255)	+ 7.3	+ 14.1
Correction of Prior Base Year (Quantity)	+ 10.8	
Support for Decrease Quantity (Support)	- .8	- 4.2
Estimating - revision of cost	- 58.1	- 227.5
Revised escalation rates (Economics)		- 7.3

c. References --

- . Dev. Est.: DCP No. 77 dated May 16, 1973, Amended by DSARC IIR, June 25, 1974.
- . Approved Program: NDCP #40555SH dtd May 13, 1978 FY 88 President's Budget

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14. Program Acquisition Unit Cost (PAUC) History:

a. Initial SAR Estimate To Current Baseline Estimate

First Authorization: FY 1970

Program Acquisition Unit Cost:

First Authorization: .251

Development Estimate: .353

b. Current Baseline Estimate to Current Estimate

PAUC (Development Estimate)	Changes (Then Year Dollars in Millions)								PAUC (Current) Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
.353	+.030	+.115	-	+.018	+.295	+.129	-	+.587	.940

15. Contract Information: (Then Year Dollars in Millions)

a. RDT&E -- None

b. Procurement

Missile:
 McDonnell Douglas Astronautics
 St. Charles, Mo.
 N00019-82-C-0013/FFP
 Award: March 31, 1982
 Definitized: March 31, 1982

Initial Contract Price		
Target	Ceiling	Qty
\$229.5	\$229.5	406

Current Contract Price		
Target	Ceiling	Qty
307.7	N/A	406

Estimated Price At Completion	
Contractor	Program Mgr
307.7	\$307.7

Previous Cumulative Variances
 Cumulative Variances To Date
 Net Change

Cost Variance	Schedule Variance
N/A	N/A
N/A	N/A

Explanation of Change: Not Reportable on FFP contracts

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Harpoon (84A/C/D) December 31 1986

Missile:

McDonnell Douglas Astronautics
St. Charles, Mo.
N00019-82-C-0017/FFP
Award: March 8, 1983
Definitized: March 8, 1983

Current Contract Price
Target Ceiling Qty
\$281.5 N/A 364

Previous Cumulative Variances
Cumulative Variance To Date
Net Change

Explanation of Change: Not reportable on FFP contracts.

Initial Contract Price
Target Ceiling Qty
\$215.5 \$215.5 364

Estimated Price at Completion
Contractor Program Mgr
\$281.5 \$281.5

Cost Variance Schedule Variance
N/A N/A
N/A N/A

Missile

McDonnell Douglas Astronautics
St. Charles, Mo.
N00019-83-C-0036C/FFP
Award: March 31, 1982
Definitized: March 31, 1984

Current Contract Price
Target Ceiling Qty
\$316.7 N/A 437

Previous Cumulative Variance
Cumulative Variance To Date
Net Change

Explanation of Change: Not reportable for FFP contracts.

Initial Contract Price
Target Ceiling Qty
\$282.6 \$282.6 437

Estimated Price At Completion
Contractor Program Mgr
\$316.7 \$316.7

Cost Variance Schedule Variance
N/A N/A
N/A N/A
N/A

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Harpoon (84A/C/D) 31 December 1986

Missile

McDonnell Douglas Astronautics
St. Charles, Mo.
N00019-85-C-00161/FFP
Award: March 28, 1985
Definitized: March 28, 1985

Current Contract Price		
Target	Ceiling	Qty
FFP	\$366.8	565

Initial Contract Price		
Target	Ceiling	Qty
\$330.2	\$330.2	565

Estimate Price at Completion	
Contractor	Program Mgr
\$366.8	\$366.8

Previous Cumulative Variance
Cumulative Variance To Date
Net Change

Cost Variance	Schedule Variance
N/A	N/A
N/A	N/A
N/A	N/A

Explanation of Change: Not reportable for FFP contracts.

Missile

McDonnell Douglas Astronautics
St. Charles, MO
N00019-85-C-0415/FFP
Award: June 30, 1986
Definitization: June 30, 1986

Current Contract Price		
Target	Ceiling	Qty
\$285.0	N/A	404

Initial Contract Price		
Target	Ceiling	Qty
\$285.0	\$285.0	404

Estimated Price At Completion	
Contractor	Program Mgr
\$25.5	\$25.5

Previous Cumulative Variance
Cumulative Variance To Date
Net Change

Cost Variance	Schedule Variance
N/A	N/A
N/A	N/A
N/A	N/A

Explanation of Change: Not reportable on FFP contracts.

Engine

Teledyne CAE
Toledo, Ohio
N00010-82-C-0011/FFP
Award: June 30, 1982
Definitized: June 30, 1982

Current Contract Price		
Target	Ceiling	Qty
424.3	N/A	426

Initial Contract Price		
Target	Ceiling	Qty
FFP	\$24.3	426

Estimated Price At Completion	
Contractor	Program Mgr
\$24.3	\$24.3

Previous Cumulative Variance
Cumulative Variance To Date
Net Change

Cost Variance	Schedule Variance
N/A	N/A
N/A	N/A
N/A	N/A

Explanation of Change: Not reportable on FFP contracts.

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Harpoon (84A/C/D) 31 December 1986

15. Program Funding Summary:

a. Program Status - -

(1) Percent Program Completed: 78.3% (18/23 Yrs)

(2) Percent Program Cost Appropriated: 75.7% (\$2862.1/3781.3)

b. Appropriation Summary - -

<u>Approp</u>	<u>Current</u> <u>Prior Yrs</u> (FY71-87)	<u>Budget</u> <u>Year</u> (FY88)	<u>Balance</u> <u>F-1 DP</u> (FY89-92)	<u>To Comp</u> <u>Beyond FYDP</u>	<u>Total</u>
RDT&E	339.7	32.5	17.0	-	389.2
Proc	2521.7	172.0	697.7	-	3391.4
Milcon	.7	-	-	-	.7
Total	2862.1	204.5	714.7	-	3781.3

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Harpoon (U4A/C/D/ December 1986

C. Annual Summary

Fiscal Year	Qty	FY 70 Base-Year Dollars		Then Year Dollars			Bscd Rate %	
		Flyaway		Total	Advance	Proc		Total
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1970	—	—	—	5.0	—	—	5.1	5.51
1971	12	—	—	18.1	—	—	19.3	5.14
1972	—	—	—	38.1	—	—	42.3	4.61
1973	—	—	—	61.6	—	—	71.8	4.35
1974	40	—	—	74.0	—	—	92.0	7.97
1975	—	—	—	51.7	—	—	69.1	10.94
1976	—	—	—	13.9	—	—	19.7	6.61
1979	—	—	—	.8	—	—	1.5	8.40
1987	—	—	—	6.5	—	—	18.9	3.10
1988	—	—	—	11.0	—	—	32.5	3.50
1989	—	—	—	5.5	—	—	17.0	3.50
Total	52	—	—	286.3	—	—	389.2	

APPROPRIATION: PROCUREMENT

1975	100	7.0	42.8	58.3	—	—	82.4	8.81
1976	170	7.4	68.6	87.6	—	—	153.3	6.59
1977	66	1.0	22.6	27.5	—	—	43.9	3.56
1977	220	—	78.3	89.3	—	—	150.8	3.78
1978	234	—	63.6	73.8	—	—	139.2	6.80
1979	240	—	59.4	66.1	—	—	137.4	8.72
1980	240	—	56.2	64.3	—	—	147.4	11.80
1981	240	—	61.0	84.8	—	—	216.8	11.60
1982	240	—	67.5	82.7	—	—	229.6	14.30
1983	223	—	59.9	79.2	—	—	232.3	9.00
1984	315	—	73.1	94.9	—	—	291.1	8.00
1985	354	—	73.1	93.4	—	—	294.3	3.40
1986	347	—	71.5	88.3	—	—	287.5	2.90
1987	96	—	31.5	40.3	—	—	135.7	3.10
1988	124	—	48.0	49.6	31.0	—	172.0	3.50
1989	138	—	63.1	38.7	—	15.0	139.2	3.50
1990	188	—	84.0	46.4	—	4.9	170.9	3.30
1991	181	—	43.6	45.5	—	5.0	171.8	2.90
1992	255	—	47.2	55.9	—	6.1	215.8	2.40
Total	3971	15.4	1067.8	1266.6	31.0	31.0	3391.4	

Appropriation: Milcon

1979	—	—	—	.3	—	—	.7	9.31
TOTAL	4023	15.4	1067.8	1553.2	31.0	31.0	3781.3	

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Harpoon (84/A/C/D) December 1986

d. Obligations and Expenditures

Fiscal Year	Then-Year Dollars (Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1970	5.1	5.1	5.1
1971	19.3	18.9	18.9
1972	42.3	42.3	42.3
1973	71.8	71.8	71.7
1974	92.0	91.9	91.8
1975	69.1	69.1	68.7
1976	19.7	19.7	18.7
1979	1.5	1.5	1.5
1987	18.9	1.1	-
1988	32.5	-	-
1989	17.0	-	-
Total	389.2	321.4	316.7

Appropriation: Procurement			
1975	82.4	82.4	82.2
1976	133.3	133.2	130.8
1977	43.9	43.9	43.9
1977	150.8	150.8	148.4
1978	139.2	139.1	136.5
1979	137.4	137.4	134.3
1980	147.4	145.2	145.2
1981	216.8	216.8	209.9
1982	229.6	227.2	199.2
1983	232.3	230.8	191.0
1984	291.1	287.6	232.6
1985	294.3	262.8	164.6
1986	287.5	237.6	63.4
1987	135.7	-	-
To Complete	869.7	-	-
Total	3391.4	2294.8	1882.2

Appropriation: Milcon			
1979	.7	.7	.7
TOTAL	.7	.7	.7

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Harpoon ((84A/C/D) December 31, 1986

17. Production Rate Data:

- a. Annual Production Rates: (NOTE: Maximum rate is attainable only with additional customer participation.)

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Original Production Estimate	Current Estimate	Economic Maximum
1986	NA	Note 1	347	660
1987			96	660
1988			124	660
1989			138	
1990			188	
1991			181	
1992			255	

*Note 1 - Original SAR production estimate after Mileston III extended only to 1981.

- b. Cost Variance (NOTE: Subject to the limitations on production rate above)

ITEM	PRODUCTION ESTIMATE	VARIANCE CE LESS PdE	CURRENT ESTIMATE	VARIANCE (CE LESS MAX)	MAXIMUM ECONOMIC
PROGR. ACQ COST (BY \$)	795.0	758.2	1553.2	69.8	1483.4
(TY \$)	1031.8	2749.5	3781.3	311.7	3469.6
PAUC (BY \$)	.272	.114	.386	.017	.369
(TY \$)	.353	587.0	.940	.078	.862

- c. Schedule (NOTE: Subject to the limitations on production rates above)
(Data based on Procurement Year 1985 Thru 1991)

	PRODUCTION ESTIMATE	VARIANCE (DE VS PdE)	CURRENT ESTIMATE	VARIANCE (CE VS MAX)	MAXIMUM
START DATE (MO/YR)	N/A	NONE	8/86	N/A	8/86
DURATION (IN MONTHS)	N/A	NONE	84	+49	35
END DATE (MO/YR)	N/A	NONE	7/93	N/A	4/89

- d. Deliveries (Plan/Actual) - -

RDT&E
Procurement

To Date
52/52
2431/2446

18. Operating and Support Costs: NA

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)

PROGRAM: LAMPS MK III

AS OF DATE: December 31, 1986

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DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (OASD-PA)
 DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): Light Airborne Multi-Purpose System (LAMPS MK III)

2. DoD Component: U.S. Navy

3. Responsible Office and Telephone Number:

Light Airborne Multi-Purpose System
 Project Office
 Naval Air Systems Command
 Washington, D.C. 20361

PM: Capt R.G. Harrison
 Assigned: May 23, 1984
 AV 286-1534; COMM (202)746-1534

4. Program Elements/Procurement Line Items:

ROD&E,N: PE 64212N Project W1707 (Shared funding)

PROCUREMENT: APPN 1506 ICN 0180 PE 24243N, PE 24262N (No shared funding)
 APPN 1810 ICN 4255 PE 24243N (No shared funding)

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5. (U) Related Programs: Army UH-60A BLACK HAWK; Army EH-60A Quickfix; Air Force HH-60A NIGHT HAWK combat SAR Helicopter; Kidd Class Guided Missile Destroyer (DDG-993 Class); Arleigh Burke Class Guided Missile Destroyer (DDG-51 Class); Perry Class Guided Missile Frigate (FFG-7 Class); Spruance Class Destroyer (DD-693 Class); Ticonderoga Class Aegis Cruiser (CG-47 Class); Tactical Towed Array Sonar (TACTAS) AN/SQR-19; Penguin Missile Program; Aircraft Carrier Inner Zone Anti-Submarine Warfare Helo (SH-60F); Helicopter combat Support (HCS)/Coast Guard Medium Range Discovery (MRR) Helo (HH-60)

6. (U) Mission and Description: The Light Airborne Multi-Purpose System (LAMPS MK III) is a computer integrated snip/helicopter system that increases the effectiveness of surface combatants. It is their main battery and is optimized for Anti-Submarine Warfare (ASW). Secondary missions include Anti-Ship Surveillance and Targeting (ASST), Search and Rescue (SAR), Medical Evacuation (MEDEVAC), Vertical Replenishment (VERTREP), and Communications Relay (COMM). Incorporation of Penguin air-to-surface missile launch capability will also allow LAMPS MK III to perform an Anti-Surface Warfare (ASUM) Mission. The ship provides sensor processing, command and control, integrates LAMPS MK III information gained with other sensors, and provides the landing and traversing system, visual landing aids, and maintenance and support facilities for the aircraft. The helicopter provides a remote platform for deployment of sonobuoys and an elevated platform for radar and Electronic Warfare Support Measures (ESM). LAMPS MK III supplements but does not replace any existing defense systems.

7. (U) Program Highlights:

a. Significant Historical Developments -- Development of the LAMPS Program was initiated in 1969 with the requirement for a manned helicopter aboard destroyer-class ships to enhance Anti-Submarine Warfare (ASW) and Anti-Ship Surveillance and Targeting (ASST). The Validation Phase was completed in December 1976. Authorization was granted at DSARC IIC, in February 1978, to proceed with Full Scale Development. The first flight of the SH-60B helicopter was conducted in December 1979, followed by a successful total weapon system demonstration in May 1980. Following the installation of LAMPS MK III ship equipments in USS MCINERNEY (FFG-8), weapon system testing at sea was successfully conducted. Provisional Approval for Service Use (PASU) was granted in September 1981 following a successful OPEVAL of the Helicopter Landing System (HLS) and exercise of the entire weapon system in various operational scenarios. A Secretary of Defense Decision Memorandum (SDDM) in November 1981 provided guidance to proceed with limited production and directed that specific goal and threshold parameters be addressed at DSARC III. ASU was granted for the HLS and the Sonar Signal Processing System (AN/SQQ-28) on June 25, 1982. PASU was granted for the LAMPS MK III Weapon System and the Radio Terminal set (AN/SRQ-4). DSARC Milestone III was conducted on June 29, 1982. A SDDM was issued on December 8, 1982, granting approval for production.

The baseline program estimated procurement of 204 aircraft over a four year period and procurement of 110 ship systems. The December 1982 SAR estimate extended the aircraft procurement to an eleven year period and reduced ship systems to 94. The December 1983 SAR estimate increased ship systems to 97. With the transfer of FFG-24 and FFG-26 to Naval Reserve and the addition of DDG-51 the current number of ship systems to be procured is 96.

The first production aircraft was delivered in September 1983, one month ahead of schedule. The first LAMPS MK III training squadron was established at Naval Air Station, North Island on January 21, 1983. Initial Operational Capability was achieved in July 1984.

A Chief of Naval Operations Executive Board (CEB) decision made in April 1984 will add an ASUM capability to the LAMPS MK III weapon system by incorporating the Norwegian manufactured PENGUIN anti-ship missile.

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7. (U) Program Highlights (Cont'd):

b. Significant Developments Since Last Report -- As of December 31, 1986, the Navy has accepted a total of 84 production SH-60B airframes, 75 full avionics populated SEAHAWKS, and 60 AN/SQQ-28s, 63 AN/SRQ-4s and 61 HLSs for ship installation. Based on current projections, LAMPS MK III is expected to fulfill all mission requirements. For SAR reporting purposes, the SRQ-4 and SQQ-28 were transferred to PMS-411 and are reported in SQQ-89.

c. Changes Since "As Of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches:

a. The program is approved in accordance with the December 8, 1982, SDDM.

b. The LAMPS MK III mission requirements are contained in DCP No. 85 of June 4, 1982, and were presented to the Office of the Secretary of Defense during the June 29, 1982, DSARC III presentation.

c. No technical thresholds have been breached. The funding thresholds reflected in the baseline program reported to Congress in the December 1981 Selected Acquisition Report (SAR) were breached as a result of extending the aircraft procurement from a four year profile (18-48-64-74) to an eleven year profile (18-27-21-18-18-18-18-18-18-12). FY 1984 Congressional action changed the eleven year profile to 18-27-21-24-18-18-18-18-18-6. The FY 1987 Congressional Budget changed the procurement estimate to a fourteen year profile (18-27-21-24-18-17-6-6-6-12-12-12-13). The Secretary of Defense Decision Memorandum of December 8, 1982, authorized the LAMPS MK III program to proceed with production in FY 1983. Decisions on the total procurement objective and annual phasing for the LAMPS MK III program will be examined at future program and budget reviews.

9. (U) Schedule:

a. Milestones --	Development Estimate/ Current	
	<u>Approved Program</u>	<u>Estimate</u>
Program Initiated (TSOR issued)	Feb 69/Feb 69	Feb 69
DSARC I/II	Jun 72/Jun 72	Jun 72
DSARC IIA	Jul 73/Jul 73	Jul 73
Select System Prime Contractor (Phase I System Integration)	Apr 74/Apr 74	Apr 74
DSARC IIB	May 76/May 76	May 76
Award Full Scale Development Sustaining Engineering Contracts (Prototype System)	Sep 77/Sep 77	Sep 77
DSARC IIC	Feb 78/Feb 78	Feb 78
First Prototype Aircraft Flight	N/A / N/A	Dec 79
First Prototype Aircraft Delivery	Nov 79/Nov 79	Jan 80
Complete Prototype Ship System Installation	Oct 80/Oct 80	Nov 80
Complete OT IIA, HLS OPEVAL	N/A / N/A	Jun 81
Program Review	Aug 81/Aug 81	Sep 81
Award Aircraft Pilot Production Contract	Oct 81/Oct 81	Oct 81
Complete Initial Operational Evaluation	Jan 82/Jan 82	Feb 82
Complete Initial Board of Inspection and Survey Trials	Jan 82/Jan 82	Sep 82
DSARC IIE	Apr 82/Jun 82	Jun 82
Award Full Scale Production Contracts	Oct 82/Oct 82	Dec 82
First Production Ship ASW System Delivery	Jul 83/Jul 83	Jun 83
First Pilot Production Aircraft Delivery	Oct 83/Oct 83	Sep 83
CEB Decision on PENGUIN Missile	Apr 84/Apr 84	Apr 84
Initial Operational Capability (IOC)	Jul 84/Jul 84	Jul 84
Navy Support Date (NSD)	Dec 87/Dec 87	Dec 87

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9. (U) Schedule (Cont'd):

b. Previous Change Explanations --

On September 22, 1981, a Program Review versus the planned DSARC IIIA was conducted on the LAMPS MK III Weapon System by the Under Secretary of Defense for Research and Engineering. Board of Inspection and Survey Initial Trials were delayed due to non-availability of aircraft and OPEVAL concurrency. Scope was reduced to eliminate duplications of test effort. DSARC III was completed on June 29, 1982.

c. Current Change Explanations -- None

d. References --

Development Estimate: DCP No. 85 dated March 5, 1979.

Approved Program: FY 88/89 President's Budget.

10. (U) Technical/Operational Characteristics:

a. (U) Technical --	Dev Estimate/ Appr Program	Demonstrated Performance	Current Estimate
(U) Weight (Lbs) (Maximum Gross)	20,829/N/A	21,884	21,884
(U) Dimensions			
(U) Length (Ft)			
Overall	64.8/N/A	64.8	64.8
Folded	41.1/N/A	41.1	41.1
(U) Width (Ft)			
Normal (W/O Main Rotor)	14.3/N/A	14.3	14.3
Folded	10.8/N/A	10.8	10.8
(U) Height (Ft)			
Normal	17.2/N/A	17.0	17.0 (Ch-1)
Folded	13.3/N/A	13.2	13.2 (Ch-1)

b. (U) Operational --

(U) System Performance

(U) Operate in Sea State	5/4	5	5
(U) Data Transfer Reliability (%)			
(b)(1)			
(U) Mission Reliability			
(b)(1)			
(U) Mean Flight Hours Between Failures			
SH-60B Seahawk (Air Vehicle Avionics)	2.0/1.5	4.9	2.3

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10. (U) Technical/Operational Characteristics (Cont'd):

b. (U) Operational (Cont'd) --	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
--------------------------------	---------------------------------------	-------------------------------------	-----------------------------

(U) Maintainability

*(U) Direct Maintenance

Man-Hours/Flight Hour

SH-60B SEAHAWK

(O-Level Total)

N/A/15.9

11.6

15.9

(U) Mean Time to Repair (Hrs)

(Elapsed Maintenance Time/
Maintenance Action)

Air Vehicle

1.0/2.0

1.3

2.0

Ship Electronics

1.5/1.5

1.5

2.0

(b)(1)

(Total System)

(U) Aircraft Performance

(b)(1)

c. (U) Previous Change Explanations --

The increase in aircraft maximum gross weight is the result of incorporating approved Engineering Change Proposals. The increase in Mean Flight Hours Between Failures SH-60B SEAHAWK is the result of performance improvements. The changes in Direct Maintenance Man-Hours/Flight Hour SH-60B SEAHAWK and Mean Time to Repair Air Vehicle are derived from maintenance statistics and indicate performance less than prior estimates. The Operational Availability (%) (Total System) is the current estimate of the DCP-85 mature system goal.

d. (U) Current Change Explanations --

(Ch-1) As reported in Naval Aviation Training Operational Procedures.

e. (U) References --

Development Estimate: DCP No. 85 dated March 5, 1979.Approved Program: FY 88/89 President's Budget.

^{1/}(o) represents results obtained during operational testing. (d) represents results obtained during developmental testing.

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11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Changes	Current Estimate
Development (RDT&E,N)	\$ 579.7	\$ -22.5	\$ 557.2
Procurement (Aircraft)	1482.8	+502.7	1985.5
Airframe & Changes	(342.1)	(+190.4)	(532.5)
Engine	(67.9)	(+50.9)	(98.8)
Electronics & Comm.	(399.6)	(-286.8)	(112.8)
Armament & Other GFE	(18.1)	(-5.2)	(12.9)
Weapon System Integration	(62.2)	(+460.5)	(522.7)
Total Flyaway	(889.9)	(+389.8)	(1279.7)
Peculiar Support Equip.	(169.9)	(-16.7)	(153.2)
Other Support Costs	(269.6)	(+92.4)	(362.0)
Total Support	(439.5)	(+75.7)	(515.2)
Initial Spares	(153.4)	(+37.3)	(190.7)
Procurement (Ship Systems)	325.2	-160.1	165.1
Equipment (OPN)			
Sailaway*	(124.4)	(-124.4)	(0.0)
Support	(40.3)	(+24.4)	(64.7)
Spares	(36.0)	(-33.6)	(2.4)
Total (OPN)	(200.7)	(-133.6)	(67.1)
Installation (O&MN)(FMP)**	(124.5)	(-26.5)	(98.0)
Construction (MILCON)	9.0	+3.3	12.3
Total FY 76 Base-Year \$	2396.7	+323.4	2720.1
Escalation	1510.9	+1561.8	3062.7
Development (RDT&E,N)	(142.1)	(+22.1)	(164.2)
Procurement	(1362.4)	(+1526.9)	(2889.3)
Construction (MILCON)	(6.4)	(+2.8)	(9.2)
Total Then-Year \$ ***	\$3907.6	\$+1875.2	\$5782.8

b. Quantities -- See page 6a for Aircraft and page 6b for Ship Systems.

c. Unit Cost -- See page 6a for Aircraft and page 6b for Ship Systems.

d. Approved Design to Cost Goal -- See page 6a for Aircraft and page 6b for Ship Systems.

e. Foreign Military Sales -- See page 6a for Aircraft and page 6b for Ship Systems.

f. Nuclear Costs -- See page 6a for Aircraft and page 6b for Ship Systems.

* Sailaway costs not applicable due to transference of SQQ-28 and SRQ-4 to PMS-411 for SAR reporting responsibilities.

** FMP - Fleet Modernization Program.

*** Excludes SCN costs of \$474.2M for 47 ship systems (20 FFG-7 class ships, 25 CG-47 class ships, and 2 Trainers). The applicable systems/costs are reported in the FFG-7, CG-47, and DDG-51 Selected Acquisition Reports. RDT&E,N costs of \$15.3M (included in PE 64212N, W1707) for the Penguin Missile are also excluded.

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11. (U) Program Acquisition Cost (Cont'd): (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Changes	Current Estimate
(1) Aircraft --			
Development (RDT&E,N)	\$ 527.2	\$ +16.8	\$ 544.0
Procurement	1482.8	+502.7	1985.5
Airframe & Changes	(342.1)	(+190.4)	(532.5)
Engine	(67.9)	(+30.9)	(98.8)
Electronics & Comm.	(399.6)	(-286.8)	(112.8)
Armament & Other GFE	(18.1)	(-5.2)	(12.9)
Weapon System Integration	(62.2)	(+460.5)	(522.7)
Total Flyaway	(889.9)	(+389.8)	(1279.7)
Peculiar Support Equip.	(169.9)	(-16.7)	(153.2)
Other Support Costs	(269.6)	(+92.6)	(362.0)
Total Support	(439.5)	(+75.7)	(515.2)
Initial Spares	(153.4)	(+37.3)	(190.7)
Construction (MILCON)	7.2	+2.6	9.8
Total FY 76 Base-Year \$	2017.2	+522.1	2539.3
Escalation	1222.3	+1660.2	2882.5
Development (RDT&E,N)	(131.8)	(+28.9)	(160.7)
Procurement	(1085.5)	(+1629.0)	(2714.5)
Construction (MILCON)	(5.0)	(+2.3)	(7.3)
Total Then-Year \$	\$3239.5	\$+2182.3	\$5421.8
b. Quantities --			
(1) Aircraft			
Development (RDT&E,N)	5	-	5
Procurement	204	-	204
Total	209	-	209
c. Unit Cost --			
(1) Aircraft			
Procurement:			
FY 76 Base-Year \$	\$7.3	\$+2.4	\$9.7
Then-Year \$	12.6	+10.4	23.0
Program:			
FY 76 Base-Year \$	9.7	+2.4	12.1
Then-Year \$	\$15.5	\$+10.4	\$25.9
d. Approved Design to Cost Goal --			
(1) Aircraft			
	(Average Unit Flyaway Cost)		
	Dev Estimate/ Appr Program	Current Estimate	Latest Approved Threshold
@ Qty: 204			
@ Peak Rate: 5/mo			
FY 76 Base-Year \$	4.4/N/A	6.3	N/A
Then-Year \$	7.6/N/A	15.0	N/A
e. Foreign Military Sales -- Spanish Letter of Offer and Acceptance was signed January 15, 1985, for an estimated total cost of \$173.4M for the purchase of six (6) LAMPS MK III helicopters and associated spares, support equipment, and services.			
f. Nuclear Cost -- None.			

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11. (U) Program Acquisition Cost (Cont'd): (Current Estimate in Millions of Dollars)

a. Cost --	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
(2) Ship Systems --			
Development (RDT&E,N)	\$ 52.5	\$ -59.3	\$ 13.2
Procurement (Ship Systems)	325.2	-160.1	165.1
Equipment (OPN)			
Sailaway*	(124.4)	(-124.4)	(0.0)
Support**	(40.3)	(+24.4)	(64.7)
Spares	(36.0)	(-33.6)	(2.4)
Total (OPN)	(200.7)	(-133.6)	(67.1)
Installation (O&MN)(FMP)***	(124.5)	(-26.5)	(98.0)
Construction (MILCON)	1.8	+0.7	2.5
Total FY 76 Base-Year \$	379.5	-198.7	180.8
Escalation	288.6	-108.4	180.2
Development (RDT&E,N)	(10.3)	(-6.8)	(3.5)
Procurement	(276.9)	(-102.1)	(174.8)
Construction (MILCON)	(1.4)	(+0.5)	(1.9)
Total Then-Year \$	\$ 668.1	\$ -307.1	\$ 361.0
b. Quantities --			
(2) Ship Systems			
Development (RDT&E,N)	3	-3	N/A
Procurement	58	-53	N/A
Total	61	-61	N/A
c. Unit Cost --			
(2) Ship Systems			
Procurement:			
FY 76 Base-Year \$	N/A	N/A	N/A
Then-Year \$	N/A	N/A	N/A
Program:			
FY 76 Base-Year \$	N/A	N/A	N/A
Then-Year \$	N/A	N/A	N/A

d. Approved Design to Cost Goal --

(2) Ship Systems - Not Applicable.

e. Foreign Military Sales -- Four (4) Helicopter Landing System (HLS) at approximately \$6.5M are being procured under a separate Spanish FMS case. The Australian government has purchased six (6) HLS at approximately \$9.1M through FMS.

f. Nuclear Cost -- None.

* Sailaway costs no longer applicable due to the transfer of SRQ-4 and SQQ-28 SAR reporting responsibilities to PMS-411. Quantities no longer applicable.

** Includes trainers and HLS costs.

*** FMP - Fleet Modernization Program.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
 (Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	SAR Current	UCR Baseline	UCR Baseline
(Aircraft)	Estimate	Estimate	Estimate
	(Dec 86)	(Dec 85)	(Dec 86)
a. Program Acquisition --			
(1) Cost	5421.8	5385.8	5421.8
(2) Quantity	209	209	209
(3) Unit Cost	25.9	25.8	25.9
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
	APPM ACT	APPM ACT	
(1) Cost	225.2	225.2	143.6
Less CY Adv Proc	-20.7	-20.7	-26.3
Plus PY Adv Proc	+48.3	+48.3	+20.7
Net Total	252.8	252.8	138.0
(2) Quantity	17	17	6
(3) Unit Cost	14.9	14.9	23.0

	Current Year		Budget Year
	SAR Current	UCR Baseline	UCR Baseline
(Ship Systems)	Estimate	Estimate	Estimate
	(Dec 86)	(Dec 85)	(Dec 86)
a. Program Acquisition --			
(1) Cost	361.0	948.1	N/A
(2) Quantity	N/A	53	N/A
(3) Unit Cost	N/A	17.9	N/A
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
	APPM ACT	APPM ACT	
(1) Cost	54.1	54.1	36.9
Less CY Adv Proc	N/A	N/A	N/A
Plus PY Adv Proc	N/A	N/A	N/A
Net Total	54.1	54.1	36.9
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

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13. (U) Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RD&E, N	PROC	MILCON	TOTAL
Development Estimate	721.8	3170.4	15.4	3907.6
Previous Changes:				
Economic	+23.2	-237.0	+1.1	-212.7
Quantity	-	-228.9	-	-228.9
Schedule	-	+1566.4	-	+1566.4
Engineering	+92.3	+167.0	-	+259.3
Estimating	-72.2	\$552.9	+5.0	+485.7
Other	-	-	-	-
Support	+1.6	+554.9	-	+556.5
Subtotal	+44.9	+2375.3	+6.1	+2426.3
Current Changes:				
Economic	-0.5	-46.6	-	-47.1
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+46.0	-	+46.0
Estimating	-44.8	-209.7	-	-254.5
Other	-	-	-	-
Support	-	-295.5	-	-295.5
Subtotal	-45.3	-505.8	-	-551.1
Total Changes	-0.4	+1869.5	+6.1	+1875.2
Current Estimate	721.4	5039.9	21.5	5782.8

(FY 1976 Constant (Base-Year) Dollars in Millions)

	RD&E, N	PROC	MILCON	TOTAL
Development Estimate	579.7	1808.0	9.0	2396.7
Previous Changes:				
Quantity	-	-119.8	-	-119.8
Schedule	-	+199.3	-	+199.3
Engineering	+44.0	+53.3	-	97.3
Estimating	-29.1	+305.7	+3.3	+279.9
Other	-	-	-	-
Support	+1.2	+122.4	-	+123.6
Subtotal	+16.1	+560.9	+3.3	+580.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+15.3	-	+15.3
Estimating	-38.6	-89.5	-	-128.1
Other	-	-	-	-
Support	-	-144.1	-	-144.1
Subtotal	-38.6	-218.3	-	-256.9
Total Changes	-22.5	+342.6	+3.3	+323.4
Current Estimate	557.2	2150.6	12.3	2720.1

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13. (U) Cost Variance Analysis (Cont'd):

b. Previous Change Explanations --

ROD&E.N

Economic: revised escalation indices

Estimating: reconfiguration of test and evaluation ship and addition of
Preplanned Product Improvement (PPI) programSupport: cost change to fund tasks directed by Office of the Secretary of
Defense relating to availability.Procurement

Economic: revised escalation indices

Quantity: deletion of fourteen (14) FFG class ships from LAMPS MK III backfit
program (OPN/O&MN(FMP))Schedule: revised aircraft procurement production schedules (APN) and ship
installation schedules; revised procurement schedule: SQQ-28 slipped
buy; SRQ-4 accelerated buy; HLS accelerated buy (OPN/O&MN(FMP))Engineering: design engineering for production tooling; engineering testing;
and production impact of development-derived improvements to the
aircraft, avionics, and engine; incorporation of an approved ECP
matrix (APN)Estimating: impact of projected change in Army's BLACK HAWK procurement plan
and refinement of estimates to reflect contract actuals (APN)
and refinement of ship electronics and HLS procurement and
installation cost estimates (OPN/O&MN(FMP))Support: refinement of support requirements, equipment, and spares to support
revised aircraft procurement schedules and to reflect contract actuals
(APN) and refinement of support and spares to support revised ship
procurement schedules (OPN)MILCON

Economic: revised escalation indices

Estimating: refinement of requirements for Applied Instruction Building and
Operational/Maintenance Trainer Building

c. Current Change Explanations --

		(Dollars in Millions)	
		Base-Year	Then-Year
(1)	<u>ROD&E.N</u>		
	Revised escalation indices. (Economic)	N/A	-0.5
	Refinement of estimate of Preplanned Product Improvement Program; transfer of SQQ-28 and SRQ-4 to PMS 411 for SAR reporting responsibilities (Estimating)	(11.1) (-49.7) -38.6	(12.9) (-57.7) -44.8
(2)	<u>Procurement</u>		
	(a) APN		
	Revised escalation indices. (Economic)	N/A	-43.8
	ECPs required revision of Block II Upgrade (Engineering)	+15.3	+46.0
	Refinement of prior estimates based on additional procurement cost history (includes impact of six (6) Spanish FMS aircraft); refinement of prior year controls (Estimating)	+4.7	-14.8
	Reconciliation of program support requirement based on more accurate cost history. (Support)	+19.0	+36.2

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13. (U) Cost Variance Analysis (Cont'd):

c. Current Change Explanations (Cont'd) --

		(Dollars in Millions)	
		Base-Year	Then-Year
(b) OPN			
Revised procurement schedule, refinement of		(-44.3)	(-90.0)
support equipment and spares; transfer of		(-118.8)	(-241.7)
SOQ-28 and SRQ-4 to PMS 411 for SAR reporting			
and responsibilities (Support)		-163.1	-331.7
(c) O&MN			
Revised escalation indices. (Economic)		N/A	-2.8
Refinement of prior estimates. (see support			
change in OPN) (Estimating)		5.8	12.0
Transfer of SOQ-28 and SRQ-4 (Estimating)		-100.0	-206.9
(3) MILCON - Not Applicable			

d. References --

Development Estimate: DCP No. 85 dated March 5, 1979.

Approved Program: FY 88/89 President's Budget.

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of (Then-Year Dollars))

a. Initial SAR Estimate to Current Baseline Estimate --

(1) Aircraft

PAUC (Initial SAR Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
15.5	--	--	--	--	--	--	--	--	15.5

b. Current Baseline Estimate to Current Estimate --

(1) Aircraft

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
15.5	-1.0	--	+7.6	+1.5	-0.2	--	+2.5	+10.4	25.9

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15. (U) Contract Information: (Then-Year Dollars in Millions)

a. RDT&E, N -- Not Applicable.

b. Procurement

	<u>System Integrator:</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty.</u>
1.	IBM Corporation, Owego, NY, N00019-83-C-0368, Lot IV, FFP, Award: March 14, 1984 Definitized: January 28, 1985	\$134.0	N/A	24

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$134.0	N/A	24	\$139.5	\$139.5

Cost/schedule variance is not applicable to firm fixed price contract. The current estimates at completion include anticipated engineering change proposals.

	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
2. IBM Corporation, Owego, NY, N00019-84-C-0377, Lot V, FFP, Award: March 22, 1985 Definitized: May 21, 1986	\$109.1	N/A	18

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$110.3	N/A	18	\$116.0	\$116.0

Cost/schedule variance is not applicable to firm fixed price contract. The current estimates at completion include anticipated engineering change proposals.

	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
3. IBM Corporation, Owego, NY, N00019-85-C-0403, Lot VI, FFP, Award: February 1986 Definitized: N/A	\$ 78.0	N/A	17

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
N/A	N/A	17	N/A	N/A

Cost/schedule variance is not applicable to firm fixed price contract.

15. FOI Contract Information (Cont'd): (Then-Year Dollars in Millions)

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
1. <u>Airframe:</u> Sikorsky Aircraft Division, Stratford, CT, N00019-83-C-0297, Lot IV, FFP, Award: March 12, 1984 Definitized: November 8, 1984	\$112.2	N/A	18

	Current Contract Price			Estimated Price At Completion	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
	\$112.2	N/A	18	\$118.5	\$118.5

Cost/schedule variance is not applicable to firm fixed price contract. The current estimates at completion include anticipated engineering change proposals.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
2. Sikorsky Aircraft Division, Stratford, CT, N00019-84-C-0352, Lot V, FFP, Award: January 22, 1985 Definitized: August 25, 1986	\$ 81.7	N/A	18

	Current Contract Price			Estimated Price At Completion	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
	\$ 81.7	N/A	18	\$ 87.4	\$ 87.4

Cost/schedule variance is not applicable to firm fixed price contract. The current estimates at completion include anticipated engineering change proposals.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
3. Sikorsky Aircraft Division, Stratford, CT, N00019-85-C-0444, Lot VI, FFP, Award: February 1986 Definitized: N/A	\$ 86.4	N/A	17

	Current Contract Price			Estimated Price At Completion	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
	N/A	N/A	17	N/A	N/A

Cost/schedule variance is not applicable to firm fixed price contract.

15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

c. MILCON -- Not Applicable.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 65.5% (19 yrs/29 yrs)

(2) Percent Program Cost Appropriated: 67.1% (\$3880.4/\$5782.8)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY69-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance To Complete FYDP (FY89-92)</u>	<u>Balance To Complete Beyond FYDP (FY93-97)</u>	<u>Total</u>
RDT&E,N	710.1	4.0	7.3	-	721.4
PROCUREMENT	3148.8	171.8	903.7	815.6	5039.9
MILCON	<u>21.5</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>21.5</u>
Total	3880.4	175.8	911.0	815.6	5782.8
(Aircraft)					(5421.8)
(Ship Systems)					(361.0)

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

Annual Summary --

Program: Lamps MK III

Fiscal Year	Qty	FY 76 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total			Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E M3/								
1976				0.8			0.8	
1977				2.0			2.0	
1978				2.4			2.4	
1979				22.7			22.7	
1980				18.6			18.6	
1981				9.5			9.5	
1982				16.1			16.1	
1983				20.9			20.9	
1984				3.1			3.1	2.9
1985				60.6			60.1	2.6
1986				106.3			124.9	6.8
1987				67.1			67.0	8.4
1988				114.0			153.4	10.5
1989				58.7			91.8	10.6
1990				39.7			65.3	7.6
1991				4.8			4.3	4.9
1992				0.8			1.4	3.8
1993				0.0			0.0	3.4
1994				0.9			0.7	2.9
1995				1.0			1.2	3.1
1996				2.0			4.0	3.5
1997				1.0			2.0	3.5
1998				0.5			1.1	3.3
1999				0.9			7.0	2.9
2000				1.0			2.2	2.4
TOTAL SA/C, BS/C ²				557.2			721.4	

Appropriation: APN								
1981				52.2	182.8		103.8	11.6
1982	18	40.7	200.0	347.3	126.6	105.8	697.8	14.3
1983	27	8.0	160.4	361.2	56.4	82.6	766.2	9.0
1984	21	.2	121.6	223.8	58.8	100.4	496.4	8.0
1985	24	6.7	121.3	182.4	57.8	58.8	415.2	3.4
1986	18	1.3	85.4	113.2	48.3	50.8	268.6	2.9
1987	17	0.1	84.3	92.0	20.7	48.3	225.2	3.1
1988	6		29.8	56.7	26.3	21.7	143.6	3.5
1989	3		29.5	47.3	20.2	28.3	121.5	3.5
1990	3	10.5	31.9	68.9	33.1	20.9	121.3	3.3
1991	12	1.1	62.9	88.8	22.1	33.1	243.6	2.9
1992	12		62.6	81.3	32.8	32.1	228.2	2.4
1993	12		61.7	76.8	33.7	32.8	220.9	2.4
1994	2		61.5	76.5	35.1	33.7	225.2	2.4
1995	13	10.1	86.0	99.0		35.1	297.6	2.4
1996				11.7			36.0	2.4
1997				11.4			35.9	2.4
TOTAL	204	79.6	1199.0	1985.5	686.4	686.4	4700.0	

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	FY 76 Base-Year Dollars				Then-Year Dollars			Escl Rate (%)
	Sailaway			Total	Advance Proc		Total	
	Qty	Nonrec	Rec		Debit	Credit		

Appropriation: OPN ^{3/}

1982				10.3			18.1	7.6
1983				13.9			25.5	4.9
1984				9.0			17.0	3.8
1985				9.4			18.2	3.4
1986				9.1			18.2	2.9
1987				5.5			11.5	3.1
1988				4.0			8.5	3.5
1989				1.0			2.3	3.5
1990				4.9			11.0	3.3
1991				0.0			.1	2.9
1992				0.0			.1	2.4
Subtotal				67.1			130.6	

Appropriation: O&MN (FMP) ^{3/}

1984	1			.7			1.2	3.8
1985	7			8.1			15.4	3.4
1986	4			8.4			16.5	2.9
1987	6			16.3			33.0	3.1
1988	4			9.4			19.6	3.5
1989	7			13.2			28.4	3.5
1990	7			16.9			37.7	3.3
1991	8			15.8			36.0	2.9
1992	5			9.2			21.5	2.4
Subtotal	50			98.0			209.3	

Appropriation: MILCOM

1982				7.3			12.5	7.6
1983				5.0			9.0	4.9
Subtotal				12.3			21.5	
Total				2720.1			5782.8	
(Aircraft)				(2539.3)			(5421.8)	
(Ship Systems)				(180.8)			(361.0)	

- 1/ Excludes RDT&E,N costs for the Penguin missile, SRQ-4 and SQQ-28.
 2/ Includes 5 aircraft and 3 ship systems which were incrementally funded with no annual procurement quantities identified.
 3/ Excludes cost for SRQ-4 and SQQ-28.

16. (U) Program Funding Summary (Cont'd):

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: ROT&E, N --			
1969	0.8	0.8	0.8
1970	3.0	3.0	3.0
1971	5.4	5.4	5.4
1972	22.7	22.7	22.7
1973	18.6	18.6	18.6
1974	9.5	9.5	9.5
1975	16.1	16.1	16.1
1976	20.9	20.9	20.9
1977	3.3	3.3	3.3
1978	66.1	66.1	66.1
1979	124.9	124.9	124.9
1980	87.0	87.0	87.0
1981	163.4	163.4	163.4
1982	91.8	91.8	91.8
1983	55.3	55.3	55.3
1984	8.3	8.3	8.3
1985	1.4	1.3	1.2
1986	0.0	0.0	0.0
1987	1.7	1.7	0.0
1988	1.9	0.0	0.0
To Complete	11.3	N/A	N/A
Total	725.4	708.1	706.3

Appropriation: APN

1981	103.8	104.4	109.2
1982	697.8	704.8	554.7
1983	766.2	735.9	581.2
1984	496.4	496.2	367.4
1985	416.2	406.6	232.9
1986	268.6	219.7	27.0
1987	225.2	20.4	0.0
To Complete	1725.8	N/A	N/A
Total	4700.0	2688.0	2082.4

Appropriation: OPM 2/

1982	18.1	13.5	11.7
1983	25.5	17.8	14.0
1984	17.0	15.3	8.1
1985	18.2	13.5	4.6
1986	18.2	9.7	.6
1987	11.5	.1	0.0
To Complete	22.1	N/A	N/A
Total	130.6	69.9	39.0

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16. (U) Program Funding Summary (Cont'd):d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: O&MN (FMP) ^{3/}			
1984	1.2		
1985	15.4		
1986	16.5		
1987	33.0		
To Complete	142.2		
Total	209.3		

Appropriation: MILCON

1982	12.5	12.1	12.1
1983	9.0	7.5	7.2
Total	21.5	19.6	19.3

1/ Note: Excludes SRQ-4 and SQQ-28 and \$47.0M for Penguin Missile.

2/ Excludes costs for SRQ-4 and SQQ-28.

3/ Ship alterations are done on a per ship basis. Obligations and expenditures are not broken out by weapon system. Excludes costs for SRQ-4 and SQQ-28.

17. (U) Production Rate Data:a. Annual Production Rates -- The maximum economic production rate is the combination of SH-60B/SH-60F.

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1982	16	16	18	60
1983	48	48	27	60
1984	48	48	21	60
1985	48	48	24	60
1986	44	44	18	60
1987			17	60
1988			6	60
1989			2	60
1990			6	60
1991			12	60
1992			12	60
1993			12	60
1994			12	60
1995			13	60

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17. (U) Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Estimate*	Variance (CE less PdE)*	Current Estimate	Variance (CE less Max)	Maximum
Prog Acc Cost (BY \$)	2017.2	+522.1	2539.3	+149.3	2391.0
(TY \$)	3239.5	+2182.3	5421.8	+742.3	4679.5
PAUC (BY \$)	9.7	+2.4	12.1	+0.7	11.4
(TY \$)	15.5	+10.4	25.9	+3.5	22.4

* Development Estimate used.

c. Schedule Variance --

	Production Estimate*	Variance (CE vs PdE)*	Current Estimate	Variance (CE vs Max)	Maximum
Start Date (Mo/Yr)	10/83	N/A	10/83	N/A	10/83
Duration (in Months)	59	109	168	127	41
End Date (Mo/Yr)	3/88	N/A	9/97	N/A	2/87

* Development Estimate used.

d. Deliveries (Plan/Actual) --

Aircraft:	To Date
RD&E, N	5/5
Procurement	72/76

Ship Systems:	To Date
RD&E, N	3/3
Procurement	28/28**

** OPN ship systems only.

18. (U) Operating and Support Costs: Not Reported.

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PROGRAM: AGM-65D & AGM-65G

AS OF DATE: December 31, 1986

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FOR OPEN PUBLICATION
AS AMENDED

FEB 11 1987 18

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (DASS-F)
DEPARTMENT OF DEFENSE

1. Designation/Nomenclature (Popular Name): AGM-65D & G/IR Maverick
2. DoD Component: U.S. Air Force
3. Responsible Office and Telephone Number:

Maverick Program Office
Aeronautical Systems Division
Wright-Patterson AFB, OH 45433

Col R. Shearer
Assigned: April 1, 1986
AV 785-2417; COMM (513) 255-2417

4. Program Elements:

RDT&E: PE 64608F
PROCUREMENT: PE 27313F APPN 3020 ICN M65DAG

5. (U) Related Programs: IR GBU-15 (V)/B Cruciform Wing Weapon
F-4D/E, A-7D, A-10A, F-16, F-15E, F-4G
NAVY IR Maverick (AGM-65F), USMC Laser
Maverick (AGM-65E)

6. (U) Mission and Description:

The AGM-65D is a rocket propelled, air-to-surface precision guided missile that develops tracking signals from the naturally occurring thermal energy of the target. It is designed to destroy small hard tactical targets during day or night even under limited adverse weather conditions in the counter-air, interdiction, and close air support operations of the tactical air

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forces. The AGM-65D will be compatible with F-4D/E, A-7D, A-10A, F-16, F-15E and F-4G aircraft. It will increase the capability of the Maverick Weapon System by providing a day or night launch and leave mission capability and complements the capabilities of the AGM-65A and B missiles. It does not replace any existing Air Force missile system. The AGM-65G, the Maverick Alternate Warhead Missile, contains the same guidance and control hardware and is designed to destroy specific hardened targets.

7. (U) Program Highlights :

a. (U) Significant Historical Developments - The IR Maverick Development Estimate assumed start of engineering development in April 1977. Congress denied FY78 funding for IR Maverick with direction to use FY77 funds for additional advanced development and testing of an IR Centroid Tracker. Extensive captive flight tests were completed at Fort Polk, Louisiana and in Germany in 1977 and 1978. Engineering development was initiated in October 1978. The IR Maverick Preliminary Design Review was in June 1979 and the Critical Design Review was conducted in June 1980. The DT&E/IOT&E for the AGM-65D began in early FY81 and concluded in August 1982. During this test program, 334 captive missions and 26 actual launches were accomplished. Of the 26 firings, 20 were direct hits. AFOTEC IOT&E results were reported during the September 1982 AFSARC/OSD Review cycle. Operational Effectiveness was reported as satisfactory and Operational Suitability as deficient. OSD directed the production of 200 missiles with FY82 funds. The next OSD Review, held in April 1983, approved the FY83 buy of 900 missiles. Test data from the Reliability Maintainability Validation Program (RMVP) presented at this review showed a favorable improvement in reliability.

Part 1 of FOT&E took place at Eglin AFB from May-Oct 1984 and consisted of captive carry and launch missions with F-111F and F-16 aircraft. A total of 220.3 captive carry hours were recorded along with 17 missile launches. Part 2 consisted of 211.6 captive carry hours (no launches) with the emphasis on target acquisition and delivery aircraft survivability.

Phase I, Part 3 of FOT&E concluded on the 6 Sep 85. Twelve launches of the post-ECP 604 producibility version of the IR Maverick were completed at Nellis AFB from A-10 launch aircraft against a variety of targets. This was an AFOTEC piggy-back test effort with TAC FOT&E Phase II. Out of 12 launches, 11 direct hits were accomplished.

The TAC Phase II of FOT&E was conducted on 20 Nov 85 with 13 hits for 13 launches.

The eighth launch on 4 Dec 85 set in motion the final efforts to award the production option to Raytheon for 800 missiles scheduled for delivery from May 1987 through Nov 1988.

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7. Program highlights (Cont'd):

(b) (U) - Significant Developments Since Last Report

Test data presented at the April 83 OSD Review is reflected in our Production Reliability Acceptance Tests (PRAT) which are conducted on at least three production units every month. Data from the PRAT shows we are far exceeding the design specification and TAC requirement of 36 hours Mean Time Between Failures (MTBF). Cumulative data from 19 PRAT lots demonstrates that we have an MTBF of more than 110 hours.

Following a March 86 DSARC (Joint Review Management Board--JRMB) review, the Maverick program was given a full production decision.

IOC was attained in Feb 86 with activation of an A-10 squadron with IR Mavericks at RAF Bentwaters, United Kingdom.

From July 1986 through December 1986 the AGM-65D was fired during operational training and LANTIRN testing with a very high success rate. As of 1 Dec 86, the AGM-65D has recorded 28 consecutive direct hits which brings the total to 106 hits for 123 AGM-65D missiles fired to date (86% success rate).

The AGM-65G captive flight test program was completed on 17 Oct 86. This successful program paved the way for the five live QT&E launches scheduled for the Spring of 1987.

Hughes Aircraft Company delivered 2332 missiles and 85 spare guidance sections through 31 Dec 86. Three Quality Disassembly Inspections were held with only 3 significant findings, none of which would be expected to impact performance or reliability.

The new Hughes guidance and control manufacturing facility in La Grange, GA started guidance section deliveries in July 86 with GBU-15 deliveries. The first Maverick guidance and control units were built in Nov 86.

The Raytheon QT&E efforts have produced 10 AGM-65D launches with 8 hits. The last of these shots was conducted on 17 Mar 86.

A Subsequent Application Review was held at Raytheon, Bristol, TN on the production contract C/SCSC system in September 1986. The system was found to be satisfactory.

The IR Maverick system will satisfy the mission requirements.

(c) (U) Change since "As Of" date - None

8. (U) Decision Coordinating Paper Threshold Breaches: DCP #154, 20 Sep 1976. IOC Threshold of Dec 81 was breached due to Congressional action on FY 1978 budget.

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9. (U) Schedule:

a. (U) Milestones

	<u>Dev Estimate/ Appr Program</u>	<u>Current Estimate</u>
DSARC II (JRMB)	Sep 76/Sep 76	Sep 76
Engineering Development Contract Award	Apr 77/Oct 78	Oct 78
DT&E/IOT&E Flight Tests Start	Nov 78/Jul 80	Jun 80
Demonstration Milestones	May 79/N/A	N/A
DSARC III A (JRMB) (Pilot Prod. Partial Release)	Jun 79/N/A	Mar 82
Complete DT&E/IOT&E	Jan 80/Sep 81	Aug 82
DSARC III B (JRMB) (Pilot Production Full Go-Ahead)	Mar 80/N/A	Sep 82
DSARC III (JRMB)	N/A / Sep 81	N/A
IOC	Jun 81/Dec 83	Feb 86
OSD Review (Reliability/Maintainability Review)	N/A / N/A	Apr 83
OSD Review (Full Production go-ahead)	N/A / N/A	Mar 86

b. (U) Previous Change Explanations:

The Engineering Development Contract Award date was changed to May 77 because of a Dec 76 PBD cut of \$16.2M in FY78 RDT&E funds. Again changed to Aug 77 because of OSD deferral of FY77 IR Maverick funds pending congressional action on the FY78 program. Further changed to Oct 78 because all FY78 funds were deleted and also because additional advance development and testing was required for the IR Centroid Tracker.

The DT&E/IOT&E Flight Tests Start Date was first changed to Apr 79 because of a Dec 76 PBD cut of \$16.2M in FY78 RDT&E funds. Further changed to Jul 80 because all FY78 funds were deleted and because additional advanced development and testing was required for the IR Centroid Tracker. Completed June 80.

Demonstration Milestones was first changed to Sep 79 because of a Dec 76 PBD cut of \$16.2M in FY78 RDT&E funds. Further changed to Dec 80 because all FY78 funds were deleted and because additional advanced development and testing was required for the IR Centroid Tracker. The need for Demonstration Milestones was deleted when DSARC III milestone was created.

DSARC III A (JRMB) was first changed to Apr 80 because of a Dec 76 PBD cut of \$16.2M in FY78 RDT&E funds. Changed to Jan 81 because all FY78 funds were deleted and because additional advanced development and testing was required for the IR Centroid Tracker. Late missile deliveries delayed DT&E completion and the need to reaccomplish winter site testing due to abnormally warm weather during Feb and Mar 81 tests precluded AFOTEC from completing IOT&E until Mar 82. Production decision milestones have been restructured to allow interim decision in Jan 82 to support FY82/490 missile pilot production start with a follow-on full scale production decision in May 82 after completion of DT&E/IOT&E testing. Combined into one DSARC III (JRMB) (Milestone 8) and deleted the need for Demonstration Milestones (Milestone 4). OSD Program Review on 2 Mar 82 changed AFSARC/DSARC (JRMB) decision points.

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b. (U) Previous Change Explanations (Cont'd):

The date of completion for DT&E/IOT&E was first changed to Jul 80 because of a Dec 76 PBD cut of \$16.2M in FY78 RDT&E funds. Changed to Jul 81 because all FY78 funds were deleted and because additional advanced development and testing was required for the IR Centroid Tracker. Delayed release of FY79 development funds and increased emphasis on operational testing precluded AFOTEC from completing IOT&E until Sep 81. Changed because DOD guidance and Program Management Directive, dated 21 Feb 80, recognized a delay in completion of IOT&E which will impact DSARC III (JRMB) IOC (Milestone 8 and 9 respectively). Late missile deliveries delayed DT&E completion and the need to reaccomplish winter site testing due to abnormally warm weather during Feb and Mar 81 tests precluded AFOTEC from completing IOT&E until Mar 82. Production decision milestones were restructured to allow interim decision in Jan 82 to support FY82/490 missile pilot production start with a follow-on full scale production decision in May 82 after completion of DT&E/IOT&E testing. Changed to accommodate delays encountered in completing DT&E/IOT&E due to limited test support resources. This milestone was accomplished in Aug 82.

DSARC III B (JRMB) was first changed to Dec 81 because of a Dec 76 PBD cut of \$16.2M in FY78 RDT&E funds. Late missile deliveries delayed DT&E completion and the need to reaccomplish winter site testing due to abnormally warm weather during Feb 80 and Mar 81 tests precluded AFOTEC from completing IOT&E until Mar 82. Changed to accommodate delays encountered in completing DT&E/IOT&E due to limited test support resources. OSD Program Review on 2 Mar 82 changed AFSARC/DSARC (JRMB) decision points. OSD Review occurred 21 Sep 82 and approved Pilot Production.

Late missile deliveries delayed DT&E completion and the need to reaccomplish winter site testing due to abnormally warm weather during Feb and Mar 1981 tests precluded AFOTEC from completing IOT&E until Mar 82. DSARC III (JRMB) was changed to accommodate delays encountered in completing DT&E/IOT&E due to limited test support resources. Revised by 29 Mar 82 OSD memorandum restructuring the program and establishing new program milestones. DSARC III (JRMB) was replaced by two-phased DSARC III A (JRMB)(Pilot Production) and DSARC III B (JRMB)(Pilot Production, Full Go-ahead).

The IOC was changed to Mar 83 because all FY78 funds were deleted and because additional advanced development and testing was required for the IR Centroid Tracker. Changed to accommodate temporary suspension of DT&E/IOT&E testing needed to correct missile problem identified at Ft. Drum winter testing. Due to production line shutdown and the resultant delay in shipment of hardware, the IOC was slipped from Apr 85 to Sep 85 and then again to Feb 86.

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b. (U) Previous Change Explanations (Cont'd):

The Reliability/Maintainability Review was accomplished on Apr 83.

The decision of the Apr 83 OSD Review was that the next review should not occur until completion of FOT&E, approximately Aug 85. The Full Production go-ahead slipped from Aug 85 to Mar 86 due to the impact of the production delays previously mentioned, the resulting slip in FOT&E, and a slower build-up of the production rate.

c. (U) Current Change Explanations -- None

d. (U) References --

Development Estimate: DCP 154, dated September 20, 1976, subject "Imaging Infrared Maverick Missile System."

Approved Program: Same as Development Estimate

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10. (U) Technical/Operational Characteristics:

a. (U) Technical	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance*</u>	<u>Current Estimate</u>
------------------	---------------------------------------	--------------------------------------	-----------------------------

(b)(1)

(U) Boresight Accuracy (mr)

4.0/4.0

4.0

4.0

b. (U) Operational

(b)(1)

e. (U) References --

Development Estimate: DCP 154, dated September 20, 1976, subject "Imaging Infrared Maverick Missile System."

Approved Program: Same as Development Estimate.

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11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	<u>Development Estimate (FY75-86)</u>	<u>Changes</u>	<u>Current Estimate (FY75-97)</u>
a. (U) Cost --			
Development (RDT&E)	\$ 100.0	+6.7	\$ 106.7
Procurement	895.1	+1575.3	2470.4
Total Flyaway	(792.1)	(+1507.0)	(2299.1)
Peculiar Support	(99.1)	(+13.2)	(112.3) 1/
Other Weapon System Cost	---		---
Initial Spares	(3.9)	(+54.6)	(56.7)
Construction (MILCON)	---		---
 Total Constant FY75 \$	 995.1	 +1582.0	 2577.1
 Escalation	 597.8	 +3908.8	 4506.6
Development (RDT&E)	(34.4)	(+26.9)	(61.3)
Procurement	(563.4)	(+3881.9)	(4445.3)
 Total Program Cost (TY\$)	 1592.9	 +5490.8	 7083.7

1/ Includes \$57.8 in recurring flyaway costs for 891 training missiles.

b. (U) Quantities --

Development (RDT&E)	35	-2	33
Procurement	31078	+29586	60664
Total	31113	+29584	60697

c. (U) Unit Cost --

Procurement:			
Constant FY75 \$	\$ 0.029	\$+ 0.012	\$ 0.041
Current (TY \$)	0.047	+ 0.067	0.114

Program:			
Constant FY75 \$	0.032	\$+ 0.010	0.042
Current (TY \$)	0.051	+ 0.066	0.117

d. (U) Approved Design to Cost Goal --

	<u>Dev Estimate/ Appr Program</u>	<u>(Average Unit Flyaway Cost) Current Estimate</u>	<u>Latest Approved Threshold</u>
Qty: 14740			
Peak rate: 500			
Constant FY 1975 \$	0.032/0.032	0.067	0.032
Current (TY \$)	0.050/0.072	0.165	0.050

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11. (U) Program Acquisition Cost (Cont'd):

- e. (U) Foreign Military Sales -- None
- f. (U) Nuclear Costs -- None

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Dec 86 SAR</u> <u>Estimate</u>	<u>Dec 85 SAR</u> <u>Baseline</u>	<u>Dec 86 SAR</u> <u>Estimate</u>
a. Program Acquisition			
(1) Cost	7083.7	5236.1	7083.7
(2) Quantity	60697	60697	60697
(3) Unit Cost	.117	.103	.117
b. Current Procurement--	(FY 1987)	(FY 1987)*	(FY 1988)
(1) Cost	375.3	375.3	363.7
Less CY Adv Proc	-	-	-
Plus FY Adv Proc	-	-	-
Net Total	375.3	375.3	363.7
(2) Quantity	2000	2000	2100
(3) Unit Cost	.188	.188	.173

* FY87 CPUC for baseline value has been adjusted to reflect FY87 Appropriation Act in accordance with congressional change to SAR law.

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13. (U) Cost Variance Analysis:

a. Summary---(Current (Then-Year) Dollars in Millions)

	RDT&E	PRDC	TOTAL
Development Estimate	✓ 134.4	✓ 1453.5	✓ 1587.9
Previous Changes			
Economic	+10.4	-73.0	- 62.6
Quantity	-1.1	+1564.4	+1563.3
Schedule	+18.6	+1137.6	+1156.2
Engineering	0.0	+30.0	+30.0
Estimating	-0.2	+1832.9	+1832.7
Other	0.0	0.0	0.0
Support	+5.9	+117.7	+123.6
Subtotal	+33.6	+4609.6	+4643.2
Current Changes			
Economic	0.0	- 108.1	- 108.1
Quantity	0.0	0.0	0.0
Schedule	0.0	+1208.1	+1208.1
Engineering	0.0	0.0	0.0
Estimating	0.0	-366.7	-366.7
Other	0.0	0.0	0.0
Support	0.0	+114.3	+114.3
Subtotal	0.0	+847.6	+847.6
Total Changes	+33.6	+5457.2	+5490.8
Current Estimate	✓ 168.0	6915.7	7083.7

13. (U) Cost Variance Analysis (Cont'd):

a. Summary--(FY1975 Constant Dollars (Base Year) In Millions)

	RDT&E	PROC	TOTAL
Development Estimate	100.0	895.1	995.1
Previous Changes			
Quantity	-0.7	+512.7	+512.0
Schedule	+6.4	+135.8	+142.2
Engineering	0.0	+10.6	+10.6
Estimating	-2.5	+650.9	+648.4
Other	0.0	0.0	0.0
Support	+3.5	+35.6	+39.1
Subtotal	+6.7	+1345.6	+1352.3
Current Changes			
Quantity	0.0	0.0	0.0
Schedule	0.0	+307.8	+307.8
Engineering	0.0	0.0	0.0
Estimating	0.0	-110.5	-110.5
Other	0.0	0.0	0.0
Support	0.0	+32.4	+32.4
Subtotal	0.0	+229.7	+229.7
Total Changes	+6.7	+1575.3	+1582.0
Current Estimate	106.7	2470.4	2577.1

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised Economic Escalation indices.
 Quantity: RDT&E change from 35 missiles to 33.
 Schedule: PBD changes, Congressional cancellation of FY78 funds.
 Estimating: Definitization of FSD Contract, restoration of IR test and second source, estimating offset for economic change due to change in prior year escalation, program amounts aligned to actual obligations in prior years, and completion of Rapid Fire II effort, and adjustment for impact of prior year inflation adjustments, and completion of Rapid Fire II effort, and adjustment for impact of prior years inflation.
 Support: Addition of initial support items.

13. (U) Cost Variance Analysis (Cont'd):

b. (U) Previous Change Explanations (Cont'd):

PROCUREMENT

Economic: Revised Economic Escalation Indices.
 Quantity: Procurement change from 31078 to 60664.
 Schedule: PBD changes, Congressional Cancellation of FY78 funds, realignment of buy quantities, slippage of production start from FY81 to FY82 and program restructure, net change(loss) in production efficiency due to rescheduling units to 1990 time frame due to funding cuts, program schedule extended one year due to amendment to FY85 PB, delay in missile procurement due to out-year budget cuts.

Engineering: Engineering change on 1800 units to modify them to AGM-65Gs, addition of VECF 718, rate of acceleration meter (ROAM) resulted in savings in hardware costs.

Estimating: Revised estimate from definitization of Segment I, revised estimate from DSARC III ICA, recategorization of containers from Support to Flyaway, reestimate of containers using contract settlement, reestimate of Value Engineering Royalties using contract settlement, 300 unit increase in Raytheon pilot production for FY86 and change in FY87 Competition assumptions estimate updated using contract proposal and Hughes productivity plan, adjustment for prior year escalation, one-time change resulting from correction to methodology for computing inflation on programs with advance procurement funding, cost impact to unit prices (production rate inefficiencies) and fixed costs (additional fiscal year buys) caused by schedule delays, budgeting reductions absorbed by ECO line, impact of prior year inflation adjustments.

Support: Deletion of FDT, addition of initial spares and support items, reestimate of training equipment, support equipment and data using Hughes Production Contract, recategorization of containers from Support to Flyaway, Plant 44 environmental clean-up, reduction of initial spares due to funding cuts contained in the amended FY85 P.B. and the FY86 P.B., reestimate of Support using contract settlements, reestimate of initial spares requirements, amount to be added to support to balance to proper mix, additional peculiar support equipment (depot work stations) for missile inventory build-up in FY88, additional data for second source.

c. (U) Current Change Explanations: (Dollars in Millions)

	<u>Base Year \$</u>	<u>Then Year \$</u>
(1) <u>RDT&E</u>	NONE	

13. (U) Cost Variance Analysis (Cont'd):c. (U) Current Change Explanations (Cont'd):(2) PROCUREMENT (Cont'd)

	<u>Base Year \$</u>	<u>Then Year \$</u>
Revised Economic Escalation Indices (Economic)	---	- 108.1
Schedule changes due to a Congressional budget reduction in FY87 and a four-year extension of the program. (Schedule)	+ 307.8	+1208.1
Change in estimate for multiyear assumptions. (Estimating)	- 156.2	- 478.4
Prior year inflation adjustment. (Flyaway) (Estimating)	+ 13.8	+ 34.2
Reestimation based on updated information. (Estimating)	+ 31.9	+ 77.5
Change in reporting of initial spares requirements to include replenishment spares. (Support)	+ 28.2	+ 101.8
Additional data needed due to extension of the program. (Support)	+ 2.9	+ 9.3
Prior Year Inflation Adjustment. spares. (Support)	+ 1.3	+ 3.2

d. (U) References --

Development Estimate: DCP 154, dated September 20, 1976, subject
"Imaging Infrared Maverick Missile System."

Approved Program: Same as Development Estimate.

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14. (U) Program Acquisition Unit Cost (PAUC) History:

Initial SAR Estimate to Current Estimate

Changes (Then-Year Dollars in Millions)									
PAUC Initial SAR Development Estimate	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	PAUC Current Estimate
.051	-.003	.001	.039	.000	.025	.004	.000	.066	.117

15. (U) Contract Information: (Dollars in Millions)

a. RDT&E - N/A

b. Procurement

NOTE: The Qualification portion of Raytheon contract F33657-83-C-2113 has been deleted per the 31 Dec 85 SAR.

Second Source Production:

Initial Contract Price

Target	Ceiling	Qty
\$150.1	\$166.6	800

Raytheon Co, Missile Systems Division
Bristol, TN, F33657-83-C-2113, FPIF(1st Production Option Only)
Award: January 1, 1986
Definitized: January 1, 1986

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
Target	Ceiling	Qty	Contractor	Program Manager
\$150.4	\$166.9	800	\$150.6	\$150.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance	\$ -	\$ -
Cumulative Variance to Date(26 Oct 86)	\$+2.8	\$+0.3
Net Change(After Correction)	\$+2.8	\$+0.3

Explanation of change: The cost variance is favorable due to delayed billings, payments and lower-than-planned manpower usage. The schedule variance is favorable due to early receipt of material. The target price increased due to contract modifications for a dome durability study (\$0.2M) and a change from Telemetry Missile to Tactical/Telemetry Missile. The program manager's estimate at completion is \$150.6.

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15. (U) Contract Information (Cont'd):

NOTE: Contract #F33657-83-C-2195 for Hughes Aircraft Company has been deleted. It is completed and was last reported on the Sept 86 UCR.

*Guided Missile Test Sets (GMTS):

Bendix Corporation	Initial Contract Price		
#F33657-81-C-2047, FFP	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Award: March 1, 1981	\$1.3	N/A	N/A
Definitized: March 1, 1981			

* Deleted, DoD FY87 authorization Act requires reporting on contracts of \$40M or greater. CPR data is not available on FFP contracts.

*Containers:

Plastics Research Corporation	Initial Contract Price		
#F33657-83-C-2063, FFP	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Award: August 30, 1983	\$0.2	N/A	7
Definitized: August 30, 1983			

* Deleted, DoD FY87 Authorization Act requires reporting on contracts of \$40M or greater. CPR data is not available on FFP contracts.

Follow on Production Segment 34:

Hughes Aircraft Company	Initial Contract Price		
#F33657-84-C-2220, FFP	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Award: March 29, 1985	\$269.9	N/A	1980
Definitized: March 29, 1985			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$277.6	N/A	1980	\$277.6	\$277.6

*CPR data is not available on FFP contracts.

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15. (U) Contract Information (Cont'd):

Hughes Aircraft Company *
 #F33657-85-C-0086, FFP
 Award: May 21, 1986
 Definitized: May 21, 1986

Initial Contract Price		
Target	Ceiling	Qty
\$450.2	N/A	2600

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$460.2	N/A	2600	\$460.2	\$460.2

*CPR data is not available on FFP contracts.

16. (U) Program Funding Summary: (Current Estimate in Millions of dollars)a. (U) Program Status--

(1) Percent Program Completed: 56.5% (13/23)

(2) Percent Program Cost Appropriated: 29.1% (\$2063.2/\$7083.7)

b. (U) Appropriation Summary --

Appropriation	(Then Year Dollars in Millions)					Total
	Current & Prior Years (FY75-87)	Budget Year (FY88)	Balance to Complete			
			FYDP (FY89-92)	Beyond FYDP (FY93-97)		
RD&E	\$ 460.2	\$ 1.7	\$ 0.0	\$ 0.0	\$ 461.9	
Procurement	\$ 1895.2	\$ 363.7	\$ 1441.2	\$ 3215.6	\$ 6915.7	
NELOO	\$ ---	\$ ---	\$ ---	\$ ---	\$ ---	
	<u>\$ 2063.2</u>	<u>\$ 363.7</u>	<u>\$ 1441.2</u>	<u>\$ 3215.6</u>	<u>\$ 7083.7</u>	

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16. (U) Program Funding Summary: (Current Estimate in Millions of dollars)

c. (U) Annual Summary --

FISCAL YEAR	QTY	FY75 BASE-YEAR DOLLARS			TOTAL	THEN-YEAR DOLLARS		ESCL RATE
		FLYAWAY		ADV PROCUREMENT		TOTAL		
		NONREG	REC				DEBIT		CREDIT

APPROPRIATION: RDT&E

1975	---	---	---	3.6	---	---	3.9	9.6
1976	---	---	---	3.7	---	---	4.3	9.6
1977	---	---	---	8.2	---	---	10.2	9.9
1978	---	---	---	---	---	---	---	7.4
1979	---	---	---	29.8	---	---	43.4	8.4
1980	---	---	---	30.6	---	---	49.5	9.4
1981	---	---	---	21.9	---	---	39.3	11.9
1982	---	---	---	6.1	---	---	11.6	9.2
1983	---	---	---	2.0	---	---	4.1	4.9
1984	---	---	---	0.8	---	---	1.7	3.8
SUBTTL	33	*	*	106.7	---	---	168.0	---

APPROPRIATION: PROCUREMENT

1982	200	14.4	77.5	105.4	---	---	221.5	9.6
1983	900	30.4	72.6	111.5	---	---	248.7	9.0
1984	1900	0.5	111.4	129.5	---	---	302.0	8.0
1985	2600	0.4	125.9	150.7	14.7	---	361.8	3.4
1986	2240	8.1	151.4	155.5	---	14.7	365.9	2.9
1987	2000	1.9	140.8	146.3	---	---	375.3	3.1
1988	2100	0.9	131.3	137.3	---	---	363.7	3.5
1989	1900	4.6	86.5	135.2	108.6	---	368.9	3.5
1990	2700	0.4	103.6	123.6	101.9	59.8	346.1	3.3
1991	4400	0.4	141.9	124.6	58.5	123.7	357.4	2.9
1992	4800	0.4	147.3	125.5	---	85.5	368.8	2.4
1993	7000	5.1	198.9	274.8	196.1	---	826.5	2.4
1994	7000	0.4	198.8	213.8	153.8	122.5	658.6	2.4
1995	7000	0.4	199.7	193.7	156.8	188.2	610.8	2.4
1996	7000	0.4	199.4	191.4	128.7	167.7	618.3	2.4
1997	6844	0.4	194.8	151.6	---	157.0	501.4	2.4
SUBTTL	60664	75.1	2281.8	2470.4	919.1	919.1	6915.7	---
TOTAL	60697	*	*	2577.1	---	---	7083.7	---

16. (U) Program Funding Summary: (Current Estimate in Millions of dollars)

d. (U) Obligations and Expenditures 1/ --

Fiscal Year	Then Year Dollars in Millions		
	Total	Obligated	Expended
APPROPRIATION: RDT&E			
1975	3.9	3.9	3.9
1976	4.3	4.3	4.3
1977	10.2	10.2	10.2
1978			
1979	43.4	43.4	43.4
1980	49.5	49.5	49.5
1981	39.3	34.5	34.5
1982	11.6	10.5	10.5
1983	4.1	3.7	3.5
1984	1.7	1.7	1.3
TOTAL	168.0	161.7	161.1

Appropriation: Procurement

1982	221.5	220.2	213.6
1983	248.7	245.8	233.2
1984	302.0	301.4	223.2
1985	361.8	352.7	117.6
1986	335.9	266.9	15.1
TO COMP	5395.8	N/A	N/A
TOTAL	6915.7	1387.0	802.7

1/ Reflects Program Office records as of 31 December 1985.

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17. (U) Production Rate Data:

- a. (U) Annual Production Rates -- The annual production rates shown differ from the annual funded quantity buys because the funded delivery period is 21 months for FY82, 10 months for FY83 and FY84. For FY86 the delivery period is 19 months due to the introduction of the second source. For FY87 the delivery period is 12 months.

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1979	240			
1980	3100			
1981	5400			
1982	5000	114	114	1800
1983	6000	1080	1080	4200
1984	6000	2376	2376	4200
1985	4338	2600	2600	4200
1986		1642	1814	6000
1987		4700	2000	8400
1988		7000	2100	8400
1989		7000	1900	10200
1990		7000	2700	10200
1991		7000	4400	3064
1992		10000	4800	
1993		9684	7000	
1994			7000	
1995			7000	
1996			7000	
1997			6844	

b. (U) Cost Variance -- Dollars in Millions

Item	Development Estimate	Variance (CE less DE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BYS)	995.1	+1582.0	2577.1	+ 447.0	2130.1
Prog Acq Cost (TYS)	1592.9	+5490.8	7083.7	+1443.4	5640.3
PAUC (BYS)	.032	+.010	.042	+.007	.035
PAUC (TYS)	.051	+.066	.117	+.024	.093

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17. (U) Production Rate Data:

c. (U) Schedule Variance --

	Development Estimate	Variance (CE less DE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	11/81	+36	11/84	---	11/84
Duration (in Months)	73	+84	157	---	157
End Date (Mo/Yr)	12/87	+120	12/97	---	12/97

d. (U) Deliveries including spares (Plan/Actual) --

	To Date
RDT&E	33/33
Procurement	2302/2332

18. (U) Operating and Support Costs

Not Applicable

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PROGRAM: Torpedo MK 48 ADCAP

AS OF DATE: December 31, 1986

SUBJECT

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1. Designation and Nomenclature (Popular Name): Torpedo MK 48 ADCAP Program
2. DoD Component: Department of the Navy
3. Responsible Office and Telephone Number:

Torpedo MK 48 Weapon Systems Program CAPT Peter G. Chabot
Naval Sea Systems Command (PMS402) Assigned: August 17, 1983
Washington, D.C. 20362 AV 222-0610; COMM (202) 692-0610

4. Program Elements/Procurement Line Items:

HDT&E: PE 64675N Project S0366

PROCUREMENT: PE 24284N 3111 MK 48 ADCAP APPN 1507
PE 24284N 5120 Spares

MILCON: PB 24896W

5. Related Programs: Submarine Fire Control and Launch Systems, Mobile ASW
Target

CLASSIFIED BY: 70005 LTR 5511/MK 48 S. 0000000001 of 26 NOV 85
DECLASSIFY ON: OADR

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ADCAP, December 31, 1986

(b)(1)

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- In October 1975, CNO established an operational requirement for the Torpedo MK 48 ADCAP, citing need for improvements in ASW and ASUW. Prior to formal approval of this program, emergence of a new Soviet class of submarine caused an increase in program scope. This broader program was reviewed and approved by formal DNSARC I action on 28 September 1979. The Demonstration and Validation (D&V) contract was awarded in October 1979. Cost and schedule difficulties identified in July 1981 resulted in CNM review of the program. The program was restructured in January 1982 in accordance with recommendations from the NAVMAT review team. In November 1981, the program was designated by the Secretary of Defense as a program of the highest national priority and assigned a BRICKBAT, DX priority rating. The program was reviewed and approved by formal DNSARC II action in September 1982. The Full Scale Engineering Development (FSED) contract was awarded in August 1982. A formal production readiness review conducted in March 1984 certified that the program was ready to enter initial production. The D&V phase was completed in April 1984. A CEB review in October 1984 approved initial WPN funding for long lead material, tooling and test equipment. The limited production contract was signed in March 1985. An Approval for Limited Production (ALP) review in September 1985 authorized FY85 WPN funding for fabrication of 28 limited production torpedoes and the approved Milestone III date of January 1987. Technical problems have required additional testing and delayed Milestone III by 18 months to July 1988.

(b)(1)

(U) Mission Requirements - ADCAP is expected to satisfy all current mission requirements.

c. (U) Change Since "As of" Date -- None

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ADCAP, December 31, 1986

8. (U) Navy Decision Coordinating Paper (NDCP) Threshold Breaches: Milestone III and IOC threshold breaches to the NDCP approved January 1985 are due to technical problems requiring a program restructure. Revision 1 to the NDCP will reflect this restructured program.

9. (U) Schedule

a. (U) Milestones --

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
(U) DNSARC I	Sep 79/Sep 79	Sep 79
(U) PSED Contract Award	Aug 82/Aug 82	Aug 82
(U) DNSARC II	Sep 82/Sep 82	Sep 82
(U) Critical Design Review	Aug 84/Aug 84	Aug 84 (CH-2)
(U) LRIP Contract Award	Mar 85/Mar 85	Mar 85
(U) OPEVAL Completion	Oct 86/Apr 88	Apr 88 (CH-2)
(U) DNSARC III	Jan 87/Jul 88	Jul 88 (CH-1)

(b)(1)

b. (U) Previous Change Explanations -- Not Applicable

(b)(1)

d. (U) References --

Development Estimate: NDCP Rev. 1, dated (DRAFT), Subject: "Navy Decision Coordinating Paper (NDCP) for Torpedo MK 48 ADCAP Program". NDCP Rev. 1 has been delayed in the approval cycle due to program schedule changes caused by technical problems.

Approved Program: FY 1988 President's Budget.

1/ (U) IOC is defined as the initial delivery of production MK 48 ADCAP Torpedoes to the fleet following successful completion of OPEVAL and determination of Approval for Full Production.

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ADCAP, December 31, 1986

e. (U) References --

Development Estimate:

(1) NDCP Rev. 1, dated (DRAFT), subject "Navy Decision Coordinating Paper (NDCP) for Torpedo MK 48 ADCAP Program."

(2) OPNAV TEMP 371 Rev. 2, dated (DRAFT), subject "Test and Evaluation Master Plan No. 371 for Torpedo MK 48 ADCAP."

Approved Program: FY 1988 President's Budget

(b)(1)



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11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. Cost --			
Development (RDT&E)	1,092.1	25.2	1,117.3
Procurement	4,471.7	-320.1	4,151.6
Total Swimaway	(3,932.3)	(-405.2)	(3,527.1)
Other Weapon System Cost	(427.1)	(118.3)	(545.4)
Initial Spares	(122.3)	(-31.2)	(91.1)
Construction (MILCON)	0.7	10.7	11.4
Total FY86 Base-Year \$	5,564.5	-284.2	5,280.3
Escalation	749.5	-3.1	746.4
Development	(-68.3)	(7.1)	(-61.2)
Procurement	(817.8)	(-11.5)	(806.3)
Construction (MILCON)	(0.0)*	(1.3)	(1.3)
Total Then-Year \$	6,314.0	-287.3	6,026.7
b. Quantities --			
Development (RDT&E)	48		48
Procurement	3,353		3,353
Total	3,401	0	3,401
c. Unit Cost --			
Procurement:			
FY86 Base-Year \$	1.33	-0.09	1.24
Then-Year \$	1.58	-0.10	1.48
Program:			
FY86 Base-Year \$	1.64	-0.09	1.55
Then-Year \$	1.86	-0.09	1.77
d. Approved Design to Cost Goal --	N/A		
e. Foreign Military Sales -- None			
f. Nuclear Costs -- None			

* less than \$ 0.1

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

(Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est	UCR Baseline	UCR Baseline
	(DEC 86 SAR)	(DEC 85 SAR)	(DEC 86 SAR)
a. Program Acquisition --			
(1) Cost	6,026.7	6,314.0	6,026.7
(2) Quantity	3,401	3,401	3,401
(3) Unit Cost	1.77	1.86	1.77
b. Current Procurement --	(FY87 Approp	(FY87 Approp	(FY 1988)
	ACT)	ACT)	
(1) Cost	248.4	248.4	255.7
Less CY Adv Proc	0.0	0.0	0.0
Plus FY Adv Proc	0.0	0.0	0.0
Net Total	248.4	248.4	255.7
(2) Quantity	50	50	100
(3) Unit Cost	4.97	4.97	2.56

13. (U) Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1,023.8	5,289.5	0.7	6,314.0
Previous Changes:	None	None	None	
Economic				0.0
Quantity				0.0
Schedule				0.0
Engineering				0.0
Estimating				0.0
Other				0.0
Support				0.0
Subtotal	0.0	0.0	0.0	0.0
Current Changes:				
Economic	0.2	-38.5		-38.3
Quantity				0.0
Schedule	40.0	364.3		404.3
Engineering				0.0
Estimating	-7.9	-617.2	12.0	-613.1
Other				0.0
Support		-40.2		-40.2
Subtotal	32.3	-331.6	12.0	-287.3
Total Changes	32.3	-331.6	12.0	-287.3
Current Estimate	1,056.1	4,957.9	12.7	6026.7

13. (U) Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1986 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1,092.1	4,471.7	0.7	5,564.5
Previous Changes:	None	None	None	
Quantity				0.0
Schedule				0.0
Engineering				0.0
Estimating				0.0
Other				0.0
Support				0.0
Subtotal	0.0	0.0	0.0	0.0
Current Changes:				
Quantity				0.0
Schedule	33.3	267.4		300.7
Engineering				0.0
Estimating	-8.1	-555.1	10.7	-552.5
Other				0.0
Support		-32.4		-32.4
Subtotal	25.2	-320.1	10.7	-284.2
Total Changes	25.2	-320.1	10.7	-284.2
Current Estimate	1,117.3	4,151.6	11.4	5,280.3

b. Previous Change Explanations --

RDT&E

None

Procurement

None

Milcon

None

13. (U) Cost Variance Analysis (Cont'd):

		(Dollars in Millions)	
c. Current Change Explanations --		Base Year \$	Then Year \$
		-----	-----
(1) <u>PDTEE</u>			
REVISED JAN 87 ECONOMIC ESCALATION RATES.(ECONOMIC)		N/A	0.2
DEPARTMENT PROGRAM/BUDGET ADJUSTMENT ADCAP BASELINE DNSARC III ESTIMATED TO COMPLETE JUL 88 VS JAN 87 & PRODUCT IMPROVEMENT COMPLETION IN FY 94 VS FY92.(SCHEDULE)		33.3	40.0
NIF ACTIVITY RATE ADJUSTMENT, CONGRESSIONAL ADJUST- MENTS AND OTHER BUDGET ADJUSTMENTS.(ESTIMATING)		-8.1	-7.9
(2) <u>Procurement</u>			
REVISED JAN 87 ECONOMIC ESCALATION RATES.(ECONOMIC)		N/A	-38.5
DEPARTMENT ACTIONS TO ADJUST FY 87 AND OUTYEAR PROCUREMENTS TO REFLECT PROCUREMENT DELAYS CAUSED BY ADDITIONAL TESTING PROBLEMS.(SCHEDULE)		267.4	364.3
DEPARTMENT RATE AND PRICING ADJUSTMENTS FOR NIF ACTIVITY RATES, PRICING, AND OTHER DEPARTMENT ADJUSTMENTS.(ESTIMATING)		-123.1	-144.1
CONGRESSIONAL ACTIONS ON FY 87 AND PRIOR YEAR PRO- CUREMENTS TO MEET CONGRESSIONAL BUDGET REDUCTIONS COUPLED WITH AN INFLATION ADJUSTMENT AND PROFIT POLICY CHANGE.(ESTIMATING)		-39.1	-41.2
ORIGINAL TORPEDO COST PROJECTIONS WERE BASED UPON CAIG APPROVED ASSUMPTIONS WHEREAS THE CURRENT TORPEDO COSTS PROJECTIONS REFLECT MEMORANDUM OF AGREEMENTS RESULTING FROM THE INTRODUCTION OF COMPETITIVE FOLLOWER TO THE ADCAP PROGRAM.(ESTIMATING)		-392.9	-431.9
THE DECREASE IN SPARES REFLECTS AN EARLIER TRANSITION OF SUPPORT TO ALL DOD/SPCC SUPPORT ACTIVITIES (SUPPORT)		-32.4	-40.2

13. (U) COST VARIANCE ANALYSIS (Cont'd):

(Dollars in Millions)
 Base Year \$ Then Year \$

(3) Milcon

DEPARTMENT DETERMINATION THAT MILCON COSTS ARE
 UNIQUE TO ADCAP. (ESTIMATING)

10.7

12.0

d. References -- FY 1988 President's Budget

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of
 then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate --

Initial SAR is Current Baseline.

PAUC (Baseline Est)(DE)	Changes (Then Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
1.86	-0.01	0.0	0.12	0.0	-0.18	-0.01	0.0	-0.09	1.77

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

Prime Contractor (Torpedo):

Initial Contract Price

Target	Ceiling	Qty
--------	---------	-----

Hughes Aircraft Company, Fullerton, CA.

\$257.5

N/A

37

N00024-82-C-6296, CPAP,

Award: August 5, 1982

Definitized: May 9, 1983

Current Contract Price		
Target	Ceiling	Qty
\$295.9	N/A	32

Estimated Price at Completion	
Contractor	Program Manager
\$295.9	\$295.9

Cost Variance	Schedule Variance
0.0	0.0
-5.0	-9.0
-5.0	-9.0

Previous Cumulative Variances

Cumulative Variances To Date (12/31/1986)

Net Change

Explanation of Change: The variances are based upon an increase in scope consistent with directed program restructure.

Propulsion System:

Target	Ceiling	Qty
--------	---------	-----

Gould, Cleveland, OH,

\$40.3

N/A

50

N00024-82-C-6389, CPAP,

Award: August 10, 1982

Definitized: July 27, 1983

Current Contract Price		
Target	Ceiling	Qty
\$49.0	N/A	45

Estimated Price at Completion	
Contractor	Program Manager
\$49.0	\$49.0

Cost Variance	Schedule Variance
0.0	0.0
-0.9	-7.0
-0.9	-7.0

Previous Cumulative Variances

Cumulative Variances To Date (12/31/1986)

Net Change

Explanation of Change: The variances are based upon an increase in scope consistent with directed program restructure.

15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

b. WPN --

Prime Contractor (Torpedo):

Initial Contract Price		
Target	Ceiling	Qty
\$159.3	N/A	28

Hughes Aircraft Company, Fullerton, CA,
N00024-85-C-6098, CRIF.

Award: March 6, 1985

Definitized: April 14, 1986

Current Contract Price		
Target	Ceiling	Qty
\$202.6	N/A	28

Estimated Price at Completion	
Contractor	Program Manager
\$205.3	\$205.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	0.0	0.0
Cumulative Variances To Date (11/21/86)	-3.6	-10.8
Net Change	-3.6	-10.8

Explanation of Change: The negative cost and schedule variance is being driven by the additional work necessary to enhance workmanship specification, priority given to test equipment for the upgrade and repair of FSED hardware, circuit card production delays and greater than planned test equipment design complexity. Schedule delays will be mitigated by work around plans. Management Reserve funds have been applied to offset unanticipated problems. The schedule and cost variances are not significant in relation to the estimated price at completion.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 50.0% (8 yrs/16 yrs)
 (2) Percent Program Cost Appropriated: 23.5% (\$1419.1/\$6026.7)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs	Budget Year	Balance FYDP	To Complete Beyond FYDP	Total
	(FY79-87)	(FY88)	(FY89-92)	(FY93-94)	
ROT&E	913.7	32.2	110.2	0.0	1,056.1
Procurement	811.1	255.7	2,643.3	1,247.8	4,957.9
MILCON	0.7	0.0	12.0	0.0	12.7
Total	1,725.5	287.9	2,765.5	1,247.8	6,026.7

c. Annual Summary --

Fiscal Year	Qty	FY 86 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Swinaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1979				25.7			17.9	8.4%
1980				68.3			52.5	10.6%
1981				107.8			90.8	10.6%
1982				174.6			154.4	7.6%
1983				195.2			180.4	4.9%
1984				180.5			173.2	3.8%
1985				127.4			125.9	3.4%
1986				59.6			60.7	2.9%
1987				55.2			58.0	3.1%
1988				29.6			32.2	3.5%
1989				26.9			30.3	3.5%
1990				6.5			7.5	3.3%
1991				25.1			29.9	2.9%
1992				34.9			42.5	2.4%
Subtotal	48	N/A	N/A	1117.3			1056.1	

16. (U) Program Funding Summary (Cont'd): (Current Estimate in

Millions of Dollars)

c. Annual Summary (Cont'd) --

Fiscal Year	Qty	FY 86 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Swimaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: Procurement								
1984		24.7	33.0	76.4	20.9		75.9	8.0%
1985	28	14.3	71.2	106.8		20.9	109.0	3.4%
1986	123	63.3	222.7	358.7			377.8	2.9%
1987	50	43.0	101.7	228.2			248.4	3.1%
1988	100	6.8	171.2	227.2			255.7	3.5%
1989	350	2.6	420.5	481.2			557.8	3.5%
1990	451	22.8	409.7	494.0			588.1	3.3%
1991	618	3.7	516.6	587.0			716.0	2.9%
1992	712	3.7	559.6	625.6			781.4	2.4%
1993	700	3.7	552.5	590.0			754.7	2.4%
1994	221	3.7	276.1	376.5			493.1	2.4%
Subtotal	3353	192.3	3,334.8	4,151.6	20.9	20.9	4,957.9	
Appropriation: MILCON								
1986				0.7			0.7	2.9%
1987				0.0			0.0	3.1%
1988				10.7			12.0	3.5%
Subtotal				11.4			12.7	
Total				5,280.3			6,026.7	

16. (U) Program Funding Summary (Cont'd):

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1979	17.9	17.9	17.8
1980	52.6	52.6	52.4
1981	90.6	90.6	89.9
1982	154.4	154.4	152.6
1983	180.4	180.4	175.6
1984	173.2	173.2	170.3
1985	125.9	125.9	125.2
1986	60.7	60.4	56.1
1987	58.0	26.0	12.2
To Complete	142.4	N/A	N/A
Total	1,056.1	881.3	852.0
Appropriation: Procurement			
1984	75.9	75.9	69.6
1985	109.0	97.7	17.8
1986	277.8	74.8	31.7
1987	248.4	13.0	1.8
To Complete	4,146.8	N/A	N/A
Total	4,957.9	261.4	120.9

17. (U) Production Rate Data:

- a. Annual Production Rates -- Note: The annual production rates shown for FY 85 reflect a delivery period of 18 months. The annual production rates shown for FY 86 reflect a delivery period of 5 months for FY 88. FY 88 and out reflects two contractors (leader/follower) and FY 87 supports one contractor.

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1984		N/A		N/A
1985	24	N/A	19	N/A
1986	123	N/A	123	N/A
1987	227	N/A	50	N/A
1988	296	N/A	240	N/A
1989	368	N/A	350	N/A
1990	469	N/A	451	N/A
1991	574	N/A	618	N/A
1992	600	N/A	712	N/A
1993	668	N/A	700	N/A
1994		N/A	221	N/A

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17. (U) Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BY \$)	N/A	N/A	5,200.3	N/A	N/A
(TY \$)	N/A	N/A	6,026.7	N/A	N/A
PAUC (BY \$)	N/A	N/A	1.55	N/A	N/A
(TY \$)	N/A	N/A	1.77	N/A	N/A

c. Schedule Variance --

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	N/A	N/A	3/87	N/A	N/A
Duration (in Months)	N/A	N/A	98	N/A	N/A
End Date (Mo/Yr)	N/A	N/A	7/97	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	48/48
Procurement	0/0

18. (U) Operating and Support Costs:

Operating and Support Costs are currently not available.

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

Program: Sparrow (AIM/RIM-7M)

AS OF DATE: December 31, 1986

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1. (U) Designation and Nomenclature: AIM/RIM-7M/Air-to-Air Guided Missile (Sparrow).
2. (U) DOD Component: Department of the Navy.
3. (U) Responsible Office and Telephone Number:
Air-to-Air Missile Systems Program Office PM: CAPT J. J. Stewart, USN
PMA-259 Assigned: Feb 14, 1984
Washington, D.C. 20361 AUTOVON 222-8222
4. (U) Program Elements/Procurement Line Items:
RDT&E,N: 64354N (W0457) (W1927) (NAVAIR) (Shared Funding)
Procurement: 24162N, 26138N (AIM-7M) ION 2202, 5120 APPN: 1507
24229N (RIM-7M)
5. (U) Related Programs: Electronic counter-countermeasures (NAVAIR Element 64354N (W1927)); Low altitude fuze improvement (NAVSEA Element 63609N (51821)).

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6. (U) Mission and Description: The AIM/RIM-7M missile is a semi-active radar-guided intercept missile for use with a number of air-to-air and ship-to-air weapon systems. Provides all-aspect attack capability in all weather conditions against a broad spectrum of targets and in a variety of countermeasures environments. The AIM/RIM-7M utilizes an inverse monopulse seeker to guide semi-actively to a target illuminated by radar signals emanating from the launching aircraft or ship. The missile incorporates on-board digital processing to provide improved counter-countermeasures capabilities and better capabilities to track targets against a clutter background, a new autopilot band with low altitude capability for surface-to-surface firing, and a new active fuze for improved burst control and low altitude capability. The RIM-7M is the ship-to-air version of the AIM-7M which can be launched from NATO SEASPARROW Surface Missile Systems. The AIM/RIM-7M motor, warhead, wings, fins and autopilot design are the AIM-7F design. A new blast fragmentation warhead was developed and was introduced in the FY-81 buy. The AIM/RIM-7M missiles will replace the AIM-7E, AIM-7F and RIM-7H series missiles in the present inventory. The AIM-7M is specified as a primary weapon for use on F-4, F-14, F-15 and F-18 series aircraft. The RIM-7M will be the primary weapon for use with the NATO SEASPARROW Missile System aboard ships of the U.S. Navy and NATO SEASPARROW consortium nations.

7. (U) Program Highlights:

a. Significant Historical Developments -- DSARC II held in April 1978 approved engineering development of the AIM/RIM-7M. The FY 1980 AIM/RIM-7M Sparrow guidance and control section production was approved by the Office of the Secretary of Defense in September 1980 (UNDERSECDEF memo of 9/22/80). The second OSD Program Review of 9 March 1981 authorized go-ahead of the FY 1981 procurement program. DNSARC III held in November 1982 authorized full rate production of the AIM/RIM-7M (ASN memo of 11/2/82). Approval for service use for the AIM-7M was granted in November 1982 (ONO ltr ser 401E/394759 of 11/8/82).

b. Significant Developments Since Last Report -- A decision was made to cancel the procurement of the AIM/RIM-7M after FY 1987 (a total decrease of 3394 missiles). Funding for the development of a modified AIM-7 SPARROW missile with electronic counter-countermeasures (ECCM) was also deleted after FY 1986.

c. Changes Since "As Of" Date -- None.

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AIM/RIM-7M, December 31, 1986

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: Beginning of IOT&E slipped beyond threshold date of October 1980. Early IOT&E events occurred in December 1980. Delays in the test program and rescheduling of IOT&E to 1982 caused approval for service use threshold to be breached. DSARC III (DNSARC III) and IOC thresholds were breached.

9. (U) Schedule:

a. Milestones	Development Estimate/	Current
	Approved Program	Estimate
AIM/RIM-7M FSD (DSARC II)	Apr 78/Apr 78	Apr 78
Commence Joint TECHEVAL	Feb 80/Feb 80	Jun 80 1/
OSD Program Review	Apr 80/Apr 80	Aug 80 2/
Commence IOT&E	Apr 80/Apr 80	Jun 81 2/
Approval for Service Use	May 81/May 81	Nov 82 3/
DSARC III	Jun 81/Jun 81	-- 3/
IOC (1st delivery to Fleet)	Jul 81/Jul 81	Jan 83 3/
DNSARC III	-- / --	Nov 82 3/

b. Previous Change Explanations --

- 1/ Delayed due to difficulties in repackaging the government-supplied fuze, and the need to incorporate a new firmware package into the JTE firing missiles.
- 2/ Delayed due to difficulties in repackaging the government-supplied fuze, and the need to incorporate a new firmware package and routine delays in the firing program.
- 3/ New milestones are the result of the restarting of IOT&E, delay in receipt of first production units from the contractor, and the change of program status from a major program to a Navy-managed program. Approval for service use for AIM-7M granted November 1982; ASU for RIM-7M granted July 1983.

c. Current Change Explanations -- None.

d. References -- Development Estimate: DCP #89, Revision B, dated 19 April 1979 and full approval for service use dated 8 November 1982.

Approved Program: Same as Development Estimate.

10. (U) Technical/Operational Characteristics:

a. (U) Technical --	Dev Estimate/ Appr Program	Demonstrated Performance	Current Estimate
(U) Weight			
Launch, lbs	510/510	510	510
Warhead, lbs	90/90	90	90
(U) Size	Length 144", Diameter 8", Wing Span 40"		
(U) Guidance	Semi-Active Continuous Wave or Pulse Doppler Radar		
(U) Prop Impulse, lb/sec	31,000/31,000	31,000	31,000

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10. (U) Technical/Operational Characteristics (Cont'd):

b. (U) Operational --	Dev Estimate/ Appr Program	Demonstrated Performance	Current Estimate
-----------------------	-------------------------------	-----------------------------	---------------------

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10. (U) Technical/Operational Characteristics (Cont'd):

c. (U) Previous Change Explanations -- (Cont'd)

(b)(1)

d. (U) Current Change Explanations -- None.

e. (U) References -- Development Estimate: DCP #89, Revision B, dated 19 April 1979 and full approval for service use dated 8 November 1982.

Approved Program: Same as Development Estimate.

11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a. Cost	Development Estimate (FY75-85)	Changes	Current Estimate (FY75-87)
Development (RDT&E)	51.6	- 1.6	50.0
Procurement	581.8	+178.9	760.7
G,C&A	(448.9)	(+161.7)	(610.6)
Propulsion	(30.8)	(+1.8)	(32.6)
Other Hardware	(23.6)	(-7.0)	(16.6)
Procurement	(52.2)	(-10.7)	(41.5)
Total Flyaway	(555.5)	(+145.8)	(701.3)
Fleet Support	(18.3)	(+30.1)	(48.4)
Initial Spares	(8.0)	(+3.0)	(11.0)
Construction	(-)	(-)	(-)
 Total FY78 Base Year \$	 633.4	 +177.3	 810.7
 Escalation	 261.5	 +441.6	 703.1
Development (RDT&E)	(2.4)	(+4.3)	(6.7)
Procurement	(259.1)	(+437.3)	(696.4)
Construction	(-)	(-)	(-)
 Total Then-Year \$	 894.9	 +618.9	 1513.8
 b. Quantities --			
Development (RDT&E)	44.	-	44
Procurement	7305	+639	7944
Total	7349	+639	7988
 c. Unit Cost --			
Procurement:			
FY78 Base-Year \$	\$.080	\$ +.016	\$.096
Then-Year \$.115	+0.068	.183
 Program:			
FY78 Base-Year \$.086	+0.016	.102
Then-Year \$	\$.122	\$ +.068	\$.190

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ATM/RIM-7M, December 31, 1986

11. (U) Program Acquisition Cost: (Cont'd)

d. Approved Design to Cost Goal --

	(Average Unit Flyaway Cost)		
	<u>Dev Estimate/ Appr Program</u>	<u>Current Estimate</u>	<u>Latest Approved Threshold</u>
@ Qty: 1000			
@ Peak Rate: 100/mo			
FY78 Base-Year \$	.092/.092	.092	.108
Then-Year \$	.201/.201	.201	.236

e. Foreign Military Sales: Signed letters of offer to date total up to 2538 for \$673.6 including support to the following: Greece, 264/\$67.0; Taiwan, 100/\$27.9; Australia, 223/\$52.3; Israel, 150/\$49.5; Canada, 663/\$163.5; Egypt, 216/\$53.9; Turkey, 85/\$19.4; and NATO 813/\$232.4.

f. Nuclear Costs: None.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then Year) Dollars in Millions)

	Current Year		Budget Year
	<u>Current Est Dec 86 SAR</u>	<u>UCR Baseline Dec 85 SAR</u>	<u>UCR Baseline Dec 86 SAR</u>
a. Program Acquisition --			
(1) Cost	1513.8	2347.3	1513.8
(2) Quantity	7988	11382	7988
(3) Unit Cost	.190	.206	.190
b. Current Procurement --	FY 1987 Appropriation Act		(FY 1988)
	<u>(FY 1987)</u>	<u>(FY 1987)</u>	
(1) Cost	269.9	269.9	0
Less CY Adv Proc	0	0	0
Plus FY Adv Proc	0	0	0
Net Total	269.9	269.9	0
(2) Quantity	1716	1716	0
(3) Unit Cost	.157	.157	0

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AIM/RIM-7M, December 31, 1986

13. (U) Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate (DE)	54.0	840.9	0	894.9
Previous Changes:				
Economic	+4.0	+205.5	0	+209.5
Quantity	0	+650.2	0	+650.2
Schedule	+43.4	+300.7	0	+344.1
Estimating	-2.3	+42.4	0	+40.1
Support	0	+208.5	0	+208.5
Subtotal	+45.1	+1407.3	0	+1452.4
Current Changes:				
Economic	-.8	-12.4	0	-13.2
Quantity	0	-559.7	0	-559.7
Schedule	-37.8	-95.4	0	-133.2
Estimating	-3.8	+.8	0	-3.0
Support	0	-124.4	0	-124.4
Subtotal	-42.4	-791.1	0	-833.5
Total Changes	+2.7	+616.2	0	+618.9
Current Estimate	56.7	1457.1	0	1513.8

(FY 1978 Constant (Base Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	51.6	581.8	0	633.4
Previous Changes:				
Quantity	0	+229.0	0	+229.0
Schedule	+23.1	+123.2	0	+146.3
Estimating	-2.3	+78.1	0	+75.8
Support	0	+92.9	0	+92.9
Subtotal	+20.8	+523.2	0	+544.0
Current Changes:				
Quantity	0	-248.7	0	-248.7
Schedule	-20.2	-41.1	0	-61.3
Estimating	-2.2	+.5	0	-1.7
Support	0	-55.0	0	-55.0
Subtotal	-22.4	-344.3	0	-366.7
Total Changes	-1.6	+178.9	0	+177.3
Current Estimate	50.0	760.7	0	810.7

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation rates
 Schedule: Change in milestone for improving AIM/RIM-7M
 Estimating: Reprogramming to higher priority programs and a re-estimate of prior year rates.

Note: Schedule and Estimating Changes adjusted to correct December 1985 variance.

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AIM/RM-7M, December 31, 1986

13. (U) Cost Variance Analysis: (Cont'd)

b. Previous Change Explanations -- (Cont'd)

Procurement

Economic: Revised escalation rates
Quantity: Production quantities increased by 3963 missiles
Schedule: Total program restructured to reflect revised Air Force and Navy procurement strategies. FY82 Congressional reduction to requested appropriations. Increased procurement in FY 88-91.
Estimating: Revised quantities FY83-90; revised estimates based on actual contractor proposals; increase in contract growth from target to ceiling; reprogramming initial spares to Harpoon re-estimate of prior year rates.
Support: Increased procurement and revised escalation rates.

MILCON

None.

c. Current Change Explanations --

	(Dollars in Millions)	
	Base Year	Then Year
(1) <u>RDT&E</u>		
Revised Dec 85 economic escalation rates. (Economic)	N/A	-.8
Add-on of improved AIM/RM-7M	-22.4	-41.6
o Change in milestone for improving AIM/RM-7M (Schedule)	(-20.2)	(-37.8)
o Re-estimate of prior year NIF overhead rates (Estimating)	(-2.2)	(-3.8)
(2) <u>Procurement</u>		
Revised Dec 86 economic escalation rates. (Economic)	N/A	-12.4
Decreased quantity of 3,394 missiles in FY88-91	-344.3	-778.7
o Decrease of 3,394 missiles (Quantity)	(-248.7)	(-559.7)
o Decrease of procurement in FY88-91 (Schedule)	(-41.1)	(-95.4)
o Re-estimate of prior year NIF overhead rates (Estimating)	(+.5)	(+.8)
o Decrease in support due to decrease of missile procurement. (Support)	(-55.0)	(-124.4)

(3) MILCON: None.

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13. (U) Cost Variance Analysis: (Cont'd)

d. References -- DCP #89, Revision 8, dated 19 April 1979 and full approval for service use dated 8 November 1982.

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate (DE) to Current Estimate (CE) --

Changes										PAUC
Initial										Current
SAR	EST (DE)	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	Estimate
\$122		+0.24	+0.001	+0.22	0	+0.010	+0.011	0	+0.068	\$190

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

GC&A
Raytheon Company, Lowell, MA
N00019-85-C-0075, FFP,
Award: 24 Dec 1984
Definitized: 24 Dec 1984

Initial Contract Price		
Target	Ceiling	Qty
249.8	N/A	1973
(A/F) (58.4)	N/A	(446)
(FMS/Other) (74.8)	N/A	(689)

Current Contract Price		
Target	Ceiling	Qty
238.71	N/A	2275
(A/F) (59.6)	N/A	(453)
(FMS/Other) (75.1)	N/A	(689)

Estimated Price at Completion	
Contractor	Program Manager
288.7	288.7
(59.6)	(59.6)
(75.1)	(75.1)

GC&A
Raytheon Company, Lowell, MA.
N00019-86-C-0167, FFP,
Award: 13 March 1986
Definitized: 13 March 1986

Initial Contract Price		
Target	Ceiling	Qty
227.6	N/A	1639
(A/F) 47.7	N/A	236
(FMS/Other) 43.8	N/A	376

Current Contract Price		
Target	Ceiling	Qty
227.6	N/A	1639
(A/F) 47.7	N/A	236
(FMS/Other) 43.8	N/A	376

Estimated Price at Completion	
Contractor	Program Manager
227.6	227.6
47.7	47.7
43.8	43.8

1/ Reflects additional funds for engineering changes.

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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

<u>GC&A</u>		<u>Initial Contract Price</u>		
General Dynamics, Camden, AR		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00019-85-C-0074, FFP		207.4	N/A	1300
Award: 24 Dec 1984		(A/F) (66.5)	N/A	(370)
Definitized: 24 Dec 1984		(FMS/Other) (55.7)	N/A	(397)

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
208.31	N/A	1300	207.4	207.4
(A/F) (66.6)	N/A	(370)	(66.5)	(66.5)
(FMS/Other) (56.0)	N/A	(397)	(55.7)	(55.7)

<u>GC&A</u>		<u>Initial Contract Price</u>		
General Dynamics, Camden, AR.		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00019-86-C-0148, FFP,		221.8	N/A	1628
Award: 13 March 1986		(A/F) 42.5	N/A	233
Definitized: 13 March 1986		(FMS/Other) 44.5	N/A	374

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
221.2	N/A	1628	221.8	221.8
(A/F) 42.5	N/A	233	42.5	42.5
(FMS/Other) (44.5)	N/A	374	44.5	44.5

Explanation of Changes: Cost and schedule variances not required for FFP contracts.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 100% (13 yrs/13 yrs)

(2) Percent Program Cost Appropriated: 100% (\$1513.8/\$1513.8)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY75-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Balance Beyond FYDP (FY93)</u>	<u>Total</u>
RD&E	56.7	-	-	-	56.7
Procurement	1457.1	-	-	-	1457.1
Total	1513.8	-	-	-	1513.8

1/ Reflects additional funds for engineering changes.

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AIM/RM-7M, December 31, 1986

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY78 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1975	-	-	-	2.4	-	-	2.4	10.9
1976	-	-	-	7.8	-	-	7.8	6.6
1977	-	-	-	.8	-	-	.8	2.9
1977	38	-	-	12.8	-	-	12.8	2.6
1978	-	-	-	-	-	-	-	-
1979	6	-	-	11.1	-	-	12.8	8.4
1980	-	-	-	10.9	-	-	13.8	10.5
1981	-	-	-	-	-	-	-	-
1982	-	-	-	3.7	-	-	5.4	7.6
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	.5	-	-	.9	2.9
SUB TOTAL	44	-	-	50.0	-	-	56.7	

Appropriation: WPN								
1980	60	2.8	19.4	23.8	-	-	34.3	11.8
1981	625	1.2	81.4	87.8	-	-	141.0	11.6
1982	559	7.7	62.0	73.1	-	-	127.5	14.3
1983	670	-	61.5	69.1	-	-	127.3	9.0
1984	695	-	60.5	74.9	-	-	144.4	8.0
1985	1671	-	134.1	150.3	-	-	297.6	3.4
1986	1948	-	146.0	154.1	-	-	315.1	2.9
1987	1715	-	124.4	127.5	-	-	259.9	3.1
SUB TOTAL	7948	11.7	589.3	760.7	-	-	1457.1	-
TOTAL	7988	11.7	589.3	810.7	-	-	1513.8	-

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AIM/RM-7M, December 31, 1986

16. (U) Program Funding Summary: (Cont'd) (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1975	2.4	2.4	2.4
1976	7.8	7.8	7.8
1977	8	8	8
1977	12.8	12.8	12.8
1978	-	-	-
1979	12.8	12.8	12.8
1980	13.8	13.8	13.8
1981	-	-	-
1982	5.4	5.4	5.0
1983	-	-	-
1984	-	-	-
1985	-	-	-
1986	0	0	0
To Complete	-	N/A	N/A
TOTAL	56.7	56.7	55.8
Appropriation: WPN			
1980	34.3	34.3	31.4
1981	141.0	141.0	140.1
1982	127.5	127.5	123.1
1983	127.3	127.3	106.6
1984	144.4	144.4	114.0
1985	297.6	266.9	189.4
1986	315.1	273.8	67.3
To Complete	269.9	N/A	N/A
TOTAL	1457.1	1115.2	704.6

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AIM/RIM-7M, December 31, 1986

17. (U) Production Rate Data:

a. Annual Production Rates -- (NOTE: The annual production rate could include the participation of Air Force and FMS.)

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1986	-	1022	-	-
1987	-	1496	1716	3804
1988	-	875	0	3804
1989	-	N/A	0	3804
1990	-	N/A	0	3804
1991	-	N/A	0	3804

b. Cost Variance -- Dollars in Millions (NOTE: Subject to limitations on production rates above.)

Item	Development Estimate	Variance (CE less DE)	Current Estimate	Variance (CE less MAX)	Maximum
Prog Acq Cost (BY \$)	-	-	207.5	-1297.7	1505.2
(TY \$)	-	-	430.0	-2627.6	3057.6
PAUC (BY \$)	-	-	.074	-.005	.079
(TY \$)	-	-	.154	-.007	.161

c. Schedule Variance -- (NOTE: Subject to the limitations on production rates above.)

Item	Development Estimate	Variance (CE vs DE)	Current Estimate	Variance (CE vs MAX)	Maximum
Start Date (Mo/Yr)	12/81	7yr/1mo	1/88	-	1/88
Duration (in Months)	8 mos	4 mos	12 mos	-	12 mos
End Date (Mo/Yr)	7/82	5yr/5mo	12/88	-	12/88

d. Deliveries (Plan/Actual) --

RD&E	To Date
Procurement	44/44
	3204/3204

18. (U) Operating and Support Costs: N/A.

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(04A)823)
PROGRAM: SSN 688 NUCLEAR ATTACK SUBMARINE

AS OF DATE: December 31, 1986

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CLEARED
 FOR OPEN PUBLICATION
 AS AMENDED
 FEB 27 1987
 DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (OASD-P&I)
 DEPARTMENT OF DEFENSE

1. Designation and Nomenclature: SSN 688 Class Nuclear Attack Submarine (Los Angeles Class)
2. DoD Component: Department of Navy
3. Responsible Office and Telephone Number:
 NAVSEASYS COM CAPT J.S. Claman FMS 393 Program Office Assigned:
 April 1986; AV 222-3407; COMM (202) 692-3405
4. Program Elements/Procurement Line Items:
 RDT&E: PE 63564N, 64567N PROCUREMENT: PE 24281N
5. Related Programs: HARPOON, TOMAHAWK, SSBN (TRIDENT), BSY-1 Advanced Combat System, SSN 21

CLASSIFIED BY: ~~EXEMPT FOR CLASSIFICATION GUIDE FOR THE NAVAL NUCLEAR PROPULSION PROGRAM, CG-RN-1 AND THE INTERPRETIVE GUIDANCE BULLETINS~~
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SSN 688, December 31, 1986

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[U]7. Program Highlights:

a. Significant Historical Developments--The SSN 688 Class submarine construction program consists of 52 awarded ships from FY 70 to the present: 31 awarded to General Dynamics Corporation, Electric Boat Division, and 21 to Newport News Shipbuilding. Prior to the period covered by this SAR, 35 ships had been delivered to the Navy--21 by Electric Boat and 14 by Newport News.

b. Significant Developments Since Last Report--General Dynamics Corporation, Electric Boat Division, delivered one SSN 688 Class submarine to the Navy in 1986: the USS LOUISVILLE (SSN 724) on 28 October 1986; and Newport News Shipbuilding delivered one SSN 688 Class submarine to the Navy in 1986: the USS CHICAGO on 9 October 1986. The total number of ships delivered since program inception is 35. In addition, three SSN 688's were launched in 1986: HELENA (SSN 725) on 28 June and SAN JUAN (SSN 751) on 6 December at Electric Boat, and NEWPORT NEWS (SSN 750) on 15 March at Newport News. Four more ships were authorized for fiscal year 1987 new construction but have yet to be awarded. The current total of authorized ships for the program is 56, of which 52 have been awarded.

c. Changes Since "As Of Date"--None

[U]8 Decision Coordinating Paper (DCP) Threshold Breaches: DCP #27 was approved 19 March 1970. Notification of the schedule breach was forwarded via memo for DEPSECDEF on 13 August 1976. The DCP was revised 19 August 1986 to incorporate all program developments through 1986, including the Improved Propulsion Machinery Program for one FY 87 submarine.

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9. Schedule:

a. Milestones--	Development Estimate/ <u>Approved Program</u>	Actual
Characteristics Approved	NOV 68/NOV 68	NOV 68
DSARC I	FEB 70/FEB 70	FEB 70
DCP #27 Approved	MAR 70/MAR 70	MAR 70
Production Contract	JAN 71/JAN 71	JAN 71
Production Started	JAN 71/JAN 71	JAN 71
Lead Ship Launch	4TH QTR FY73/4TH QTR FY 73	APR 74
Acceptance Trials		
Lead Ship	1ST QTR FY 85/1ST QTR FY 85	OCT 76
Delivery-Lead Ship	1ST QTR FY 85/1ST QTR FY 85	NOV 76
Initial Operating Capability	1ST QTR FY 85/1ST QTR FY 85	NOV 76

b. Previous Change Explanations

Early ships experienced schedule delays due primarily to late contractor-furnished equipment, shipbuilder's limitations in application of his work force, production/productivity problems and late and defective design agent furnished information. Follow ships were delayed to maintain intervals between ships. Additional delays resulted from a strike at Electric Boat.

c. Changes Since Previous Report: None

d. References

Development Estimate: Ship Construction Awards dated 8 January 1971. Approved Program: DCP #27 dated 19 March 1970. FY 1988/1989 President's Budget.

10. Technical/Operational Characteristics:

A. Technical-	Dev Estimate <u>Appr Program</u>	Demonstrated <u>Performance</u>	Current <u>Estimate</u>
Submarine			
(a) Length	360 ft.	360 ft.	360 ft.
(b) Beam Max.	33 ft.	33 ft.	33 ft.
(c) Draft Dev.	32 ft.	32 ft.	32 ft.
(d) Displacement	6900 tons	6900 tons	6900 tons

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SSN 688, December 31, 1986

10. ~~10~~ Technical/Operational Characteristics:

~~10~~ A. Technical- Dev Estimate Demonstrated Current
 Appr Program Performance Estimate

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[U] Type S6G S6G S6G

(b)(1)

[U] (g) Crew 133 133 133

[U] AN/BQQ-5B

(a) Maintainability 40 177 177
(MTTR)

(b) Hardware Reliability

Passive 1,400

599 [CH-1] 599 [CH-1]

Active 480

N/A [CH-2] N/A [CH-2]

~~10~~ B. Operational

(b)(1)

[U] (c) Armament 4 torpedo 4 torpedo 4 torpedo
 tubes tubes tubes
 12 external 12 external 12 external
 VLS tubes VLS tubes VLS tubes

[U] C. Previous Change Explanations:

CH-1: AN/BQQ-5B are based on demonstrated performance during
OPEVAL and FOT&E

CH-2: Deleted from DCP #104 ON 9 September 1975.

[U] D. Current Change Explanations: None

[U] 11. Program Acquisition Cost (Current Estimate in Millions of
Dollars)

	Development Estimate	Changes	Current Estimate
	(FY70-76)		(FY70-97)
a. Cost			
Development (RDT&E)	\$0.0	+25.1	\$25.1
Procurement (SCN)	5,126.8	+7,323.6	12,450.4
Basic Ship Cost	2,484.6	(+4,763.9)	(7,248.5)
GFE	2,248.0	(+2,524.0)	(4,772.0)
Other	234.2	(-173.8)	(60.4)
OF/PD	160.0	(+209.5)	(369.5)
Construction (MILCON)	0.0	+20.4	20.4
Total: FY 71 Base Year \$	\$5,126.8	\$+7,369.1	\$12,495.9

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11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
Escalation	620.7	+16,977.5	17,598.2
Development (RDT&E)	0	(+23.9)	(23.9)
Procurement (SCN)	620.7	(+16,935.7)	(17,556.4)
Construction (MILCON)	0	(+17.9)	(17.9)
Total Then-Year \$	\$5,747.5	\$+24,346.6	\$30,094.1*
b. Quantities			
Development (RDT&E)	-	-	-
Procurement (SCN)	32	+34	66
Total	32	+34	66
c. Unit Cost			
Procurement:			
FY 71 Base-Year \$	160.2	+28.4	188.6
Then-Year \$	179.6	+275.0	454.6
Program			
FY 71 Base-Year \$	160.2	+29.1	189.3
Then-Year \$	179.6	+276.4	456.0

d. Approved Design to Cost Goal -- N/A

e. Foreign Military Sales -- None

f. Nuclear Costs -- SSN 688 draws upon general reactor plant research and development work performed by the Department of Energy, but this contribution cannot be quantified.

12. Program Acquisition/Current Procurement Unit Cost Summary:

(Current (Then-Year) Dollars in Millions)

	Current Year SAR Current Estimate (DEC 86 SAR)	UCR Baseline Estimate (DEC 85 SAR)	Budget Year UCR Baseline Estimate (DEC 86 SAR)
a. Program Acquisition -			
(1) Cost	30,094.1	31,874.9	30,094.1
(2) Quantity	66	67	66
(3) Unit Cost	456.0	475.7	456.0
b. Current Procurement -- (FY 1987) (FY 1987) (FY 1988)			
(1) Cost	2,295.0	2,295.0	1,804.6
Less CY Adv Proc	(284.8)	(284.8)	(217.5)
Plus PY Adv Proc	500.4	500.4	352.5
Less OF/PD	(65.8)	(65.8)	(67.7)
Net Total	2,444.8	2,444.8	1,871.9
(2) Quantity	4	4	3
(3) Unit Cost	611.200	611.200	623.967

*Excludes FY 92 Advance Procurement for the FY 93 ships.

Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate		5747.5		5747.5
Previous Changes:				
Economic	5.8	-3483.2	-5.0	-3482.4
Quantity		25696.3		25696.3
Schedule		87.3		87.3
Engineering	40.0	2033.0		2073.0
Estimating	21.4	-158.0	0.1	-136.5
Other		412.8		412.8
Support		1441.5	35.4	1476.9
Subtotal	67.2	26029.7	30.5	26127.4
Current Changes:				
Economic	0.1	-904.0	0.0	-903.9
Quantity		-606.8		-606.8
Engineering		-27.7		-27.7
Estimating	-18.3	21.0		2.7
Support		-252.9	7.8	-245.1
Subtotal	-18.2	-1770.4	7.8	-1780.8
Total Changes	49.0	24259.3	38.3	24346.6
Current Estimate	49	30006.8	38.3	30094.1

13. Cost Variance Analysis (Cont'd):

(FY 1971 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate		5126.8		5126.8
Previous Changes:				
Quantity		6608.0		6608.0
Schedule		14.6		14.6
Engineering	-23.2	545.4		568.6
Estimating	7.9	-157.0		-149.1
Other		298.5		298.5
Support		285.6	17.9	303.5
Subtotal	31.1	7595.1	17.9	7644.1

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Cost Variance Analysis (Cont'd):

(FY 1971 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Current Changes:				
Quantity		-196.0		-196.0
Engineering		-9.0		-9.0
Estimating	-6.0	6.6		0.6
Support		-73.1	2.5	-70.6
Subtotal	-6.0	-271.5	2.5	-275.0
Total Changes	25.1	7323.6	20.4	7369.1
Current Estimate	25.1	12450.4	20.4	12495.9

b. Previous Change Explanations --**RDT&E**

Economic: revised escalation indices
Engineering: increase to fund costs directed related to the SSN 688 Class Program
Estimating: refinement of R&D estimate and addition of the SSN 688 Class Development Line

PROCUREMENT

Economic: revised escalation indices
Quantity: addition of 6 SSNs since the authorization of the DE and 29 SSNs at the established baseline value
Schedule: postponing the construction of 3 SSNs
Engineering: Changes to the propulsion plant associated with the long life core, cost reduction improvements and the addition of VLS
Estimating: refinement of estimate, changes in procurement plan, increased estimates for deferred work, and the Government's liability under P.L. 85-804
Other: fund REA settlements under P.L. 85-804
Support: increased outfitting and post delivery requirements

CONSTRUCTION

Economic: revised escalation indices
Estimating: fund Military construction projects at New London, Norfolk San Diego, Portsmouth, and Pearl Harbor

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12. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) RDT&E

Revised Jan 86 economic escalation (Economic)		+1
--	--	----

Revised program requirements (Estimating)	-6.0	-18.3
---	------	-------

(2) Procurement

Revised Dec 86 economic escalation (Economic)		-904.0
--	--	--------

Net deletion of 1 submarine (Quantity)	-196.0	-606.8
--	--------	--------

Deletion of Outfitting/Post Delivery for quantity change (Support)	-18.8	-68.8
---	-------	-------

Installation of VLS associated with the quantity change (Engineering)	-9.0	-27.7
--	------	-------

Total variance associated with quantity change (non-add)	(-223.8)	(-703.3)
---	----------	----------

Deletion of Contract Design (Estimating)	-1.8	-6.0
--	------	------

Refinement of estimates to reflect later contract/pricing data (Estimating)	+8.4	+27.0
--	------	-------

Refinement of Offset Outfitting/Post Delivery Estimates (Support)	-54.3	-184.1
--	-------	--------

(2) MILCON

Additional MILCON Projects (Support)	+2.5	+7.8
--------------------------------------	------	------

d. References --

Development Estimate: DCP #104 dated September 1970, revised and
reapproved 13 April 1978. USDR&E letter 13 March 1979 cancelled
DCP #104 and returned surveillance to the Navy. DCP #27, dated
19 March 1970.

Program Acquisition Unit Cost (PAUC) History: (Million of then-year \$)

a. Initial SAR Estimate to Current Baseline Estimate

PAUC (Init Est)	Changes								PAUC (Baseline Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
165.8	+18.3	-5.2					+ .6	+ 13.8	179.6

b. Current Baseline Estimate to Current Estimate --

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
179.6	-66.4	+287.6	+1.3	+31.0	-2.0	+6.3	+18.6	+276.3	456.0

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SSN-688, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of \$)

c. Annual Summary --

Fiscal Year	Qty	FY 71 Base-Year Dollars			Then-Year Dollars			Escal Rate %
		Sallaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1970	0			0.5	0	0	0.5	5.51
1971	0			1.8	0	0	1.8	5.14
1972	0			1.1	0	0	1.2	4.61
1973	0			1.1	0	0	1.2	4.35
1974	0			0.4	0	0	0.5	7.96
1977	0			1.2	0	0	1.8	2.58
1978	0			1.0	0	0	1.7	6.8
1979	0			3.7	0	0	6.6	8.39
1980	0			1.3	0	0	2.7	10.5
1981	0			2.2	0	0	4.7	10.6
1982	0			2.2	0	0	5.0	7.59
1983	0			3.5	0	0	8.4	4.9
1984	0			1.9	0	0	4.6	3.8
1985	0			1.2	0	0	3.0	3.4
1986	0			2.0	0	0	5.3	2.9
1987	0			0	0	0	0.0	3.1
Subtotal	0	0		25.1	0	0	49.0	3.5

Appropriation: SCN

1969	0	23.1	23.1		26.5	26.5	
1970	3	512.0	512.0	-26.5	111.3	601.5	5.6
1971	4	499.2	499.2	-69.6	67.5	616.6	5.1
1972	5	665.5	665.5	-109.3	135.9	909.1	4.4
1973	6	615.5	617.3	-135.9	125.4	1042.2	5.3
1974	5	454.3	456.1	-125.4	130.0	932.8	9.0
1975	3	243.4	246.2	-78.0	0.0	532.7	14.1
1976	2	296.3	301.0	-52.0	102.0	581.9	11.5
1977	0	88.5	88.6	0.0	188.9	189.0	2.0

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SSN-688, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of \$)

c. Annual Summary --

Fiscal Year	Qty	FY 71 Base-Year Dollars			Then-Year Dollars			Escal Rate %
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: SCN (Cont'd)								
1977	3		827.1	832.4	-179.9	212.8	1414.8	6.2
1978	1		209.8	216.6	-91.6	0.0	454.7	8.2
1979	1		517.5	529.2	-85.7	26.3	761.1	9.6
1980	2		379.1	395.9	-137.8	76.2	966.7	9.8
1981	2		424.8	442.4	-111.2	188.8	1146.1	9.6
1982	2		667.7	685.6	-150.4	397.9	1498.9	7.5
1983	2		639.9	657.5	-169.4	406.0	1589.8	3.8
1984	3		656.4	672.7	-278.6	389.7	1946.2	3.0
1985	4		876.8	895.9	-408.7	547.2	2649.5	2.1
1986	4		757.1	775.5	-530.5	462.6	2362.9	1.2
1987	4		709.2	730.1	-500.4	284.8	2295.0	3.1
1988	3		537.5	557.4	-352.5	217.5	1804.6	3.5
1989	2		462.1	477.5	-297.3	326.4	1588.9	3.3
1990	2		442.4	478.0	-320.2	237.4	1632.2	3.3
1991	2		375.4	401.9	-329.9	61.4	1405.5	2.9
1992	1		206.3	235.1	-181.7	0.0	842.2	2.4
1993	0		0.0	29.1	0.0	0.0	106.6	2.4
1994	0		0.0	16.1	0.0	0.0	60.4	2.4
1995	0		0.0	9.5	0.0	0.0	36.4	2.4
1996	0		0.0	2.9	0.0	0.0	11.6	2.4
1997	0		0.0	0.1	0.0	0.0	0.4	2.4
Subtotal	66	0	12086.9	12450.4	-4722.5	4722.5	30006.8	

Appropriation: MILCON

1973	0			3.0	0.0	0.0	3.9	5.55
1974	0			1.5	0.0	0.0	2.3	11.76
1975	0			2.7	0.0	0.0	4.3	16.12

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SSN-688, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of \$)

c. Annual Summary --

Fiscal Year	Qty	FY 71 Base-Year Dollars			Then-Year Dollars			Escal Rate %
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: MILCON								
1976	0			4.2	0.0	0.0	7.0	3.02
1978	0			2.4	0.0	0.0	4.8	7.68
1979	0			3.8	0.0	0.0	7.6	9.31
1982	0			0.3	0.0	0.0	0.6	7.6
1987	0			2.0	0.0	0.0	6.1	3.1
1988	0			0.0	0.0	0.0	0.0	3.5
1989	0			0.5	0.0	0.0	1.7	3.5
Subtotal	0	0.0	0.0	20.4	0.0	0.0	38.3	
Total	66	0.0	12086.9	12495.9	-4722.5	4722.5	30094.1	

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1970	0.5	0.5	0.5
1971	1.8	1.8	1.8
1972	1.2	1.2	1.2
1973	1.2	1.2	1.2
1974	0.5	0.5	0.5
1977	1.8	1.8	1.8
1978	1.7	1.7	1.7
1979	6.6	6.6	6.6
1980	2.7	2.7	2.7
1981	4.7	4.7	4.7
1982	5.0	5.0	4.9
1983	8.4	8.3	8.3
1984	4.6	4.6	4.6

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SSN-688, December 31, 1986

16. Program Funding Summary (Cont'd):

d. Obligations and Expenditures -- (Cont'd)

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E (Cont'd)

1985	3.0	3.0	2.9
1986	5.3	5.3	0.2
To Complete	0.0	0.0	0.0
Total	49.0	48.9	43.6

Appropriation: SCN

1969	26.5	26.5	26.5
1970	601.5	601.3	600.6
1971	616.6	616.6	616.0
1972	909.1	909.3	605.7
1973	1042.2	1042.8	1024.0
1974	932.8	932.1	919.9
1975	532.7	532.1	525.1
1976	581.9	577.9	574.3
1977	189.0	188.9	188.6
1977	1414.8	1403.9	1377.9
1978	454.7	450.5	422.7
1979	761.1	752.7	740.2
1980	966.7	922.4	871.7
1981	1146.1	1089.9	1054.6
1982	1498.9	1415.8	1287.8
1983	1589.8	1480.0	1137.0
1984	1946.2	1770.2	1013.8
1985	2649.5	2262.2	950.8
1986	2362.9	192.9	207.1
1987	2295.0	245.9	0.0
To Complete	7488.8	0.0	0.0
Total	30006.8	17413.9	14144.3

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SSN-688, December 31, 1986

16. Program Funding Summary (Cont'd):

d. Obligations and Expenditures -- (Cont'd)

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: MILCON			
1973	3.9	3.9	3.9
1974	2.3	2.3	2.3
1975	4.3	4.3	4.3
1976	7.0	7.0	7.0
1978	4.8	4.8	4.8
1979	7.6	7.6	7.6
1982	0.6	0.6	0.6
1987	6.1	0	0
To Complete	1.7	N/A	N/A
Total	38.3	30.5	30.5

17. Production Rate Data:

- a. Annual Production Rates: N/A
- b. Cost Variance: N/A
- d. Deliveries (Plan/Actual) --

RDT&E
Procurement

To Date
N/A
35/35

18. Operating and Support Costs: N/A

A-23 STINGER

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RECEIVED SUBMISSION TO
DATE 20 JAN 1987

SELECTED ACQUISITION REPORT (RCS-DD-COMP (Q & A) 823)

PROGRAM: STINGER Weapon System PIM 92A/92B

As of Date: 31 December 1986

INDEX

86-017

SUBJECT

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1. (U) Designation and Nomenclature (Popular name): FIM 92A/92B
Man portable Air Defense Guided Missile System
STINGER/STINGER POST/STINGER Reprogrammable Microprocessor (RMP)

2. (U) DOD Component: Department of The Army

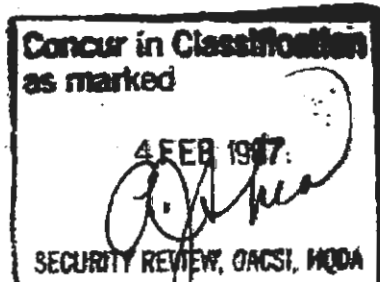
3. (U) Responsible office and telephone number:

STINGER Project Office
Redstone Arsenal, AL 35898-5000

COL ROBERT A. DROLET
Assigned: 6 Jan 86
AUTOVON: 746-6191
Commercial: 205-876-6191

CONCUR IN CLASSIFICATION
AS MARKED DOWN

FEB 26 1987 5



DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

~~CLASSIFIED BY STINGER Security
Classification Code, dtd 23 Dec 84
DECLASSIFY ON: 31 Dec 92~~

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87-0391

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STINGER, December 31, 1986

4. (U) Program Elements/Procurement Line Items
RDTE: PE 64305 Project D546 (Shared funding)
Procurement: APPN 2032 SSN C18500

5. (U) Related Programs: None

6. (U) Mission and Description: The STINGER Weapon System is an advanced man-portable shoulder fired air defense system. It provides low altitude defense for ground forces against attack by low-flying aircraft. STINGER utilizes a passive infrared homing guidance system which operates independently after aiming and launching by the operator. The system is comprised of the weapon (missile in launcher and reusable gripstock), an identification friend or foe (IFF) unit, trainers, and ancillary equipment. The STINGER is replacing the REDEYE Weapon System.

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- An integrated development/production program has been structured to deliver STINGER-RMP missiles with initial deliveries of the FY 85 production contract. Modification of the FY 85 STINGER-POST production contract was accomplished in Nov 85 which will allow for deliveries of STINGER-RMP missiles in Aug 87.

b. (U) Significant Developments Since Last Report -- The STINGER-POST initial production program began in Sep 85 with the delivery of five missiles in accordance with the contract schedule. Thirteen missiles were delivered in Oct 86 as scheduled. As of 31 Dec 86, a total of 29 missiles have been delivered. The Department of the Army approved the acquisition strategy for three-year multiyear/second source production of STINGER-RMP 2 Dec 86. STINGER is expected to meet system requirements and Pedestal Mounted STINGER has been removed.

c. (U) Changes as of 31 Dec 86: The program depicted here reflects a 5-year MYP procurement. In response to Congressional direction contained in the FY 87 Appropriations Conference Report, the Army is currently formulating a 3-year MYP with Second Source qualification leading to full competition in FY 90. A draft RFP for competitive procurement has been released.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated June 1978) threshold breaches.

9. (U) Schedule:

a. (U) Milestones	Development Estimate/ Approved Program	Current Estimate
(1) (U) BASIC STINGER		
(A) (U) Milestone II (DSARC II)	May 72/May 72	May 72
(B) (U) Development Contract Awarded	Jun 72/Jun 72	Jun 72
(C) (U) Milestone III (ASARC/DSARC III)	Aug 75/Oct/Nov 77	Oct/Nov 77
(D) (U) Milestone IIIa (ASARC/DSARC IIIa)	Aug 77/N/A	N/A
(E) (U) Initial Operational Capability (IOC)	Sep 77/Feb 81	Feb 81

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(2) (U) STINGER-POST		Development Estimate Approved Program	Current Estimate
(A)	(U) Special ASARC (Development)	Apr 77/Apr 77	Apr 77
(B)	(U) Development Contract Award	Jun 77/Jun 77	Jun 77
(C)	(U) Completion of Design Evaluation Testing	Apr 79/Jun 81	Jun 81
(D)	(U) Completion of Guided Test Vehicles	Apr 80/May 82	May 82
(E)	(U) Completion of Prototype Qualification Test/OT	Jan 81/Oct 82	Oct 82
(F)	(U) Completion of R&D Program	Feb 81/Nov 82	Nov 82
(G)	(U) Special ASARC (POST Production)	Mar 81/Jan 83	Jan 83
(H)	(U) First Unit Equipped	Sep 82/Sep 87	Sep 87
(3) (U) STINGER-RMP			
(A)	(U) Special ASARC (Development)	Jun 83/Jun 83	Jun 83
(B)	(U) Development Contract Award	Sep 84/Sep 84	Sep 84
(C)	(U) Completion of Design Evaluation Testing	Jul 86/Sep 86	Sep 86
(D)	(U) Production Baseline Established	Nov 86/Sep 86	Sep 86
(E)	(U) Completion of Guided Test Vehicles/Testing	Jul 87/Jul 87	Jul 87
(F)	(U) Completion of R&D Program	Dec 87/Feb 88	Feb 88 (CH-1)
(G)	(U) First Unit Equipped (FUE)	Nov 87/Mar 88	Mar 88 (CH-1) (CH-1)

b. (U) Previous Change Explanation -

Change in RMP milestone is based on the schedule contained in the contract.

c. (U) Current Change Explanation -

CH-1- Changes in RMP milestones are based on current schedule.

d. (U) References -

Development Estimate: DCP 114, dated Jul 72, for Basic/Revised DCP 114 dated 5 Jun 78 for STINGER-POST. ASARC III, Jun 83, for STINGER-RMP.

Approved Program: FY 88-89 President's Budget

Secretary of the Army Memo, Jul 83, Subj: System Acquisition Decision

Memo - STINGER-POST/RMP ASARC III Executive Council Session, 6 Jun 83.

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10. (U) Technical/Operational Characteristics:

a. (U) Technical (BASIC/POST/RMP)

	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Ready-to-Fire Weapon Weight Including Onboard IFF Antenna (lbs)	32/35/35.5/36	35	35/35.5/36

b. (U) Operational (BASIC/STINGER)

(b)(1)



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	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(g) (U) Weapon Reli- ability	.82/.92 (CH-2)	.92	.92
(h) (U) IFF Maximum Instantaneous Search Sector (Degrees)	<u>+ 6</u> /+5	<u>+ 5</u>	<u>+ 5</u>

(2) (U) STINGER (POST/RMP)

(b)(1)



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(2) (U) STINGER (POST/RMP) (Cont'd)

	<u>Dev Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(g) (U) Weapon Reliability	.82/.89/.89	.83	.89/.89

c. (U) Previous Change Explanations --

Item 1.f was adjusted based on change from percent degradation to lethality. Item 2.f was adjusted based on change from percent degradation to lethality. Item (2.g) was changed from 0.90 to 0.89 to include tests conducted in 1985. Items 1.g and 2.g were in error in Dec 84 SAR.

d. (U) Current Change Explanations --

(CH-1) - System effectiveness was adjusted based on reliability change.
(CH-2) - Weapon reliability was changed from 0.89 to 0.92 to reflect current performance.

e. (U) References --

Development Estimate: DCP 114, dated Jul 72 for Basic STINGER
Revised DCP 114 dated 5 Jun 78 for STINGER-POST
Approved Program: FY 88-89 President's Budget

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11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. (U) COST	Development Estimate	Changes	Current Estimate 1/
Development	76.6	+ 97.4	\$174.0
Basic	(76.6)	(+ 34.8)	(111.4)
POST-RMP	-	(+ 62.6)	(62.6)
Procurement	334.3	+585.9	920.2
Weapon (FLYAWAY)	(307.8)	(+512.8)	(820.6)
IFF			
Belt Pack	(13.1)	(+ 10.7)	(23.8)
Programmer	(1.0)	(+ 1.8)	(2.8)
Other	(11.1)	(+ 61.5)	(72.6)
Initial Spares	(1.3)	(- .9)	(.4)
Total Constant FY72\$	\$410.9	+583.3	\$1094.2
Escalation	62.9	+2119.4	+2182.3
Development	4.2	+ 95.0	99.2
Procurement	58.7	+2034.4	2093.1
Total Then-Year \$	\$473.3	+2802.7	\$3276.5
b. (U) Quantities --			
Development (RDT&E)			
Weapon-Basic	222	-43	179 2/
-Post		+26	26
RMP		+ 9	9
IFF			
Belt Pack	32		32
Programmer	6		6
Procurement			
Weapon	22,980	+27,390	50,370
IFF			
Belt Pack	1,248	+ 2,459	3,707
Programmer	250	+ 392	642
Total Weapons	23,202	+27,332	50,584

Footnotes:

1/ The current estimate (FY 88 and 89) is based on the FY 88/89 President's Budget which represents a 5-year Multiyear Procurement (MYP) Sole Source Acquisition Plan. A 3-year MYP Second Source Acquisition strategy is being developed.

2/ Complete weapons used for development testing.

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11. (U) Program Acquisition Cost (Cont'd) (Current Estimate in Millions of Dollars)

<u>COST</u>	<u>DEVELOPMENT ESTIMATE</u>	<u>CHANGES</u>	<u>CURRENT ESTIMATE</u>
c. (U) Unit Cost--			
Procurement:			
FY72 Base-Years	.014	+.004	.018
Then-Years	.017	+.043	.060
Program:			
FY72 Base-Years	.018	+.004	.022
Then-Years	.020	+.045	.065

d. (U) Approved Design to Cost Goal --
No DTC goal was established with Secretary of Defense in DCP 114 dated 5 Jan 78.

e. (U) Foreign Military Sales: Sales to date total 2390 Basic STINGER Missiles, Training/Training Support Equipment, and/or services. A breakdown of dollar value by country is as follows:

<u>COUNTRY</u>	<u>TOTAL \$</u>
Pakistan	8.1
France	3.5
Germany	2.8
Italy	46.6
Japan	39.3
Netherlands	34.4
Saudi Arabia	38.9
Switzerland	.5
Turkey	20.7
United Kingdom	6.3
	<u>201.1</u>

f. (U) Nuclear Costs -- None

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12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	Current Year Current Est (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	Budget Year UCR Baseline (Dec 86 SAR)
a. (U) Program Acquisition			
(1) (U) Cost	3276.5	4084.0	3276.5
(2) (U) Quantity	50584	50878	50584
(3) (U) Unit Cost	.065	.080	.065
b. (U) Current Procurement (FY 1987)		(FY87 APPN)	(FY 1988)
(1) (U) Cost	254.9	311.7	199.7
Less CY Adv Proc	30.0	30.0	45.5
Plus PY Adv Proc	N/A	N/A	21.4
Net Total	224.9	281.7	175.6
(2) (U) Quantity	4180	4180	4200
(3) (U) Unit Cost	.054	.067	.042

13. (U) Cost Variance Analysis:

a. (U) Summary--(Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	TOTAL
Development Estimate	80.8	393.0	473.8
Previous Changes:			
Economic	+5.1	+491.1	+496.2
Quantity	+11.0	+342.5	+353.5
Schedule	+27.4	+785.2	+812.6
Engineering	+121.6	+87.0	+208.6
Estimating	+16.2	+1648.1	+1664.3
Other	+7.3		+7.3
Support	+2.7	+65.0	+67.7
Subtotal	+191.3	+3418.9	+3610.2
Current Changes:			
Economic	-.3	-76.1	-76.4
Quantity		-69.8	-69.8
Schedule		+28.4	+28.4
Engineering	-7.3	-	-7.3
Estimating	-1.3	-681.1	-682.4
Other		-	-
Support			
Subtotal	-8.9	-798.6	-807.5
Total Changes	+182.4	+2620.3	+2802.7
Current Estimate	263.2	+3013.3	3276.5

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13. (U) Cost Variance Analysis (Cont'd): (FY 1972 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	TOTAL
Development Est	76.6	334.3	410.9
Previous Changes:			
Quantity	+6.6	+104.1	+110.7
Schedule	+13.7	+158.3	+172.0
Engineering	+66.9	+18.8	+85.7
Estimating	+5.8	+482.6	+488.4
Other	+6.0	-	+6.0
Support	+1.9	+23.6	+25.5
Subtotal	+100.9	+787.4	+888.3
Current Changes:			
Quantity		-26.0	-26.0
Schedule		+6.9	+6.9
Engineering	-2.8		-2.8
Estimating	- .7	-182.4	-183.1
Other			-
Support			
Subtotal	-3.5	-201.5	-205.0
Total Changes	+97.4	+585.9	+683.3
Current Estimate	174.0	920.2	1,094.2

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices
Quantity: Additional 6 POST and 3 RMP Missiles.
Schedule: Revision to the POST program resulting in stretchout.
Engineering: Development of RMP to counter future threat; addition of PMS.
Estimating: Transfer of PEP effort from procurement; increased test costs.
Other: Technical problems and 6 week strike.
Support: Increased flight tests and computer simulation.

Procurement

Economic: Revised escalation indices
Quantity: Additional 8080 missiles for Sgt York and 444 additional peace-time losses due to stretchout of program; reduction of 4505 IFF Interrogators from requirements. Additional Army of Excellence quantities and deletion of Sgt York missiles.
Schedule: Reduction of missiles in early years and rescheduling procurement in subsequent years as a result of budget cuts.
Engineering: Additional manufacturing and assembly cost for producing RMP added to the POST Seekers.
Estimating: Adding additional tooling costs and changing cost estimating methodology and cost savings from actual contracts. Unit cost reduction and revised ECO estimate;
addition of estimated warranty risk balance of cost of 8524 missiles added for Sgt York, additional peacetime losses, and the addition of Pedestal Mounted STINGER.

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13. (U) Cost Variance Analysis (Cont'd)
 c. (U) Current Change Explanations --

	(Dollars in Millions)	
	Base-Year	Then Year
Revised economic escalation rates. (Economic)	N/A	-3
Deletion of Pedestal Mounted STINGER (PMS). (Engineering)	-3.1	-8.1
o Engineering changes applicable to PMS. (Engineering)	(-2.8)	(-7.3)
o Estimating changes applicable to PMS due to revision of estimate. (Estimating)	(-.3)	(-.8)
Estimating changes due to misc. cuts, i.e., Gramm-Rudman, etc. (Estimating)	-.4	-.5
(2) (U) Procurement		
Revised economic escalation. (Economic)	N/A	-76.1
Deletion of Pedestal Mounted STINGER (PMS). (Estimating)	-220.0	-819.2
Change of program from 6000 per year (annual) to 5000 per year (annual).	+18.5	+96.7
o Quantity of 530 shifted to outyear. (Quantity)	(-26.0)	(-69.8)
o Production stretch of 6 months. (Schedule)	(+6.9)	(+28.4)
o Estimating changes due to quantity changes from 6000 per year to 5000 per year; quantity of 530 in FY 86 moved to outyear. (Estimating)	(-7.0)	(-32.1)
o CER changes due to revised curves of Tracking Head Trainer and Gripstock. (Estimating)	(+30.4)	(+117.3)
o Increased target cost for full-scale targets. (Estimating)	(+14.2)	(+52.9)

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then Year Dollars in Millions)

- a. (U) Initial SAR Estimate to Current Estimate

PAUC (Initial SAR Est)	Changes								PAUC (Dev Estimate)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
.020	+.008	-.005	+.017	+.004	+.020	-0-	+.001	+.045	.065

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15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) Initial Production

General Dynamics Corp., Pomona, CA,
DAAH01-83-C-A145, FFP/FP1
Award: Apr 83
Definitized: Sep 83

Current Contract Price			Estimated Price at Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$132.6	\$151.3	559	(b)(4)	
			Cost Variance	Schedule Variance
Previous Cumulative Variances			\$ -1.4	\$ -2.1
Cumulative Variances To Date (Oct 86)			\$ -2.3	\$ -6.2
Net Change			\$ -.9	\$ -3.9

Explanation of Change:

The negative change in cost was caused primarily with WBS 1, Guided Missile. The main problem being an HMA shorting problem occurring during launch tube pressurization. The negative variance in schedule is also attributed mainly to the same WBS 1, Guided Missile. Minor negative variance in schedule came also from WBS 5, System Test and Evaluation, WBS 6, System Project Management, and WBS 9A, Training Set.

b. (U) Production

RMP
General Dynamics Corp., Pomona, CA
DAAH01-85-C-A073, FFP/FP1
Award: Aug 85
Definitized: Feb 86

Current Contract Price			Estimated Price at Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$226.8	\$256.6	3218	\$226.8	\$226.8
			Cost Variance	Schedule Variance
Previous Cumulative Variances			\$ -.004	\$ +.04
Cumulative Variances To Date (Oct 86)			\$ +.84	\$ -.43
Net Change:			\$ +.80	\$ -.39

Explanation of Change: The negative schedule variance is with WBS 8, Test Equipment and Tooling. The variance resulted because of the late start on the RMP SIE modification tasks, both because of a lack of test requirements and a lack of available manpower requirements.

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c. (U) Production
Missiles
General Dynamics Corp., Pomona, CA
DAAH01-84-C-A088, FFP
Award: 23 Mar 94
Definitized: 29 Sep 84

Initial Contract Price		
Target	Ceiling	Qty
\$97.6	\$97.8	2488

Current Contract Price		
Target	Ceiling	Qty
\$106.1	\$106.3	2898

Estimated Price at Completion	
Contractor	Program Manager
\$106.1	\$106.1

Previous Cumulative Variances
Cumulative Variances To Date (Oct 86)
Net Change:

Cost Variance	Schedule Variance
\$N/A	\$N/A

Explanation of Change: None

d. (U) Production
General Dynamics Corp., Rancho Cucamonga, CA
DAAH01-86-C-0838, FPI
Award: Sep 86
Definitized: Sep 86

Initial Contract Price		
Target	Ceiling	Qty
\$231.9	\$263.1	4534

Current Contract Price		
Target	Ceiling	Qty
\$231.9	\$263.1	4534

Estimated Price at Completion	
Contractor	Program Manager
\$231.9	\$231.9

Previous Cumulative Variances
Cumulative Variances To Date (Oct 86)
Net Change:

Cost Variance	Schedule Variance
None	None
None	None
None	None

Explanation of Change: None, Oct 86 first CPR reported.

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STINGER, December 13, 1986

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) (U) Percent program completed: 72.7% (16 years/22 years)
(Year Funds Appropriated/Total Program Years)

(2) (U) Percent program cost appropriated: 52.4% (\$1718.0/\$3276.5)
(Funds Appropriated to Date in Millions/Total Program Funding in Millions)

b. (U) Appropriation Summary -

(Then Year Dollars in Millions)

<u>APPROPRIATION</u>	<u>CURRENT & PRIOR YRS (FY 72-87)</u>	<u>BUDGET YEAR (FY 88)</u>	<u>BALANCE FYDP (FY 89-92)</u>	<u>TO COMPLETE BEYOND FYDP</u>	<u>TOTAL</u>
RD&E	263.2	-0-			263.2
PROCUREMENT	<u>1,398.1</u>	<u>199.7</u>	<u>1,094.7</u>	<u>320.8</u>	<u>3,013.3</u>
TOTAL	1,661.3	199.7	1,094.7	320.8	3,276.5

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. (U) Annual Summary -

FISCAL YEAR	QTY	FY72 BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESCL RATE (%)
		FLYAWAY		TOTAL	ADVANCE PRDC		TOTAL	
		NONREC	REC		DEBIT	CREDIT		
APPROPRIATION: RDT&E								
1971				4.7			4.5	4.4
1972	179			7.5			7.5	2.6
1973				18.1			19.8	7.4
1974				21.8			25.4	9.4
1975				24.9			32.1	11.2
1976				16.4			22.4	8.7
1977				1.1			1.7	1.9
1977	26			18.5			26.7	8.0
1978				7.7			11.9	8.6
1979				14.3			24.6	8.5
1980				9.9			18.7	9.4
1981				2.7			5.6	11.9
1982				7.6			16.6	7.6
1983				8.7			20.0	4.9
1984				-0-			-0-	3.8
1985				2.0			5.0	3.4
1986	3			7.1			17.9	2.9
1987	6			1.0			2.8	3.1
SUBTOTAL	214			174.0			263.2	

APPROPRIATION: PROCUREMENT								
1978	258		19.5	21.1			36.9	6.8
1979	1,651		34.4	51.5			100.8	8.7
1980	1,482		31.1	40.2			81.0	9.7
1981	1,144		23.3	31.5			70.2	11.9
1982	2,544		42.7	59.6			166.7	14.3
1983	1,006		34.1	40.8			122.7	9.0
1984	1,205		43.2	43.4			136.6	8.0
1985	2,360		56.1	58.7			198.9	3.4
1986	2,909	3439	59.6	69.8			229.4	2.9
1987	4,180		68.6	75.0		30.0	254.9	3.1
1988	4,200	5964	48.0	56.9	-21.4	45.5	199.7	3.5
1989	5,000	6000	63.0	67.6	-33.9	44.0	244.3	3.5
1990 1/	5,000	6000	68.5	72.2	-44.2	28.6	267.9	3.3
1991 1/	5,000	6000	71.0	72.7	-48.6		276.4	2.9
1992 1/	6,000	6000	76.9	78.7			306.1	2.4
1993	6,431	1431	80.5	80.5			320.8	2.4
SUBTOTAL	50,370		820.8	920.2			3,013.3	
TOTAL	50,584		820.8	1,094.2			3,276.5	

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

1/ This program is based on a 5-year MYP single source acquisition strategy. FY 90, FY 91, and FY 92 differ from the FY 88/89 President's Budget as a result of anticipated changes to the acquisition strategy.

d. (U) Obligations and Expenditures --

FISCAL YEAR	THEN-YEAR DOLLARS (CURRENT ESTIMATE IN MILLIONS)		
	TOTAL	OBLIGATED	EXPENDED

APPROPRIATION: RDT&E

1971	4.5	4.5	4.5
1972	7.5	7.5	7.5
1973	19.8	19.8	19.8
1974	25.4	25.4	25.4
1975	32.1	32.1	32.1
1976	22.4	22.4	22.4
1977	1.7	1.7	1.7
1977	26.7	26.7	25.3
1978	11.9	11.9	11.7
1979	24.6	24.6	24.4
1980	18.7	18.6	18.6
1981	5.6	5.6	5.6
1982	16.6	16.6	16.4
1983	20.0	20.0	17.2
1984	-0-	-0-	-0-
1985	5.0	5.0	3.0
1986	17.9	17.9	3.2
1987	2.8	2.8	-0-
To Complete	-0-	-0-	-0-
TOTAL	\$263.2	\$263.1	\$238.8

APPROPRIATION: PROCUREMENT

1978	36.9	36.9	36.2
1979	100.8	100.9	100.5
1980	81.0	80.2	79.2
1981	70.2	66.3	65.3
1982	166.7	163.3	162.4
1983	122.7	123.5	111.0
1984	136.6	121.0	74.2
1985	198.9	186.4	29.6
1986	229.4	164.9	29.0
1987	254.9	-0-	-0-
To Complete	1,615.2	-0-	-0-
TOTAL	3,013.3	1,043.4	687.4

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17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year	Development Estimate	Production Estimate	Current Estimate	Maximum 1/ Economic
1976/Prior	772		179	179
1977	3050		26	26
1978	3850	258	258	258
1979	4800	2250	1651	1651
1980	4800	2400	1482	1482
1981	4800	2400	1144	1144
1982	1130	2450	2544	2544
1983		4450	1012	1012
1984		4000	1205	1205
1985		5750	2360	2360
1986		6495	2912	2912
1987			4186	4186
1988			4200	8331
1989			5000	9184
1990			5000	9442
1991			5000	9442
1992			6000	9442
1993			6431	9442

1/ The Maximum Economic Production Rate for a I-8-5 is estimated to be 960 per month for all customers under current facilities. The Army-only portion is reflected above.

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17. (U) Production Rate Data (Cont'd)

b. (U) Cost Variance -- Dollars in Millions (NOTE: Subject to limitations on production rates above.)

ITEM	PRODUCTION ESTIMATE <u>1/</u>	VARIANCE (CE LESS Pd E)	CURRENT ESTIMATE	VARIANCE (CE LESS MAX)	MAXIMUM ECONOMIC
Prog Acq Cost (BY \$)	N/A	N/A	1,094.2	+14.3	1,079.9
(TY \$)	N/A	N/A	3,276.5	+105.3	3,171.2
PAUC (BY \$)	N/A	N/A	21.6	+.3	21.3
(TY \$)	N/A	N/A	64.8	+2.1	62.7

c. (U) Schedule Variance -- (NOTE: Subject to the limitations on production rates above.)

	PRODUCTION ESTIMATE	VARIANCE (CE VS. PDE)	CURRENT ESTIMATE	VARIANCE (CE VS. MAX)	MAXIMUM ECONOMIC
Start Date (Mo/Yr)	N/A	N/A	06/72	N/A	06/72
Duration (in months)	N/A	N/A	303	+19	284
End Date (Mo/Yr)	N/A	N/A	9	N/A	02/95

1/ Not applicable due to combination of Basic/POST & RMP programs.

d. (U) Deliveries (Plan/Actual) --

TO DATE

RDT&E	211/208
Procurement	8,091/8,757

18. (U) Operating and Support Costs: Not Applicable

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Improved AN/SQQ-89

RDT&E,N: 64713N/S1916

PROCUREMENT: SCN 24292N/8219, 8224: Funding is shared.
OPN 24225N/82YY

BLI/ICN: Not available for the AN/SQQ-89.
AN/SRQ-4; AN/SQQ-28: 4255
AN/SQS-53C: 0382

5.(U) Related Programs. LAMPS MK III

(b)(1)



7.(U) Program Highlights

a. Significant Historical Developments

The various subsystems in the Basic AN/SQQ-89 were originally developed under independent programs. The subsystems were designed so that they could be integrated into a single system. Subsequent to FY87 only Basic AN/SQQ-89 and Improved AN/SQQ-89 systems will be procured and the AN/SQQ-89 subsystems lose their separate identity. Basic AN/SQQ-89 testing has been completed as follows:

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7.(U) Program Highlights (continued)

a.(U) Significant Historical Developments (continued)

<u>SUBSYSTEM</u>	<u>OPERATIONAL TESTING COMPLETED</u>
AN/SQR-19	1983
AN/SQQ-28	1981
AN/SQS-53B	1983
MK 116	1982
AN/SRQ-4	1981

Operational testing of the integrated Basic AN/SQQ-89 was completed in 1983.

The AN/SQS-53C update to the Basic AN/SQQ-89 has been installed in DD 978 in preparation for at-sea testing.

The Basic AN/SQQ-89 is expected to satisfy all mission requirements.

The Request for Proposal for the Improved AN/SQQ-89 Design Definition Contract was issued 9/86 with contract award expected in March 1987.

b.(U) Significant Developments Since Last Report. This is the initial submission of the AN/SQQ-89 (Basic and Improved) SAR.

c.(U) Changes Since "As Of" Date. None

8.(U) Decision Coordinating Paper (DCP) Threshold Breaches. There are no Decision Coordinating Paper (DCP) threshold breaches.

9. ☒ Schedule

a. ☒ Milestones

	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
(U) <u>Basic AN/SQQ-89:</u>		
(U) <u>AN/SRQ-4 Subsystem</u>		
FSD Contract Award	09/77	09/77
DNSARC III	06/82	06/82
Approval for Production	12/82	12/82
(U) <u>AN/SQR-19 Subsystem</u>		
FSD Contract Award	10/76 ⁽¹⁾	10/79
DNSARC III	11/80	03/83
Approval for Production	03/83	12/84

(1)(U) The AN/SQR-19 Subsystem FSD contract awarded to GE in December 1977 was terminated in May 1978 due to cost increases and schedule slips. A new FSD contract was awarded in September 1979 with program restructuring resulting in delays in meeting program milestones.

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9. ~~(S)~~ Schedule (continued)

a. ~~(S)~~ Milestones (continued)

	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
(U) <u>AN/SQQ-28 Subsystem</u>		
FSD Contract Award	02/78	02/78
DNSARC IIIA (PASU)	12/81	12/81
DNSARC IIIB (ASU)	08/82	08/82
(U) <u>AN/SQS-53B Subsystem</u>		
FSD Contract Award	06/79	06/79
DNSARC III	12/82	12/82
Approval for Production	06/83	06/83
(U) <u>AN/SQS-53C Subsystem</u>		
FSD Contract Award	05/82	05/82
DNSARC IIIA	01/86	01/86
NPDM IIIB	09/86	09/86
NPDM IIIC	12/87	12/87
Approval for Production	12/87	12/87
(U) <u>MK 116 MOD 5 Subsystem</u>		
Approval for Production	12/82	12/82

~~(S)~~ Improved AN/SQQ-89:

	<u>Planning Estimate/ Approved Program</u>	<u>Current⁽²⁾ Estimate</u>
MS II	4th Qtr/FY89	4th Qtr/FY89
MS III (FFG)	4th Qtr/FY93	4th Qtr/FY93
MS III (BGE)	3rd Qtr/FY94	3rd Qtr/FY94

(b)(1)

b. (U) Previous Change Explanations. The AN/SQR-19 Subsystem FSD contract award was delayed due to funding deficiencies in FY77.

The schedule for the AN/SQR-19 Subsystem prototype installation and DT/OT-III was definitized in early FY81 following the assignment of USS MOOSBRUGGER (DD 980) as the test ship in June 1980. The AN/SQR-19 Subsystem schedule was also affected by the requirement to accommodate the installation and test of the AN/SQS-53B Subsystem and the ASW Control Subsystem concurrent in DD 980.

AN/SQR-19 Subsystem DNSARC III was conducted in March 1983 and resulted in Approval for Limited Production (ALP). First production contracts were awarded in June 1983.

(2) (U) The Improved AN/SQQ-89 Program is currently undergoing restructuring to permit compliance with the FY87 DoD Appropriation Act.

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9. ~~(S)~~ Schedule (continued)

c.(U) Current Change Explanations. None

d.(U) References

- (1) DCP-92 dated August 16, 1976 (AN/SQR-19)
- (2) DCP-85 dated March 5, 1979 (AN/SRQ-4 and AN/SQQ-28)
- (3) OR 062-03-86 dated 24 December 1985 (AN/SQQ-89)
- (4) ASN (RE&S) Milestone IIIB (20 September 1986)
Decision Memorandum of 17 December 1986 (AN/SQS-53C)
- (5) FY 1988 President's Budget

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Production
Estimate/
Appr. Program

Demonstrated
Performance

Current
Estimate

(U) Technical: none

(b)(1)



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10. ~~(U)~~ AN/SQQ-89A(V)1 Technical/Operational Characteristics (continued)

(b)(1)

<u>Production Estimate/ Appr. Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
---	-------------------------------------	-----------------------------

(U) Technical:

N/A

N/A

(b)(1)

(U) AN/SQQ-28

(U) Technical/Operational: (5)

Processing Capability/Sonobuoy
LOFAR (AN/SSQ-41)
DIFAR DIRECTIONAL (AN/SSQ-53)
DIFAR OMNI (AN/SSQ-53)
DIFAR NULL STEER (AN/SSQ-53)
VLAD DIRECTIONAL (AN/SSQ-77)
VLAD OMNI (AN/SSQ-77)
DEMON (AN/SSQ-41, AN/SSQ-53,
or AN/SSQ-77)
BT (AN/SSQ-36)
ANM (AN/SSQ-57)
RO (AN/SSQ-47)
CASS (AN/SSQ-50)
DICASS DIRECTIONAL (AN/SSQ-62)
DICASS OMNI (AN/SSQ-62)

(b)(1)

(U) Technical:

Space and Weight (electronics)	178 sq. ft. 16.5 tons	N/A	178 sq. ft. 16.5 tons
Reliability			
Passive Subsystem (MTBF) (HW)	600 hr.	N/A	600 hr.
Active Subsystem (MTBF) (HW)	1,100 hr.		1,100 hr.
Total Subsystem (MTBF) (HW)	460 hr.		460 hr.

(5) (U) The AN/SQQ-28 is required to process the sonobuoys identified, and has demonstrated this capability.

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(b)(1)



(U) Operational:

Operational Availability	.8	.8
--------------------------	----	----

c.(U) Previous Change Explanations. Changes in operational characteristics between the Production Estimate and the Current Estimate for the AN/SQR-19 result from subsystem improvements incorporated during program restructuring in 1978. Current estimate of Operational Availability, was revised from 0.95 to 0.82 in accordance with NAVMATINST 3000.2 of 21 January 1981 to account for Mean Logistics Delay Time (MLDT). Detection Figure of Merit (FOM) and Frequency Coverage are being improved by incorporation of an engineering change to improve TACTAS performance.

d.(U) Current Change Explanations. Demonstrated Performance in AN/SQR-19 subsystem Figure of Merit and Array MTBF have been revised to accurately show performance demonstrated subsequent to TECHEVAL/OPEVAL. Current Estimate in Streaming and Recovery Time and Array MTTR have been revised to accurately show performance being achieved.

e.(U) References: Same as Section 9.d.

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11.(U) Program Acquisition Cost. (Current Estimate in Millions of Then-Year Dollars)

a. Basic AN/SQQ-89

	<u>Production Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
<u>Costs</u>			
Development (RDT&E,N)	754.2	142.9	897.1
Procurement (OPN)	2961.0	-283.2	2677.8
Major System Equipment	1986.5	-283.2	1703.3
System Support	207.9	.0	207.9
Flyaway Total	2194.4	-283.2	1911.2
Other Wpn Sys Cost	548.3	.0	548.3
Initial Spares	218.3	.0	218.3
O&M,N (Fleet Mod. Prog.) (6)	183.8	.0	183.8
TOTAL FY85 BASE-YEAR \$	3899.0	-140.3	3758.7
<u>Escalation</u>			
Development (RDT&E,N)	-66.4	-40.3	-106.7
Procurement (OPN)	+291.9	-.5	291.4
O&M,N (FMP)	23.1	.0	23.1
TOTAL THEN-YEAR \$	4147.6	-181.1	3966.5
<u>Quantities</u> (7)			
Development (RDT&E,N)	0	0	0
Procurement (OPN)	120	0	120
TOTAL	120	0	120
<u>Unit Cost</u>			
Procurement (OPN):			
FY85 Base-Year \$	24.7	-2.4	22.3
Then-Year \$	27.1	-2.4	24.7
Program:			
FY85 Base-Year \$	32.5	-1.2	31.3
Then-Year \$	34.6	-1.5	33.1

Approved Design to Cost Goal: Not available.Foreign Military Sales:

- (1) AN/SQR-19
 Spain: 3 AN/SQR-19 Subsystems in FY83 for \$50.9M.
 Canada: 7 Handling and Stowage Groups and 8 Towed
 Array Groups in FY85 for \$47.1M.
- (2) AN/SQQ-28
 Spain: 4 AN/SQQ-28 Subsystems in FY81 for \$14.2M.
 Canada: 1 AN/SQQ-28 Subsystem in FY85 for \$2.3M.

Nuclear Costs: None

(6)(U)Only AN/SRQ-4 and AN/SQQ-28 O&MN (FMP) cost estimates are currently addressed.

(7)(U)To avoid distortion of the number of Basic AN/SQQ-89 sonars in

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11.(U) Program Acquisition Cost (continued). (Current Estimate in Millions of Then-Year Dollars)

b. Improved AN/SQQ-89

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
<u>Costs</u>			
Development (RDT&E,N)	764.8	0	764.8
Procurement (OPN)	TBD	0	TBD
Major System Equipment	TBD	0	TBD
System Support	TBD	0	TBD
Flyaway Total	TBD	0	TBD
Other Wpn Sys Cost	TBD	0	TBD
Initial Spares	TBD	0	TBD
O&MN (FMP)	TBD	0	TBD
TOTAL FY85 BASE-YEAR \$	764.8	0	764.8
<u>Escalation</u>			
Development (RDT&E,N)	187.9	0	187.9
Procurement (OPN)	0	0	0
O&MN (FMP)	0	0	0
TOTAL THEN-YEAR \$	952.7	0	952.7

(7)(U)(continued) the Fleet, the quantity acquired with OPN funding is considered to be equal to the number of ships receiving a Basic AN/SQQ-89 plus shore systems and trainers. Ships, shore systems, and trainers will receive several incremental upgrades over the program years to achieve Basic AN/SQQ-89 capability. To prevent duplicate counting, each ship, shore system, or trainer is counted to have received a Basic AN/SQQ-89 when it is finally upgraded to the final Basic AN/SQQ-89 configuration it is scheduled to receive assuming the Improved AN/SQQ-89 is introduced starting in FY93. The number of AN/SRQ-4s, AN/SQQ-28s, AN/SQR-19s, AN/SQS-53Cs, and the individual subsystems contained in Other Component Programs, procured in the program years prior to FY88, in RDT&E,N and OPN, are not included in the quantities total as they are subsumed by the Basic AN/SQQ-89 program. Similarly, the number of Improved AN/SQQ-89 to be acquired is considered to be equal to the number of ships, shore systems, and trainers scheduled to receive Improved AN/SQQ-89. The total number of AN/SQQ-89 systems to be acquired is considered to be the sum of the Basic AN/SQQ-89 and Improved AN/SQQ-89 systems.

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11.(U) Program Acquisition Cost. (Current Estimate in Millions of Then-Year Dollars) (continued)

b. Improved AN/SQQ-89 (continued)

<u>Quantities</u> (7)	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
Development (RDT&E,N)	0	0	0
Procurement (OPN)	TBD	0	TBD
TOTAL	TBD	0	TBD

Unit Cost

Procurement (OPN):

FY85 Base-Year \$

TBD

0

TBD

Then-Year \$

TBD

0

TBD

Program:

FY85 Base-Year \$

TBD

0

TBD

Then-Year \$

TBD

0

TBD

Approved Design to Cost Goal: Not available.

Foreign Military Sales: None.

Nuclear Costs: None.

12.(U) Program Acquisition/Current Procurement Unit Cost Summary.
(Current Then-Year Dollars in Millions)

a. Basic AN/SQQ-89

	<u>Current Year</u>	<u>Budget Year</u>
	<u>SAR Current Estimate</u>	<u>UCR Baseline Estimate</u>
<u>Program Acquisition:</u>		
(1) Cost	3966.4	3966.4
(2) Quantity	120	120
(3) Unit Cost	33.1	33.1

Current Procurement: Not applicable due to year to year changes in the mix of hardware components being purchased under this program.

b. Improved AN/SQQ-89

Program Acquisition:

(1) Cost	TBD	TBD	TBD
(2) Quantity	TBD	TBD	TBD
(3) Unit Cost	TBD	TBD	TBD

Current Procurement: Not available.

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13. (U) Cost Variance Analysis

a. Summary. Total AN/SQQ-89 Program

Current Then-Year Dollars in Millions

	RDT&E	OPN	O&M,N	TOTAL
Production/Planning Estimate	1640.5	3252.9	206.9	5100.3
Previous Changes:				
Economic	2.6	127.3		129.9
Quantity		-246.3		-246.3
Schedule	4.5	104.8		109.3
Engineering	6.6	203.1		209.7
Estimating	84.4	78.3		162.7
Other				
Support		-8.6		-8.6
SUBTOTAL	98.1	258.6	0	356.7
Current Changes:				
Economic	3.3	-78.3		-75.0
Quantity		-175.3		-175.3
Schedule		53.5		53.5
Engineering		47.9		47.9
Estimating	1.2	-390.2		-389.0
Other				
Support				
SUBTOTAL	4.5	-542.4	0	-537.9
TOTAL CHANGES	102.6	-283.8	0	-181.2
CURRENT ESTIMATE	1743.1	2969.1	206.9	4919.1

FY85 Constant (Base-Year) Dollars in Millions

	RDT&E	OPN	O&M,N	TOTAL
Production/Planning Estimate	1519.0	2961.0	183.8	4663.8
Previous Changes:				
Quantity		-266.4		-266.4
Schedule	4.7	.9		5.6
Engineering	9.0	171.5		180.5
Estimating	98.3	138.8		237.1
Other				.0
Support		-14.3		-14.3
SUBTOTAL	112.0	30.5	0	142.5
Current Changes:				
Quantity		-120.4		-120.4
Schedule				
Engineering		39.9		39.9
Estimating	30.9	-233.2		-202.3
Other				
Support				
SUBTOTAL	30.9	-313.7	0	-282.8
TOTAL CHANGES	142.9	-283.2	0	-140.3
CURRENT ESTIMATE	1661.9	2677.8	183.8	4523.5

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13. (U) Cost Variance Analysis (continued)

b. Summary. Basic AN/SQQ-89

Current Then-Year Dollars in Millions (8)

	RDT&E	OPN	O&M,N	TOTAL
Production Estimate	687.8	3252.9	206.9	4147.6
Previous Changes:				
Economic	2.6	127.3		129.9
Quantity		-246.3		-246.3
Schedule	4.5	104.8		109.3
Engineering	6.6	203.1		209.7
Estimating	84.4	78.3		162.7
Other				
Support		-8.6		-8.6
SUBTOTAL	98.1	258.6	0	356.7
Current Changes:				
Economic	3.3	-78.3		-75.0
Quantity		-175.3		-175.3
Schedule		53.5		53.5
Engineering		47.9		47.9
Estimating	1.2	-390.2		-389.0
Other				
Support				
SUBTOTAL	4.5	-542.4	0	-537.9
TOTAL CHANGES	102.6	-283.8	0	-181.2
CURRENT ESTIMATE	790.4	2969.1	206.9	3966.4

FY85 Constant (Base-Year) Dollars in Millions

	RDT&E	OPN	O&M,N	TOTAL
Production Estimate	754.2	2961.0	183.8	3899.0
Previous Changes:				
Quantity		-266.4		-266.4
Schedule	4.7	.9		5.6
Engineering	9.0	171.5		180.5
Estimating	98.3	138.8		237.1
Other				
Support		-14.3		-14.3
SUBTOTAL	112.0	30.5	0	142.5
Current Changes:				
Quantity		-120.4		-120.4
Schedule				
Engineering		39.9		39.9
Estimating	30.9	-233.2		-202.3
Other				
Support				
SUBTOTAL	30.9	-313.7	0	-282.8
TOTAL CHANGES	142.9	-283.2	0	-140.3
CURRENT ESTIMATE	897.1	2677.8	183.8	3758.7

(8)(U)The baseline is based on the addition of former SAR programs (AN/SQR-19 and AN/SQS-53C), a portion of a SAR program (AN/SQQ-28), (continued on page 14)

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13.(U) Cost Variance Analysis (continued)c. Previous Change Explanations⁽⁹⁾RDT&E

Economic: Revised escalation rates.
 Schedule: Program restructured due to funding deficiencies.
 Engineering: System redesigned to use Navy standard hardware.
 Estimating: Increased contractor support costs and hardware development costs.

Procurement

Economic: Revised escalation rates.
 Quantity: Decreased ship market.
 Schedule: Program restructured due to funding constraints.
 Engineering: System redesigned to use new Navy standard hardware and accommodate improvement program.
 Estimating: Changed GFM and CFE costs.
 Support: Changed procurement requirements.

d. Current Change Explanations

(Dollars in Millions)
 FY85 Then-
 (Base Year)\$ Year \$

RDT&E

Revised escalation rates for AN/SQS-53C (Economic). 3.3

(8)(U)(continued) plus non-SAR programs (AN/UYQ-25, AN/SQS-53B, and MK 116).

	Baseline (Then-Year) Dollars in Millions			
	<u>RDT&E,N</u>	<u>OPN</u>	<u>O&M,N</u>	<u>Total</u>
AN/SQR-19	62.4	538.7	0	601.1
AN/SQS-53C	312.5	1934.7	0	2247.2
Other	1265.6	779.5	206.9	2252.0
TOTAL	<u>1640.5</u>	<u>3252.9</u>	<u>206.9</u>	<u>5100.3</u>

(9)(U)Addresses all AN/SQQ-89 subsystems (AN/SQR-19 and AN/SQS-53C) previously reported separately in SARs. Only the AN/SQR-19 Subsystem SAR reported previous changes.

13.(U) Cost Variance Analysis (continued)

d. Current Change Explanations (continued)

<u>RDT&E</u> (continued)	(Dollars in Millions)	
	FY85 (Base Year)\$	Then- Year \$
Transfer of funds and SAR reporting responsibilities for the shipboard portion of the (AN/SQQ-28 and AN/SQR-4) LAMPS MK III program (Estimating).	64.9	44.8
Reduction in out-year requirements for the AN/SQS-53C (Estimating).	-34.0	-43.6
<u>Procurement</u>		
Revised escalation rates for the AN/SQR-19 and AN/SQS-53C (Economic).		-78.2
Increase of 20 AN/SQR-19 Subsystems; 18 for Naval Reserve ships, 1 life cycle maintenance facility and 1 EDM replacement (Quantity).	216.7	264.9
Decrease of 43 AN/SQS-53C Subsystem out-year requirements (Quantity)	-337.1	-440.2
Revised procurement profile for the AN/SQR-19 Subsystem (Schedule).		1.8
Revised ship installation schedule with reduction in procurement rate for the AN/SQS-53C Subsystem (Schedule).		51.7
Upgrade with new Navy standard computers (e.g., AN/UYK-44 vs. AN/UYK-20) for the AN/SQR-19 Subsystem in accordance with Congressional directions (Engineering).	39.9	47.9
Extension of production support and services for the AN/SQR-19 Subsystem due to revised schedule (Estimating).	34.2	48.9
Savings due to a total AN/SQQ-89 systems procurement vs. individual subsystems approach (Estimating).	-267.4	-439.1

13.(U) Cost Variance Analysis (continued)**e. Summary. Improved AN/SQQ-89****Current Then-Year Dollars in Millions**

	RDT&E	OPN	O&M,N	TOTAL
Planning Estimate	952.7	TBD	0	952.7
Previous Changes:				
Economic				
Quantity				
Schedule				
Engineering				
Estimating				
Other				
Support				
SUBTOTAL	952.7	TBD	0	0
Current Changes:				
Economic				
Quantity				
Schedule				
Engineering				
Estimating				
Other				
Support				
SUBTOTAL	0			0
TOTAL CHANGES	0			0
CURRENT ESTIMATE	952.7	TBD	0	952.7

FY85 Constant (Base-Year) Dollars in Millions

	RDT&E	OPN	O&M,N	TOTAL
Planning Estimate	764.8	TBD	0	764.8
Previous Changes:				
Quantity				
Schedule				
Engineering				
Estimating				
Other				
Support				
SUBTOTAL	0		0	0
Current Changes:				
Quantity				
Schedule				
Engineering				
Estimating				
Other				
Support				
SUBTOTAL	0		0	0
TOTAL CHANGES	0		0	0
CURRENT ESTIMATE	764.8	TBD	0	764.8

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13.(U) Cost Variance Analysis (continued)

- f. References. FY88 President's Budget
 DCP-92 dated August 16, 1982 (AN/SQR-19)
 ASN (RE&S) Milestone IIIB Decision Memorandum
 of December 17, 1986

14.(U) Program Acquisition Unit Cost (PAUC) History. AN/SQQ-89
(Millions of Then-Year Dollars)**a. Basic AN/SQQ-89**

Initial SAR Estimate (Development Estimate)
 to Current Estimate

PAUC (Initial SAR Est)	CHANGES								PAUC (Current Est.)
	Econ	Qty	Schd	Engr	Est	Other	Spt	Total	
34.6	.5	-3.5	1.4	2.1	-1.9	0	-.1	-1.5	33.1

b. Improved AN/SQQ-89

Initial SAR Estimate (Planning Estimate)
 to Current Estimate

PAUC (Initial SAR Est)	CHANGES								PAUC (Current Est.)
	Econ	Qty	Schd	Engr	Est	Other	Spt	Total	
TBD								.0	TBD

15.(U) Contract Information (Then-Year Dollars in Millions)**a. AN/SQR-19 Subsystem Procurement**
General Electric Co., Syracuse, NY

N00024-83-C-6292/CPAF
 Awarded: June 7, 1983
 Definitized: February 1, 1984

Initial Contract Price

Target	Ceiling	Qty.
\$109.5	\$109.5	26

Current Contract Price
 Target Ceiling Qty.
 \$141.5 N/A 762

Estimated Price at Completion
 Contractor Program Manager
 \$123.4 \$141.5

Cost Variance	Schedule Variance
------------------	----------------------

Previous Cumulative Variances

Cumulative Variances to Date (11/86)	\$+2.5	\$-4.3
Net Change	\$+2.5	\$-4.3

Explanation of Change: Current target price includes add-on of FY85/86 production quantities. Lot II assembly and test are the major contributors to schedule variance because of late deliveries of GFM by supplier and missed intermediate assembly milestones. Acceptance test delays also contribute to schedule variance. Although systems are being delivered to testing behind the original plan, customer delivery schedules are still being met prior to shipyard need dates.

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15.(U) Contract Information (Then-Year Dollars in Millions)
(continued)

b. AN/SQR-19 Subsystem Procurement
Gould, Inc., Glen Burnie, MD

		Initial Contract Price		
N00024-83-C-6294/FPIF		<u>Target</u>	<u>Ceiling</u>	<u>Qty.</u>
Awarded: June 16, 1983		\$102.5	\$113.2	26 Arrays
Definitized: August 13, 1984				

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty.</u>	<u>Contractor</u>	<u>Program Manager</u>
\$179.1	\$199.0	62 Arrays 39 H&SGs	\$157.7	\$179.1

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances		
Cumulative Variances to Date (9/86)	\$-3.2	\$-1.1
Net Change	\$-3.2	\$-1.1

Explanation of Change: Current target price includes add-on of FY85/86 production effort. Schedule and cost variances are the result of early production failures on Torispherical Heads, can housings, Hughes connectors, FITS boards and components, engineering revisions, vendor start-up problems, unanticipated complexity encountered to design and build test equipment, late arrival of miscellaneous parts, and some internal personnel management changes.

c. AN/SQS-53B Subsystem Procurement
Hughes Aircraft Co., Fullerton, CA

		Initial Contract Price		
N00024-83-C-6316/FPI/FFP ⁽¹⁰⁾		<u>Target</u>	<u>Ceiling</u>	<u>Qty.</u>
Awarded: May 3, 1983	FPI	\$ 66.0	\$ 73.3	23
Definitized: May 10, 1984	FFP	9.8	9.8	

Current Contract Price				Estimated Price at Completion	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty.</u>	<u>Contractor</u>	<u>Program Manager</u>
FPI	\$ 70.7	\$ 78.5	23	\$ 77.5	\$ 77.5
FFP	9.8	9.8		9.8	9.8

d. AN/SQS-53B Subsystem Procurement
General Electric Co., Syracuse, NY

		Initial Contract Price		
N00024-84-C-6232/FPI/FFP ⁽¹⁰⁾		<u>Target</u>	<u>Ceiling</u>	<u>Qty.</u>
Awarded: May 4, 1984	FPI	\$127.7	\$137.9	8 Subsystems
Definitized: Dec. 3, 1984	FFP	6.7	6.7	16 Kits 24 Switches

Current Contract Price				Estimated Price at Completion	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty.</u>	<u>Contractor</u>	<u>Program Manager</u>
FPI	\$129.2	\$139.7	8 sys.	\$127.2	\$127.2
FFP	6.7	6.7	16 kits/ 24 swts.	6.7	6.7

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(10)(U)Cost Performance Report is not in the contract.

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15.(U) Contract Information (Then-Year Dollars in Millions)
(continued)

e. AN/SQS-53C Subsystem RDT&E

General Electric Co., Syracuse, NY

		Initial Contract Price		
N00024-82-C-6208/CPAF		<u>Target</u>	<u>Ceiling</u>	<u>Qty.</u>
Awarded:	May 28, 1982	\$114.9	\$131.5	3
Definitized:	May 28, 1982			

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty.</u>	<u>Contractor</u>	<u>Program Manager</u>
\$155.6	N/A	3	\$170.1	\$170.1

	<u>Cost</u>	<u>Schedule</u>
	<u>Variance</u>	<u>Variance</u>
Previous Cumulative Variances		
Cumulative Variances to Date (11/86)	\$-17.9	\$-0.7
Net Change	\$-17.9	\$-0.7

Explanation of Change: The cost variance is caused by non-availability of operable AN/UYK-44s, and by technical problems with the transducer and beamformer. These problems have been resolved and estimated price at completion has been stable since July 1985 and is within the approved funding. Schedule variance is not significant.

f. AN/SQS-53C Subsystem Procurement

General Electric Co., Syracuse, NY

		Initial Contract Price		
N00024-85-C-6116/FPI		<u>Target</u>	<u>Ceiling</u>	<u>Qty.</u>
Awarded:	April 30, 1985	\$ 44.5	\$ 47.4	1
Definitized:	June 31, 1986			

Current Contract Price			Estimated Price at Completion (11)	
<u>Target</u>	<u>Ceiling</u>	<u>Qty.</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 44.5	\$ 47.4	1	\$ 53.2	\$ 60.4

	<u>Cost</u>	<u>Schedule</u>
	<u>Variance</u>	<u>Variance</u>
Previous Cumulative Variances		
Cum Variance to Date (10/86)	\$0.3	\$-1.2
Net Change	\$0.3	\$-1.2

Explanation of Change: The schedule variance is due to delayed manufacturing effort due to late delivery of material.

(11)(U) This number includes effort authorized by two contract modifications that are not yet negotiated or definitized. One modification is for spares; the other modification is for repackaged Active Receive Beamformers and long lead material for DDG 52 and DDG 53.

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16. (U) Program Funding Summary
(Current Estimate in Millions of Dollars)

a. Basic AN/SQQ-89

1. Program Status

- (a) Percent Program Completed: ^{50%}~~66.7%~~ ⁶
(1³ yrs./2¹ yrs.)
- (b) Percent Program Cost Appropriated: 47.6%
(\$1,887.4/\$3,966.4)

2. Appropriation Summary (Then-Year Dollars)

<u>Appropriation</u>	<u>Prior Yrs.</u> (FY75-87)	<u>Budget</u> <u>Year</u> (FY88)	<u>Balance to Complete</u> <u>FYDP</u> (FY89-92)	<u>Beyond FYDP</u> (FY93-00)	<u>Total</u>
RDT&E, N	667.8	25.8	96.8	.0	790.4
OPN	1153.4	181.9	1239.4	394.4	2969.1
O&M, N (FMP)	66.3	19.6	121.0	.0	206.9
TOTAL	1887.5	227.3	1457.2	394.4	3966.4

b. Improved AN/SQQ-89

1. Program Status

- (a) Percent Program Completed: N/A
(1 yr./TBD)
- (b) Percent Program Cost Appropriated: N/A
(\$15.6/TBD)

2. Appropriation Summary (Then-Year Dollars)

<u>Appropriation</u>	<u>Prior Yrs.</u> (FY75-87)	<u>Budget</u> <u>Year</u> (FY88)	<u>Balance to Complete</u> <u>FYDP</u> (FY89-92)	<u>Beyond FYDP</u> (FY93-04)	<u>Total</u>
RDT&E, N	15.6	27.3	414.0	495.8	952.7
OPN	.0	.0	TBD	TBD	TBD
O&M, N (FMP)	.0	.0	.0	.0	.0
TOTAL	15.6	27.3	414.0	495.8	952.7

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AN/SQQ-89 31 December 1986

16.(U) Program Funding Summary (continued)
(Current Estimate in Millions of Dollars)

c. Annual Summary. Total AN/SQQ-89 Program

Fiscal Year	Qty	FY85 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc.		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E,N

1975		16.6		16.6		8.7	8.7	10.9%
1976		19.1		19.1		10.6	10.6	6.6%
1977		7.1		7.1		4.1	4.1	2.9%
1977		42.3		42.3		25.1	25.1	2.6%
1978		58.9		58.9		37.6	37.6	6.8%
1979		66.1		66.1		46.6	46.6	8.4%
1980		95.3		95.3		74.3	74.3	10.5%
1981		82.5		82.5		70.2	70.2	10.6%
1982		86.9		86.9		77.8	77.8	7.6%
1983		96.1		96.1		89.9	89.9	4.9%
1984		72.4		72.4		70.3	70.3	3.8%
1985		61.4		61.4		61.4	61.4	3.4%
1986		50.8		50.8		52.3	52.3	2.9%
1987		51.3		51.3		54.6	54.6	3.1%
1988		48.3		48.3		53.1	53.1	3.5%
1989		63.3		63.3		72.0	72.0	3.5%
1990		111.6		111.6		130.9	130.9	3.3%
1991		126.6		126.6		152.5	152.2	2.9%
1992		125.9		125.9		155.3	155.3	2.4%
1993		106.6		106.6		134.6	134.6	2.4%
1994		110.4		110.4		142.7	142.7	2.4%
1995		86.8		86.8		114.9	114.9	2.4%
1996		52.9		52.9		71.7	71.7	2.4%
1997		17.2		17.2		23.9	23.9	2.4%
1998		5.5		5.5		8.0	8.0	2.4%
1999		.0		.0		.0	.0	2.4%
2000		.0		.0		.0	.0	2.4%
Subtotal		1661.9	.0	1661.9	.0	1743.1	1743.1	

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16. (U) Program Funding Summary (continued)
(Current Estimate in Millions of Dollars)

c. Annual Summary. Total AN/SQQ-89 Program (continued)

Fiscal Year	Qty	FY85 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc.		Total	
		Nonrec	Rec.		Debit	Credit		
Appropriation: OPN								
1979		.0	.7	1.0		.7	.7	8.7%
1980		.0	2.7	3.0		2.3	2.3	10.6%
1981		.0	4.1	4.3		3.6	3.6	10.6%
1982		.0	36.0	42.0		37.6	37.6	7.6%
1983		4.5	80.9	132.2		123.4	123.4	4.9%
1984		10.1	168.8	280.8		270.3	270.3	3.8%
1985		7.3	160.6	245.5		245.5	245.5	3.4%
1986		4.8	138.2	217.1		224.3	224.3	2.9%
1987		10.7	152.1	230.7		245.6	245.6	3.1%
1988		.1	114.4	164.8		181.9	181.9	3.5%
1989		.2	162.2	214.6		243.8	243.8	3.5%
1990		.3	178.1	244.2		284.9	284.9	3.3%
1991		.3	160.8	237.2		283.4	283.4	2.9%
1992		.4	233.9	349.2		427.3	427.3	2.4%
1993		.2	137.3	157.1		196.8	196.8	2.4%
1994		.2	141.1	154.1		197.7	197.7	2.4%
To Com- plete		TBD	TBD	TBD		TBD	TBD	
Subtotal	TBD	39.2	1872.0	2677.8	.0	2969.1	2969.1	

Appropriation: O&M,N (FMP)								
1984				1.2		1.2	1.2	3.8%
1985				15.4		15.4	15.4	3.4%
1986				16.1		16.6	16.6	2.9%
1987				31.1		33.1	33.1	3.1%
1988				17.8		19.6	19.6	3.5%
1989				24.9		28.4	28.4	3.5%
1990				30.0		35.2	35.2	3.3%
1991				29.9		36.0	36.0	2.9%
1992				17.4		21.4	21.4	2.4%
Subtotal		.0	.0	183.8	.0	206.9	206.9	

TOTAL	TBD	1701.2	1872.0	4523.5	.0	4919.1	4919.1	
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16.(U) Program Funding Summary (continued)
(Current Estimate in Millions of Dollars)

d. Annual Summary. Basic AN/SQQ-89

Fiscal Year	Qty	FY85 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc.		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E,N

1975		16.6		16.6		8.7	8.7	10.9%
1976		19.1		19.1		10.6	10.6	6.6%
1977		7.1		7.1		4.1	4.1	2.9%
1977T		42.3		42.3		25.1	25.1	2.6%
1978		58.9		58.9		37.6	37.6	6.8%
1979		66.1		66.1		46.6	46.6	8.4%
1980		95.3		95.3		74.3	74.3	10.5%
1981		82.5		82.5		70.2	70.2	10.6%
1982		86.9		86.9		77.8	77.8	7.6%
1983		96.1		96.1		89.9	89.9	4.9%
1984		72.4		72.4		70.3	70.3	3.8%
1985		61.4		61.4		61.4	61.4	3.4%
1986		50.8		50.8		52.3	52.3	2.9%
1987		36.6		36.6		38.9	38.9	3.1%
1988		23.5		23.5		25.8	25.8	3.5%
1989		20.5		20.5		23.3	23.3	3.5%
1990		19.8		19.8		23.2	23.2	3.3%
1991		20.7		20.7		24.9	24.9	2.9%
1992		20.5		20.5		25.3	25.3	2.4%
1993		.0		.0		.0	.0	2.4%
1994		.0		.0		.0	.0	2.4%
1995		.0		.0		.0	.0	2.4%
1996		.0		.0		.0	.0	2.4%
1997		.0		.0		.0	.0	2.4%
1998		.0		.0		.0	.0	2.4%
Subtotal		897.1	.0	897.1	.0	790.4	790.4	

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AN/SQQ-89 31 December 1986

16.(U) Program Funding Summary (continued)
(Current Estimate in Millions of Dollars)

d. Annual Summary. Basic AN/SQQ-89 (continued)

Fiscal Year	Qty	FY85 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc.		Total	
		Nonrec	Rec.		Debit	Credit		

Appropriation: OPN (12)

1979		.0	.7	1.0		.7	.7	8.7%
1980		.0	2.7	3.0		2.3	2.3	10.6%
1981		.0	4.1	4.3		3.6	3.6	10.6%
1982		.0	36.0	42.0		37.6	37.6	7.6%
1983		4.5	80.9	132.2		123.4	123.4	4.9%
1984		10.1	168.8	280.8		270.3	270.3	3.8%
1985		7.3	160.6	245.5		245.5	245.5	3.4%
1986		4.8	138.2	217.1		224.3	224.3	2.9%
1987		10.7	152.1	230.7		245.6	245.6	3.1%
1988		.1	114.4	164.8		181.9	181.9	3.5%
1989		.2	162.2	214.6		243.8	243.8	3.5%
1990		.3	178.1	244.2		284.9	284.9	3.3%
1991		.3	160.8	237.2		283.4	283.4	2.9%
1992		.4	233.9	349.2		427.3	427.3	2.4%
1993		.2	137.3	157.1		196.8	196.8	2.4%
1994		.2	141.1	154.1		197.7	197.7	2.4%
1995		.0	.0	.0		.0	.0	2.4%
1996		.0	.0	.0		.0	.0	2.4%
Subtotal	120	39.2	1872.0	2677.8	.0	2969.1	2969.1	

Appropriation: O&M,N (FMP)

1984				1.2		1.2	1.2	3.8%
1985				15.4		15.4	15.4	3.4%
1986				16.1		16.6	16.6	2.9%
1987				31.1		33.1	33.1	3.1%
1988				17.8		19.6	19.6	3.5%
1989				24.9		28.4	28.4	3.5%
1990				30.0		35.2	35.2	3.3%
1991				29.9		36.0	36.0	2.9%
1992				17.4		21.4	21.4	2.4%
Subtotal		.0	.0	183.8	.0	206.9	206.9	

TOTAL	120	936.3	1872.0	3758.7	.0	3966.4	3966.4	
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(12)(U) To avoid distortion of the number of Basic AN/SQQ-89 sonars in the Fleet, the quantity acquired with OPN funding is considered to be equal to the number of ships receiving a Basic AN/SQQ-89 plus shore systems and trainers. Ships, shore systems, and trainers will receive several incremental upgrades over the program years to achieve Basic AN/SQQ-89 capability. To prevent duplicate counting, each ship, shore system, or trainer is counted to have received a Basic AN/SQQ-89 when it is finally upgraded to the final Basic

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16.(U) Program Funding Summary (continued)
(Current Estimate in Millions of Dollars)

e. Annual Summary. Improved AN/SQQ-89

Fiscal Year	Qty	FY85 Base Year Dollars			Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc.		Total	
		Nonrec	Rec.		Debit	Credit		

Appropriation: RDT&E,N

1987		14.7		14.7		15.6	15.6	3.1%
1988		24.8		24.8		27.3	27.3	3.5%
1989		42.8		42.8		48.7	48.7	3.5%
1990		91.8		91.8		107.7	107.7	3.3%
1991		105.9		105.9		127.6	127.6	2.9%
1992		105.4		105.4		130.0	130.0	2.4%
1993		106.6		106.6		134.6	134.6	2.4%
1994		110.4		110.4		142.7	142.7	2.4%
1995		86.8		86.8		114.9	114.9	2.4%
1996		52.9		52.9		71.7	71.7	2.4%
1997		17.2		17.2		23.9	23.9	2.4%
1998		5.5		5.5		8.0	8.0	2.4%
1999		.0		.0		.0	.0	2.4%
2000		.0		.0		.0	.0	2.4%
Subtotal	0	764.8	.0	764.8	.0	952.7	952.7	

Appropriation: OPN

Subtotal	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
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Appropriation: O&M,N (FMP)

Subtotal		0	0	0	0	0	0	
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TOTAL	TBD	764.8	.0	764.8	.0	952.7	952.7	
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(12)(U)(continued) AN/SQQ-89 configuration it is scheduled to receive assuming the Improved AN/SQQ-89 is introduced starting in FY93. The number of AN/SRQ-4s, AN/SQQ-28s, AN/SQR-19s, AN/SQS-53Cs, and the individual subsystems contained in Other Component Programs, procured in the program years prior to FY88, in RDT&E,N and OPN, are not included in the quantities total as they are subsumed by the Basic AN/SQQ-89 program. Similarly, the number of Improved AN/SQQ-89 to be acquired is considered to be equal to the number of ships, shore systems, and trainers scheduled to receive Improved AN/SQQ-89. The total number of AN/SQQ-89 systems to be acquired is considered to be the sum of the Basic AN/SQQ-89 and Improved AN/SQQ-89 systems.

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AN/SQQ-89 31 December 1986

16. (U) Program Funding Summary (continued)
(Current Estimate in Millions of Dollars)

f. Obligations and Expenditures. Basic AN/SQQ-89

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E,N

1975	8.7	8.7	8.7
1976	10.6	10.6	10.6
1977	4.1	4.1	4.1
1977	25.1	25.1	25.1
1978	37.6	36.8	36.8
1979	46.6	46.1	46.1
1980	74.3	74.3	74.3
1981	70.2	70.2	69.9
1982	77.8	77.8	77.6
1983	89.9	89.9	84.2
1984	70.3	69.0	68.2
1985	61.4	61.3	60.4
1986	52.3	52.2	37.9
1987	38.9	9.1	.0
To Complete	122.5	N/A	N/A
Subtotal	790.4	635.2	603.9

Appropriation: OPN

1979	.7	.7	.7
1980	2.3	2.3	2.3
1981	3.6	3.6	3.6
1982	37.6	37.6	33.4
1983	123.4	123.4	108.5
1984	270.3	267.7	234.0
1985	245.5	233.1	136.5
1986	224.3	132.4	32.5
1987	245.6	.7	.0
To Complete	1815.8	N/A	N/A
Subtotal	2969.1	801.5	551.5

Appropriation: O&M,N (FMP)

1984	1.2	1.2	1.2
1985	15.4	15.4	15.4
1986	16.6	16.6	16.6
1987	33.1	0	0
To Complete	140.6	N/A	N/A
Subtotal	206.9	33.2	33.2

TOTAL	3966.4	1472.6	1198.2
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AN/SQQ-89 31 December 1986

16.(U) Program Funding Summary (continued)
(Current Estimate in Millions of Dollars)

g. Obligations and Expenditures. Improved AN/SQQ-89

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E,N

1987	15.6	.0	.0
To Complete	937.1	N/A	N/A
Subtotal	952.7	.0	.0

Appropriation: OPN

To Complete	TBD	N/A	N/A
Subtotal	TBD	N/A	N/A

TOTAL	952.7	.0	.0
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17.(U) Production Rate Data

a. Annual Production Rates. The year to year changes in the mix of hardware components being purchased under this program preclude the identification of quantities by fiscal year.

b. Deliveries. AN/SQQ-89 (Plan/Actual):

RDT&E,N	0/0
OPN	8/8

18.(U) Operating and Support Costs

a. Assumptions and Ground Rules

(1) There is no antecedent system.

(2) O&S costs for the AN/SQQ-89 are based upon 103 Basic AN/SQQ-89 systems and 142 Improved Systems which do not include Technical Training Equipment and Shore Sites, each operating in the Fleet for 10 years.

(3) OPN O&S costs are for ECPs to the system and procurement of spares.

(4) MPN O&S costs are for personnel required to operate and support the shipboard system.

(5) O&M,N O&S costs are for laboratory and program office support of inservice systems, field services, and equipment and software maintenance.

b. Costs. FY85 Constant (Base-Year) Dollars in Millions

Cost Element	Basic AN/SQQ-89 Avg. Annual Cost (Per System)	Antecedent
O&M,N	1.13	N/A
MPN	.69	N/A
OPN	.35	N/A
TOTAL	2.17	N/A

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

PROGRAM: TOMAHAWK SEA LAUNCHED CRUISE MISSILE, R/UGM-109 (U)

AS OF DATE: December 31, 1986

INDEXSUBJECT

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1. (U) Designation/Nomenclature (Popular Name): RGM-109/Sea Launched Cruise Missile (TOMAHAWK), Surface; UGM-109/Sea Launched Cruise Missile (TOMAHAWK), Submarine

2. (U) DoD Component: U.S. Navy

3. (U) Responsible Office and Telephone Number:

Cruise Missiles Project (PDA-14)
Washington, DC 20363-5140

RADM Larry E. Blose
Assigned: 1 August 1986
AV 222-7409; Comm (202)692-7409

4. (U) Program Elements/Procurement Line Items:

RDT&E: PE 64367N, PE 64707N - Project K1784 - PE 63717N (Prior years)
PROCUREMENT: PE 28009N, PE 24229N, PE 24660N - APPN 1507 and APPN 1810 (ICN 2071)

5. (U) Related Programs: Air-Launched and Ground-Launched Cruise Missiles (USAF); MK-41 Vertical Launching System; Harpoon Missile; OTH Targeting; SSN 21 Combat System Improvement; BB-61; CG-47; DDG-51; DD-963; SSN-688; and SSN-637 Class Ships.

CLASSIFIED BY: OPNAVINST S5513.2B, Rev. 1 (71)
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TOMAHAWK, December 31, 1986

6. (U) Mission and Description: The TOMAHAWK Land Attack Missile/Conventional, (TLAM/C), variant counters threats against the U.S Navy by destroying naval targets ashore, fleet command, control and logistic systems; industrial or other high value targets and ground-based air defense systems aiding aircraft penetration. The TOMAHAWK Anti-Ship Missile, (TASM), redresses the current Soviet anti-ship cruise missile stand-off advantage and complements aircraft strikes against combat ships with effective air defense systems. The TOMAHAWK Land Attack Missile/Nuclear, (TLAM/N), variant provides a highly survivable, world-wide theater nuclear capability.

7. (U) Program Highlights:

a. (U) Development of this generation of U.S. cruise missiles began in 1972. Since then, the ground-launched and sea-launched land-attack nuclear variants and the sea-launched anti-ship and land-attack conventional variants have completed full scale engineering development and OPEVAL, entered rate production, and have been deployed: approximately 500 missiles in operational status in Western Europe and at sea. The remaining missiles will be procured and delivered before the mid-1990's. In total, ground-launched cruise missiles will be based in five western European countries including the United Kingdom, and sea-launched cruise missiles will be deployed in more than 190 surface ships and submarines.

b. (U) Significant Developments since Last Report

(b)(1)

(a) (U) Launch of a TOMAHAWK in a pure open-ocean environment by USS LONG BEACH along the Aleutian Islands off Alaska. Also demonstrated first TOMAHAWK "Flyaway" missile handling team concept.

(b)(1);(b)(3):42 USC §2168(a) (1)(C)--(FRD)

(c) (U) Initial Operational Capability (IOC) of the TLAM/C was achieved in March 1986.

(d) (U) Launch of a vertical guidance set missile from an Amored Box Launcher (ABL).

(e) (U) Three successful development launches of the R/UGM-109D submunition conventional land-attack TOMAHAWK.

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TOMAHAWK, December 31, 1986

b. (U) Significant Developments since Last Report (continued)

(b)(1)

(g) (U) First submarine vertical launched TOMAHAWK, (UGM-109B) from USS Pittsburgh (SSN 720) in November 1986.

(b)(1)

(3) (U) Ship Vertical Launch TOMAHAWK (VL/T) achieved the following four TOMAHAWK "firsts" with the USS BUNKER HILL, CG-52, certification in August: (1) certification at an industrial activity; (2) certification of the VL/T system; (3) certification with no critical deficiencies; and (4) certification of an AEGIS class ship.

(4) (U) Major funding changes to the approved program since last report include the incorporation of the FY87 Appropriation Act and the FY 88 President's Budget which decreased the FY87 procurement funding by 11.6% to reflect anticipated savings in competition, Navy affordability issues, Congressional adjustments, and new inflation rates. One weapons control system and nine dispenser variant missiles were deleted from the FY87 procurement because of the reductions. Thus total program costs decreased \$1,218.3M (9.4%).

- (U) TOMAHAWK is expected to satisfy its current mission requirements.

c. Changes since December 31, 1986. There have been three test flights, all successful, three TLAM/Ns (two sub-surface, one surface). OPTEVFOR is evaluating results.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are current no NDCP, approved 20 October 1986, threshold breaches.

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TOMAHAWK, December 31, 1986

9. (U) Schedule:

Development Estimate/
Approved Program Actual

a. (U) Milestones

1. (U) DSARC I - Land Attack (SUBMARINE) Anti-Ship	2/74 2/74	2/74 2/74
2. (U) First Flight	5/76	3/76
3. (U) First Guided Flight - Land Attack Anti-Ship	10/76 12/76	12/76 12/76
4. (U) DSARC II - Land Attack Anti-Ship	1/77 1/77	1/77 1/77
5. (U) First Full Scale Development (FSD) Flight - Land Attack	3/77	1/77
Anti-Ship	2/77	2/77
Land Attack/ Conventional	N/A	7/81
Conventional (Blk IIA)	N/A	6/84
Conventional (Blk IIB)	N/A	11/85
6. (U) Combined DTOT/OPEVAL Complete	<u>Sub</u> <u>Ship</u>	<u>Sub</u> <u>Ship</u>
Conventional Land Attack (Block I)	N/A N/A	N/A N/A
Conventional Land Attack (Block IIA)	N/A N/A	4/85 4/85
Conventional Dispenser Variant (Block IIB)	N/A N/A	7/87 7/87 (CH-1)
Anti-Ship	5/80 1/81	10/83 5/84
Land Attack Nuclear	5/80 1/81	10/83 4/84
7. (U) DNSARC III (now NPDM)		
Conventional Land Attack (Block I)	N/A N/A	N/A N/A
Conventional Land Attack (Block IIA)	N/A N/A	12/85 12/85
Conventional Dispenser Variant (Block IIB)	N/A N/A	12/87 12/87 (CH-2)
Anti-Ship	9/80 5/81	12/84 12/84
Land Attack Nuclear	9/80 5/81	12/84 12/84
Vertical Launch TOMAHAWK	N/A N/A	N/A 10/86
8. (U) IOC		
Conventional Land Attack (Block I)	N/A N/A	N/A 4/83
Conventional Land Attack (Block IIA)	N/A N/A	3/86 3/86
Conventional Land Attack (Block IIB)	N/A N/A	9/87 9/87
Anti-Ship	6/81 6/82	11/83 6/84
Land Attack Nuclear	1/82 6/82	6/84 6/84

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TOMAHAWK, December 31, 1986

b. (U) Previous Change Explanation:

Combined DT/OT Complete -- Weapon Control System unavailability delayed the Ship-Launched Anti-Ship. The Conventional, Nuclear Land-Attack, and Anti-Ship delays are described below.

DNSARC III Anti-Ship and Land-Attack Nuclear were rescheduled based on several restructures of the program which alternated priorities of the two missile systems. These restructures alternately cancelled and resurrected the nuclear program in the early 1980's. Dates were established for Land-Attack Conventional (Blocks IIA and IIB) in December 1984 after the original development estimate was established.

IOC Anti-Ship, and Conventional Land-Attack dates were delayed due to OPEVAL testing difficulties. The Theater Mission Planning System and U/RGM-109C missiles were decertified and later recertified when those problems were solved. Missile Quality Assurance corrections added further delay.

c. (U) Current Change Explanation: (CH-1) Conventional Dispenser Variant OPEVAL completion and (CH-2) DNSARC III were delayed one month due to anticipated scheduling considerations.

d. (U) References --

Development Estimate: Draft DCP 125 dated 22 December 1976 (Land-Attack), Program Memorandum No. 117, 22 December 1976 (Anti-Ship) approved by SECNAV 5 January 1977; NDCP K0545 dated 20 October 1986 (TOMAHAWK Weapons System) approved by OPNAV.

Approved Program: FY88 President's Budget

10. (U) Operational/Technical Characteristics:

<u>Development Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
---	-------------------------------------	-----------------------------

a. (U) Operational (Land Attack):

(b)(1);(b)(3):42 USC §2168(a) (1)(C)--(FRD)

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TOMAHAWK, December 31, 1986

10. (U) Operational/Technical Characteristics (Cont'd):

Development Estimate/ Approved Program	Demonstrated Performance	Current Estimate
---	-----------------------------	---------------------

(b)(1)

b. (U) Technical (Land Attack):

(b)(1);(b)(3):42 USC §2168(a) (1)(C)--(FRD)

c. (U) Operational (Anti-Ship)

(b)(1)

f. (U) References --

Development Estimate: Draft DCP 125 dated 22 December 1976 (Land-Attack), Program Memorandum No. 117, 22 December 1976 (Anti-Ship) approved by SECNAV 5 January 1977; NDCP K0545 dated 20 October 1986 (TOMAHAWK Weapon System) approved by OPNAV.

Approved Program: FY 88 President's Budget

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TOMAHAWK, December 31, 1986

11. (U) PROGRAM ACQUISITION COSTS (Current Estimate in Millions of Dollars)

	Development Estimate (FY74-86)	Changes	Current Estimate (FY74-93)
a. (U) <u>Program Acquisition Cost</u>			
Development (RDT&E)	782.8	519.6	1302.4
Procurement	1023.6	3343.5	4367.1
Air Vehicle (Flyaway)	(786.0)	(2743.1)	(3529.1)
Other Launch/Fire Control Costs	(90.2)	(349.0)	(439.2)
Peculiar Support	(81.1)	(147.1)	(228.2)
Initial Spares	(66.3)	(104.3)	(170.6)
Construction (MILCON)	0	0.3	0.3
Total FY 77 Base-Year \$	1806.4	3863.4	5669.8
Escalation	616.5	5528.3	6144.8
Development (RDT&E)	(83.3)	(422.6)	(505.9)
Procurement	(533.2)	(5105.5)	(5638.7)
Construction (MILCON)	(0.0)	(0.2)	(0.2)
Total Then-Year Prog Cost 1/	\$2,422.9	9391.7	11,814.6
b. (U) Quantities--			
Development (RDT&E)	81	-7	74
Procurement	1,082	+2,912	3,994
Total	1,163	+2,905	4,068
c. (U) Unit Cost --			
Procurement:			
FY 77 Base-Year \$	0.946	+0.147	1.093
Then-Year \$	1.439	+1.066	2.505
Program:			
FY 77 Base-Year \$	1.553	-0.159	1.394
Then-Year \$	2.083	+0.821	2.904
d. (U) Approved Design to Cost Goal --			
(Average Unit Flyaway Cost)	Dev Estimate/ Appr Program	Current Estimate	Latest Approved Threshold
@ Qty: 3994			
@ Peak Rate: 50/mo			
FY 77 Base-Year \$	.707/ .999	.989	1.225
Then-Year \$	1.075/2.484	2.316	2.870
e. (U) Foreign Military Sales (FMS): N/A			

(b)(1)

1/ (U) Excludes SCN for new construction ships and shipboard Vertical launching system costs.

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TOMAHAWK, December 31, 1986

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current Estimate</u> Dec 86 SAR	<u>UCR Baseline Estimate</u> Dec 85 SAR	<u>UCR Baseline Estimate</u> Dec 86 SAR
a. (U) Program Acquisition --			
(1) Cost	11,814.6	13,032.9	11,814.6
(2) Quantity	4,068	4,068	4,068
(3) Unit Cost	2.904	3.204	2.904
b. (U) Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
	-- Appropriation Act --		
(1) Cost	876.8	876.8	1,075.0
Less CY Adv Proc	(66.5)	(66.5)	(78.0)
Plus FY Adv Proc	51.9	51.9	66.5
Net Total	862.2	862.2	1,063.5
(2) Quantity	315	315	475
(3) Unit Cost	2.737	2.737	2.239

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then Year) Dollars in Millions)

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Development Estimate	866.1	1,556.8	-	2,422.9
<u>Previous Changes:</u>				
Economic	+5.4	-1,533.6	+0.1	-1,528.1
Quantity	-22.6	+7,649.2	-	+7,626.6
Schedule	+213.4	+638.3	-	+851.7
Engineering	+803.2	+999.6	-	+1,802.8
Estimating	+9.8	-27.0	-0.1	-17.3
Other	-	-	-	-
Support	+2.9	+1,870.9	+0.5	+1,873.3
Subtotal	+1,012.1	+9,597.4	+0.5	+10,610.0
<u>Current Changes:</u>				
Economic	-23.8	-354.9	-	-378.7
Quantity	-	-	-	-
Schedule	-	-505.9	-	-505.9
Engineering	-43.1	-	-	-43.1
Estimating	-3.0	-183.1	-	-186.1
Other	-	-	-	-
Support	-	-104.5	-	-104.5
Subtotal	-69.9	-1,148.4	-	-1,218.3
Total Changes	+942.2	+8,449.0	+0.5	+9,391.7
Current Estimate	1,808.3	10,005.8	+0.5	11,814.6

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TOMAHAWK, December 31, 1986

13. (U) Cost Variance Analysis (Cont'd):

(FY 1977 Constant (Base Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Baseline Estimate(DE)	782.8	1,023.6	-	1,806.4
<u>Previous Changes:</u>				
Quantity	-17.5	+2,641.0	-	+2,623.5
Schedule	+148.5	+98.4	-	+246.9
Engineering	+419.7	+422.1	-	+841.8
Estimating	-7.7	-22.8	-0.1	-30.6
Other	-	-	-	-
Support	+2.1	+765.3	+0.4	+767.8
Subtotal	+545.1	+3,904.0	+0.3	+4,449.4
<u>Current Changes:</u>				
Quantity	-	-	-	-
Schedule	-	-374.1	-	-374.1
Engineering	-23.9	-	-	-23.9
Estimating	-1.6	-135.4	-	-137.0
Other	-	-	-	-
Support	-	-51.0	-	-51.0
Subtotal	-25.5	-560.5	-	-586.0
Total Changes	+519.6	+3,343.5	+0.3	+3,863.4
Current Estimate	\$1,302.4	\$4,367.1	0.3	\$5,669.8

b. (U) Previous Change Explanations

RDT&E

Economic: Revised escalation rates.

Schedule: Program delay to make design improvements, increase commonality, accelerate development of conventional land attack missile variant, and realign development of nuclear land attack.

Quantity: Reduction of 7 missiles.

Engineering: Design changes for commonality with the Ground Launch Cruise Missile. Complete TOMAHAWK baseline program including BGM-109 IOC. Establishment of TOMAHAWK Improvement Program. Implementation of program restructuring including additions such as Submunition Dispenser, Terminal Maneuver, Improved Booster, Nuclear Safety, specific Weapon System block upgrades, and Theater Mission Planning Center Upgrades.

Estimating: Revised estimate to offset economic indices. Addition of Theater Mission Planning System development caused by program restructuring.

Support: To fund the first surface ship fire control system trainer from RDT&E.

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TOMAHAWK, December 31, 1986

13. (U) Cost Variance Analysis (Cont'd):

Procurement

Economic: Revised escalation rates.
Quantity: Reduction of fire control systems for 33 ships and 52 submarines. Establish Procurement Objective of 3994 missiles.
Schedule: Delay first procurement from FY80 and FY81. Rephasing of 689 missiles from FY85-87 to FY88-92 and the Congressionally mandated rephasing of FY84 TASM's.
Engineering: Requirement to use Armored Box Launcher vice cannister launchers and production of 1,157 BGM-109D variants, vice BGM-109C versions.
Estimating: Congressionally mandated amortization of tooling and test equipment. Reestimate of Quality Assurance requirements. Inclusion of both Systems Engineering/Integrating Agent and Principal Support Laboratory in FY85 and later years. Lower costs due to competition.
Support: Support equipment and initial spares associated with missile quantity changes. Schedule rephasing of associated missile support equipment, spares and Common Weapon Control System (CWCS) spares. Transfer of Theater Mission Planning Center (TMPC) support requirements from missile flyaway.

MILCON

Estimating: Military construction requirement not estimated in DE.

c. (U) <u>Current Change Explanations</u>	(Dollars in Millions)	
	<u>Base Year \$</u>	<u>Then Year \$</u>
<u>RDT&E</u>		
Revised January 87 escalation rates (Economic)	N/A	-23.8
Navy affordability Issues (ENGR)	-39.9	-73.3
Theater Mission Planning Reestimate (ENGR)	-10.9	-19.6
Congressional Reduction including GRH (EST)	-1.6	-3.0
Addition of FY92 R&D requirements (ENGR)	+26.9	+49.8
TOTAL	-25.5	-69.9

Procurement

Revised January 87 escalation rates	N/A	-354.9
Accelerated Procurement of Missiles (SCHD)	-374.1	-505.9
Expected savings from competition including Congressional adjustments (EST)	-135.4	-183.1

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13. (U) Cost Variance Analysis (Cont'd)
 Deletion of seven Weapon Control Systems (Spt) -51.0 -104.5

TOTAL -560.5 -1,148.4

c. (U) References

- Development Estimate: RDT&E -- FY 1981 RDT&E Descriptive Summary Program Element 64367N; Procurement --
- FY 79 President's Budget
- Approved Program: FY 88 President's Budget

14. (U) Program Acquisition Unit Cost (PAUC) History:

a. (U) Initial SAR Estimate to Current Estimate.

PAUC(DE) Baseline Estimate)	Changes (Then Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng*	Est	Spt	Other	Total	
2.083	-0.469	+0.387	+0.085	+0.433	-0.050	+0.435	0.0	+0.821	2.904

15. (U) Contract Information: (Dollars in Millions)

a. (U) RDT&E: Dollar Value of ongoing effort has dropped below reporting threshold.

b. (U) Procurement: Information includes SLCM and GLCM cost and quantities.

1. AUR Missile:

General Dynamics (FY87 AUR)
 San Diego, CA
 N00032-86-C-6126, FFP
 Award: December 1986
 Definitized: December 1986

Initial Contract Price		
Target	Ceiling	Qty
	N/A	
\$136.7M		138
21.1M		13
\$157.8M		151

Current Contract Price		
Target	Ceiling	Qty
\$157.8M	N/A	151

Estimated Price at Completion	
Contractor	Program Manager
\$157.8M	\$157.8M

Previous Cumulative Variances
 Cumulative Variances To Date
 Net Change

N/A

N/A

Explanation of Change: Not reported for FFP contracts.

2. AUR Missile:

McDonnell Douglas (FY87 AUR)
 St. Louis, MO
 N00032-86-C-6124, FFP
 Award: November 1986
 Definitized: November 1986

Initial Contract Price		
Target	Ceiling	Qty
\$187.9M	N/A	240

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TOMAHAWK, December 31, 1986

15. (U) Contract Information (Cont'd): (Dollars in Millions)

2. AUR Missile (Cont'd):

<u>Current Contract Price</u>			<u>Estimate Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$187.9M	N/A	240	\$187.9M	\$187.9M

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date		
Net Change		

Explanation of Change: Not reported for FFP contracts.

3. AUR Missile:

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
General Dynamics (FY85 AUR)	\$170.3M	N/A	86
San Diego, CA			
N00019-84-C-4484, FFP			
Award: December 1984			
Definitized: December 1984			

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$200.8M	N/A	180	\$204.1M	\$210.5M

Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date		
Net Change		

Explanation of Change: Not reported for FFP contracts

4. AUR Missile:

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
General Dynamics (FY86 AUR)	\$201.9M	N/A	206
San Diego, CA			
N00019-85-C-4484, FFP			
Award: February 1986			
Definitized: February 1986			

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$201.9M	N/A	206	\$201.9M	\$201.9M

Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date		
Net Change		

Explanation of Change: Not reported for FFP contracts

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15. (U) Contract Information: (Cont'd) (Dollars in Millions)

5. AUR Missile:

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
McDonnell Douglas (FY86 AUR Option)	\$192.0M	N/A	139
San Diego, CA			
N00019-84-C-4485, FFP			
Award: December 1985			
Definitized: December 1985			

<u>Current Contract Price</u>			<u>Estimate Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$199.0M	N/A	139	\$199.0M	\$199.0M

6. AUR Missile:

	<u>Initial Contract Price</u>		
	<u>Target Price</u>	<u>Ceiling</u>	<u>Qty</u>
McDonnell Douglas (FY85 AUR)	\$182.9	N/A	108
St. Louis, MO			
N00019-84-C-4485, FFP			
Award: December 1984			
Definitized: December 1984			

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$199.7M	N/A	120	\$213.0M	\$216.9M

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date		
Net Change		

Explanation of Change: Not reported for FFP contracts.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

- (1) Percent Program Completed: 70.0% (14 yrs/20 yrs)
- (2) Percent Program Cost Appropriated: 43.8%
(\$5,180.2/\$11,814.6)

b. (U) Appropriation Summary --

<u>Appropriation</u>	<u>Current & Prior Yrs (FY74-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance FYDP (FY89-92)</u>	<u>To Complete Beyond FYDP (FY93)</u>	<u>Total</u>
RDT&E	1,521.7	73.1	213.5	-	1,808.3
Procurement	3,658.0	1,075.0	4,571.9	700.9	10,005.8
Weapon	(3,053.8)	(1,015.5)	(4,426.1)	(700.9)	(9,196.3)
Other	(604.2)	(59.5)	(145.8)	(-)	(809.5)
MILCON	0.5	-	-	-	0.5
Total	5,180.2	1,148.1	4,785.4	700.9	11,814.6

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TOMAHAWK, December 31, 1986

16. (U) PROGRAM FUNDING SUMMARY (Cont'd) (Current Estimate in Millions of Dollars)

c. (U) Annual Summary —

FISCAL YEAR	QUANTITY	FY 77 BASE-YEAR DOLLARS			THEN YEAR DOLLARS			ESCL RATE (%)
		FLYAWAY (NON-ADD)		TOTAL	Advance Procurement		TOTAL	
		NON-REC	REC		Debit	Credit		
APPROPRIATION, RDT&E, N								
1974				8.4			6.6	—
1975				43.1			37.3	—
1976				140.6			130.6	—
1977				115.3			119.2	—
1978				188.2			209.5	6.8
1979				125.4			154.1	8.4
1980				77.7			105.5	10.5
1981				90.4			133.9	10.6
1982				92.6			144.5	7.6
1983				72.7			118.5	4.9
1984				80.0			135.4	3.8
1985				45.9			79.9	3.4
1986				40.9			73.5	2.9
1987				39.5			73.2	3.1
1988				38.0			73.0	3.5
1989				30.7			60.8	3.5
1990				26.9			54.9	3.3
1991				22.9			48.1	2.9
1992				236.1			49.8	2.4
SUBTOTAL	74			1,302.4			1,808.3	

APPROPRIATION: WPN

1980	6	0.0	12.6	19.6	10.7	—	30.1	11.8
1981	50	4.8	89.0	113.2	14.0	-10.7	195.0	11.6
1982	61	10.5	95.6	124.2	14.0	-14.0	232.4	14.3
1983	51	22.8	69.8	111.8	6.7	-14.0	220.8	9.0
1984	124	20.3	122.7	167.5	15.3	-6.7	345.4	8.0
1985	180	31.8	196.7	269.5	27.8	-15.3	570.6	3.4
1986	249	43.8	226.4	319.4	51.9	-27.8	698.4	2.9
1987	315	34.4	249.9	336.2	66.3	-51.9	761.1	3.1
1988	475	29.1	360.5	434.3	78.0	-66.5	1,015.5	3.5
1989	510	21.2	384.7	438.7	88.6	-78.0	1,056.9	3.5
1990	515	23.0	396.5	453.0	97.3	-88.6	1,121.1	3.3
1991	515	18.5	394.8	467.2	103.4	-97.3	1,184.1	2.9
1992	515	16.0	386.3	409.8	71.3	-103.4	1,064.0	2.4
1993	428	14.1	251.3	263.5	0	-71.3	700.9	2.4
SUBTOTAL	3,994	290.3	3,238.8	3,927.9	645.5	-645.5	9,196.3	

APPROPRIATION: OPN

1981				23.3			36.6	10.6
1982				45.8			75.1	7.6
1983				75.7			129.0	4.9
1984				36.3			64.0	3.8
1985				44.7			81.0	3.4
1986				55.0			102.8	2.9
1987				59.8			115.7	3.1
1988				29.8			59.5	3.5
1989				20.9			43.0	3.5
1990				20.7			43.7	3.3
1991				20.1			43.4	2.9
1992				7.1			15.7	2.4
SUBTOTAL				439.2			809.5	

APPROPRIATION: MILCON

1982	—	—	—	0.3			0.3	7.6
SUBTOTAL				0.3			0.3	
TOTAL	4,068			5,669.8			11,814.6	

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TOMAHAWK, December 31, 1986

16. (U) PROGRAM FUNDING SUMMARY (Cont'd)

d. (U) Obligations and Expenditures

FISCAL YEAR	THEN YEAR DOLLARS (Current Estimate in Millions)		
	TOTAL	OBLIGATED	EXPENDED

APPROPRIATION: RDT&E,N

1974	6.6	6.6	6.6
1975	37.3	37.3	37.3
1976	130.6	130.6	130.6
1977	119.2	119.0	119.0
1978	209.5	209.5	209.5
1979	154.1	154.1	154.1
1980	105.5	105.5	105.5
1981	133.9	133.9	133.9
1982	144.5	144.2	143.2
1983	118.5	118.5	115.3
1984	135.4	134.8	130.0
1985	79.9	79.9	70.0
1986	73.5	73.5	60.8
1987	73.2	37.5	2.1
To Complete	286.6	N/A	N/A
TOTAL	1,808.3		

APPROPRIATION: WPN

1980	30.1	30.1	30.1
1981	195.0	195.0	172.6
1982	232.4	232.4	232.1
1983	220.8	220.8	199.4
1984	345.4	345.4	321.2
1985	570.6	565.0	446.9
1986	698.4	608.9	159.1
1987	761.1	329.1	18.4
To Complete	6,142.5	N/A	N/A
TOTAL	9,196.3		

APPROPRIATION: OPN

1981	36.6	36.6	36.6
1982	75.1	75.0	59.3
1983	129.0	128.8	105.0
1984	64.0	64.0	37.2
1985	81.0	81.0	51.9
1986	102.8	85.0	33.6
1987	115.7	28.8	
To Complete	205.3	N/A	N/A
TOTAL	809.5		

APPROPRIATION: MILCON

1982	0.5	0.5	0.5
TOTAL	0.5	0.5	0.5

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TOMAHAWK, December 31, 1986

17. (U) Production Rate Data:

a. (U) Annual Production Rates -- (Note: The annual production rates shown differ from the annual funded quantities because the funded delivery period for prior Fiscal Year procurements was greater than 12 months. Starting with the FY 1984 funding delivery period we project a twelve month period to program completion. Also, the attainment of the Sea Launched Cruise Missile maximum production rate may be limited by Ground Launched Cruise Missile (GLCM) missile delivery requirements until the completion of the FY 1988 funding delivery period when the GLCM program is completed.

Fiscal Year Deliveries **	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Econ Rate
1980	-	-	-	N/A
1981	30	-	-	N/A
1982	104	3	3	N/A
1983	149	22	22	135
1984	156	74	75	244
1985	161	123	92	300
1986	190	155	182	480
1987	198	201	210	540
1988	94	302	278	600
1989	-	371	398	600
1990	-	540	506	600
1991	-	647	510	600
1992	-	609	515	600
1993	-	653	514	600
1994	-	249	470	600*
1995	-	-0-	216	600
TOTAL	1082	3994	3994	N/A

* March 1994 would be the earliest theoretical date for total program (3994) completion at maximum production rates.

** This column represents the years of deliveries, not the fiscal year buys, and as such does not track directly to section 16.c.

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TOMAHAWK, December 31, 1986

17. (U) Production Rate Data (Cont'd):

b. (U) Cost Variance -- Dollars in Millions (Note: Subject to limitations on production rates above.)

Item	Production Estimate	Variance (CE less PDE)	Current Estimate	Variance (CE less Max)	Maximum Economic Rate
Prog Acq Cost (BY \$)	6,240.0	-570.2	5,669.8	1,763.4	3,906.4
(TY \$)	13,791.4	-1,976.8	11,814.6	2,742.5	9,072.1
PAUC (BY \$)	1.534	-0.14	1.394	0.434	0.960
(TY \$)	3.390	-0.486	2.904	0.674	2.230

c. (U) Schedule Variance -- (Note Subject to the limitations on production rates above.)

	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic Rate
Start Date (Mo/Yr)	July 1982	N/A	July 1982	N/A	July 1982
Duration (in Months)	152	0	152	35	117
End Date (Mo/Yr)	Mar 1995	N/A	Mar 1995	N/A	Mar 1994

(U) DELIVERIES (Plan/Actual)

	<u>R&D To Date</u>		<u>Procurement To Date</u>
R&D: Land Attack	47/37	Procurement: Land Attack	46/46
Anti-Ship	27/37	Anti-Ship	198/198
Total	74/74	Land Attack/Nuclear	167/167
		Total	411/411

18. (U) Operating and Support Costs: N/A

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A-25 UH-60A

SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A) 823)

PROGRAM: UH-60A BLACK HAWK

86-019

AS OF DATE: December 31, 1986

<u>SUBJECT</u>	<u>INDEX</u>	<u>PAGE</u>
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Program Acquisition Unit Cost History		13
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Program Funding Summary		
Production Rate Data		
1. <u>Designation and Nomenclature (Popular Name):</u>	UH-60A BLACK HAWK	
2. <u>DOD Component:</u>	Department of the Army	
3. <u>Responsible Office and Telephone Number:</u>		
BLACK HAWK Project Manager's Office		
4300 Goodfellow Boulevard		
St. Louis, Missouri 63120-1798		
	PM: COL William E. Turner,	
	Assigned: July 7, 1986	
	AUTOVON: 693-1700	
4. <u>Program Elements/Procurement Line Items:</u>		
RDT&E: PE 64206A, Projects D378 (SUNK), D189 (SUNK), D069		
Procurement: APPN 2031, SSN A05002; SSN AA0952		
5. <u>Related Programs:</u>	Army's EH-60A QUICK FIX, MH-60X BLACK HAWK and AH-64 APACHE programs; Navy's SH-60B SEAHAWK program; Global Positioning System (GPS); Air Force's HH-60A NIGHT HAWK program; and Army's UH-60A BLACK HAWK Flight Simulator.	
6. <u>Mission and Description:</u>	The BLACK HAWK is a new twin engine helicopter that is used in the performance of the air assault, air cavalry and aeromedical evacuation mission. This new aircraft is the Army's first true squad assault helicopter. It performs the missions of transporting troops and equipment into combat, resupplying the troops while in combat and performing the associated functions of aeromedical evacuation, repositioning of reserves, and command and control. The UH-60A BLACK HAWK is replacing the UH-1H Iroquois in air assault, air cavalry, and aeromedical evacuation units.	

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AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE



87-0384

7. Program Highlights:

a. Significant Historical Developments: June 22, 1971 the BLACK HAWK program was approved by the DEPSECDEF for full-scale development. March 6, 1972 a contract to develop a 1500 shaft horsepower advanced technology engine was awarded to General Electric Company (GE). August 30, 1972 contracts were awarded to Boeing Vertol and Sikorsky Aircraft to develop the BLACK HAWK airframe. Prototype qualification testing commenced October 17, 1974 and was completed December 8, 1976. These tests accumulated 2990 flight test hours and 2676 ground vehicle test hours. The BLACK HAWK was approved for production as a result of DSARC III, held November 30, 1976. December 23, 1976 Sikorsky Aircraft and GE were awarded initial production contracts for airframes and engines, respectively. October 22, 1979 ASARC IIIA was held at which time permission was granted for follow-on BLACK HAWK production.

May 15, 1979 FY 80 HASC report 96-166 directed the Army to perform a UH-60A HELLFIRE feasibility demonstration. The demonstration was integrated with Army requirements for the UH-60A BLACK HAWK to carry external stores such as fuel tanks to meet self deployment and extended range needs--the External Stores Support System (ESSS) program. May 20, 1982, the HELLFIRE feasibility demonstration was satisfactorily concluded. July 1, 1983 Development Testing II (DT II) of the ESSS was successfully completed. September 23, 1983 Operational Test II (OT II) was successfully completed at Ft. Campbell, KY. The DOD FY 84 Authorizations and Appropriation Acts directed the Army to qualify the HELLFIRE missile system on the UH-60A and appropriated \$15 million to fund the program.

b. Significant Developments Since Last Report -- Congress appropriated an additional \$15.8 million in the DOD FY86 Appropriation Act to complete qualification of the HELLFIRE missile system on the UH-60A.

During calendar year 1986, the Army awarded contracts to Sunstrand to fabricate and Sikorsky Aircraft to install crashworthy flight data recorders on approximately 247 UH-60As. In addition, February 11, 1986, the Army awarded a firm fixed price FY 86-88 T700 series engine multiyear contract to General Electric for 1,762 installed and whole spare engines.

The BLACK HAWK system currently meets all essential mission requirements.

c. Changes since "As of" Date -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: The update to UH-60A BLACK HAWK DCP No. 13 was approved November 1, 1977. It is apparent that the total quantity of 1,107 UH-60As cannot be procured within the total cost threshold of \$1,447M (FY 71 C \$). The current estimate is \$1,969.1M (FY 71 C \$).

9. Schedule:

a. Milestones --	Development Estimate/ Approved Program	Current Estimate
First Year of Funding	Jul 67/Jul 67	Jul 67
Engine Development Contract Award	Dec 71/Mar 72	Mar 72
Prototype Development Contracts Awarded	Sep 72/Aug 72	Aug 72
First Flight	Sep 74/Nov 74	Nov 74
Engine Military Qualification Test (150 Hrs)	Dec 75/Mar 76	Mar 76

9. Schedule (Cont'd):

Development Test II			
Started	Feb 76/Mar 76	Mar 76	
Completed	Dec 77/Dec 76	Dec 76	
Operational Test II			
Started	Not Shown/Jun 76	Jun 76	
Completed	Not Shown/Sep 76	Sep 76	
Milestone III (DSARC)	Sep 76/Nov 76	Nov 76	
Type Classification (Standard)	Not Shown/Nov 76	Nov 76	
Prototype Evaluation Completed	Not Shown/Dec 76	Dec 76	
Initial Production Contract Award	N/A /Dec 76	Dec 76	
1st Production Aircraft Delivery	N/A /Oct 78	Oct 78	
FDTE			
Started	Not Shown/Jun 79	Jun 79	
Completed	Not Shown/Oct 79	Oct 79	
Milestone III A (ASARC)	Not Shown/Oct 79	Oct 79	
Initial Operational Capability (IOC) 1/	Jun 79 /Nov 79	Nov 79	
Department of the Army Program Review (DAPR)	N/A /Mar 87 (Ch-1)	Mar 87 (Ch-1)	

b. Previous Change Explanations --

Changes in the current estimate of milestone accomplishments have been caused by (a) conformance with the new Army Acquisition Guidelines; (b) reduction in prototype aircraft from 6 to 3; (c) time required to repair the prototype which was damaged in November 1975; (d) scheduling problems and additional time required by other Government agencies for testing; (e) decision by DSARC III on initial production go ahead in December 1976; (f) the January 22, 1979 temporary grounding of the BLACK HAWK fleet because of the observance of a failure mode in a primary servo; (g) the June 11, 1979 official beginning of FDTE at Ft. Campbell, KY; and (h) the October 15, 1979 completion of FDTE at Ft. Campbell, KY.

c. Current Change Explanations --

(Ch-1) DA directed that a DAPR be held to consider increasing the original procurement objective for UH-60A BLACK HAWK aircraft. DA cancelled the DAPR to future date.

d. References --

Development Estimate: DCP #13, June 13, 1971 and DCP #13 Update, November 1, 1977.

Approved Program: FY 88-89 President's Budget.

Footnote:

- 1/ IOC of the BLACK HAWK means that during 1st Quarter of FY 80, Company "D" Combat Support Aviation Company, 158th Aviation Battalion (Combat), 101st Airborne Division, Ft. Campbell, KY was equipped with BLACK HAWK aircraft and operationally ready.

10. Technical/Operational Characteristics:

a. Technical --	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Payload (Pounds)	2640/2640	2640	2640
Flight Performance with Payload <u>1/</u>			
(1) Vertical Climb in Feet Per Minute (FPM) <u>2/</u>	500/664	450	664 <u>3/</u>
(2) Cruise Speed in Knots <u>4/</u>	150/145	145	145
(3) Endurance in Hours <u>5/</u>	2.3/2.3	2.3	2.3
System Meantime Between Failure (MTBF) in Hours	4.0/6.6	6.6	6.6
Maintenance Man-hours Per Flight Hour (MMH/FH) <u>6/</u>	3.8/3.0	3.1	3.0
b. Operational --			
Payload (Troop) <u>7/</u>	11/11	11	11
Air Transportability			
(1) C-130 (Quantity) <u>8/</u>	1/ N/A	N/A	N/A
(2) C-141 (Quantity)	2/2	2	2
(3) C-5 (Quantity)	6/6	6	6
Mission Reliability (Probability of Success)	.986/.987	.983	.987

c. Previous Change Explanations --

Variances in the demonstrated performance and current estimates of the operational/technical characteristics are due to: (1) bands of acceptable performance which were identified to allow for cost effective trade-offs in the BLACK HAWK MN, ED, October 1976; (2) an analysis of the data which were obtained from the previously conducted RAM/LOG sample data collection on 7 Lot IV (FY 80) production aircraft at Ft. Campbell; KY; (3) an adjustment to vertical climb to reflect the latest findings of the US Army Aviation Engineering Flight Activity (AEFA), the expected results from Lot IX (FY 85) production aircraft RAM/LOG sample data collection when the ESSS removable provisions kit is fielded, and the actual weight of the 685th production aircraft; and (4) the demonstrated performance of maintenance man-hours per flight hour reflect the increase due to an update using 1985 fleet wide sample unscheduled maintenance data from January 1, 1985 to April 18, 1985.

d. Current Change Explanations -- None

10. Technical/Operational Characteristics (Cont'd):

e. References --

Development Estimate: DCP #13, June 13, 1971 and DCP #13 Update, November 1, 1977.

Approved Program: FY 88-89 President's Budget.

Footnotes:

- 1/ At 4,000 ft. altitude and 95°F.
- 2/ Using 95% Intermediate Rated Power (IRP).
- 3/ Current estimate is based on the actual weighing of a latest configuration UH-60A BLACK HAWK production aircraft.
- 4/ Using Maximum Continuous Power (MCP).
- 5/ Using a mission profile.
- 6/ Inspection and Servicing, total Corrective MMH/FH mission reconfiguration, preparation of aircraft for air transport and refueling through Aviation Intermediate Maintenance (AVIM) level.
- 7/ At 4,000 ft. altitude and 95°F, with a crew of 3 and mission fuel.
- 8/ TWX, DAMO-RQD, June 8, 1978, approved deletion of this requirement from the UH-60A BLACK HAWK program.

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost --	<u>Development^{1/}</u> <u>Estimate</u>	<u>Changes</u>	<u>Current</u> <u>Estimate</u>
Development (RDT&E)	\$ 357.6	\$ +23.9	\$ 381.5
Procurement	1,584.4	+384.7	1,969.1
Airframe			(1,102.8)
Engine			(332.7)
Avionics			(62.7)
Other Flyaway			(276.6)
Total Flyaway			1,774.8
Other Weapon System Cost			44.6
Initial Spares			149.7
Construction (MILCON)			0
 Total FY 71 Base-Year \$	 1,942.0	 +408.6	 2,350.6
 Escalation	 365.3	 +3,684.4	 4,049.7
Development (RDT&E)	(52.3)	(+101.9)	(154.2)
Procurement	(313.0)	(+3,582.5)	(3,895.5)
Construction (MILCON)	(0)	(0)	(0)
 Total Then-Year \$	 \$2,307.3	 \$+4,093.0	 \$6,400.3

1/ Adjusted from the December 31, 1985 SAR to reflect the current then-year dollars in the Development Estimate.

11. Program Acquisition Cost (Cont'd): (Current Estimate in Millions of Dollars)

b. Quantities --

Development (RDT&E)	16	-6	10
Procurement	1,107	+4	1,111
Total	1,123	-2	1,121

c. Unit Cost --

Procurement:			
FY 71 Base-Year \$	\$1.43	\$+.34	\$1.77
Then Year \$	1.71	+3.57	5.28
Program:			
FY 71 Base-Year \$	1.73	+.37	2.10
Then Year \$	\$2.05	\$+3.66	\$5.71

d. Approved Design to Cost Goal --

	(Average Unit Flyaway Cost) 1/		
	Dev Estimate/ Appr Program	Current Estimate	Latest Approved Threshold
Qty: 1,107			
Peak Airframe Rate: 14 per month			
Peak Engine Rate: 60-80 per month within 45 months, for a total of 4,700			
FY 72 Base-Year	.951/ .951	1.581	N/A
Then-Year \$	1.089/1.089	4.607	N/A

e. Foreign Military Sales -- None

f. Nuclear Costs -- None

Footnote:

1/ System Project Management, System Test and Evaluation, and Warranty are excluded.

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
a. Program Acquisition --	<u>Curr Est Dec 86 SAR</u>	<u>UCR Baseline Dec 85 SAR</u>	<u>UCR Baseline Dec 86 SAR</u>
(1) Cost	6,400.3	6,401.6	6,400.3
(2) Quantity	1,121	1,117	1,121
(3) Unit Cost	5.710	5.731	5.710

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):
 (Current (Then-Year) Dollars in Millions)

b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	345.6	345.6	435.6
Less CY Adv Proc	161.3	161.3	198.9
Plus FY Adv Proc	212.8	212.8	150.9
Net Total	397.1	397.1	387.6
(2) Quantity	82	82	61
(3) Unit Cost	4.843	4.843	6.354

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Development Estimate	409.9	1,897.4	-	2,307.3
Previous Changes:				
Economic	+52.3	+1,289.3	-	+1,341.6
Quantity	-22.0	-	-	-22.0
Schedule	+3.0	-60.9	-	-57.9
Engineering	+40.3	+111.5	-	+151.8
Estimating	+25.9	+2,656.5	-	+2,682.4
Other	+18.5	+1.4	-	+19.9
Support	+8.2	-29.7	-	-21.5
Subtotal	+126.2	+3,968.1	-	+4,094.3
Current Changes:				
Economic	-	-133.7	-	-133.7
Quantity	-	+10.5	-	+10.5
Schedule	-	+18.6	-	+18.6
Engineering	-	-	-	-
Estimating	-.4	+68.1	-	+67.7
Other	-	-	-	-
Support	-	+35.6	-	+35.6
Subtotal	-.4	-.9	-	-1.3
Total Changes	+125.8	+3,967.2	-	+4,093.0
Current Estimate	535.7	5,864.6	-	6,400.3

13. Cost Variance Analysis (Cont'd):

(FY 1971 Constant (Base Year) Dollars in Millions)

	<u>RDTE</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Development Estimate	357.6	1,584.4	-	1,942.0
Previous Changes:				
Quantity	-20.2	-	-	-20.2
Schedule	+1.4	-106.1	-	-104.7
Engineering	+16.3	+12.3	-	+28.6
Estimating	+7.7	+535.8	-	+543.5
Other	+12.6	+8	-	+13.4
Support	+6.2	-110.3	-	-104.1
Subtotal	+24.0	+332.5	-	+356.5
Current Change				
Quantity	-	+3.2	-	+3.2
Schedule	-	+5.6	-	+5.6
Engineering	-	-	-	-
Estimating	-.1	+32.9	-	+32.9
Other	-	-	-	-
Support	-	+10.5	-	+10.5
Subtotal	-.1	+52.2	-	+52.1
Total Changes	+23.9	+384.7	-	+408.6
Current Estimate	381.5	1,969.1	-	2,350.6

b. Previous Change Explanations --

RDTE

Economic: Due to the application of January 1986 and prior DA/OSD inflation guidance.

Quantity: Due to a reduction in the number of engines and number of flying prototypes from 12 to 6 to support the development program.

Schedule: Due to the net of decreases resulting from a Congressional reduction in FY 75 and an OSD reduction in FY 78 and increases resulting from rescheduling the program because of the November 19, 1975 Boeing-Vertol and May 19, 1978 Sikorsky Aircraft prototype accidents.

Engineering: Due to the net of a decrease resulting from deleting the vertical instrument requirement and increases resulting from developing a prototype auxiliary fuel cell system and addition of the ESSS program.

Estimating: Due to the net of decreases resulting from revised cost estimates based on current information following contract negotiations, providing funds to the DIVADS program, and application of OSD generic historical RDTE inflation factors; and increases for transferring APA funds to RDTE for CIP, extension of the airframe and engine maturity contracts, decrement to program, restoration of funds previously decremented for development of 230 gallon crashworthy external fuel tank, and addition of Congressional directed HELLFIRE qualification program.

13. Cost Variance Analysis (Cont'd):

- Other: Due to increases to overhaul/repair the Boeing-Vertol prototype damaged in the November 19, 1975 accident and to sustain the development program as a consequence of the Sikorsky Aircraft prototype damaged in the May 19, 1978 accident.
- Support: Due to the net of decreases resulting from favorable cost performance on the Maturity Test, reduction in the number of overhauls during the Government Competitive Tests, and reduction in support because of 6 vice 12 prototypes; and increases for providing engine and avionics representatives for support at the airframe contractor's site.

Procurement

- Economic: Due to application of January 1986 and prior DA/OSD inflation guidance.
- Quantity: None.
- Schedule: Due to the net of decreases resulting from increasing the procurement quantity in FY 77-79 from 85 to 200, in FY 82-90 following cancellation of the SOTAS program, and in FY 85 from 78 to 86; and increases from stretching the program from FY 77-85 to FY 77-86 to FY 77-91.
- Engineering: Due to net deletion of funding for Special Operations Forces aircraft and addition of HELLFIRE production.
- Estimating: Due to the net of decreases resulting from revising the parametric cost estimating methodology, transfer of PEP funding from procurement to RDTE, reductions in the FY 78 avionics initial spares requirement and FY 81 and FY 82 airframe costs because of contract negotiations and reprogramming actions; award of a FY 82-84 airframe Multiyear Contract (MYC), FY 83-85 engine MYC production acceleration, lower airframe prices negotiated in the FY 85-87 airframe MYC and lower engine prices in the FY 86-88 T700 series engine MYC and increases resulting from revising the cost estimating methodology and estimates based on the March 1974 design-to-unit-cost review and independent parametric cost estimate, Source Selection Evaluation Board's review, FY 78 airframe Should Cost Team's results, addition of mission flexibility kits and aircraft survivability equipment, airframe production start-up problems, a change in procurement strategy from three airframe single year contract to a FY 85-87 airframe MYC increase in External Stores Support System (ESSS) requirements, application of OSD approved BLACK HAWK system peculiar historical indices and January 1986 DA/OSD Inflation Guidance to prior year costs and net of increased cost estimates for airframe and mission kits and decreased cost estimates for engines and avionics.
- Other: Due to cost growth on the FY 77 airframe production contract.
- Support: Due to the net of decreases resulting from transferring stock fund spares requirements from the project manager's budget to the respective major subordinate command's budget, revised initial spares requirements because of completion of initial spares in FY 82, peculiar ground support equipment, and production delivery acceleration; and increases resulting from increased quantity and unit price of

13. Cost Variance Analysis (Cont'd):

engines for initial spares, increased funding requirements for initial spares in the subsequent years to accommodate an increased number of deployment sites and the carryover of funding shortfalls from earlier years, resumption of funding liability for peculiar ground support equipment (PGSE), increased technical data requirements and inclusion of funds to procure a Command Instrument System Trainer (CIST) and Cockpit Emergency Procedures Trainer (CEPT).

MILCON: None.

c. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Reduction of the HELLFIRE Qualification Program in FY 86 due to sequestration (Estimating)	- .4	-1.0
Cost overrun on the contract to develop a 230 gallon crashworthy external fuel cell (Estimating)	+ .3	+ .6
(2) <u>Procurement</u>		
Application of January 1987 DA/OSD Inflation Guidance (Economic)	0.0	-133.7
Procurement of four aircraft for the U.S. Customs Service as directed by Congress (Quantity)	+3.2	+10.5
Reduction of annual procurement quantity buy by 24 per year from FY 88 to program completion (Schedule)	+5.6	+18.6
Effect of application of Jan. 1987 DA/OSD Unique Inflation Factors to prior year funding (Estimating)	+19.3	0.0
Increase in the flyaway cost of the aircraft procured for the U.S. Customs Service over that included in quantity change (Estimating)	+2.3	+7.5
Revised hardware cost estimates to reflect reduced production rates (Estimating)	+11.3	+60.6
Effect of application of Jan 1987 DA/OSD Inflation Factors on prior year costs (Support)	+ .8	.0
Increased initial spares cost estimates due to new definition of initial spares (Support)	+14.0	+48.1
Reduced cost estimates for PGSE and Data (Support)	-4.3	-12.5

(3) MILCON None.

13. Cost Variance Analysis (Cont'd):

d. References --

Development Estimate: DCP #13, June 13, 1971 and DCP #13 Update, November 1, 1977.

Approved Program: FY 88-89 President's Budget.

14. Program Acquisition Unit Cost (PAUC) History:

Initial SAR (Development) Estimate to Current Estimate

PAUC (Dev Estimate)	Econ	Qty	Sch	Changes Eng	Est	Spt	Other	Total	PAUC (Current Estimate)
2.055	+1.077	-.007	-.035	+.135	+2.453	+.013	+.018	+3.654	5.709

Footnote: Initial SAR dated December 31, 1971.

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E: None.

b. Procurement 1/

1/ Contracts are not under C/SCSC reporting. Cost and Schedule variance not applicable.

Airframe

United Technologies Corp.,
Sikorsky Aircraft Division,
Stratford, CT, DAAJ09-82-C-A326 2/, FFP,
Award: April 12, 1982
Definitized: April 12, 1982

Initial Contract Price		
Target	Ceiling	Qty
950.0	N/A	294

Current Contract Price		
Target	Ceiling	Qty
1,332.0	N/A	294

Estimated Price at Completion	
Contractor	Program Manager
1,335.0	1,335.0

2/ Deliveries on this contract are complete. Therefore, it will no longer be reported.

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

United Technology Corp., Sikorsky Aircraft Division, Stratford, CT, DAAJ09-85-C-A006, FFP, Award: October 31, 1984 Definitized: October 31, 1984	<u>Target</u> 832.4	<u>Ceiling</u> N/A	<u>Qty</u> 296
--	------------------------	-----------------------	-------------------

Current Contract Price	Estimated Price at Completion	
<u>Target</u> <u>Ceiling</u> <u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
1,070.0 N/A 296	1,082.0	1,082.0

Engine

General Electric Co., Lynn, MA, DAAJ09-83-C-A395 2/, FFP, Award: October 7, 1983 Definitized: October 7, 1983	Initial Contract Price <u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	749.9	N/A	1,560

Current Contract Price	Estimated Price at Completion	
<u>Target</u> <u>Ceiling</u> <u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
819.3 N/A 1,621	825.0	825.0

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

General Electric Co.,
Lynn, MA, DAAJ09-85-C-A481, FFP,
Award: February 11, 1986
Definitized: February 11, 1986

Initial Contract Price		
Target	Ceiling	Qty
716.2	N/A	1,724

Current Contract Price		
Target	Ceiling	Qty
786.6	N/A	1,808

Estimated Price at Completion	
Contractor	Program Manager
800.0	800.0

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 84.0% (21/25 yrs)

(2) Percent Program Cost Appropriated: 76.8% (\$4,913.5/\$6,400.3)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY68-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance To Complete</u>		<u>Total</u>
			<u>FYDP</u>	<u>Beyond FYDP</u>	
			<u>(FY88-92)</u>		
RDT&E	535.7	0	0	0	535.7
Procurement	4,377.3	435.6	1,051.7	0	5,864.6
MILCON	0	0	0	0	0
TOTAL	4,913.0	435.6	1,051.7	0	6,400.3

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	FY 71 Base-Year Dollars				Then-Year Dollars			Escal Rate (%)
	Qty	Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1968				0.6			0.5	4.2
1969				1.9			1.8	5.1
1970				1.2			1.2	5.3
1971				7.7			7.9	5.0
1972				21.1			22.7	4.7
1973				44.1			50.3	6.2
1974				83.3			102.6	8.0
1975				39.4			52.7	8.7
1976				65.8			93.6	6.3
7T				12.7			18.6	3.1
1977				49.9			76.0	3.9
1978				23.9			39.2	7.7
1979				6.3			11.4	9.7
1980				1.8			3.6	10.1
1981				3.2			7.0	9.0
1982				2.9			6.7	6.5
1983				3.8			9.1	4.5
1984				6.0			15.0	3.8
1985				0.0			0.0	3.2
1986				5.9			15.8	3.3
Subtotal	10			381.5			535.7	

Appropriation: Procurement

1977	15	18.7	39.7	71.9	7.2	0.0	140.6	1.6
1978	56	11.8	82.2	111.6	10.6	5.8	245.7	12.7
1979	92	5.4	131.8	157.7	13.1	11.2	395.6	13.8
1980	94	3.2	124.5	138.0	15.1	13.4	380.2	9.8
1981	80	2.3	123.3	165.0	24.7	15.4	478.0	5.2
1982	96	2.6	180.3	211.4	130.0	25.0	618.8	1.0
1983	96	8.7	164.3	183.3	144.2	103.0	540.6	.8
1984	84	1.1	124.0	130.6	136.8	152.1	389.4	1.0
1985	86	1.3	135.0	143.5	166.6	151.1	436.0	1.9
1986	78	.4	119.4	127.5	186.8	135.0	406.8	5.0
1987	82	.8	97.3	105.1	161.3	212.8	345.6	3.1
1988	61	2.1	114.9	128.3	198.9	150.9	435.6	3.5
1989	72	2.6	133.1	142.8	189.2	178.3	499.7	3.5
1990	72	1.4	97.9	104.2	119.1	203.8	374.4	3.3
1991	47	1.1	43.6	47.5	0.0	145.8	174.9	2.9
1992	0	0.0	0.0	.7	0.0	0.0	2.7	2.4
Subtotal	1,111	63.5	1,711.3	1,969.1	1,503.6	1,503.6	5,864.6	

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

Appropriation: MILCON

Subtotal	0	0	0	0
Total	1,121	2,350.6	1,503.6	1,503.6 6,400.3

NOTE: The escalation rates shown represent the difference between the yearly inflation factors (including spendout rates). The RDT&E factor to convert base year (FY 1971) constant dollars to the escalated dollars requirement for the first year RDT&E funds were appropriated (FY 1968) is .8834. The Procurement factor to convert base year (FY 1971) constant dollars to the escalated dollars requirement for the first year Procurement funds were appropriated (FY 1977) is 1.9561.

d. Obligations and Expenditures --

Fiscal	Then-Year Dollars (Current Estimate in Millions)		
<u>Year</u>	<u>Total</u>	<u>Obligated</u>	<u>Expended</u>

Appropriation: RDT&E

1968	0.5	0.5	0.5
1969	1.8	1.8	1.8
1970	1.2	1.2	1.2
1971	7.9	7.9	7.9
1972	22.7	22.7	22.7
1973	50.3	50.3	50.3
1974	102.6	102.6	102.6
1975	52.7	52.7	52.7
1976	93.6	93.6	93.6
7T	18.6	18.6	18.6
1977	76.0	76.0	76.0
1978	39.2	39.2	39.2
1979	11.4	11.4	11.4
1980	3.6	3.6	3.6
1981	7.0	7.0	7.0
1982	6.7	6.4	6.4
1983	9.1	9.1	8.1
1984	15.0	15.0	12.2
1985	0.0	0.0	0.0
1986	15.8	8.2	1.0
Subtotal	535.7	527.8	516.8

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

<u>Fiscal Year</u>	<u>Then-Year Dollars (Current Estimate in Millions)</u>		
	<u>Total</u>	<u>Obligated</u>	<u>Expended</u>

Appropriation: Procurement

1977	140.6	139.6	139.5
1978	245.7	245.7	245.7
1979	395.6	392.8	387.8
1980	380.2	378.7	377.2
1981	478.0	473.5	458.6
1982	618.8	613.4	610.9
1983	540.6	539.1	527.7
1984	389.4	389.4	373.4
1985	436.0	428.5	383.9
1986	406.8	397.5	243.1
1987	345.6	145.4	2.6
To Complete	1,487.3	N/A	N/A
Subtotal	5,864.6	4,143.6	3,750.4

Appropriation: MILCON

Subtotal	0	0	0
Total	6,400.3	4,671.4	4,267.2

17. Production Rate Data:

a. Annual Production Rates --

Note: The annual production rates shown differ from the annual funded quantities because the funded delivery period does not equal 12 months.

<u>Fiscal Year</u>	<u>Production Rates (Quantity/Year)</u>			<u>Maximum Economic</u>
	<u>Development Estimate</u>	<u>Production Estimate</u>	<u>Current Estimate</u>	
1977	15	15	16	16
1978	45	56	62	62
1979	66	129	102	102
1980	165	168	133	133
1981	165	168	114	115
1982	165	168	121	138
1983	165	168	136	144
1984	165	180	113	132
1985	165	180	108	126
1986			78	126
1987			81	126
1988			60	144
1989			72	144
1990			72	144
1991			72	144

17. Production Rate Data (Cont'd :

b. Cost Variances -- Dollars in Millions

Item	<u>Production Estimate</u>	<u>Variance (CE less Pde)</u>	<u>Current Estimate</u>	<u>Variance (CE less Max)</u>	<u>Maximum Economic</u>
Prog Acq Cost (BY\$)	1,755.6	595.0	2,350.6	44.1	2,306.5
(TY\$)	3,402.4	2,997.9	6,400.3	273.8	6,126.5
PAUC (BY\$)	1.572	.525	2.097	.039	2.058
(TY\$)	3.046	2.663	5.709	.244	5.465

c. Schedule Variance --

Item	<u>Production Estimate</u>	<u>Variance (CE vs Pde)</u>	<u>Current Estimate</u>	<u>Variance (CE vs Max)</u>	<u>Maximum Economic</u>
Start Date (Mo/Yr)	Oct 78	N/A	Oct 78	N/A	Oct 78
Duration (in months)	93	62	155	36	119
End Date (Mo/Yr)	Jun 86	N/A	Aug 91	N/A	Aug 88

d. Deliveries (Plan/Actual) --

	<u>To Date</u>
RDT&E	10/10
Procurement	779/779

18. Operating and Support Costs: N/A

A-14 MI TANK

~~CONFIDENTIAL~~

86-12a

SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A)823)
PROGRAM: TANK, COMBAT, FT. MI/M1A1

AS OF DATE: December 31, 1986

SUBJECT	INDEX	PAGE
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- (U) Designation and Nomenclature(Popular Name):
M1/M1A1 (Abrams)/Tank, Combat, Full Tracked (General Abrams Tank)
- (U) DOD COMPONENT: Department of the Army
- (U) Responsible Office and Telephone Number:
Program Manager, Combat Vehicles (Acting) PETER M. MCVEY, BG, USA
Program Manager, Tank Systems
AMCPM-GCM
US Army Tank-Automotive Command
Warren, MI 48397-5000
ASSIGNED: 6 January 1986
AV: 786-6662
COMM: (313)574-6662

- (U) Program Elements/Procurement Line Items:
RDT&E: PE 64620A Project DG20 (Sunk)
PE 64630A Project D287
PE 23735A Project D330

PROCUREMENT: Appn 2033 GB 1300
Appn 2033 GB 2916

MILCON: PE (FY80 NA) Project 704 (Sunk)
PE 85796A Project 295 (Sunk)
PE 84731A Project 333 (Sunk)
PE 72007A Project 096 (Sunk)

Concur in Classification
as marked
2 FEB 1987
P. Shea
SECURITY REVIEW, OACSI, HQDA

- (U) Related Programs:
Tank Main Armament Systems (TMAS); Combat Vehicle Improvement Program

CONCUR IN CLASSIFICATION
AS MARKED
FEB 26 1987

~~CLASSIFIED BY: SCG for M1/M1A1 Tank
DECLASSIFIED ON: OADR~~

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
EXCEPT WHERE SHOWN OTHERWISE
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

CONFIDENTIAL 87-7-0397

UNCLASSIFIED

Tank, Combat, FT. M1/M1A1, December 31, 1986

6. (U) Mission and Description: The Abrams tank provides a significant improvement to the Army offensive and defensive ground combat power. The Abrams tank mounts a large caliber main gun and complementary armament systems with improved day/night fire control and shoot-on-the-move capabilities, thus assuring increased first round kill capability. The tank's significant improvement in survivability is achieved by incorporation of special armor, compartmentation, improved nuclear, biological, and chemical protection, and enhanced mobility. Higher cross country speeds and faster acceleration make the Abrams tank a more difficult target for opposing ground and air forces. The goal of reduced maintenance requirements over earlier tanks has been realized in the Abrams through increased emphasis on reliability, availability, maintainability, and durability (RAM-D) during engineering and test programs. The Abrams replaces the M60 tank in selected active Army units and reserve components.

7. (U) Program Highlights:

a. (U) Significant Historical Developments--The M1 Abrams Tank program was approved on 8 Jan 73 by DCP #117. On 12 Nov 76, a Full Scale Engineering Development/Productibility Engineering and Planning (FSED/PEP) contract was awarded for the M1 Tank System. On 19 Nov 81, the SECDEF authorized production beyond 30 tanks per month. The M1A1 Tank Army Systems Acquisition Review Council (ASARC) approval was obtained on 28 Aug 84 and the Department of Defense Systems Acquisition Review Council (DSARC) was successfully completed on 12 Dec 84.

b. (U) Significant Developments Since Last Report--The last of 3,268 105mm Abrams Tanks was accepted by the government on 30 May 1986. To date, 535 M1A1 120mm tanks have been produced. The M1A1 Initial Production Test (IPT), began 12 June 1986 with a mix of nine tanks (seven RAM and two Performance) from both the Lima and Detroit Tank Plants. The IPT is on schedule and is two thirds complete. Scored data indicate that RAM performance is exceeding requirements. The M1A1 fielding to the 3rd Armored Cavalry Regiment at Ft. Bliss is ongoing. The M1A1 fielding milestone for First Unit Equipped (FUE) was accomplished in December 1986. Fielding is continuing on schedule. The Block II Improvement Program was restructured by the VCSA on 24 September 1986. M1/M1A1 Tanks meet mission requirements.

c. (U) Changes Since "As Of" Date. None.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches:

The combat loaded weight of the M1A1 exceeds the original DCP threshold due to engineering changes to the basic M1 and M1A1 vehicles. The system continues to meet or exceed all its operational RAM-D, and transportation requirements. The original requirement has been raised to 65 tons as part of the M1A1 Block II product improvement program. This new threshold will be included in the next DCP revision. It is planned to retrofit all M1A1s to this new configuration. This 65 ton weight will be met when Block II modifications are made to the current M1A1 tank.

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Tank, Combat, FT. M1/M1A1, December 31, 1986

9. (U) Schedule: M1

	Development Estimate/ Approved Program	Current Estimate
a. (U) Milestones - -		
DSARC I	Nov 72/Nov 72	Nov 72
Validation Contracts Awarded	Jun 73/Jul 73	Jun 73
Developmental/Operational Test I		
Started	Feb 76/Feb 76	Feb 76
Completed	May 76/May 76	May 76
DSARC II	Jul 76/Nov 76	Nov 76
Full Scale Development Contract Awarded	Jul 76/Nov 76	Nov 76
Development/Operational Test II		
Started	Mar 78/Feb 78	Feb 78
Started	May 78/May 78	May 78
Completed	Jul 79/Sep 79	Sep 79
Completed	Dec 78/Feb 79	Feb 79
DSARC III	Feb 79/Apr 79	Apr 79
Low Rate Initial Production Contract Awarded	May 79/May 79	May 79
Developmental/Operational Test III		
Started	May 80/Mar 80	Mar 80
Started	May 80/Sep 80	Sep 80
Completed	Nov 80/Nov 81	Nov 81
Initial Operational Capability (Tank Company)	CY 80/Jan 81	Jan 81
DSARC IIIa (Full Production Decision)	Feb 81/Sep 81	Sep 81
Full Production Contract Awarded	Feb 81/Oct 81	Oct 81
European Operational Capability	NA/CY82	CY 82

b. (U) References - -

Development Estimate: DCP #117A, May 24, 1978.

Approved Program: FY88 - 89 President's Budget.

10. (U) Technical/Operational Characteristics: M1

	Dev Estimate/ Appr Program	Demonstrated Performance	Current Estimate
a. (U) Technical - -			
Weight, Combat Loaded (Short Tons)	58.00/58.00	60.00	60.8 Ch-1
Width (Inches)	120-144/120-144	144.125	144.125
Height (Inches) (Top of Turret Roof)	90-95/90-95	93.5	93.5 Ch-2
Armament			
Main Armament (Cannon)	105-120mm/105mm	105mm	105mm
Coaxial MG	7.62mm/7.62mm	7.62mm	7.62mm
Commander's MG	Cal .50/Cal .50	Cal .50	Cal .50
Loader's MG	7.62mm/7.62mm	7.62mm	7.62mm
Engine Horsepower (HP)	1500HP/1500HP	1500HP	1500HP

Tank, Combat, FT. M1/M1A1, December 31, 1986

Technical/Operational Characteristics : M1 (Continued)

b. (U) Operational - -

	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(U) Acceleration (Seconds) Hard Surface 0% Slope 0-20 MPH (Tactical Idle)	6/6.6-7.0	5.8	7.0 Ch-3
(U) Speed:			
(U) Level Terrain X-Country (MPH) Sustained	30/30	31.6	30 Ch-4
(U) Cruising Range (Miles)	275-325/ 310	310	310 Ch-5

(b)(1)

(U) Combat Mission Reliability (MMBF)	360/385	372	385 Ch-6
(U) System Maintainability (MR)	1.0/ 1.18	1.22	1.18 Ch-7
(U) System Availability (%)	92.0/ -	-	- Ch-8
(U) Power Train Durability (Probability of 4,000 miles)	.67/.66	.66	.66 Ch-9

c. (U) Previous Change Explanations - -

Weight estimate changed from 60.0 to 60.28 due to user requirements for a Bustle Rack which was previously referred to as a Pivot Rack. Cruising range estimate changed to 310 miles which was the estimate being met during Comparison Production Testing (CPT).

d. (U) Current Change Explanations - -

(Ch-1) Current estimate changed from 60.28 to 60.8 per PM, Tank Systems Engineering M1 Weight Status Report, December 1986, due to engineering changes to the basic M1 vehicle.
(Ch-2) Demonstrated 93.5 inches during M1 DT/OT.

(Ch-3) The Approved Program Acceleration is 6.6 seconds (nominal) - 7.0 seconds maximum per Abrams Tank Systems Specification 5AX00004A dated 16 April 1984. The current PM, Tank Systems engineering estimate is 7.0 seconds due to engineering changes which resulted in increased weight.

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(CH-4) The current PM, Tank Systems Engineering estimate for level terrain cross country speed is the M1 System Specification Number 5AX-001G, 10 April 1981, requirement of 30 mph which is equivalent to the Development Estimate/Approved Program.

(Ch-5) Current estimate changed to reflect demonstrated performance (DT-III)

(CH-6) Current Engineering estimate from PM, Tank Systems Product Assurance and Test Division (PA&T) for Mission Reliability (MMBF) has increased from a 320 - 360 range to a 385 engineering estimate based upon improved production experience.

(CH-7) Current PM, Tank Systems Product Assurance and Test (PA&T) Engineering estimate for Systems Maintainability (MR) has improved from 1.25 to 1.18 due to maturation of the tank system.

(CH-8) System availability is not a stated DCP requirement for the ABRAMS Tank System.

(CH-9) System Durability Power Train (Miles) was erroneously presented in the previous SARs showing system miles unrelated to the Power Train Durability.

e. (U) References --

Development Estimate: DCP #117A, 24 May 1978.

Approved program: SDDM Decision, 8 May 1979 and 12 March 1980.

Acceleration: 6.6 nominal - 7 maximum per M1 Tank System Specification Number 5AX-00004A, dated 16 April 1984.

Demonstrated Performance: M1 Tank System Development Test (DT)/ Operational Test (OT) 1979 - 1985. Power Train Durability Test, Jul 83 - Mar 84.

Current Estimate: M1 Tank System Specification Number 5AX-001G dated 16 April 1984.

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(U) Technical/Operational Characteristics: M1A1

	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. (U) Technical - -			
Weight (Cbt Loaded) (Short Ton)	63 tons/63 tons	63 tons	63.99 tons (1)
b. (U) Operational - -			
Range (Miles)	257-279 w NBC/ 257-279 w NBC	265 w NBC 302 w-o NBC	265 w NBC 302 w-o NBC
Paved Roads (Minimum - Nominal)	270-289 w-o NBC/ 270-289 w-o NBC		NBC
Speed (Cross Country) (Top) (MPH)	30/30 41.5/41.5	30 41.5	30 41.5
Combat Mission Reliability (MMBF)	DT/OT II-298/ IPT - 320	400 DT/OT II	390 (Est. end of IPT) (2)
System Maintainability (MR)	DT II 1.4/ IPT 1.25	DT II 1.17	1.1 (Est. end of IPT) (3)
Power Train Durability (Probability of Achieving/ Miles)	.50/4000/.50/4000	DT/OT II .53/4000	.50/4000 (Est. end of IP-
Vehicle Life (Miles)	6000/6000	6000	6000
Track Life (Miles) 95% of M1	95% of M1 Demon- strated (705)/ 95% of M1 Demon- strated (705)	756	756 (4)
Weapon Tube Life (Rounds)	500/500	500/500	500/500
Sprocket Life (Miles)	1500/1500	1544	1500
Road/Idler Wheel Durability	95% of M1/ 95% of M1	4% replace- ment in 1st 3,000 miles	4% replace- (5) ment in 1st 3,0 miles
c. (U) Previous Change Explanations - - None.			

1/ Performance Qualification Test - Government

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d. (U) Current Change Explanations - -

- (1) Current PM, Tank Systems Engineering projected weight for the M1A1 Tank of 63.99 tons is based on 25 combat loaded vehicles weighed through 31 Oct 1986. This increase from the 63.0 tons demonstrated during DT/OT is due to engineering changes to the basic M1 and M1A1 vehicles.
- (2) Current estimate of combat mission reliability continues to surpass requirements due to the impact of positive production experience.
- (3) Current estimate of system maintainability continues to exhibit a low maintenance burden due to maturation of the tank system.
- (4) M1 track Development Estimate/Approved Program was originally 2,000 miles. M1 demonstrated track life necessitated an extensive track program. The track requirement for the M1A1 per the M1A1 Test and Evaluation Master Plan (TEMP) dated 18 January 1985, is that it shall demonstrate at least 95% of the life demonstrated by the M1 track under identical operating conditions (location and time). Demonstrated performance will be available upon completion of IPT in late March 1987.
- (5) M1 Development Estimate/Approved Program is no more than 20% replacement in first 3,000 miles. Current estimate is 4% replacement in first 3,000 miles. Demonstrated performance will be available upon completion of IPT in late March 1987.

(e) References - -

Development Estimate: M1E1 DCP Annex B, 28 September 1984.

Approved Program: FY88-89 President's Budget.

Demonstrated Performance: M1E1 Tank System Development Test (DT)/
Operational Test (OT) October 1982 - March 1985.

Current Estimate: Emerging M1A1 IPT test results, June 1986 through March 1987. Final scoring results will impact demonstrated performance. PM, Tank Systems Product Assurance and Test (PA&T) estimate of .50/4000 for Power Train Durability.

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11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. (U) Cost - -			
Development (RDTE)	422.6	250.6	673.2
Primary Veh/105mm Gun	(422.6)	(18.5)	(441.1)
Primary Veh/120mm Gun	(0.0)	(232.1)	(232.1)
Procurement	1970.2	4149.4	6119.6
Primary Veh/105mm Gun	(1900.4)	(180.3)	(2080.7)
Primary Veh/120mm Gun	(0.0)	(3610.5)	(3610.5)
Initial Spares	(69.8)	(236.2)	(306.0)
Training Devices	(0.0)	(122.4)	(122.4)
Construction (MILCON)	0.0	9.0	9.0
Total FY 72 Base-Year \$	2392.8	4409.0	6801.8
Escalation	2386.6	12671.6	15058.2
Development (RDTE)	(162.0)	(425.9)	(587.9)
Procurement	(2224.6)	(12232.3)	(14456.9)
Construction (MILCON)	(0.0)	(13.4)	(13.4)
Total Then-Year \$	4779.4	17080.6	21860.0
b. (U) Quantities - -			
Development (RDTE)			
105mm Gun	13	0	13
120mm Gun	0	0	0
Procurement			
105mm Gun	3312	-44	3268
120mm Gun	0	4576	4576
Total	3325	4532	7857
c. (U) Unit Cost - -			
Procurement			
FY72 Base-Year \$	0.6	0.2	0.8
Then-Year \$	1.3	1.3	2.6
Program			
FY72 Base-Year \$	0.7	0.2	0.9
Then-Year \$	1.4	1.4	2.8
d. (U) Approved Design to Cost Goal - -			
	(Average Unit Flyaway Cost)		
	<u>Dev Estimate/ Appr Program</u>	<u>Current Estimate</u>	<u>Latest Approved Threshold</u>
@ Qty 3312			
@ Prod Rate: 60/Month			
FY72 Base-Year \$	.6/.6	.6	.6
Then-Year \$	1.2/1.2	1.9	1.2
e. (U) Foreign Military Sales - - None			
f. (U) Nuclear Costs - - None			

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12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u> (Dec 86 SAR)	<u>UCR Baseline</u> (Dec 85 SAR)	<u>UCR Baseline</u> (Dec 86 SAR)
a. (U) Program Acquisition - -			
(1) Cost	21860.0	19402.6	21860.0
(2) Quantity	7857	7480	7857
(3) Unit Cost	2.8	2.6	2.8
b. (U) Current Procurement - -	(FY 1987)	(FY1987)	(FY1988)
(1) Cost	1799.3	1799.3	1510.7
Less CY Adv Proc	233.0	233.0	156.0
Plus PY Adv Proc	276.1	276.1	182.8
Net Total	1842.4	1842.4	1537.5
(2) Quantity	800	840	600
(3) Unit Cost	2.3	2.2	2.6

13. (U) Cost Variance Analysis:

a. (U) Summary - - (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
<u>Development Estimate</u>	584.6	4194.8		4779.4
<u>Previous Changes:</u>				
Economic	12.5	431.1	-	443.6
Quantity	-	5858.3	-	5858.3
Schedule	-	1175.8	-	1175.8
Engineering	338.0	1517.2	-	1855.2
Estimating	113.6	4281.2	22.3	4417.1
Other	-	-	-	-
Support	98.5	774.7	-	873.2
<u>Subtotal</u>	562.6	14038.3	22.3	14623.2
<u>Current Changes:</u>				
Economic	-6.3	-213.4	-	-219.7
Quantity	-	2467.8	-	2467.8
Schedule	-	-	-	-
Engineering	-	-346.7	-	-346.7
Estimating	120.2	697.7	0.1	818.0
Other	-	-	-	-
Support	-	-262.0	-	-262.0
<u>Subtotal</u>	113.9	2343.4	0.1	2457.4
<u>Total Changes</u>	676.5	16381.7	22.4	17080.6
<u>Current Estimate</u>	1261.1	20576.5	22.4	21860.0

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(FY72 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	422.6	1970.2	-	2392.8
Previous Changes:				
Economic	-	-	-	-
Quantity	-	1830.4	-	1830.4
Schedule	-	123.1	-	123.1
Engineering	145.7	367.1	-	512.8
Estimating	16.3	1079.9	8.5	1104.7
Other	-	-	-	-
Support	46.2	142.2	-	188.4
Subtotal	208.2	3542.7	8.5	3759.4
Current Changes				
Economic	-	-	-	-
Quantity	-	578.9	-	578.9
Schedule	-	-	-	0
Engineering	-	-89.9	-	-89.9
Estimating	42.4	185.0	0.5	227.9
Other	-	-	-	-
Support	-	-67.3	-	-67.3
Subtotal	42.4	606.7	.5	649.6
Total Changes	250.6	4149.4	9.0	4409.0
Current Estimate	673.2	6119.6	9.0	6801.8

b. (U) Previous Change Explanations - -

RDT&E

Economic: Revised escalation indices.

Engineering: Added 120 mm system and Block II improvements.

Estimating: Additional FY77 and FY78 funding for turbine engine improvements. Revised 120 mm system integration effort. Increased contractor cost to support DT/OT III and other M1 tests support. Extended FSED test support and increased funding for logistics associated with DT/OT III.

Procurement

Economic: Revised escalation indices

Quantity: Increase from 3312 to 7467 units.

Schedule: Lengthened build-up and procurement schedule.

Engineering: Incorporation of 120mm gun and revised Block II improvements, Chemical Agent Resistant Coating (CARC), Reliability, Availability Maintainability - Durability (RAM-D) investments, and optical improvements.

Estimating: Increased cost for initial production facilities.

Revised estimates from contract awards for transmission and final drive. Negotiations that resulted in revised proposals on multi-year procurement data for basic vehicle, engine and fire control subsystems.

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Support: Revised estimates for peculiar support equipment (TMDE, Spécial Tools), initial spares (engine and modules), special tools, and training devices.

MILCON

Revised estimate to include MILCON in SAR reporting as of 31 Dec 82.

c. (U) Current Change Explanations - -

		(Dollars in Millions)	
		Base Year	Then-Year
(1)	<u>RDT&E</u>		
	Revised Dec 86 economic escalation rates. (Economic)	NA	-6.3
	Revised estimates of development cost for Block II improvements and increased funding of previously unfunded Block II requirements. (Estimating)	42.4	120.2
(2)	<u>Procurement</u>		
	Revised Dec 86 economic escalation rates. (Economic)	NA	-213.4
	Program revisions.	606.7	2556.8
*	Production stretchout of program to FY92 resulting in procurement of 377 additional tanks. (Quantity)	(578.9)	(2467.8)
*	Increased provision for engineering changes (+247.1), reduction in scope and slippage of Block II improvements (-585.1), and misc (-8.7). (Engineering)	(-89.9)	(-346.7)
*	Additional special project requirements (+355.0); additional requirements for first article test, government engineering, government test and contractor survivability test (+342.7). (Estimating)	(185.0)	(697.7)
*	Increased requirements for test sets (+43.7), special tools (+19.0) and training devices (+11.2); decreased requirements for system technical support (-92.5) initial spares (-216.3), and misc (-27.1). (Support)	(-67.3)	(-262.0)
(3)	<u>MILCON</u> - Incorporation of 0.5M base year dollars reflects correction of previous error (Estimating)	+0.5	+0.1

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- d. (U) References - -
Development Estimate: DCP #117A, May 24, 1978.

Approved Program: SDDM Decision, 8 May 1979, and 12 March 1980.

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year dollars)

- a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial SAR EST)	Changes								PAUC (Dev Estimate)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
.9	.58	-	-.03	-.09	-	.06	.02	.54	1.44

- b. (U) Current Baseline Estimate to Current Estimate

PAUC (Dev Estimate)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1.44	.03	.22	.15	.19	.67	-	.08	1.34	2.78

15. (U) Contract Information: (Then-Year Dollars in Millions)

- a. (U) RDT&E - - NA
b. (U) Procurement - -
Laser Range Finder/Thermal
Imaging System 5th, 6th, 7th
Year Production (MYP)

Initial Contract Price		
Target	Ceiling	Quantity
NA	365.0	2161.0

Hughes Aircraft Co.
El Segundo, Calif
DAAA09-81-C-2010/1005
FFP
Award: April 5, 1982
Definitized: July 16, 1982

Current Contract Price		
Target	Ceiling	Quantity
NA	428.7	2535.0

Estimated Price at Completion	
Contractor	Program Manager
360.0	360.0

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Laser Range Finder/Thermal Imaging System 8th, 9th, 10th, 11th, 12th Year Production (MYP) Hughes Aircraft Co El Segundo, CA DAAA09-85-G-0029/0026 FFP Award: May 31, 1986 Definitized: Target Jan 21, 1987			<u>Initial Contract Price</u> <table border="0"> <tr> <td><u>Target</u></td> <td><u>Ceiling</u></td> <td><u>Quantity</u></td> </tr> <tr> <td>403.8</td> <td>252.3</td> <td>3299.0</td> </tr> </table>			<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	403.8	252.3	3299.0				
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>													
403.8	252.3	3299.0													
<u>Current Contract Price</u> <table border="0"> <tr> <td><u>Target</u></td> <td><u>Ceiling</u></td> <td><u>Quantity</u></td> </tr> <tr> <td>403.8</td> <td>252.3</td> <td>3299.0</td> </tr> </table>			<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	403.8	252.3	3299.0	<u>Estimated Price at Completion</u> <table border="0"> <tr> <td><u>Contractor</u></td> <td><u>Program Manager</u></td> </tr> <tr> <td>403.8</td> <td>403.8</td> </tr> </table>			<u>Contractor</u>	<u>Program Manager</u>	403.8	403.8
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>													
403.8	252.3	3299.0													
<u>Contractor</u>	<u>Program Manager</u>														
403.8	403.8														

Sixth and Seventh Year Tank Production General Dynamics Land Systems Div Warren, Mich DAAE07-83-C-A128 FFP Award: August 30, 1984 Definitized: April 30, 1985			<u>Initial Contract Price</u> <table border="0"> <tr> <td><u>Target</u></td> <td><u>Ceiling</u></td> <td><u>Quantity</u></td> </tr> <tr> <td>NA</td> <td>107.0</td> <td>840</td> </tr> </table>			<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	NA	107.0	840				
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>													
NA	107.0	840													
<u>Current Contract Price</u> <table border="0"> <tr> <td><u>Target</u></td> <td><u>Ceiling</u></td> <td><u>Quantity</u></td> </tr> <tr> <td>NA</td> <td>1500.9</td> <td>1680</td> </tr> </table>			<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	NA	1500.9	1680	<u>Estimated Price at Completion</u> <table border="0"> <tr> <td><u>Contractor</u></td> <td><u>Program Manager</u></td> </tr> <tr> <td>1500.9</td> <td>1500.9</td> </tr> </table>			<u>Contractor</u>	<u>Program Manager</u>	1500.9	1500.9
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>													
NA	1500.9	1680													
<u>Contractor</u>	<u>Program Manager</u>														
1500.9	1500.9														

Seventh Year Engine Production AVCO Lycoming Division Stratford, Conn DAAE07-84-C-A001 FFP Award: December 2, 1983 Definitized: August 12, 1985			<u>Initial Contract Price</u> <table border="0"> <tr> <td><u>Target</u></td> <td><u>Ceiling</u></td> <td><u>Quantity</u></td> </tr> <tr> <td>NA</td> <td>92.4</td> <td>840</td> </tr> </table>			<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	NA	92.4	840				
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>													
NA	92.4	840													
<u>Current Contract Price</u> <table border="0"> <tr> <td><u>Target</u></td> <td><u>Ceiling</u></td> <td><u>Quantity</u></td> </tr> <tr> <td>NA</td> <td>280.7</td> <td>840.0</td> </tr> </table>			<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	NA	280.7	840.0	<u>Estimated Price at Completion</u> <table border="0"> <tr> <td><u>Contractor</u></td> <td><u>Program Manager</u></td> </tr> <tr> <td>280.7</td> <td>280.7</td> </tr> </table>			<u>Contractor</u>	<u>Program Manager</u>	280.7	280.7
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>													
NA	280.7	840.0													
<u>Contractor</u>	<u>Program Manager</u>														
280.7	280.7														

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Eighth Year Engine/MYP Production
AVCO Lycoming Division
Stratford, Conn
DAAE07-86-C-A050
FFP
Award: June 13, 1986
Definitized: Target March 31, 1987

Initial Contract Price		
Target	Ceiling	Quantity
301.6	150.8	840

Current Contract Price		
Target	Ceiling	Quantity
1164.8	226.9	3299

Estimated Price at Completion	
Contractor	Program Manager
1164.8	1164.8

Eighth Year Tank/MYP Production
General Dynamics Land Systems Div
Warren, Mich
DAAE07-85-C-A043
FFP
Award: April 1, 1985
Definitized: Target April 30, 1987

Initial Contract Price		
Target	Ceiling	Quantity
NA	2.5	840

Current Contract Price		
Target	Ceiling	Quantity
3160.0	1026.0	3000

Estimated Price at Completion	
Contractor	Program Manager
3160.0	3160.0

c. MILCON - - NA

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status - -

- (1) Percent Program Completed: 76.2% (16 yrs/21 yrs)
- (2) Percent Program Cost Appropriated: 67.7% (\$14791.6/\$21860.0)

b. (U) Appropriation Summary - -

Appropriation	Current and Prior Years (FY72-87)	(Then-Year Dollars in Millions)			Total
		Budget Year (FY88)	Balance FYDP (FY89-92)	To Complete Beyond FYDP (FY93)	
RDT&E	1116.0	54.3	90.8	0	1261.1
Procurement	13653.2	1589.7	5333.6	0	20576.5
MILCON	22.4				22.4
Total	14791.6	1644.0	5424.4	0	21860.0

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c.(U) Annual Summary - -

Fiscal Year	QTY	FY72 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Non-Rec	Rec		Debit	Credit		

Appropriation: RDT&E

1972				19.3			20.0	
1973				19.4			21.5	4.6
1974				46.1			53.8	7.6
1975				51.9			65.0	8.2
1976				38.8			52.8	7.5
1977				27.0			39.3	4.7
1977				63.8			98.6	9.8
1978				74.9			125.8	7.0
1979				50.2			92.3	8.4
1980				34.0			68.7	9.4
1981				43.4			95.4	11.9
1982				48.3			114.2	7.6
1983				28.1			69.3	4.9
1984				34.1			87.4	3.8
1985				24.2			64.1	3.4
1986				8.8			22.3	2.9
1987 1/				9.3			24.5	3.1
1988				20.0			54.3	3.5
1989				16.4			46.0	3.5
1990				5.2			14.9	3.3
1991				6.7			19.9	2.9
1992				3.3			10.0	2.4
Subtotal	13			573.2			1261.1	

1/ FY87 RDTE funds to be available in PE 23735A, Proj D330, subsequent to anticipated reprogramming action.

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Fiscal Year	FY72 Base-Year Dollars				Then-Year Dollars			Escal Rate (%)
	QTY	Flyaway		Total	Advance Proc		Total	
		Non-Rec	Rec		Debit	Credit		

Appropriation: Procurement

1977		12.9		12.9			21.2	.57
1978		57.9		87.4	37.0		164.8	3.61
1979	90	69.2	81.6	190.8	67.5	37.0	402.7	10.67
1980	309	53.9	194.0	301.0	70.5	67.5	729.1	11.37
1981	569	62.5	351.1	511.2	133.9	70.5	1416.8	18.31
1982	665	17.3	374.1	521.6	212.0	133.9	1557.4	20.22
1983	855	32.8	427.8	620.8	368.4	212.0	1976.6	9.00
1984	840	16.9	416.0	507.3	290.8	368.4	1696.6	8.00
1985	840	13.5	471.7	541.7	301.3	289.0	1880.3	3.40
1986	790	6.6	450.8	537.2	281.4	244.2	1884.6	2.90
1987	800	2.3	447.5	530.0	233.0	276.1	1923.1	3.10
1988	600	3.1	350.0	424.3	156.0	182.8	1589.7	3.50
1989	534	1.3	311.7	380.3	146.1	228.6	1467.0	3.50
1990	304	6.7	233.4	302.9	169.6	187.9	1199.0	3.30
1991	331	3.8	262.2	324.9	153.4	169.6	1317.2	2.90
1992	317		266.5	325.3		153.4	1350.4	2.40
Subtotal	7844	360.7	4638.4	6119.6	2620.9	2620.9	20576.5	

Appropriation: MILCON

1980				2.6			5.8	
1981								10.6
1982								7.6
1983				3.7			9.4	4.9
1984				1.6			4.3	3.8
1985				1.1			2.9	3.6
Subtotal				9.0			22.4	
Total	7857	360.7	4638.4	6801.8	2620.9	2620.9	21860.0	

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Tank, Combat, FT. M1/M1A1, December 31, 1986

d. (U) Obligations and Expenditures - -

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1972	20.0	20.0	20.0
1973	21.5	21.5	21.5
1974	53.8	53.8	53.8
1975	65.0	65.0	65.0
1976	52.8	52.8	52.8
1977	39.3	39.3	39.3
1977	98.6	98.6	98.6
1978	125.8	125.8	125.8
1979	92.3	92.3	92.3
1980	68.7	68.7	68.7
1981	96.4	96.4	96.4
1982	114.2	113.7	113.7
1983	69.3	68.9	68.9
1984	87.4	87.3	80.1
1985	64.1	58.5	45.4
1986	22.3	13.4	5.7
1987	24.5	1.4	0.2
1988	54.3		
1989	46.0		
1990	14.9		
1991	19.9		
1992	10.0		
Total	1261.1	1077.4	1048.2

Appropriation: Procurement

1977	21.2	21.2	21.2
1978	164.8	162.9	162.1
1979	402.7	402.6	396.8
1980	729.1	724.6	695.3
1981	1416.8	1350.0	1308.1
1982	1557.4	1495.5	1430.9
1983	1976.6	1975.4	1856.6
1984	1696.6	1692.6	1405.8
1985	1880.3	1810.7	1446.4
1986	1884.6	1588.2	165.3
1987	1923.1	20.4	
1988	1589.7		
1989	1467.0		
1990	1199.0		
1991	1317.2		
1992	1350.4		
Total	20576.5	11244.1	8888.5

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Tank, Combat, FT. M1/M1A1, December 31, 1986

Appropriation: MILCON

Then-Year Dollars (Current Estimate in Millions)			
Fiscal Year	Total	Obligated	Expended

Appropriation: MILCON

1980	5.8	5.8	5.8
1981			
1982			
1983	9.4	9.4	4.0
1984	4.3		
1985	2.9		
Total	22.4	15.2	9.8

17. (U) Production Rate Data:

a.(U) Annual Production Rates. (NOTE: The annual production rates shown differ from the annual funded quantities because the funded delivery period is 11 months for FY86, 17 months for FY87, 11 months for FY88-89, 8 months for FY90, and 11 months for FY91-92).

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1979	110	110	90	90
1980	352	352	309	309
1981	360	506	569	569
1982	360	665	665	665
1983	360	855	855	855
1984	360	840	840	840
1985	360	840	840	840
1986	360	840	790	1080
1987	360	720	800	1080
1988	330	720	600	1080
1989		610	534	436
1990			304	
1991			331	
1992			317	

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Tank, Combat, FT. M1/M1A1, December 31, 1986

b.(U) Cost Variance - - Dollars in Millions

Item	Production Estimate	Variance	Current Estimate	Variance	Maximum Economic
Prog Acc Cost (BY \$)	5747.9	1053.9	6801.8	379.3	6422.5
(TY \$)	19574.2	2285.8	21860.0	1796.6	20063.4
PAUC (BY \$)	0.7	+2	0.9	0.1	0.8
(TY \$)	2.6	+2	2.8	0.2	2.6

c. (U) Schedule Variance - -

	Development Estimate	Variance	Current Estimate	Variance	Maximum Economic
Start Date (Mo/Yr)	2/80		2/80		2/80
Duration (in Months)	118	42	160	35	125
End Date (Mo/Yr)	12/89		6/93		6/90

d. (U) Deliveries (Plan/Actual) - -

	To Date
RDT&E	13/13
Procurement	4076/3803

18. (U) Operating and Support Costs: NA

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A-2 AH-64

SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A) B23)
PROGRAM: AH-64 (APACHE)

86-022

AS OF DATE: December 31, 1986

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CONCUR IN CLASSIFICATION
AS MARKED

FEB 26 1987

JRRC/CHATEL FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name): AH-64/Advanced Attack Helicopter (APACHE)

2. (U) DoD Component: Department of the Army

3. (U) Responsible Office and Telephone Number:

Advanced Attack Helicopter
Program Manager
4300 Goodfellow Boulevard
St. Louis, MO 63120-1798

PM: BG William H. Forster
Assigned: September 15, 1986
AV: 693-1911; COMM (314) 263-1911

4. (U) Program Elements/Procurement Line Items:

RDT&E: PE 64207

Project D425 (SUNK)

PROCUREMENT: APPN 2031 SSN A06605/AA0951/AA0968

MILCON: Project 304/242/221/352/405/2294/471/350/268/
2295/1543/1304/TWB30801/2131

Concur in Classification
as marked

4 FEB 1987

SECURITY REVIEW, OACSI, HQDA

5. (U) Related Programs: HELLFIRE, 30MM Ammunition, AH-64 Combat Mission Simulator, 2.75" Rockets.

6. (U) Mission and Description: The AH-64 is a twin engine rotary wing aircraft, designed as a stable, manned aerial weapon system capable of defeating a wide range of targets, including armored vehicles. It provides responsive direct aerial fires as an integral element of the ground units and is capable of performing its mission at night and under adverse weather conditions. It contributes highly mobile and effective firepower to the anti-armor capability of the Army in the field. Aircraft armament

OASD/PA) DFOISR 87-T-0397

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~~CLASSIFIED BY: AAH SCG
TADS/PAVS SCG
DECLASSIFY ON: 31 Dec 91: When
removed from classified
inclosures:~~

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includes the HELLFIRE anti-tank missile system, 30MM automatic gun and 2.75" rockets. This aircraft is the platform for the Target Acquisition Designation Sight/Pilot Night Vision Sensor (TADS/PNVS) which will provide day and night acquisition and designation of targets and hand-off capabilities in support of HELLFIRE and other guided munitions. The AH-64 does not replace another defense system.

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- In September 1972, the U.S. Army approved the Advanced Attack Helicopter System. On 22 June 1973, competitive Phase 1 Development Contracts were awarded to Hughes Helicopter (now McDonnell Douglas Helicopter Company (MDHC)) and Bell Helicopter Textron. Subsequently, on 7 December 1976, the AAH DSARC approved the AAH entry into full scale engineering development (Phase 2), and the Secretary of the Army selected MDHC (Model YAH-64) as the Phase 2 prime aircraft systems contractor. The Target Acquisition Designation Sight/Pilot Night Vision Sensor (TADS/PNVS) subsystems were subsequently directed for development as a competitive program, with contracts awarded to Martin Marietta Orlando Aerospace (MMAA) and Northrop Corporation on 10 March 1977. On 30 January 1981 the Army awarded a LLTI contract to MMAA (TADS/PNVS) and on 20 February 1981 to MDHC (LLTI for production AH-64s). UT II (Jun-Aug 81) was completed on time at Ft Hunter-Liggett. ASARC III was completed on 18 November 1981. The Defense Systems Acquisition Review Council (DSARC III), at which initial production of the APACHE was approved, was held on 26 March 1982. Production contracts for the first production quantity of 11 aircraft and associated equipment were awarded to MDHC, MMAA and General Electric in April 1982. The FY 84 President's Budget increased the procurement objective from 446 to 515 helicopters. MDHC rolled out the first production vehicle (PVO1) on January 26, 1984. The first production lot of Air Vehicles (11 ea) was completed on October 20, 1984. MDHC acquired Hughes Helicopter in early 1984.

b. (U) Significant Developments Since Last Report -- A total of 184 production APACHES were delivered through 31 December 1986. The third production lot of Air Vehicles (112 ea) was completed in November 1986, approximately one month ahead of contract schedule. Initial handoff of APACHES to FORSCOM occurred at Ft. Hood (6th Cavalry Brigade's 7th Squadron, 17th Cavalry) on 25 February 1986. FUE was 10 May 1986. IOC was 22 July 1986. First two production CMSs installed at Fts Rucker and Hood. Aircraft grounded for cracked rotor blades on 25 January 1986. Cracks determined to be non-structural. Aircraft released for flight 15 February 1986. Aircraft grounded for mixer support bolt on 12 March 1986. Old mixer support bolts removed from service and replaced with new lower Rockwell Hardness bolts. Aircraft ungrounded 16 April 1986. Settlement with McDonnell Douglas Helicopter Company for P5 (FY86), P6 (FY87), and P7 (FY88 option) Air Vehicle requirements and P6 (FY87) Program System Support was reached 14 November 1986. TADS/PNVS FY86 and 87 requirements and Advance Procurement for FY88 were awarded to Martin Marietta Orlando Aerospace on 25 November 1986. MG Charles F. Drenz departed APACHE PM on 15 May 86 with Mr. John F. Clarke designated as Acting PM. Effective 15 Sep 86, BG William H. Forster reported for duty as APACHE PM, succeeding Mr. Clarke. The AH-64 system is expected to satisfy all mission requirements.

c. (U) Changes Since "As Of" Date -- None.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated 1 March 1982); SDDM (dated 15 April 1985); or CSA Program Decision ltr (dated 21 September 1984) threshold breaches.

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9. (U) Schedule:

a. (U) Milestones --

	Development Estimate /Approved Program	Current Estimate
Milestone I (DSARC I)	Sep 72/Sep 72	Sep 72
Issue Request for Proposal (RFP)	Nov 72/Nov 72	Nov 72
Contract Award (Phase I Engineering Dev)	Jun 73/Jun 73	Jun 73
Mockup Review Completed	May 74/May 74	May 74
Critical Design Review Completed	May 74/May 74	May 74
First T700 Engine Delivery	Oct 74/Oct 74	Oct 74
Initial Ground Test Vehicle Operation	Jun 75/Jun 75	Jun 75
First Flight	Sep 75/Sep 75	Sep 75
DT/OT I Completed	Sep 76/Sep 76	Sep 76
Milestone II (DSARC II)	Dec 76/Dec 76	Dec 76
Contract Award (Phase 2 Engineering Dev)	Dec 76/Dec 76	Dec 76
Engineering Design Test 3 Completed	Jul 79/--	--
Competitive TADS Fly-Off Completed	Dec 79/Mar 80	Mar 80
Engineering Design Test 4 Completed	--/Nov 80	Nov 80
OT IIa Completed	--/--	--
Milestone III (DSARC III)	May 80/Mar 82	Mar 82
Contract Award (LLTI)	Jun 80/Feb 81	Feb 81
Contract Award (Production)	Oct 80/Apr 82	Apr 82
Engineering Design Test 5 Completed	--/Jan 81	Jan 81
OT II Completed	Feb 81/Aug 81	Aug 81
First Production Delivery (AC)	Jun 82/Jan 84	Jan 84
Initial Operational Capability (IOC)	May 83/Jul 86	Jul 86

(CH-1)

b. (U) Previous Change Explanations --

(U) The development estimate reflected a 50-month schedule with a LLTI award in June 1980. The current estimate reflects a 56-month schedule for completion of Operational Test II with a LLTI contract in February 1981 and a production decision in March 1982. Complete single rather than split operational testing permitted deletion of OT IIa and completion of EDT 5 in January 1981 rather than June 1981. DSARC III Prod Decision, LLTI Contract Award, First Production Delivery, and Initial Operational Capability delayed due to program restructuring. First Production Delivery reflects actual delivery. Prior to Dec 85, IOC dates were FUE.

c. (U) Current Change Explanation --

(U) (Ch-1) Revision is made to reflect actual IOC date.

d. (U) References --

(U) Development Estimate: Dep Sec Def Memo, January 5, 1977, subject: "Advanced Attack Helicopter (AAH) DSARC II."

(U) Approved Program: FY 88/89 President's Budget.

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10. (U) Technical/Operational Characteristics:

a. (U) Technical --	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
---------------------	---------------------------------------	-------------------------------------	-----------------------------

(b)(1)

b. (U) Operational --

(U) Primary Mission Gross Weight (PMGW) lbs. w/8 HF MsIs, 320 Rds, 30MM	13,910/14,765	14,694	14,765
(U) Cruise Airspeed @ PMGW - KTAS	145-175/145	145	145
(U) Vertical Rate of Climb @ PMGW-FPM	450-500/800	900	800
(U) Mission Reliability (MTBF)	19.5/19.5	18.7 (Ch 1)	19.5
(U) AVUM/AVIM Direct Maintenance MMH per FH	8-13/13	3.6 (Ch-1)	13

(b)(1)

(U) Endurance (hrs) - Primary mission	1.83/1.83	1.83	1.83
Alternate mission	2.5-2.8/2.5	2.5	2.5
(U) System Reliability (MTBF)	--/2.8	5.5 (Ch-1)	2.8
(U) Operational Availability	--/ .72	.73 (Ch-1)	.72
(U) TADS System Reliability (MTBF)	--/78	78 (Ch 2)	78 (Ch-2)
(U) PNVs System Reliability (MTBF)	--/237	237 (Ch-2)	237 (Ch-2)

c. (U) Previous Change Explanations --

(U) Technical characteristics portray current estimate for production aircraft. PMGW and VROC are due to decision to incorporate T700-GE-701 engine in production vehicles. Weapon Accuracy reflects demonstrated performance during Armament Fire Control Demonstration and Survey, and Airworthiness and Flight Characteristics Test.

d. (U) Current Change Explanations --

(U) (Ch-1) Demonstrated values for APACHE for the Attack Helicopter Battalion Training Validation (AHBTv) test at Ft. Hood (21 Apr 86 - 12 Jul 86).

(U) (Ch-2) Figures are derived from AMSAA Reliability Growth Model using RAM/LOG data collected through 29 Sep 86.

e. (U) References --

(U) Development Estimate: Dep Sec Def Memo, 5 January 1977, subject: "Advanced Attack Helicopter (AAH) DSARC II."

(U) Approved Program: FY 88/89 President's Budget.

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11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

		Development		Current
a.	(U) Cost --	<u>Estimate</u>	<u>Changes</u>	<u>Estimate</u>
	Development	609.4	+\$156.6	766.0
	Procurement	1283.0	+1033.2	2316.2
	Acft Flyaway	(998.0)	(+790.3)	(1788.3)
	HF Launcher (APA)	(-0-)	(+17.7)	(17.7)
	HF Launcher (Other)	(15.4)	(-10.0)	(5.4)
	Total Flyaway	(1013.4)	(+798.0)	(1811.4)
	Initial Spares (Acft)	(136.0)	(+116.7)	(252.7)
	Initial Spares (HF)	(1.3)	(+2.6)	(3.9)
	Other Wpn Sys Cost	(132.3)	(+115.9)	(248.2)
	Construction	-0-	+26.1	26.1
	Total FY 72 Base Year	1892.4	+1215.9	3108.3
	Escalation	1897.4	+3840.9	5735.3
	Development (RDT&E)	(326.3)	(+127.1)	(453.4)
	Procurement	(1571.1)	(+3662.9)	(5234.0)
	Acft	((1556.1))	((+3618.8))	((5174.9))
	HF Launcher (APA)	((-0-))	((+49.3))	((49.3))
	HF Launcher (Other)	((15.0))	((-5.2))	((9.8))
	Construction (MILCON)	(-0-)	(+47.9)	(47.9)
	Total Then-Year \$	\$ 3789.8	\$5053.8	\$8843.6
b.	(U) Quantities --			
	Development (RDT&E)	9	--	9
	Procurement	536	+ 57	593
	Total	545	+ 57	602
c.	(U) Unit Cost --			
	Procurement:			
	FY 72 Base Year \$	\$2.4	+\$1.5	\$3.9
	Then-Year \$	5.3	+7.4	12.7
	Program:			
	FY 72 Base Year \$	3.5	+1.7	5.2
	Then-Year \$	\$7.0	+\$7.7	\$14.7

d. (U) Approved Design to Cost Goal --

		(Average Unit Flyaway Cost)	
	Dev Estimate/ Appr Program	Current Estimate	Latest Approved Threshold
@ Qty: 515		593	
Peak Rate: 12/mo		12/mo	
FY 72 Base Year \$	1.804/3.314	3.66	3.314
Then-Year \$	4.511/10.660	9.96	10.660

e. (U) Foreign Military Sales --

Country	Quantity	Estimated Cost
Federal Republic of Germany	1/	\$25.3M

(U) 1/ Three Mission Equipment Package for FAH-2 helicopter plus support equipment.

f. (U) Nuclear Costs -- None

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12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	UCR Baseline (Dec 86 SAR)
a. (U) Program Acquisition --			
(1) (U) Cost	8843.6	9206.4	8843.6
(2) (U) Quantity	602	684	602
(3) (U) Unit Cost	14.69	13.46	14.69
b. (U) Current Procurement --	(FY 1987)	(FY 1987 Appn)	(FY 1988)
(1) (U) Cost	1128.9	1126.9	735.0
Less CY Adv Proc	38.2	38.2	0
Plus FY Adv Proc	62.4	62.2	38.2
Net Total	1153.1	1150.9	773.2
(2) (U) Quantity	101	120	67
(3) (U) Unit Cost	11.42	9.59	11.54

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	935.7	2854.1	0	3789.8
Previous Changes:				
Economic	+25.8	+713.7	-9.5	+730.0
Quantity	--	+622.9	--	+622.9
Schedule	+200.4	+338.5	--	+538.9
Engineering	+61.9	+107.2	--	+169.1
Estimating	-16.6	2031.9	+98.0	+2113.3
Other	--	--	--	--
Support	+32.4	+1210.3	--	+1242.4
Subtotal	+303.9	+5024.2	+88.5	+5416.6
Current Changes:				
Economic	-1.3	-98.7	-.5	-100.5
Quantity	--	-449.6	--	-449.6
Schedule	--	--	--	--
Engineering	--	+48.6	--	+48.6
Estimating	-18.9	+394.0	-14.0	+361.1
Other	--	--	--	--
Support	--	-222.4	--	-222.4
Subtotal	-20.2	-328.1	-14.5	-362.8
Total Changes	+283.7	+4696.1	+74.0	+5053.8
Current Estimate	1219.4	7550.2	74.0	8843.6

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8. (U) Cost Variance Analysis (Cont'd):

(FY 1972 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	609.4	1283.0	0	1892.4
Previous Changes:				
Quantity	--	+206.9	--	+206.9
Schedule	+94.6	+11.2	--	+105.8
Engineering	+27.6	+34.8	--	+62.4
Estimating	+25.5	+589.4	+30.4	+645.3
Other	--	--	--	--
Support	+17.4	+294.9	--	+312.3
Subtotal	+165.1	+1137.2	+30.4	+1332.7
Current Changes:				
Quantity	--	-134.1	--	-134.1
Schedule	--	--	--	--
Engineering	--	+14.5	--	+14.5
Estimating	-8.5	+88.6	-4.3	+75.8
Other	--	--	--	--
Support	--	-73.0	--	-73.0
Subtotal	-8.5	-104.0	-4.3	-116.8
Total Changes	+156.6	+1033.2	+26.1	+1215.9
Current Estimate	766.0	2316.2	26.1	3108.3

b. (U) Previous Change Explanations --

RDT&E

Economic: revised escalation indices.

Schedule: phase 2 sched adjustment (56 mos); 3 mos sustaining prog effort; accidental crash of prototype.

Engineering: correction of technical difficulties in tail section; addition of Optical Improvement Program.

Estimating: application of revised FY 80-72 deflators; approval of OSD historical indices through Jan 83; withdrawal of funds by AMC for development of TPS for depot support which will remain with the contractor.

Support: SPA, obscurant tests; increased log support for OT-II testing; FY 82-84 budget cuts.

Procurement:

Economic: revised escalation indices.

Quantity: reduction of 90 aircraft (from 536 to 446); increase of 69 additional helicopters (446 to 515); increase of 160 aircraft (515 to 675).

Schedule: BLACKHAWK sched extension; AAH sched extension to accommodate LLTI; early year program slips; revision to max rate (12/mo); additional tooling for accelerated (515 A/C) schedule. Movement of 6 Acft from FY 85 to 88.

Engineering: incorp of T700-GE-701 engine; transfer of HELLFIRE Launcher costs from HELLFIRE SAR; addition of Optical Improvement Program. Additional Airborne Target Handover System Work.

Estimating: Nov 77 BCE; T700-GE-700 cost increases; DTC review impacts; revised prog estimates resulting from 1979 reviews; DTC/BCE/ final assembly and electrical work; application of reserve for additional quantity; use of OSD historical inflation indices on base year \$; changes applicable to increase of 160 aircraft; changes applicable to HF missile launcher funds decrease due to competitive procurement.

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13. (U) Cost Variance Analysis (Cont'd):

b. (U) Previous Change Explanation (Cont'd) --

Support: reduction of initial spare rqmts; new rqmts (Alt Msn Eqp, GSE, Cmd Spt); installation of support eqpt and assoc data and training; sched revisions; cost of kits; FAF; POSSSF, bigger training base; increase to support additional (69) helicopters; addition of HELLFIRE support costs; support of 160 additional aircraft; HF missile launcher funds increase due to acft qty increase. Revised spares definition.

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Economic: Revised escalation indices.

Estimating: Addition of system peculiar construction projects into APACHE SAR.

c. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	(U) <u>RDIME</u>		
	Revised Jan 8/ economic escalation rates. (Economic)	N/A	-1.3
	Reflects actual program amounts after Congressional/Gramm Rudman cuts and reprogramming (Estimating)	-8.5	-18.9
(2)	(U) <u>Procurement</u>		
	Revised Jan 8/ economic escalation rates. (Economic)	N/A	-98.7
	Reduction of fleet from 675 to 593.	-207.1	-672.0
	o Deletion of 82 aircraft. (Quantity)	(-134.1)	(-449.6)
	o Reduction of Special Mission Kits, ASE suites Ground Spt Equipment, and Spares as the result of smaller fleet size (593 vs 675). (Support)	(-73.0)	(-222.4)
	Incorporation of ATHS, Blue/Green lighting, Optical Improvement Program, Wire Strike Protection System and IFIDS modifications. (Engineering)	+14.5	+48.6
	Addition of FY81-83 HF launcher funding deleted from Dec 85 SAR. (Estimating)	+9.8	+28.9
	Growth in both remaining production and system program management at both MDHC and MMOA. Contract negotiations now being completed were not able to achieve all the cost reductions forecast in Dec 85 SAR. Chief among cost drivers has been labor and overhead rates and failure to achieve multiyear procurement savings. (Estimating)	+78.8	+365.1

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(3) (U) MILCON

Revised Jan 87 economic escalation rates
(Economic)

N/A

-1.5

Decrease due to reidentification of FY89
system specific construction projects for
APACHE (Estimating)

-4.3

-14.0

d. (U) References --

(U) Development Estimate: Dep Sec Def Memo, January 5, 1977, subject:
"Advanced Attack Helicopter (AAH) DSARC II."

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. (U) Initial SAR Estimate to Current Baseline Estimate --

PAUC	Changes									PAUC
(Initial SAR Est)	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	(Dev Est)	(Dev Est)
3.743	1.520	.090	.742	.486	.237	.058	.078	3.211	6.954	6.954

b. (U) Current Baseline Estimate to Current Estimate --

PAUC	Changes									PAUC
(Dev Est)	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	(Cur Est)	(Cur Est)
6.954	+1.046	-.371	+1.895	+1.361	+4.110	--	+1.695	+7.736	14.690	14.690

15. (U) Contract Information: (Then-Year Dollars in Millions)

(U) Procurement --

Initial Contract Price

Airframe
McDonnell Douglas Helicopter Co.
Culver City, CA
DAAK50-84-C-0008, FFP,
Award: November 1, 1983
Definitized: February 29, 1984

Initial Contract Price
Target Ceiling Qty
\$615.0 N/A 112

Current Contract Price
Target Ceiling Qty
\$615.7 N/A 112

Estimated Price at Completion
Contractor Program Manager
\$615.7 \$615.7

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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

<u>Airframe</u>			<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
McDonnell Douglas Helicopter Co.			\$665.6	N/A	138
Culver City, CA					
DAAJ09-85-C-A002, FFP,					
Award: November 1, 1984					
Definitized: March 29, 1985					
<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$665.8	N/A	138	\$665.8	665.8	
<u>Engine</u>			<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
General Electric Co., Lynn, MA			\$356.7	N/A	730
DAAJ09-83-C-A395, FFP MY,					
Award: October 7, 1983					
Definitized: October 7, 1983					
<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$334.0	N/A	714	\$334.0	\$334.0	
<u>Engine</u>			<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
General Electric Co., Lynn, MA			\$265.3	N/A	791.0
DAAJ09-85-C-A481, FFP MY,					
Award: February 11, 1986					
Definitized: February 11, 1986					
<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$265.3	N/A	791.0	\$265.3	\$265.3	
<u>Airframe</u>			<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
McDonnell Douglas Helicopter Co.			\$1454.0	N/A	217.0
Culver City, CA A009					
DAAJ09-86-C-A009 FFP,					
Award: November 14, 1986					
Definitized: November 14, 1986					
<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$1454.0	N/A	217.0	\$1459.3	1459.3	

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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

		Initial Contract Price		
<u>TADS/PNVS</u>		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Martin Marietta Orlando Aerospace		\$317.6	N/A	261
Orlando, FL				
DAAJ09-85-C-A011, FFP,				
Award: November 25, 1986				
Definitized: November 25, 1986				

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$317.6	N/A	261	\$317.6	\$317.6

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

- (1) (U) Percent Program Completed: 83.3% (15 yrs/18 yrs)
- (2) (U) Percent Program Cost Appropriated: 89.6% (7924.8/8843.6)

b. (U) Appropriation Summary --

	(Then-Year Dollars in Millions)				
<u>Appropriation</u>	<u>Current & Prior Yrs (FY73-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP Beyond FYDP (FY89-90)</u>		<u>Total</u>
RDT&E	1219.4	0	0	--	1219.4
Procurement	6664.9	735.0	150.3	--	7550.2
MILCON	40.5	6.5	27.0	--	74.0
Total	7924.8	741.5	177.3	--	8843.6

c. (U) Annual Summary --

Fiscal Year	Qty	FY 72 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Nonrec	Rec	Total	Advance Proc	Debit	Credit	

Appropriation: RDT&E							
1973				19.5		20.0	4.4
1974	2			44.3		49.1	7.9
1975				49.5		60.7	10.9
1976				56.4		73.9	6.6
1977				13.3		17.8	2.9
1977	7			94.5		130.8	2.6
1978				112.5		166.4	6.8
1979				112.0		179.4	8.4
1980				99.3		176.0	10.6
1981				88.2		172.8	10.6
1982				43.5		91.7	7.6
11/1983				9.0		22.1	4.9
1984				9.2		22.0	3.8
12/1985				10.1		24.9	3.4
1986				4.6		11.8	2.9
Subtotal	9			766.0		1219.4	

1/ FY 83 changed to reflect actual program amount

2/ FY 85 reflects Gramm/Rudman cuts and reprogramming from FY 85 to 86.

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. (U) Annual Summary (Cont'd) --

Fiscal Year	Qty	FY 72 Base-Year Dollars			Then-Year Dollars			Escl
		Flyaway			Advance Proc			Rate
		Nonrec	Rec	Total	Debit	Credit	Total	(%)

Appropriation: Procurement (APA, APACHE) 1/

1981	LLT	13.8	6.0	23.1	53.2		61.2	11.6
1982	11	88.7	63.9	191.6	64.4	53.2	548.2	14.3
1983	48	68.5	142.8	292.5	113.7	64.4	910.7	9.0
1984	112	63.8	274.4	422.9	61.6	113.7	1354.8	8.0
1985	138	47.9	287.1	426.3	91.0	61.6	1437.2	3.4
1986	116	47.7	253.4	373.4	62.4	91.0	1223.9	2.9
1987	101	57.7	206.6	334.2	38.2	62.4	1128.9	3.1
1988	2/ 67	42.4	119.7	210.6		38.2	735.0	3.5
1989	0	21.6	0.0	33.8			121.7	3.5
1990	0	5.4	0.0	7.8			28.6	3.3
Subtotal	593	457.5	1353.9	2316.2	484.5	484.5	7550.2	

Appropriation: Procurement (APA, HELLFIRE)

1981			(0.9)	(0.9)			(2.4)	11.6
1982			(4.5)	(4.5)			(12.8)	14.3
1983			(4.4)	(4.4)			(13.7)	9.0
1984			(4.3)	(4.3)			(13.7)	8.0
1985			(4.0)	(4.0)			(13.4)	3.4
1986			(4.6)	(4.6)			(15.0)	2.9
1987			(3.1)	(3.1)			(10.4)	3.1
1988			(0.7)	(0.7)			(2.5)	3.5
1989			(0.5)	(0.5)			(1.9)	3.5
1990			(0.1)	(0.1)			(0.4)	3.3
Subtotal			(27.1)	(27.1)			(86.2)	

Appropriation: MILCON

1983				3.4			8.7	4.9
1984				1.2			3.0	3.8
1985				5.6			15.2	3.4
1986				3.5			9.8	2.9
1987				1.3			3.7	3.1
1988				2.2			6.5	3.5
1989				8.9			27.0	3.5
Subtotal				26.1			74.0	
Total				3108.3			8843.6	

1/ FYS 81 thru 85 changed to reflect actual program amounts.

2/ Pending Congressional review of Army's Acquisition Master Plan to be submitted in March 1987.

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16. (U) Program Funding Summary (Cont'd):

d. (U) Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDTE			
1973	20.0	20.0	20.0
1974	49.1	49.1	49.1
1975	60.7	60.7	60.7
1976	73.9	73.9	73.9
1977	17.8	17.8	17.8
1977	130.8	130.8	130.8
1978	166.4	166.4	166.4
1979	179.4	179.4	179.4
1980	176.0	176.0	176.0
1981	172.8	172.8	172.8
1982	91.7	91.7	91.7
1983	22.1	22.1	19.0
1984	22.0	22.0	16.4
1985	24.9	24.9	12.6
1986	11.8	9.6	1.1
Total	1219.4	1217.2	1187.7

Appropriation: Procurement (APA, APACHE)			
1981	61.2	61.2	61.2
1982	548.2	548.2	548.2
1983	910.7	910.7	899.5
1984	1354.8	1354.1	1261.8
1985	1437.2	1420.2	842.0
1986	1223.9	1154.6	277.2
1987	1128.9	845.5	0
To Complete	885.3	N/A	N/A
Total	7550.2	6294.5	3889.9

Appropriation: Procurement (APA, HELLFIRE)			
1981	(2.4)	(2.4)	(2.4)
1982	(12.8)	(12.8)	(12.8)
1983	(13.7)	(13.7)	(13.7)
1984	(13.7)	(10.8)	(6.4)
1985	(13.4)	(10.0)	(3.1)
1986	(15.0)	(10.8)	(.6)
1987	(10.4)	(0.0)	(0.0)
To Complete	(4.8)	(N/A)	(N/A)
Total	(86.2)	(36.7)	(11.4)

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16. (U) Program Funding Summary (Cont'd):

d. (U) Obligations and Expenditures (Cont'd) --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: MILCON			
1983	8.7	1/	1/
1984	3.1	1/	1/
1985	15.2	1/	1/
1986	9.8	1/	1/
1987	3.7	1/	1/
To Complete	33.5	N/A	N/A
Total	74.0		

1/ Data Reported by another source.

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic 1/
1982	14	11	11	11
1983	78	48	48	48
1984	96	112	112	112
1985	96	144	138	144
1986	96	144	116	144
1987	96	56	101	56
1988	60	--	67	--

b. (U) Cost Variance -- Dollars in Millions

Item	Production		Variance		Variance	
	Estimate	(CE less PdE)	Current Estimate	(CE less Max)	Maximum Economic 1/	
Prog Acq Cost (BY \$)	2712.2	+396.1	3108.3	-0-	3108.3	
(TY \$)	7402.4	+1441.2	8843.6	-0-	8843.6	
PAUC (BY \$)	5.18	-.02	5.16	-0-	5.16	
(TY \$)	14.13	+.56	14.69	-0-	14.69	

c. (U) Schedule Variance --

	Production		Variance		Variance	
	Estimate	(CE less PdE)	Current Estimate	(CE less Max)	Maximum Economic 1/	
Start Date (Mo/Yr)	1/84	-0-	1/84	-0-	1/84	
Duration (in Months)	76	-4	72	-0-	72	
End Date (Mo/Yr)	4/90	-4	12/89	-0-	12/89	

d. (U) Deliveries (Plan/Actual) --

RDT&E
Procurement

To Date
9/9
172/184

1/ The maximum economic production rate is 12 A/C per month. During FY 82-84 the production ramp-up occurred reaching 12 ac at beginning of FY 85 deliveries. FY 85-88 production is based on max economic rate with funded delivery periods of less than 12 months each.

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(U) Operating and Support Costs: Not Applicable.

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)

PROGRAM: CG 47 AEGIS Cruiser Class

AS OF DATE: December 31, 1986

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CLEARED
FOR OPEN PUBLICATION
MAR 02 1987
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): CG 47 AEGIS Cruiser
Class/Guided Missile Cruiser (AEGIS Cruiser)

2. DoD Component: Department of the Navy

3. Responsible Office and Telephone Number:

AEGIS Shipbuilding Program Manager, PMS 400
Naval Sea Systems Command

PM: RADM J.F. Shaw, USN
ASSIGNED: 3 September 1985
AUTOVON: 222-7395
COMMERCIAL: (202) 692-7395

4. Program Elements/Procurement Line Items:

RDT&E: PE 64567N/1319N
PROCUREMENT (SCN): PE 24292N/APPN 1611N
MILCON:

5. Related Programs: DDG 51, SM-2 (MR), HARPOON, TOMAHAWK, TACTAS, PHALANX, MK-46, LAMPS MK-I/MK-III, VERTICAL LAUNCH, and VERTICAL LAUNCH ANTI-SUBMARINE ROCKET.

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CG 47 AEGIS Cruiser Class, December 31, 1986

6. Mission and Description: To destroy enemy aircraft, missiles, submarines, and surface ships in order to prohibit the employment of such forces against U.S. forces. CG 47 Class ships will normally be assigned to carrier battle groups or surface action groups.

The design of the TICONDEROGA (CG 47) Class is based on the Fleet-demonstrated hull and gas turbine propulsion system of the SPRUANCE (DD 963) Class. The combat system is based on the Fleet-demonstrated armaments of the VIRGINIA (CGN 38) Class and eleven years at-sea operation in the AEGIS test ship, USS NORTON SOUND (AVM 1). With AEGIS, SM-2, HARPOON, TOMAHAWK, 5-inch guns, SEAHAWK helicopter, MK-46 torpedoes, anti-submarine rockets, Vertical Launch System, (MK-26 Guided Missile Launch System prior to FY 1982 ships), SQS-53 and SQR-19 sonars, and advanced electronic systems, the CG 47 Class is the most heavily armed surface combatant constructed by the U.S. since World War II. Augmented by passive protection devices including fragmentation protection of launchers and magazines, she provides operational commanders great flexibility.

7. Program Highlights:

a. Significant Historical Developments -- The contract for the construction of the lead ship of the class, TICONDEROGA, was awarded to Litton Industries Ingalls Shipbuilding Division, Pascagoula, Mississippi in September 1978. Construction of the TICONDEROGA began in July 1979. She was launched in April 1981; began acceptance trials in November 1982, was commissioned in January 1983 and completed Post Shakedown Availability in September 1983. CG 47 has satisfied all mission requirements.

b. Significant Developments Since Last Report -- The option to the FY 85 contract for the FY 86 ships was exercised on January 8, 1986. CG 63 and CG 64 will be constructed by Bath Iron Works (BIW), Bath, Maine. Ingalls Shipbuilding Division (ISD), Pascagoula, Mississippi, will build CG 65. Both contracts are fixed price incentive. During 1986, the keel was laid on the CG 57 in March and the CG 59 in October at ISD. In May the keel was laid on the CG 58 at BIW. Another milestone was completed with the launching of three Cruisers: USS ANTIETAM (CG 54) in February, USS LEYTE GULF (CG 55) in June, and USS SAN JACINTO (CG 56) in November. Two ships were commissioned in 1986 - USS VALLEY FORGE (CG 50) in January and USS BUNKER HILL (CG 52) in September. With the commissioning of the CG 52 there are now five AEGIS Cruisers in active service. USS MOBILE BAY (CG 53) successfully completed builder's and acceptance trials during 1986.

BIW has submitted to the Navy a request for changes to contract schedules, delivery dates, and prices in its contracts for construction of six CG 47 Class ships. The following table shows the proposed changes to the delivery dates:

	<u>From</u>	<u>To</u>	<u>Months</u>
CG 51	5/4/87	6/22/87	+1
CG 58	9/30/88	1/30/89	+4
CG 60	3/27/89	9/18/89	+6
CG 61	7/31/89	12/11/89	+5
CG 63	1/29/90	4/2/90	+2
CG 64	5/28/90	11/26/90	+6

BIW's request attributes the delays to a number of factors including the impact of a 99 day strike at the shipyard during the period of July to October 1985. The BIW proposal is being evaluated by the Navy.

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CG 47 AEGIS Cruiser Class, December 31, 1986

7. Program Highlights (Cont'd):

c. Changes since "As of Date" -- The USS MOBILE BAY (CG 53) was commissioned on 21 February 1987. With the commissioning of the CG 53, there are now six AEGIS Cruisers in active service.

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP threshold breaches (AEGIS DCP #16 Revision #2 and CG 47 Class Guided Missile Cruiser #134 approved 2 March 1978).

9. Schedule:

a. Milestones --

	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
DSARC III	Jan 78/Jan 78	Jan 78
Ship Construction		
Contract Award (CG 47)	Sep 78/Sep 78	Sep 78
Launch TICONDEROGA (CG 47)	Aug 81/Mar 81	Apr 81
Ship Commissioning, TICONDEROGA (CG 47)	Apr 83/Jan 83	Jan 83
Complete Post Shakedown Availability (CG 47)	Mar 84/Dec 83	Sep 83
TICONDEROGA Deployed	N/A	Oct 83
Launch VINCENNES (CG 49)	N/A	Jan 84
Lay Keel, BUNKER HILL (CG 52)	N/A	Jan 84
Ship Commissioning, VINCENNES (CG 49)	N/A	Jul 85
Launch MOBILE BAY (CG 53)	N/A	Aug 85
Ship Christening, THOMAS S. GATES (CG 51)	N/A	Dec 85
Ship Commissioning, VALLEY FORGE (CG 50)	N/A	Jan 86
Ship Commissioning, BUNKER HILL (CG 52)	N/A	Sep 86
Ship Commissioning, MOBILE BAY (CG 53)	N/A	Feb 87 (CH-1)
Ship Commissioning, ANTIETAM (CG 54)	N/A	Jun 87 (CH-1)
Ship Commissioning, THOMAS S. GATES (CG 51)	N/A	Aug 87 (CH-1)
Ship Commissioning, LEYTE GULF (CG 55)	N/A	Sep 87 (CH-1)

b. Previous Change Explanations --

The current estimate for the launch, commissioning and completion of post shakedown availability for CG 47 was revised based on the construction schedule. The christening date for CG 51 changed from August 1985 to December 1985 because of the strike at Bath Iron Works, during 1985. The ship delivery date was moved from January 1987 to May 1987.

c. Current Change Explanations --

(CH-1) These milestones are reported for the first time with this SAR.

d. References --

Production Estimate: AEGIS DCP #16 Revision #2 and CG 47 Class Guided Missile Cruiser DCP #134 were approved 2 March 1978.

Approved Program: CG 47 Program Planning Schedule.

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CG 47 AEGIS Cruiser Class, December 31, 1986

10. Technical/Operational Characteristics:

a. Technical --	<u>Prod Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(1)(U) <u>Ship:</u>			
(a)(U) Length (overall, in feet)	563/563	567	567
(b)(U) Beam (feet)	55/55	55	55
(c)(U) Draft Navigational (feet)	31.7/31.7	31.7	31.7
(d)(U) Displacement (LT)	9100/10200	10200	9600
(e)(U) Propulsion			
1. Type	Gas Turbine/ Gas Turbine		Gas Turbine
2. Horsepower (2 Shafts)	80000/80000		80000
(f)(U) Accommodations			
1. Officers	33/33		33
2. CPO's and Enlisted	327/327		342
b. Operational --			
(1)(U) <u>Ship:</u>			
(a)(U) Speed, sustained (@ 80% power, in knots)	30/30	30+	30+
(b)(1)			
(c)(U) Armament			
1(U) <u>Anti-Submarine Warfare</u>			
a Under Water Fire Control System	MK-116 Mod 4/ MK-116 Mod 4		MK-116 Mod 6
b Sonar System	AN/SQS-53A/ AN/SQS-53A		AN/SQS-53B
c Towed-Array Sonar System	AN/SQR-19/ AN/SQR-19		AN/SQR-19
d Helo System	Seahawk/Seahawk		Sea Sprite Seahawk
e MK-46 Torpedoes	MK-46/MK-46		MK-46
f Anti-Submarine Rocket	ASHOC/ASROC		VLA
2(U) <u>Anti-Air Warfare</u>			
a AEGIS Weapon System	MK-7 Mod 3/ MK-7 Mod 3		MK-7 Mod 3
b Guided Missile Launching System	MK-26 Mod 1/ MK-26 Mod 1		MK-41 VLS

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CG 47 AEGIS Cruiser Class, December 31, 1986

10. Technical/Operational Characteristics (Cont'd):

b. Operational --	<u>Prod Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
2(U) <u>Anti-Air Warfare (Cont'd)</u>			
<u>c</u> Long Range Air Search Radar System	AN/SPS-49/ AN/SPS-49		AN/SPS-49
<u>d</u> PHALANX	MK-15 Mod 0/ MK-15 Mod 0		MK-15 Mod 2 Block I
<u>e</u> Electronic Warfare	SLQ-32/SLQ-32		SLQ-32
<u>f</u> STANDARD Missile	SM-2/SM-2		SM-2
3(U) <u>Anti-Surface Warfare</u>			
<u>a</u> Surface Search Radar	AN/SPS-55/ AN/SPS-55		AN/SPS-55
<u>b</u> HARPOON Weapon System/Launchers	4 Pod/4 Pod		4 Pod
<u>c</u> 5"/54 Rapid Fire Guns	MK-45/MK-45		MK-45
<u>d</u> Cruise Missile Control System			TOMAHAWK
(2)(U) <u>AEGIS Weapon System</u>	N/A		N/A

c. Previous Change Explanations --

The overall length of the TICONDEROGA (CG 47) is 563 feet. Beginning with CG 52 the overall length is 567 feet. The additional four feet is for the bulwark on the bow. 10,200 LT represents limiting displacement. Accommodations were increased beginning with CG 49 to support an increase in the Combat Systems. The Underwater Fire Control System, starting with CG 56, changed MK-116 to Mod 6 and AN/SQS-53A to AN/SQS-53B. Incorporation of the AN/SQR-19 was in CG 54 and beyond during construction. Incorporation of Seahawk was in CG 49 and beyond during construction. CG 47 and CG 48 are armed with Sea Sprites. ASROC is on CG 47 through CG 51. VLA replaces ASROC beginning with CG 52. Vertical Launch System MK 41 replaces MK 26 Mod 1 starting with CG 52. Block I was approved for limited production in November 1985 with installation beginning on the FY 86 ships. TOMAHAWK begins on CG 52.

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CG 47 AEGIS Cruiser Class, December 31, 1986

10. Technical/Operational Characteristics (Cont'd):

d. Current Change Explanations -- None.

e. References --

Production Estimate: AEGIS DCP #16 Revision #2 and CG 47 Class Guided Missile Cruiser DCP #134 were approved 2 March 1978.

Approved Program: Same as Production Estimate.

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a. Cost --	Production Estimate	Changes	Current Estimate
Development (RDT&E)	\$ 55.5	+12.9	\$ 68.4
Procurement (SCN)	8958.2	+5591.7	14549.9
Basic Ship Costs	(3440.3)	(+1738.5)	(5178.8)
AEGIS Weapon System	(2598.8)	(+667.7)	(3266.5)
Other GFE	(1874.6)	(+3407.5)	(5282.1)
Other Costs	(832.9)	(-430.2)	(402.7)
OF/PD	(211.6)	(+208.2)	(419.8)
Construction (MILCON)	0.0	+14.5	14.5
Total FY 78 Base-Year \$	\$ 9013.7	+5619.1	\$ 14632.8
Escalation	5069.8	+5166.6	10236.4
Development (RDT&E)	(1.8)	(+6.2)	(8.0)
Procurement (SCN)	(5068.0)	(+5150.9)	(10218.9)
MILCON	(0.0)	(+9.5)	(9.5)
Total Then-Year \$	\$ 14083.5	+10785.7	\$ 24869.2
b. Quantities --			
Development (RDT&E)	0	-	0
Procurement (SCN)	16	+11	27
Total	16	+11	27
c. Unit Cost --			
Procurement (SCN):			
FY 78 Base-Year \$	\$ 559.9	\$ -21.0	\$ 538.9
Then-Year \$	876.6	+40.8	917.4
Program:			
FY 78 Base-Year \$	563.4	-21.4	542.0
Then-Year \$	\$ 880.2	\$ +40.9	\$ 921.1

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CG 47 AEGIS Cruiser Class, December 31, 1986

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)
(Cont'd)

- d. Approved Design to Cost Goal -- The CG 47 production estimate is based on average follow ship's unit procurement cost for 15 ships as approved by DCP #134, dated 2 March 1978. This goal is based upon the execution of the procurement plan shown in DCP #134 and does not include the cost of LAMPS aircraft, expendable shipfill ordnances, ship design, or outfitting and post delivery costs. The current estimate is the average unit procurement cost computed on the 15 following ships in the FYDP estimate.

	(Average Unit Sailaway Cost)		
	Prod Estimate/ Appr Program	Current Estimate	Latest Approved Threshold
FY 78 Base-Year \$	540.0/540.0	539.1	N/A
Then-Year \$	864.8/864.8	878.9	N/A

- e. Foreign Military Sales -- None.

- f. Nuclear Costs -- None.

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	UCR Baseline (Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	24869.2	25641.0	24869.2
(2) Quantity	27	27	27
(3) Unit Cost	921.1	949.7	921.1
	(FY 87 Budget)		
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	2793.8	2793.8	2007.8
Less CY Adv Proc	-18.9	-18.9	-11.0
Plus PY Adv Proc	+79.5	+79.5	+17.5
Less OF/PD	-98.2	-98.2	-70.3
Net Total	2756.2	2756.2	1944.0
(2) Quantity	3	3	2
(3) Unit Cost	918.7	918.7	972.0

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CG 47 AEGIS Cruiser Class, December 31, 1986

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RD&E	SCN	MILCON	TOTAL
Production Estimate	57.3	14026.2	0.0	14083.5
Previous Changes:				
Economic	+1.8	-31.5	-0.5	-30.2
Quantity	-	+11739.0	-	+11739.0
Schedule	-	+616.9	-	+616.9
Engineering	+9.7	+1053.4	-	+1063.1
Estimating	+6.9	-2332.2	-	-2325.3
Other	-	-	-	-
Support	-	+469.9	+24.1	+494.0
Subtotal	+18.4	+11515.5	+23.6	+11557.5
Current Changes:				
Economic	-0.1	-648.6	-0.4	-649.1
Quantity	-	-	-	-
Schedule	-	-75.5	-	-75.5
Engineering	-	-82.5	-	-82.5
Estimating	+0.8	+57.7	-	+58.5
Other	-	-	-	-
Support	-	-24.0	+0.8	-23.2
Subtotal	+0.7	-772.9	+0.4	-771.8
Total Changes	+19.1	+10742.6	+24.0	+10785.7
Current Estimate	76.4	24768.8	24.0	24869.2

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CG 47 AEGIS Cruiser Class, December 31, 1986

13. Cost Variance Analysis (Cont'd):

(FY 1978 Constant (Base-Year) Dollars in Millions)

	RD&E	SCN	MILCON	TOTAL
Production Estimate	55.5	8958.2	0.0	9013.7
Previous Changes:				
Quantity	-	+5491.4	-	+5491.4
Schedule	-	-2.6	-	-2.6
Engineering	+7.6	+631.6	-	+639.2
Estimating	+4.8	-792.5	-	-787.7
Other	-	-	-	-
Support	-	+221.0	+14.1	+235.1
Subtotal	+12.4	+5548.9	+14.1	+5575.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-45.6	-	-45.6
Estimating	+0.5	+101.0	-	+101.5
Other	-	-	-	-
Support	-	-12.6	+0.4	-12.2
Subtotal	+0.5	+42.8	+0.4	+43.7
Total Changes	+12.9	+5591.7	+14.5	+5619.1
Current Estimate	68.4	14549.9	14.5	14632.8

b. Previous Change Explanations --

RD&E

Economic: Revised escalation indices.
 Engineering: HDF and SDMS design changes.
 Estimating: Refinement of RD&E estimates.

SCN

Economic: Revised escalation indices.
 Quantity: Addition of 11 cruisers.
 Schedule: Stretchout of ship acquisition schedule.
 Engineering: Engineering enhancements including introduction of the Vertical Launch System, the upgrade of the Underwater Fire Control System and the change in the AEGIS Weapon System from SPY-1A to SPY-1B.
 Estimating: Refinement of procurement estimates.
 Support: Adjustment of outfitting and post delivery costs corresponding to program changes.

MILCON

Economic: Revised escalation indices.
 Support: Funds for training and support sites.

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13. Cost Variance Analysis (Cont'd):c. Current Change Explanations --(Dollars in Millions)
Base-Year Then-Year(1) RDT&E

Revised Jan 87 economic escalation rates (Economic)	N/A	-0.1
Revised program funding requirements and transfer of Contract Design to RDT&E (Estimating)	+0.5	+0.8

(2) SCN

Revised Jan 87 economic escalation rates (Economic)	N/A	-648.6
Procurement profile change from 2-2-2-2 (FY 87-90) to 3-2-2-1 (FY 87-90) (Schedule)	-	-75.5
Deletion of the Level IIA Collective Protection System (Engineering)	-45.6	-82.5
Changes to the program reflecting Congressional action on the FY 87 budget, Gramm-Rudman-Hollings reductions, revised profile, and revised estimates for Government Furnished Equipment (Estimating)	+11.2	+57.7
Impact to Base Year 78 End Costs due to adjustments of projected escalation requirements reflecting revised inflation indices (Estimating)	+89.8	N/A
Outfitting and post delivery requirements for the revised procurement schedule and transfer of Contract Design to RDT&E (Support)	-12.6	-24.0

(3) MILCON

Revised Jan 87 economic escalation rates (Economic)	N/A	-0.4
Change in MILCON requirements (Support)	+0.4	+0.8

d. References --Production Estimate: - AEGIS DCP #16, Revisions #1 and #2; CG 47 DCP #134Current Estimate: - FY 1988/89 President's Budget Estimate, CG 47 Ship Data Sheet includes the following Program Elements:

RDT&E,N: 64567N

SCN: 24292N

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CG 47 AEGIS Cruiser Class, December 31, 1986

14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

- a. Initial SAR Estimate to Current Baseline Estimate -- Not Applicable.
- b. Current Baseline Estimate to Current Estimate --

PAUC (Prod Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
880.2	-25.2	+76.2	+20.1	+36.3	-84.0	--	+17.5	+40.9	921.1

15. Contract Information: (Then-Year Dollars in Millions)

- a. RDT&E -- Not Applicable.
- b. SCN --

<u>Ship Construction (CG 51)</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>

Bath Iron Works Bath, Maine N00024-82-C-2011, CPAF Awarded: May 20, 1982 Definitized: May 20, 1982	\$ 305.2	N/A	1
--	----------	-----	---

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 329.8	N/A	1	\$ 359.3	\$ 363.8

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances (12/31/85)	\$ - 8.8	\$ - 1.6
Cumulative Variances To Date (10/31/86)	\$ -31.0	\$ - 7.7
Net Change	\$ -22.2	\$ - 6.1

Explanation of Change: BIW is experiencing cost overruns attributable to: 1) the 99 day strike which ended in October 1985; 2) significant production labor hour overruns as a result of underestimating the complexity of building CG 47 Class Cruisers; 3) increased cost impact from the large volume of Navy change orders; and 4) an aggressive schedule for meeting ship delivery in June 1987. The program manager's assessment includes unfavorable variances to date. The contract will exceed the target price.

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CG 47 AEGIS Cruiser Class, December 31, 1986

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

<u>Ship Construction (CG 54, 55, 56)</u>			<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
Ingalls Shipbuilding Division Pascagoula, Mississippi N00024-83-C-2013, FPI Awarded: June 20, 1983 Definitized: June 20, 1983					
	\$ 939.7	\$1084.0	3		

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 966.0	\$1121.8	3	\$ 966.0	\$ 966.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances (12/31/85)	\$ +20.3	\$ - 1.0
Cumulative Variances To Date (11/30/86)	\$ +38.3	\$ -10.1
Net Change	\$ +18.0	\$ - 9.1

Explanation of Change: Cost variance results from the contractor's favorable performance. The unfavorable schedule performance reported is in material which is not a true schedule indicator; in labor the shipyard is actually 12% ahead of schedule. The program manager's assessment remains at the estimated contract price and is within approved funding.

<u>Ship Construction (CG 57, 59)</u>			<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
Ingalls Shipbuilding Division Pascagoula, Mississippi N00024-84-C-2004, FPI Awarded: December 16, 1983 Definitized: December 16, 1983					
	\$ 325.5	\$ 367.0	2		

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 338.5	\$ 380.0	2	\$ 338.5	\$ 338.5

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances (12/81/85)	\$ + 2.6	\$ + 2.1
Cumulative Variances To Date (11/30/86)	\$ +24.1	\$ - 3.2
Net Change	\$ +21.5	\$ - 5.3

Explanation of Change: Cost variance results from the contractor's favorable performance. The deterioration in schedule performance is not indicative of the shipbuilder's true performance as mentioned above on the 54/5/6 contract; the unfavorable schedule performance reported is in material, labor is 19% ahead of schedule. The program manager's assessment remains at the estimated contract price.

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15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

<u>Ship Construction (CG 60, 61, 63, 64)</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Bath Iron Works			
Bath, Maine			
N00024-85-C-2036, FPI	\$ 383.6	\$430.4	2
(Mod)	\$ 770.2	\$864.0	4
Awarded: November 26, 1984 for			
CG 60/61 and modified			
January 8, 1986 for CG 63/64			
Definitized: November 26, 1984			
for CG 60/61 and			
January 8, 1986 for CG 63/64			
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
\$ 773.2	\$873.1	4	\$ 773.2
			\$ 773.2
		<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances (12/31/85)		\$ -0.2	\$ +15.0
Cumulative Variances To Date (10/31/86)		\$ -2.6	\$ +19.4
Net Change		\$ -2.4	\$ + 4.4

Explanation of Change: With only 4% of the contract work completed, the cost variance of -\$2.4M is not considered significant. The program manager is currently assessing BIW's request for changes to contract schedules, delivery dates and prices in its contracts for construction of CG 47 ships. BIW's request attributes the delays to a number of factors including the impact of a 99 day strike at the shipyard in 1985.

<u>AEGIS Weapon System (CG 54, 55, 56)</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
RCA Government Systems			
Moorestown, New Jersey			
N00024-83-C-5116, FPI/PP	\$ 303.8	\$ 330.0	3
Awarded: April 12, 1983			
Definitized: August 12, 1983			
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
\$ 305.6	\$ 333.1	3	\$ 305.6
			\$ 305.6
		<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances (12/31/85)		\$ +14.5	\$ - 2.0
Cumulative Variances To Date (10/31/86)		\$ +19.9	\$ - 0.1
Net Change		\$ + 5.4	\$ + 1.9

Explanation of Change: Cost variance results from the contractor's favorable performance and schedule variance is not significant and will not impact deliveries to the shipbuilders. The program manager's assessment remains at the target price and is within the approved funding.

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

<u>AEGIS Weapon System</u>	<u>Initial Contract Price</u>		
(CG 60, 61, 62 and DDG 51) 1/	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>

RCA Government Systems
Moorestown, New Jersey
N00024-85-C-5100, FPI

\$ 372.4 \$ 414.0 4

Awarded: December 23, 1985
Definitized: December 23, 1985

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 394.1	\$ 431.3	4	\$ 409.6	\$ 409.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances (12/31/85)	\$ - 0.0	\$ - 0.0
Cumulative Variances To Date (10/31/86)	\$ - 0.7	\$ - 8.5
Net Change	\$ - 0.7	\$ - 8.5

Explanation of Change: Current target and ceiling adjusted to reflect negotiated changes. Estimate to complete includes amounts for authorized but not negotiated changes of \$15.5M. The program manager's assessment remains at the target price and is within the approved funding.

c. MILCON -- Not Applicable.

1/ This is a combined procurement contract for the CG 60, 61, 62 and the DDG 51. It is reported in the SARs of each program.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 62.5% (10 yrs/16 yrs)

(2) Percent Program Cost Appropriated: 79.4% (\$19739.4/\$24869.2)

b. Appropriation Summary --

<u>Appropriation</u>	<u>Current & Prior Yrs</u> (FY78-87)	(Then-Year Dollars in Millions)			<u>Total</u>
		<u>Budget Year</u> (FY88)	<u>Balance FYDP</u> (FY89-92)	<u>To Complete Beyond FYDP</u> (FY93)	
RDT&E	76.1	.3	-	-	76.4
SCN	19639.3	2007.8	3040.6	81.1	24768.8
MILCON	24.0	-	-	-	24.0
Total	19739.4	2008.1	3040.6	81.1	24869.2

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CG 47 AEGIS Cruiser Class, December 31, 1986

16. Program Funding Summary Cont'd: (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 78 Base-Year Dollars			Then-Year Dollars			Escal Rate (\$) <u>1/</u>
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1978				39.4			39.4	-
1979				10.0			10.8	8.4
1980				5.4			6.5	10.6
1981				3.4			4.5	10.6
1982				5.0			7.2	7.6
1983				2.1			3.1	4.9
1984				1.0			1.5	3.8
1985				1.0			1.6	3.4
1986				0.6			1.0	2.9
1987				0.3			0.5	3.1
1988				0.2			0.3	3.5
Subtotal				68.4			76.4	

^{1/} Since spend-out rates are not shown, the escalation rates cannot be used to verify the composite index.

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CG 47 AEGIS Cruiser Class, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 78 Base-Year Dollars			Then-Year Dollars			Escal Rate (%) <u>1/</u>
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: SCN

1978	1		667.9	667.9	31.7		925.4	-
1979	-		0.0	0.0		1.7	1.7	9.6
1980	1		500.5	500.5			799.8	9.8
1981	2		1019.4	1020.3		156.5	1797.4	9.6
1982	3		1812.6	1815.1	129.0	24.6	2777.0	7.5
1983	3		1580.6	1592.0	20.7	20.0	2552.0	3.8
1984	3		1662.4	1678.9		28.8	2778.4	3.6
1985	3		1510.8	1544.5	1.2	150.7	2708.5	2.1
1986	3		1403.1	1437.5	35.7	68.9	2505.3	1.2
1987	3		1521.7	1582.2	79.5	117.1	2793.8	3.1
1988	2		1040.4	1082.2	17.5	81.3	2007.8	3.5
1989	2		921.5	961.2	8.2	74.8	1838.0	3.5
1990	1		489.2	547.1	9.8	104.1	1055.4	3.3
1991				41.1		76.0	76.0	2.9
1992				37.6		71.2	71.2	2.4
1993				41.8		81.1	81.1	2.4
Subtotal	27		14130.1	14549.9	333.3	1056.8	24768.8	

Appropriation: MILCON

1982				1.2			1.9	7.6
1983				6.8			10.8	4.9
1984				2.6			4.2	3.8
1987				3.9			7.1	3.1
Subtotal				14.5			24.0	
Total	27		14130.1	14632.8	333.3	1056.8	24869.2	

^{1/} Since spend-out rates are not shown, the escalation rates cannot be used to verify the composite index.

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CG 47 AEGIS Cruiser Class, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1978	39.4	39.4	39.4
1979	10.8	10.8	10.8
1980	6.5	6.5	6.5
1981	4.5	4.5	4.5
1982	7.2	7.2	7.2
1983	3.1	3.1	3.1
1984	1.5	1.5	1.5
1985	1.6	1.6	1.6
1986	1.0	0.8	0.6
1987	0.5	0.0	0.0
To Complete	0.3	-	-
Subtotal	76.4	75.4	75.2

Appropriation: SCN

1978	925.4	925.4	917.4
1979	1.7	1.7	1.7
1980	799.8	798.5	773.8
1981	1797.4	1785.3	1699.6
1982	2777.0	2677.7	2248.0
1983	2552.0	2315.4	1623.4
1984	2778.4	2183.4	1400.5
1985	2708.5	1875.9	697.6
1986	2505.3	1541.1	221.6
1987	2793.8	58.8	0.1
To Complete	5129.5	-	-
Subtotal	24768.8	14163.2	9583.7

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CG 47 AEGIS Cruiser Class, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: MILCON

1982	1.9	1.9	1.9
1983	10.8	10.8	10.8
1984	4.2	4.2	4.2
1987	7.1	0.0	0.0
Subtotal	24.0	16.9	16.9
Total	24869.2	14255.5	9675.8

17. Production Rate Data: Not Applicable (Exempt: Less than six ships per year).

18. Operating and Support Costs: Not Applicable.

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

Program: CVN 68 CLASS (CVN 71/ CVN 72, 73/ CVN 74, 75)
As Of Date: December 31,1986

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 03 1987
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

- 1.(U) Designation/Nomenclature: CVN 71, THEODORE ROOSEVELT;
CVN 72, ABRAHAM LINCOLN; CVN 73, GEORGE WASHINGTON; CVN 74; CVN 75
- 2.(U) DoD Component: Department of the Navy
- 3.(U) Responsible Office and Telephone Number:
Aircraft Carrier Ship Acquisition Program PM: Capt F. C. Holmes, USN
Naval Sea Systems Command (PMS 392) Assigned: August 23, 1985
Washington D.C. Phone number: (202) 692-7280
Autovon number: 8-222-7280
- 4.(U) Program Elements:
RDT&E: 65567N
PROCUREMENT: 24112N
- 5.(U) Related Programs: SSN new construction, submarine and carrier overhauls

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6. (U) Mission and Description: Nuclear aircraft carriers (CVN 68 Class) support and operate aircraft to engage in attacks on targets afloat and ashore which threaten our use of the sea and to engage in sustained operations in support of other forces. The CVN 68 Class carriers have two nuclear reactors and nuclear fuel for 15 years of normal carrier operations, the equivalent of 11 million barrels of propulsion fuel oil. Speeds of over 30 knots were achieved during NIMITZ (CVN 68) trials. The ship's overall length is 1,092 feet with an extreme breadth of 252 feet. Combat load displacement is approximately 96,000 tons. The flight deck area is about 4.5 acres. The ship has four propellers, four aircraft elevators and four catapults.

7. (U) Program Highlights:

a. Significant Historical Developments -- Construction of the CVN 68 Class aircraft carriers began in October 1967 with the start of the Nimitz (CVN 68). To date four ships have been delivered. The Nimitz (CVN 68), Dwight D. Eisenhower (CVN 69) and Carl Vinson (CVN 70) were delivered in 1975, 1977 and 1982 respectively. The Theodore Roosevelt (CVN 71) was delivered on 17 October 1986. There are two ships under construction at Newport News Shipbuilding, the Abraham Lincoln (CVN 72) and George Washington (CVN 73). Construction of both ships began in February 1982 with contract delivery dates of December 1989 and 1991. Shipbuilder target delivery dates are October 1989 and September 1991, respectively. It is too early to tell whether the earlier target delivery dates being worked to by the shipbuilder will be achieved.

b. Significant Developments Since Last Report -- Delivery of the Theodore Roosevelt (CVN 71). This is the last report for the (CVN 71).

c. This SAR includes funding for CVN 74/75 as reflected in the FY88 President's budget submission.

d. Changes Since "As Of" Date -- NONE
Expected to meet mission requirements.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: NONE

(unclassified)

9. (U) Schedule:

	<u>Development Estimate</u>	<u>Current</u>
	<u>Approved Program</u>	<u>Estimate</u>

a. Milestones (CVN 71)

(1) Establish final characteristics CVN 68 Class	10/66	10/66*
(2) Definitization of Contract	9/80	9/80*
(3) Start Production	10/80	10/80*
(4) Lay Keel	12/81	10/81*
(5) Launch	9/85	10/84*
(6) Complete Acceptance Trials	8/87	10/86*
(7) Delivery	10/87	10/86*
(8) Complete Final Contract Trials	3/88	3/87
(9) War Ready	10/88	1/88

Milestones (CVN 72)

(1) Establish Final Characteristics CVN 68 Class	10/66	10/66*
(2) Definitization of Contract	1/83	12/82*
(3) Start Production	2/83	2/83*
(4) Lay Keel	11/84	11/84*
(5) Launch	9/87	12/87 (CH-1)
(6) Delivery	12/89	12/89
(7) Complete Final Contract Trials	6/90	6/90
(8) War Ready	2/91	1/91

Milestones (CVN 73)

(1) Definitization of Contract	1/83	12/82*
(2) Start Production	2/83	2/83*
(3) Lay Keel	8/86	8/86*
(4) Launch	9/89	9/89
(5) Delivery	12/91	12/91
(6) War Ready	2/93	2/93

Milestones (CVN 74)

(1) Definitization of Contract	11/89	11/89 (CH-2)
(2) Start Production	12/89	12/89 "
(3) Lay Keel	12/90	12/90 "
(4) Launch	11/93	11/93 "
(5) Delivery	11/95	11/95 "

Milestones (CVN 75)

(1) Definitization of Contract	11/92	11/92 "
(2) Start production	12/92	12/92 "
(3) Lay Keel	12/92	12/92 "
(4) Launch	6/95	6/95 "
(5) Delivery	6/97	6/97 "

* Actuals

(unclassified)

9. Schedule: (cont)

b. Previous change explanations: NONE

c. Current change explanations:

(CH-1) Contractor's revised schedule

(CH-2) FY88 President's Budget Submission - milestones for CVN 74
and CVN 75 construction have been added.

d. References:

Development Estimate: Defense Appropriations Act of 1979

Approved Program: DASD(MS) Memo of 21 May 1980
FY 1983 Continuing Resolution
FY 88/89 President's budget

(unclassified)

10. ~~(S)~~ Technical/Operational Characteristics:

a. <u>Technical</u>	<u>Development Estimate</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(1) Length overall	1,092	1,092	1,092
(2) Beam	134	134	134
(3) Maximum width	252	252	252
(4) Draft (Combat load) (feet)	38.4	38.4	38.4
(5) Displacement (tons)	96,300	93,405 1/	96,300
(6) Propulsion	Nuclear	Nuclear	Nuclear
(b)(1)			
(8) Core life (yrs)	13	3/	15
(9) Num of reactors	2	2	2
(10) Crew including air wing	6,280	6,040 2/	6,280 2
(11) Troop	N/A	N/A	N/A

b. Operational

(b)(1)			
(3) Stores (days)	75	75	75
(4) Close In Weapon Sys	4	4 *	4
(5) NATO Sea Sparrow Missile Systems	3	3 *	3
(6) Aviation Strike Ordnance (long tons)	2400	2,451 4/	2,451 4
(b)(1)			
(8) Operational number of aircraft (deck multiple in A4 equivalents) 5/	151	151	151

c. Previous change explanations: NONE

d. Current change explanations: NONE

e. References ---

Development Estimate: Defense Appropriations Act of 1979Approved Program: DASD(MS) Memo of 21 May 1980
FY 88/89 President's budget

- 1/ Actual based on CVN 68 standardization trials
- 2/ Accomodations converted to training spaces; reconversion feasible if required
- 3/ Requires extensive operational data and is dependent on actual core life
- 4/ CVN 71 actual capability at delivery
- 5/ The operational number of aircraft (deck multiple) in A7 equivalents is 156
- * CVN 71 actuals at delivery

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CVN-68 CLASS(CVN-71)

DECEMBER 31, 1985

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. Cost --			
Development (RDT&E)	--	--	--
Procurement	1808.3	86.9	1895.2
Basic Ship Costs	(1156.3)	(128.7)	(1285.0)
Government furn. equip costs	(614.6)	(-65.3)	(549.3)
Other Costs	(5.1)	(8.5)	(13.6)
Total production costs	(1776.0)	(71.9)	(1847.9)
Outfitting & Post Delivery	(32.3)	(15.0)	(47.3)
Construction(MILCON)	(--)	(--)	(--)
Total FY 79 Base-Year \$	1808.3	86.9	1895.2
Escalation			
Development	(--)	(--)	(--)
Procurement	(612.3)	(33.6)	(645.9)
Construction	(--)	(--)	(--)
Total Then-Year \$	2420.6	120.5	2541.1
b. Quantities			
Development (RDT&E)	-	-	-
Procurement	1	-	1
Total	1	-	1
c. Unit Cost --			
Procurement:			
FY 79 Base Year \$	1808.3	86.9	1895.2
Then-year \$	2420.6	120.5	2541.1
Program:			
FY 79 Base Year \$	1808.3	86.9	1895.2
Then-year \$	2420.6	120.5	2541.1
d. Approved Design to Cost Goal --	N/A		
e. Foreign Military Sales --	NONE		
f. Nuclear Costs --	CVN-68 Class ships draw upon general reactor plant research and development work performed by the Department of Energy but this contribution cannot be quantified.		

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CVN-68 CLASS(CVN-72/73)

DECEMBER 31, 1986

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. Cost --			
Development (RDT&E)	--	1.5	1.5
Procurement	5265.5	-136.8	5128.7
Basic Ship Costs	(3261.4)	(50.3)	(3311.7)
Government furn. equip costs	(1900.7)	(-243.2)	(1657.5)
Other Costs	(14.3)	(23.8)	(38.1)
Total production costs	(5176.4)	(-169.1)	(5007.3)
Ship Design	(0.9)	(-0.9)	()
Outfitting & Post Delivery	(88.2)	(33.2)	(121.4)
Construction(MILCON)	(--)	(--)	(--)
Total FY 82 Base-Year \$	5265.5	-135.3	5130.2
Escalation			
Development	(--)	(0.1)	(0.1)
Procurement	(2153.4)	(-1133.7)	(1019.7)
Construction	(--)	(--)	(--)
Total Then-Year \$	7418.9	-1269.0	6150.0
b. Quantities			
Development (RDT&E)	-	-	-
Procurement	2	-	2
Total	2	-	2
c. Unit Cost --			
Procurement:			
FY 82 Base Year \$	2632.8	-68.4	2564.4
Then-year \$	3709.5	-635.3	3074.2
Program:			
FY 82 Base Year \$	2632.8	-67.7	2565.1
Then-year \$	3709.5	-634.5	3075.0
d. Approved Design to Cost Goal -- N/A			
e. Foreign Military Sales -- NONE			
f. Nuclear Costs -- CVN-68 Class ships draw upon general reactor plant research and development work performed by the Department of Energy but this contribution cannot be quantified.			

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(UNCLASSIFIED)

CVN-68 CLASS(CVN-74/75)

DECEMBER 31, 1986

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. Cost --			
Development (RDT&E)	--	--	--
Procurement	5911.0	--	5911.0
Basic Ship Costs	(3744.9)	(--)	(3744.9)
Government furn. equip costs	(1998.1)	(--)	(1998.1)
Other Costs	(28.1)	(--)	(28.1)
Total production costs	(5771.1)	(--)	(5771.1)
Ship Design	(0.0)	(--)	(0.0)
Outfitting & Post Delivery	(139.9)	(--)	(139.9)
Construction(MILCON)	(--)	(--)	(--)
Total FY 88 Base-Year \$	5911.0	--	5911.0
Escalation			
Development	(--)	(--)	(--)
Procurement	(1055.0)	(--)	(1055.0)
Construction	(--)	(--)	(--)
Total Then-Year \$	6966.0	--	6966.0
b. Quantities			
Development (RDT&E)	-	-	-
Procurement	2	-	2
Total	2	-	2
c. Unit Cost --			
Procurement:			
FY 88 Base Year \$	2955.5	0.0	2955.5
Then-year \$	3576.8	0.0	3576.8
Program:			
FY 88 Base Year \$	2955.5	0.0	2955.5
Then-year \$	3483.0	0.0	3483.0
d. Approved Design to Cost Goal -- N/A			
e. Foreign Military Sales -- NONE			
f. Nuclear Costs -- CVN-68 Class ships draw upon general reactor plant research and development work performed by the Department of Energy but this contribution cannot be quantified.			

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CVN-68 CLASS (CVN-71), December 31, 1986

12. Program Acquisition/Current Procurement Unit Cost Summary: (Current
(Then Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	UCR Baseline (Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	2541.1	2491.2	2541.1
(2) Quantity	1	1	1
(3) Unit Cost	2541.1	2491.2	2541.1
b. Current Procurement --	(1987)	(1987)	(1988)
(1) Cost			
Less PY Adv Proc			
Plus CY Adv Proc			
Plus OF/PD	40.8	39.1	--
Net Total	40.8	39.1	--
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

13. Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	TOTAL
Development Estimate	-	2420.6	2420.6
Previous Changes	-		
Economic	-	15.3	15.3
Engineering	-	22.0	22.0
Estimating	-	28.7	28.7
Support	-	4.6	4.6
Subtotal	-	70.6	70.6
Current Changes	-	-	-
Economic	-	-	-
Estimating	-	51.5	51.5
Support	-	-1.6	-1.6
Subtotal	-	49.9	49.9
Total Changes	-	120.5	120.5
Current Estimate	-	2541.1	2541.1

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12. Program Acquisition/Current Procurement Unit Cost Summary: (Current
(Then Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est (DEC 86 SAR)	UCR Baseline (DEC 85 SAR)	UCR Baseline (DEC 86 SAR)
a. Program Acquisition --			
(1) Cost	6150.0	6390.9	6150.0
(2) Quantity	2	2	2
(3) Unit Cost	3075.0	3195.5	3075.0
b. Current Procurement --	(1987)	(1987)	(1988)
(1) Cost	N/A	N/A	N/A
Less PY Adv Proc	N/A	N/A	N/A
Plus CY Adv Proc	N/A	N/A	N/A
Plus OF/PD	13.3	17.1	15.8
Net Total	13.3	17.1	15.8
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

13. Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	TOTAL
Development Estimate	-	7418.9	7418.9
Previous Changes	-		
Economic	-	-637.0	-637.0
Estimating	1.6	-422.0	-420.4
Support	-	29.4	29.4
Subtotal	1.6	-1029.6	-1028.0
Current Changes	-	-	-
Economic	-	-168.0	-168.0
Estimating	-	-48.6	-48.6
Support	-	-24.3	-24.3
Subtotal	-	-240.9	-240.9
Total Changes	1.6	-1270.5	-1268.9
Current Estimate	1.6	6148.4	6150.0

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CVN-68 CLASS(CVN-74/75)

DECEMBER 31, 1986

12. Program Acquisition/Current Procurement Unit Cost Summary: (Current
[Then Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est (DEC 86 SAR)	UCR Baseline (DEC 86 SAR)	UCR Baseline (DEC 86 SAR)
a. Program Acquisition --			
(1) Cost	6966.0	6966.0	6966.0
(2) Quantity	2	2	2
(3) Unit Cost	3483.0	3483.0	3483.0
b. Current Procurement --	(1987)	(1987)	(1988)
(1) Cost	N/A	N/A	N/A
Less PY Adv Proc	N/A	N/A	N/A
Plus CY Adv Proc	N/A	N/A	644.0
Plus OF/PD	N/A	N/A	N/A
Net Total	N/A	N/A	644.0
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

Cost Variance Analysis:

a. Summary -- (Current [Then Year) Dollars in Millions)

	RD&E	PROC	TOTAL
Development Estimate	-	6966.0	6966.0
Previous Changes	-	-	-
Economic	-	-	0.0
Quantity	-	-	0.0
Support	-	-	0.0
Subtotal	0.0	0.0	0.0
Current Changes	-	-	-
Quantity	-	-	-
Estimating	-	-	-
Support	-	-	-
Subtotal	0.0	0.0	0.0
Total Changes	0.0	0.0	0.0
Current Estimate	0.0	6966.0	6966.0

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CVN-68 CLASS (CVN-71), December 31, 1986

13. Cost Variance Analysis (Cont'd)

(FY 1979 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	TOTAL
Development Estimate	-	1808.3	1808.3
Previous Changes	-		
Engineering	-	28.3	28.3
Estimating	-	19.2	19.2
Support	-	5.9	5.9
Subtotal	-	53.4	53.4
Current Changes	-	-	-
Estimating	-	34.6	34.6
Support	-	-1.1	-1.1
Subtotal	-	33.5	33.5
Total Changes	-	86.9	86.9
Current Estimate	-	1895.2	1895.2

b. Previous Change Explanations --

(1) Procurement

Economic: Revised economic rates.

Engineering: Upgrading Naval Tactical Data System. Funds for future characteristic changes were added and then deleted due to congressional action.

Estimating: Refinement of estimates and increase to cover shock test requirements.

Support: Revised estimates for outfitting.

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CVN-68 CLASS (CVN-72/73), December 31, 1986

13. Cost Variance Analysis (Cont'd):

(FY 1982 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	TOTAL
Development Estimate	-	5265.5	5265.5
Previous Changes	-		
Estimating	1.5	-51.0	-49.5
Support	-	28.0	28.0
Subtotal	1.5	-23.0	-21.5
Current Changes	-	-	-
Estimating	-	-94.8	-94.8
Support	-	-19.0	-19.0
Subtotal	-	-113.8	-113.8
Total Changes	1.5	-136.8	-135.3
Current Estimate	1.5	5128.7	5130.2

b. Previous Change Explanations --

RDT&E

Estimating: Revised Requirement.

Procurement

Economic: Revised economic rates.

Estimating: Congressional reduction of funds for management reserves, contractor support services, and Independent Research and Development/Bid and Proposal (IR&D/B&D). Also adjustments were made for revised economic indices. Transfer to the FY 1985 Peacekeeper program. Reduced program reserves.

Support: Revised estimates for outfitting.

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CVN-68 CLASS (CVN-74/75), December 31, 1986

13. Cost Variance Analysis (Cont'd):

(FY 1988 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	TOTAL
Development Estimate	-	5911.0	5911.0
Previous Changes	-	-	-
Estimating	-	-	-
Support	-	-	-
Subtotal	0.0	0.0	0.0
Current Changes	-	-	-
Quantity	-	-	-
Support	-	-	-
Subtotal	-	0.0	0.0
Total Changes	0.0	0.0	0.0
Current Estimate	0.0	5911.0	5911.0

b. Previous Change Explanations -- none

(UNCLASSIFIED)

(UNCLASSIFIED) CVN-68 CLASS (CVN-71), December 31, 1986

13. Cost Variance Analysis (Cont'd):

c. Current Change Explanation --

(1) Procurement	(Dollars in Millions)	
	Base-Year	Then-Year
Final ship construction costs. (Estimating)	34.6	51.5
Revised estimates for Outfitting and Post Delivery.(Support)	-1.1	-1.6

d. References -- Defense Appropriation Act of 1980

14. Program Acquisition Unit Cost (PAUC) History:(Millions of
then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate

(Same as Current Baseline)

b. Current Baseline Estimate to Current Estimate

PAUC									PAUC
(DE)	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	(Current Estimate)
2420.6	35.6	-	-	22.0	58.9	3.0	-	120.5	2541.1

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13. Cost Variance Analysis (Cont'd):

c. Current Change Explanation --

(1) Procurement	(Dollars in Millions)	
	Base-Year	Then-Year
Revised Dec 86 economic escalation rates. (Economic)	N/A	-168.0
Reestimate of program managers reserve.	-42.2	-48.6
An increase to offset new economic indices. (Estimating)	-52.7	0
Revised estimates for Outfitting and Post Delivery. (Support)	-19.0	-24.3

d. References -- FY 1983 Continuing Resolution (Defense Appropriation Act)

14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate

(Same as Current Baseline)

b. Current Baseline Estimate to Current Estimate

PAUC									PAUC
(DE)	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	(Current Estimate)
3709.5	-402.5	-	-	-	-234.5	2.7	-	-634.4	3075.0

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CVN-68 CLASS (CVN-74/75), December 31, 1986

13. Cost Variance Analysis (Cont'd):

c. Current Change Explanation --

	(Dollars in Millions)	
	Base-Year	Then-Year
(1) RDT&E -- N/A	N/A	N/A
(2) Procurement -- N/A	N/A	N/A

d. References -- FY 1988 President's Budget Submission

14. Program Acquisition Unit Cost (PAUC) History: (Millions of
then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate

(Same as Current Baseline)

b. Current Baseline Estimate to Current Estimate

PAUC										PAUC
(DE)	Econ	Qty	Sch	Eng	Est	Spt	Other	Total		(Current Estimate)
3483.0	-	-	-	-	-	-	-	0.0		3483.0

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(UNCLASSIFIED)

CVN-68 CLASS (CVN-71), December 31, 1986

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E -- N/A

b. Procurement

Shipbuilding Contract	Initial Contract Price Target Ceiling Qty
Newport News Shipbuilding and Dry Dock Co. Newport News, Va. N00024-80-C-2023, FPIF Award: September 30, 1980	1155.4 1292.0 1
Current Target Price Target Ceiling Qty	Estimated Price At Completion Contractor Program Manager
1237.9 1375.5 1	1259.0 1259.0

Explanation of Change: Variances are not provided for this contract because reporting under DOD Instruction 7000.2 is not required.

Nuclear Components Contracts	Initial Contract Price Target Ceiling Qty
General Electric Co. Schenectady, New York N00024-74-C-5182, CPFF Award: October 6, 1976	-- 9.5 --
Current Target Price Target Ceiling Qty	Estimated Price At Completion Contractor Program Manager
--- Not Applicable---	9.5 9.5

Department of Energy N00024-67-F-5110 Economy Act Order Award: October 6, 1976	Initial Contract Price Target Ceiling Qty
	-- 118.3 --
Current Target Price Target Ceiling Qty	Estimated Price At Completion Contractor Program Manager
--- Not Applicable---	118.3 118.3

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CVN-68 CLASS (CVN-72/73), December 31, 1986

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E -- N/A

b. Procurement

Shipbuilding Contract	Initial Contract Price Target Ceiling Qty		
Newport News Shipbuilding and Dry Dock Co. Newport News, Va. N00024-83-C-2033, FPIF Award: December 27, 1982	3143.0 3454.4 2		
Current Target Price Target Ceiling Qty	3234.4 3534.2 2	Estimated Price At Completion Contractor	Program Manager
		3221.1	3234.4

Explanation of Change: Variances are not provided for this contract because under DOD Instruction 7000.2 is not required.

Nuclear Components Contracts	Initial Contract Price Target Ceiling Qty		
General Electric Co. Schenectady, New York N00024-82-C-4004, CPFF Award: December 29, 1982	-- 399.8 --		
Current Target Price Target Ceiling Qty	---	Estimated Price At Completion Contractor	Program Manager
--- Not Applicable---		369.8	369.8

Department of Energy N00024-67-F-5110 Economy Act Order Award: December 30, 1982	Initial Contract Price Target Ceiling Qty		
	-- 460.1 --		
Current Target Price Target Ceiling Qty	---	Estimated Price At Completion Contractor	Program Manager
--- Not Applicable---		345.0	345.0

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(UNCLASSIFIED)

CVN-68 CLASS (CVN-74/75), December 31, 1986

15. Contract Information: (Then-Year Dollars in Millions)

- a. RDT&E -- N/A
 b. Procurement -- N/A
 c. Milcon -- N/A

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status

- (1) Percent Program Completed: 0.0% (0 yrs/11yrs)
 (2) Percent Program Cost Appropriated: 0.0% (\$0.0/\$6966.0)

b. Appropriation Summary --

(Then-year Dollars in Millions)

Appropriation	Current & Budget Prior Yrs	Budget Year	Balance To Complete FYDP	Beyond FYDP	TOTAL
	(FY82-87)	(FY88)	(FY89-92)	(FY93)	
RDT&E	-	-	-	-	0.0
Procurement	-	644.0	3982.5	2339.5	6966.0
Total	0	644.0	3982.5	2339.5	6966.0

c. Annual Summary --

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			Then-Year Dollars			ESCAL- ATION RATE(%)
		Sailaway		Total	Advance	Proc	Total	
		Nonrec	Rec		Debit	Credit		

APPROPRIATION: SCN

1988	-	-	592.7	592.7	644.0	-	644.0	3.5
1989	-	-	713.9	713.9	797.0	-	797.0	3.5
1990	1	-	1998.0	1998.0	206.0	1241.0	2288.0	3.3
1991	-	-	582.9	582.9	696.0	-	696.0	2.9
1992	-	-	164.8	164.8	201.5	-	201.5	2.4
To Comp	1	-	1858.7	1858.7	187.7	1303.5	2339.5	2.4
Total	2	-	5911.0	5911.0	2732.2	2544.5	6966.0	

d. Obligations and Expenditures -- N/A

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CVN-68 CLASS (CVN-71), December 31, 1986

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

	Initial Contract Price		
	Target	Ceiling	Qty
Westinghouse Electric Corp. Pittsburgh, Pa N00024-73-5002, CPFF Award: October 6, 1976	--	279.1	--
	<hr/>		
Current Target Price	Estimated Price At Completion		
Target Ceiling Qty	Contractor	Program Manager	
---	263.6	263.6	
Not Applicable---			

c. MILCON -- N/A

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status

(1) Percent Program Completed: 100.0% (7 yrs/7 yrs)

(2) Percent Program Cost Appropriated: 100.0% (\$2541.1/\$2541.1)

b. Appropriation Summary --

Appropriation	Current & Prior Yrs (FY77-87)	(Then-year Dollars in Millions)			TOTAL
		Budget Year (FY88)	Balance To Complete FYDP (FY89-92)	Beyond FYDP (FY93)	
Procurement	2541.1	-	-	-	2541.1
Total	2541.1	-	-	-	2541.1

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CVN-68 CLASS (CVN-72/73), December 31, 1986

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

			Initial Contract Price		
			Target	Ceiling	Qty
Westinghouse Electric Corp. Pittsburgh, Pa N00024-82-C-5002, CPFF Award: December 29, 1982			--	540.1	--
			Estimated Price At Completion		
			Contractor	Program Manager	
Current Target Price	Target	Ceiling	Qty		
--- Not Applicable---			540.1	540.1	

c. MILCON -- N/A

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status

(1) Percent Program Completed: 33.3% (3 yrs/9 yrs)

(2) Percent Program Cost Appropriated: 97.2% (\$6214.2/\$6390.9)

b. Appropriation Summary --

Appropriation	Current & Prior Yrs	(Then-year Dollars in Millions)			TOTAL
		Budget Year	Balance To Complete FYDP	Beyond FYDP	
	(FY82-87)	(FY88)	(FY89-92)	(FY93)	
RDT&E	1.6	-	-	-	1.6
Procurement	6008.9	15.8	123.7	-	6148.4
Total	6010.5	15.8	123.7	0	6150.0

(UNCLASSIFIED)

DECEMBER 31, 1986

16. Program Funding Summary Cont'd:(Current Estimate in Millions of Dollars)

c. Annual Summary --

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			Then-Year Dollars			ESCAL- ATION RATE(%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
APPROPRIATION: SCN								
1977	-	-	241.7	241.7	268.4	-	268.4	6.20
1980	1	-	1597.4	1597.4	2189.3	268.4	2189.3	9.80
1981	-	-	-	-	-	-	-	9.60
1982	-	-	8.8	8.8	10.7	-	10.7	7.50
1983	-	-	-	-	-	-	-	3.80
1984	-	-	-	7.3	10.7	-	10.7	3.00
1985	-	-	-	6.4	9.7	-	9.7	2.10
1986	-	-	-	7.6	11.5	-	11.5	1.20
1987	-	-	-	26.0	40.8	-	40.8	3.10
Total	1	-	1847.9	1895.2	2541.1	268.4	2541.1	

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
APPROPRIATION: SCN			
1977	268.4	268.4	268.4
1980	2189.3	2118	2099.4
1982	10.7	9.7	8.6
1984	10.7	10.7	10.0
1985	9.7	9.8	4.7
1986	11.5	11.5	8.0
	40.8	0.0	0.0
To complete	0.0	0.0	0.0
Total	2541.1	2428.1	2399.1

(UNCLASSIFIED) CVN-68 CLASS (CVN-72/73), December 31, 1986

16. Program Funding Summary Cont'd: (Current Estimate in Millions of Dollars)

c. Annual Summary --

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			Then-Year Dollars			ESCAL- ATION RATE(%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

APPROPRIATION: RDT&E

1983	-	1.5	-	1.5	-	-	1.6	4.9
Subtotal	-	1.5	-	1.5	-	-	1.6	

APPROPRIATION: SCN

1982	-	-	431.3	431.3	475.0	-	475.0	7.50
1983	2	-	4576.0	4576.0	-	475.0	5520.6	3.80
1986	-	-	-	-	-	-	-	2.10
1987	-	-	-	11.9	13.3	-	13.3	3.10
1988	-	-	-	13.3	15.8	-	15.8	3.50
1989	-	-	-	21.9	26.6	-	26.6	3.50
1990	-	-	-	34.4	43.6	-	43.6	3.30
1991	-	-	-	10.5	13.7	-	13.7	2.90
1992	-	-	-	29.4	39.8	-	39.8	2.40
Total	2	-	5007.3	5128.7	627.7	475.0	6148.4	

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

APPROPRIATION: RDT&E

1983	1.6	1.6	1.5
Subtotal	1.6	1.6	1.5

APPROPRIATION: SCN

1982	475.0	460.0	325.3
1983	5520.6	4642.7	2372.5
1986	0.0	0.0	0.0
To complete	152.8	0.0	0.0
Total	6148.3	5102.7	2697.8

(Unclassified)

(UNCLASSIFIED)

CVN-68 CLASS(CVN-71-75)

DECEMBER 31, 1986

17. Production Rate Data:

- a. Annual Production Rates -- N/A
- b. Cost Variance -- N/A
- c. Schedule Variance -- N/A
- d. Deliveries (Plan/Actual) --

To Date

Procurement

1/5

18. Operating and Support Costs: N/A

(UNCLASSIFIED)

AF-31 SPARROW

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: AIM-7M, SPARROW Missile System

AS OF DATE: December 31, 1986

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-P&I)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): AIM-7M, Air-to-Air Guided Missile (SPARROW III).

2. DoD Component: U.S. Air Force; Executive Service is U.S. Navy.

3. Responsible Office and Telephone Number:

Air-to-Air Missile Systems Manager PM: CAPT Jesse J. Stewart, USN
NAVAIRSYSCOM PMA-259 Assigned: February 14, 1986
Washington, DC 20361-1259 AUTOVON 222-8228
COMMERCIAL (202) 692-0921

AF Air-to-Air Missile Systems Manager PM: LTCOL Raymond P. Hudkins, USAF
NAVAIRSYSCOM PMA-259B Assigned: August 1, 1983
Washington, DC 20361-1259 AUTOVON 222-8222
COMMERCIAL (202) 692-8224

4. Program Elements/Procurement Line Items:

RDT&E: 27161F (Shared Funding)
PROCUREMENT: PE 27161F (Shared Funding) APPN: 3020 ICN: M07FA1
MILCON: N/A

5. Related Programs: AMRAAM and AIM-9

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87-0155

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7. Program Highlights:

a. Significant Historical Development: DSARC (JRMB) II for the advanced monopulse seeker (designated AIM-7M) took place in April 1978. DCP 89B of 19 April 1979 approved the AIM-7M Program. UNDERSECDEF Memorandum of 22 September 1980 approved the AIM-7M Guidance and Control Section (G&CS) production; the second OSD Program Review of 1 March 1981 authorized continuance of the FY81 procurement program. USAF's first year buy was FY80. The USAF procurement has been continued through FY88 due to delay in production of the AMRAAM. Continued AIM-7M missile buys will maintain medium range, air-to-air missile inventories for USAF tactical forces flying F-15s. In August 1985, the AIM-7M successfully completed FOT&E.

b. Significant Development Since Last Report: The 4,700th All-Up-Round was delivered to the user in November 1986.

The AIM-7 Missile System satisfies USAF mission requirements.

c. Changes since As-of Date: None

11. Program Acquisition Cost (Current Estimate in Millions of Dollars):

a. Cost --	Development <u>Estimate</u>	<u>Changes</u>	Current <u>Estimate</u>
Development (RDT&E)	2.9	+ 0.4	3.3
Procurement	277.4	+ 403.6	681.0
Airframe	(275.1)	(370.5)	(645.6)
Total Flyaway	(275.1)	(370.5)	(645.6)
Peculiar Support	(1.6)	(13.8)	(15.4)
Initial Spares	(0.7)	(19.3)	(20.0)
Construction (MILCON)	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY78 Base Year \$	280.3	+ 404.0	684.3
Escalation	82.9	+ 403.2	486.1
Development (RDT&E)	(0.4)	(0.8)	(1.2)
Procurement	(82.5)	(402.4)	(484.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Total Then-Year \$	<u>363.2</u>	+ <u>807.2</u>	<u>1170.4</u>
b. Quantities --			
Development (RDT&E)	0	0	0
Procurement	<u>3790</u>	+ <u>2531</u>	<u>6321</u>
Total	3790	2531	6321
c. Unit Cost --			
Procurement:			
FY78 Base-Year \$	0.073	+ 0.035	0.108
Then-Year \$	0.095	+ 0.089	0.184
Program:			
FY78 Base-Year \$	0.074	+ 0.034	0.108
Then-Year \$	0.096	+ 0.089	0.185
d. Approved Design to Cost Total -- No AF Goal.			
e. Foreign Military Sales -- See Navy SAR.			
f. Nuclear Costs -- None.			

12. Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
a. Program Acquisition --	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
(1) Cost	1170.4	1196.9	1170.4
(2) Quantity	6321	6304	6321
(3) Unit Cost	0.185	0.190	0.185
b. Current Procurement --	(FY 1987)	*(FY 1987)	(FY 1988)
(1) Cost	55.9	55.9	99.5
Less CY Adv Proc	N/A	N/A	N/A
Plus PY Adv Proc	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Net Total	55.9	55.9	99.5
(2) Quantity	349	349	558
(3) Unit Cost	0.160	0.160	0.178

* Update from Dec 85 SAR to FY87 Appropriation Act in accordance with Congressional change to SAR Public Law.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	3.3	359.9	--	363.2
Previous Changes:				
Economic	+ 0.2	- 61.4	--	- 61.2
Quantity	--	+ 301.5	--	+ 301.5
Schedule	+ 0.1	+ 0.6	--	+ 0.7
Engineering	--	--	--	--
Estimating	+ 0.9	+ 459.5	--	+ 460.4
Other	--	--	--	--
Support	--	+ 132.3	--	+ 132.3
Subtotal	+ 1.2	+ 832.5	-0-	+ 833.7
Current Changes:				
Economic	--	- 6.6	--	- 6.6
Quantity	--	+ 2.5	--	+ 2.5
Schedule	--	- 0.3	--	- 0.3
Engineering	--	--	--	--
Estimating	--	+ 40.1	--	+ 40.1
Other	--	--	--	--
Support	--	- 62.2	--	- 62.2
Subtotal	-0-	- 26.5	-0-	- 26.5
Total Changes	+ 1.2	+ 806.0	-0-	+ 807.2
Current Estimate	4.5	1165.9	-0-	1170.4

(FY 1978 Constant Dollars (Base-Year) in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	2.9	277.4	--	280.3
Previous Changes:				
Quantity	--	+ 161.5	--	+ 161.5
Schedule	+ 0.1	- 12.5	--	- 12.4
Engineering	--	--	--	--
Estimating	+ 0.3	+ 200.8	--	+ 201.1
Other	--	--	--	--
Support	--	+ 64.2	--	+ 64.2
Subtotal	+ 0.4	+ 414.0	-0-	+ 414.4
Current Changes:				
Quantity	--	+ 1.2	--	+ 1.2
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	+ 19.5	--	+ 19.5
Other	--	--	--	--
Support	--	- 31.1	--	- 31.1
Subtotal	-0-	- 10.4	-0-	- 10.4
Total Changes	+ 0.4	+ 403.6	-0-	+ 404.0
Current Estimate	3.3	681.0	-0-	684.3

13. Cost Variance Analysis (Cont'd):

b. Previous Change Explanations --

RDTE

Economic: Revised escalation indices
Schedule: Delay of R&D development
Estimating: Revised R&D effort cost

Procurement

Economic: Revised escalation indices
Quantity: Addition of 2,514 SPARROW missiles
Schedule: Spread-out procurement of FY83/84/85 approved missiles.
Estimating: Revised procurement cost estimates due to increased quantities which lowered hardware costs
Support: Reduction in peculiar support cost and elimination of initial spares requirement in FY87

MILCON N/A

13. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

(Dollars in Millions)
Base-Year \$ Then-Year \$

Procurement

Revised Economic Escalation Indices (Economic)	--	- 6.6
Procurement of 17 additional missiles	+ 1.5	+ 3.1
o Flyaway cost associated with add on buy of 17 missiles (Quantity)	(+ 1.2)	(+ 2.5)
o Estimating change applicable to increased quantity (Estimating)	(+ 0.3)	(+ 0.6)
Schedule change associated with actual missiles procured (Schedule)	--	- 0.3
Congressional reduction since the last SAR accommodated with savings achieved from competitive/optimum contract award (Estimating)	- 8.3	- 16.5
Funds released as excess to prior year program needs (Estimating)	- 3.6	- 6.2
Correction to Dec 85 SAR to redefine the mix of support and estimating category changes	0.0	0.0
o Increase to estimating category (Estimating)	(+ 31.1)	(+ 62.2)
o Decrease to support category (Support)	(- 31.1)	(- 62.2)

d. References --

Development Estimate: DCP Number 89, Revision B approved 19 April 1979.

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. Initial SAR/Development estimate to Current Estimate:

PAUC (Initial SAR/ Development Estimate)	Changes								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
0.096	-.011	+.010	--	--	+.079	+.011	--	0.089	0.185

15. Contract Information: See Navy SAR (No separate AF contracts)

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 89% (8 years/9 years)

(2) Percent Program Cost Appropriated: 91% (\$1070.9/\$1170.4)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs</u> (FY80 - 87)	<u>Budget Year</u> (FY88)	<u>Balance to Complete</u> (FY89-92)	<u>Total</u>
RDT&E	4.5	-0-	-0-	4.5
Procurement	1066.4	99.5	-0-	1165.9
MILCON	-0-	-0-	-0-	-0-
Total	1070.9	99.5	-0-	1170.4

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY78 Base-Year Dollars			Then-Year Dollars			Esc1 Rate %
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1980	0	--	--	1.1	--	--	1.4	9.4
1981	0	--	--	2.2	--	--	3.1	11.9
Subtotal	-0-	--	--	3.3	--	--	4.5	

Appropriation: Procurement

1980	330	5.0	55.1	60.3	N/A	N/A	83.8	9.7
1981	865	9.0	101.7	119.9			182.2	11.7
1982	957	5.1	116.6	134.8			221.3	9.6
1983	1300	--	116.6	124.2			216.1	9.0
1984	1005	--	90.4	94.0			169.8	8.0
1985	460	--	34.6	34.6			64.4	3.4
1986	497	--	37.6	37.9			72.9	2.9
1987	349	--	26.4	27.0			55.9	3.1
1988	558	--	47.5	48.3			99.5	3.5
Subtotal	6321	19.1	626.5	681.0	-0-	-0-	1165.9	

Appropriation: MILCON

None	--	--	--	--	--	--	--	--
Subtotal	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-

Total	6321	19.1	626.5	684.3	-0-	-0-	1170.4	
-------	------	------	-------	-------	-----	-----	--------	--

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1980	1.4	1.4	1.4
1981	3.1	3.1	3.1
Total	4.5	4.5	4.5

Appropriation: Procurement

1980	83.8	83.8	83.7
1981	182.2	182.2	182.2
1982	221.3	221.3	221.2
1983	216.1	205.7	204.6
1984	169.8	164.1	141.8
1985	64.4	62.5	49.1
1986	72.9	59.7	9.1
1987	55.9	2.8	0.0
1988	99.5	0.0	0.0
Total	1165.9	982.1	891.7

Appropriation: Construction

N/A	N/A	N/A	N/A
-----	-----	-----	-----

17. Production Rate Data: See Navy SAR18. Operating and Support Costs: N/A

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SAR-86-087

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823
PROGRAM: (NAVSTAR GPS)/USER EQUIPMENT

AS OF DATE: December 31 1986

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FEB 4 1987 18

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (DASO-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): Navstar GPS/Navstar Global Positioning System (Navstar)

2. DoD Component: U.S. Air Force (Lead Service User Equipment) U.S. Army, U.S. Navy.

3. Responsible Office and Telephone Number:

Navstar GPS Joint Program Office
Space Division
P.O. Box 92960
Los Angeles AFS, CA 90009-2960

PM: Colonel Gaylord Green
Assigned: October 22, 1985
AV 833-1526; COMM (213) 643-1526

4. Program Elements/Procurement Line Items:

RDT&E: -PEs 63421F, 64478F, 64778F, 35164F, 35165F (Shared Funding)
64777N, 64778A

PROCUREMENT: AF - APPN 3020 ICN MGPS OC NAVY APPN 1810 ARMY APPN 2031
AF - APPN 3010 ICN NAVY APPN 1506 ARMY APPN 2035
AF - 3080 ICN

MILCON: PE 35165F

5. Related Programs: NUDET Detection System (NDS); Space Shuttle Operations (PAM-D, Shuttle); and Space Boosters Program (Delta II)

Classified by SCG Jul 84
Declassify on OADR

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SAF/PAS

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OASD(P&A) 87-1-0243

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Navstar GPS, December 31, 1986

6. Mission and Description: The Navstar Global Positioning System (GPS) is a space-based radio positioning, navigation and time distribution system. The GPS will ultimately provide precise, continuous, all-weather, common grid worldwide positioning, navigation and time reference capability to a multiplicity of users. Mission areas supported include navigation and position fixing, air interdiction, close air support, special operations, strategic attack, counter-air and aerospace defense, theater and tactical command, control communications and intelligence, and ground and sea warfare. While NAVSTAR GPS does not replace any existing USAF weapon system, it provides the capability to replace the following support systems: VHF Omnidirectional Range (VOR), Long Range Aid to Navigation (LORAN), OMEGA, Tactical Air Navigation (TACAN), and Distance Measurement Equipment (DME).

7. Program Highlights:

a. Significant Historical Developments -- During Phase I, satellites were launched to support testing at various locations. Highly accurate bombing and navigation resulted in all test objectives being met. In August 1979, GPS was approved to enter Full Scale Development. In 1979 a \$500 million DoD funding reduction, spread over FY 1981 - FY 1986, resulted in a restructuring of the program. This restructuring reduced the number of satellites from 24 to 18 (+3 on-orbit spares), delayed the production of user equipment and reduced the number of monitor stations.

Ten Block I satellites have been launched to support user equipment testing. In September 1982 the long lead contract for the 28 Block II GPS satellite fixed price multiyear production was awarded. In May 1983 the full multiyear production contract was awarded. These satellites were to be launched on the Shuttle, but, because of the Challenger accident, a 24 month launch standdown resulted. To minimize the effects of this delay, GPS satellites will be launched on the Medium Launch Vehicle, under development, and the Shuttle. The Block II qualification satellite successfully completed qualification testing in May 1986.

A GPS control segment was developed during the GPS Phase I development program. In Phase II the control segment began to transfer operations from Vandenberg AFB to the Consolidated Space Operations Center at Falcon AFS. The development and deployment of the Operational Control Segment began in September 1980. This system consists of three uplink antenna systems and five monitor stations installed at various locations worldwide and a master control station. Operational Control Segment operations were transferred from Vandenberg AFB to Falcon AFS supporting the current GPS operations.

User Equipment full scale development began in July 1979. Following extensive competition during the development phase, a user equipment production program was awarded to Rockwell Collins in April 1985 with production options beginning in March 1986. Initial Operational Test and Evaluation of user equipment was completed in February 1986 surfacing reliability and maintainability problems. Several reliability improvement initiatives were incorporated into the production program to correct reliability deficiencies. Based upon these improvements and upon completion of an integrated multi-service test plan for production equipment, the Low Rate Initial Production of user equipment was approved in June 1986.

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Navstar GPS, December 31, 1986

7. Program Highlights (Cont'd):

b. Significant Developments since Last Report -- During this period satellites Navstar 3 and 4 experienced gradual degradation of solar array output which may reduce future operations. Also, the last atomic clock on Navstar 4 appears to have failed resulting in usage of its less accurate crystal oscillator. The Air Force studied options to best restructure the satellite production as a result of the launch delay concluding that the most cost efficient option was to stretch the production program to meet the current launch manifest. The first option for GPS user equipment was exercised. A successful user equipment Critical Design Review was completed in December 1986.

The Navstar GPS system is expected to satisfy the mission requirement.

c. Changes Since "As of Date" -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated Jun 1986) threshold breaches.

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Navstar GPS, December 31, 1986

9. Schedule:

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
a. Milestones:		
DSARC I (JRMB I)	Dec 73/Dec 73	Dec 73
DSARC II (JRMB II)	Jun 79/Jun 79	Jun 79
Space Segment		
System Design Review	Jan 80/Jan 80	Jan 80
Preliminary Design		
Review	Mar 80/Mar 80	Mar 80
Replenishment Satellite		
Contract Award	Oct 79/Oct 79	Oct 79
Block II Satellite		
Contract Award	Dec 80/Dec 80	Dec 80
Satellite Production		
Contract	Jan 82/Jan 82	Sep 82
First Launch Ready		
Satellite	Apr 85/Jan 87 (Ch-1)	Jan 87
First Production		
Satellite Launch	Jan 87/Jan 89 (Ch-1)	Jan 89
Control Segment		
Development Contract		
Award	Sep 80/Sep 80	Sep 80
Operational Control		
Segment (FOC)	Nov 87/Apr 91 (Ch-1)	Apr 91 (Ch-2)
User Segment		
Phase IIB FSED Contract		
Awards	Jul 79/Jul 79	Jul 79
Begin DT&E/IOT&E	Jan 83/Aug 84	Aug 84
Complete DT&E/IOT&E	Aug 83/May 86	May 86
Source Selection	Apr 85/Apr 85	Apr 85
Phase III PDR	Dec 85/Dec 85	Dec 85
Production Contract		
Award	Jan 84/May 86	Aug 86
Phase III CDR	Jun 86/Jun 86	Dec 86
Program		
*JRMB Milestone IIIA	Sep 83/May 86	Jun 86
Three Dimensional		
Capability (24 hrs/ day)	Dec 87/Mar 91 (Ch-1)	Mar 91
*JRMB Milestone IIIB	Mar 89/Mar 89	Mar 89

*Formerly DSARC

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b. Previous Change Explanations --

Satellite contract award date changed based upon 28 satellite block buy contract strategy vice annual buy contract strategy, with reprogramming approval also contributing to the delay. Delay of first launch ready satellite due to slip in schedule of contract award date. Slip of 3-D capability due to OSD reallocation of procurement satellite funding. Delivery of the first Block II satellite slipped from Aug 86 to Jan 87 due to first satellite production problems. Launch of the first Block II satellite slipped from Jan 87 to Jan 89 due to the Shuttle standdown. 3-D capability also slipped from Dec 88 to Mar 91 as a result of the Shuttle standdown. IOT&E was delayed by user equipment design and host vehicle integration problems. Source Selection was added to the schedule milestones in Dec 84. JRMB Milestone III (IIIA) was delayed 8 months from Sep 83 to May 84 due to user equipment contractor schedule slip. The UE production contract award was delayed 9 months due to user equipment contractor schedule slip and to comply with Public Law 9894. Field testing difficulties further slipped that milestone into late 1985, and retesting did not provide sufficient data to support the milestone, which caused a slip to Feb 86. Reliability and maintainability problems identified during Phase II dictated additional testing which delayed completion of user equipment DT&E and IOT&E and the subsequent Milestone IIIA decision from Feb 86 to May 86. Phase III PDR (Dec 85), Phase III CDR (Jun 86) and JRMB IIIB (Mar 89) milestones were also added. Milestone IIIB, user equipment full rate production, is required to comply with Public Law 9894. The exercise of the first LRIP option was delayed from Mar 86 to Aug 86 and the Phase III CDR slipped from Jan 86 to Dec 86.

c. Current Change Explanations --

(Ch-1) PMD revised due to Shuttle standdown.

(Ch-2) Full operational capability of the GPS Control Segment slipped from Nov 87 to Apr 91 due to Shuttle standdown.

d. References --

Development Estimate:

- (1) Decision Coordinating Paper (DCP) #133, Revision B, 1 Feb 1980
- (2) Decision Coordinating Paper (DCP) Jun 1986 (User Equipment).

Approved Program: PMD No. 4075(25) (Draft)

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10. (U) Technical/Operational Characteristics:

	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance A/</u>	<u>Current Estimate</u>
a. (U) Technical --			
Expected Ground Power (End of Life) (dBW)			
a. L1 (C/A) <u>B/</u>	-160/-160	-155	-160
b. L1 (Precision Code) <u>B/</u>	-163/-163	-158	-163
c. L2 (Precision Code)	-166/-166	-159	-166
Cesium Clock Stability ($\Delta f/f$) <u>B/</u>	2X10-13/2X10-13	1.3X10-13	2X10-13
Time Transfer (Universal Coordinated Time) (nsec)	+/-100	+/-25	+/-100
User Equipment Reliability Mean Time Between Maintenance (hrs) <u>C/</u>			
a. Airborne			
1) 5 - Channel (Ch-2)	550/590 (Ch-1)	130	500 (Ch-1)
2) 2 - Channel (Ch-2)	550/929 (Ch-1)	130	500 (Ch-1)
b. Ground	850/2000 (Ch-1)	216	500 (Ch-1)
c. Sea	900/680 (Ch-1)	300	680 (Ch-1)
User Equipment Maintainability Manhours to Repair (hrs) <u>D/</u>			
a. Airborne			
1) 5 - Channel (Ch-2)	1.3/1.0 (Ch-1)	0.75	1.0 (Ch-1)
2) 2 - Channel (Ch-2)	1.3/0.75 (Ch-1)	0.75	0.75 (Ch-1)
b. Ground	1.2/0.75 (Ch-1)		0.75 (Ch-1)
c. Sea	1.3/1.5 (Ch-1)	0.77	1.5 (Ch-1)
b. (U) Operational --			
(U) 3-D Position Accuracy of User Equipment <u>B/</u> Spherical Error Probable (SEP)(m)	16/16	10 <u>F/</u>	16
(U) Block II Satellite Mean Mission Duration (yrs) <u>B/</u>	6/6	5 <u>G/</u>	6
(U) System Availability (%) <u>B/ E/</u>	98/98		98

(b)(1)

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10. Technical/Operational Characteristics (Cont'd):

- A/ The test results under demonstrated performance represent best trials data using prototype equipment that is representative of production equipment. Where no values appear, data is not yet available.
- B/ DCP Threshold.
- C/ Approved program changes requirement to measure mean time between operational failures.
- D/ Probability that a minimum of 18 satellites are operational at any time.
- E/ Approved program changed requirement to measure mean time to repair I-level.
- F/ The 16 meter objective (18 satellite constellation) corresponds to 10 meters achieved with DT&F satellite spacing (based on 24 satellite constellation).
- G/ Demonstrated performance is for Block I Spacecraft which have a design mean mission duration of 4.0 years. A 6 year mean mission duration represents Block II production satellite design.
- H/ Time required to change the degradation level of the selective availability.

c. Previous Change Explanations -- None. No previous changes.

d. Current Change Explanations --

(Ch-1) Approved program and current estimate changed to reflect Milestone IIIB thresholds in June 1986 DCP.

(Ch-2) Added to distinguish between types of user equipment.

e. References:

Development Estimate: Decision Coordinating Paper (DCP) #133, Revision B, dated 1 Feb 80.

Approved Program: Decision Coordinating Paper (DCP) JRMB Milestone IIIA Version, dated June 1986.

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11. Program Acquisition Cost: Satellite (Air Force)

(Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Change	Current Estimate
Development (RDT&E)	\$ 967.6	\$-135.4	\$ 832.2
Procurement	623.4	+134.7	758.1
Spacecraft Flyaway	(583.6)	(+25.6)	(609.2)
Other Weapon System Cost	(39.8)	(+109.1)	(148.9)
Construction (MILCON)	8.4	-3.7	4.7
Total FY 79 Base-Year \$	1599.4	-4.4	1595.0
Escalation	707.3	+75.8	783.1
Development (RDT&E)	(204.9)	(-9.5)	(195.4)
Procurement	(496.1)	(+89.0)	(585.1)
Construction	(6.3)	(-3.7)	(2.6)
Total Then-Year \$	\$2306.7	+71.4	2378.1
b. Quantities			
Development (RDT&E)	12	0	12
Procurement	28	0	28
Total	40	0	40
c. Unit Cost --			
Procurement:			
FY 79 Base-Year \$	\$22.264	\$ +4.811	\$27.075
Then-Year \$	39.982	+7.989	47.971
Program:			
FY 79 Base-Year \$	\$39.985	\$ -0.110	\$39.875
Then-Year \$	57.668	+1.785	59.453
d. Approved Design to Cost Goal --			
	(Average Unit Flyaway Cost)		
	Dev Estimate/ Appr Program	Current Estimate	Latest Approved Threshold
@ Qty: 28			
@ Peak Rate: 7/year			
FY 79 Base-Year \$	20.336/20.336	22.368	25.000(+10%)
Then-Year \$	54.812/54.812	56.713	N/A
e. Foreign Military Sales -- None.			
f. Nuclear Costs -- None.			

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11. Program Acquisition Cost: User Equipment (Tri-Service)

(Current Estimate in Millions of Dollars)

	<u>Development Estimate</u>	<u>Change</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	\$ 941.8	- 37.9	\$ 903.9
Procurement	1613.1	-227.9	1385.2
Flyaway Cost	(1115.9)	(-68.1)	(1047.8)
Other Weapon System Cost	(497.2)	(-159.8)	(337.4)
Construction (MILCON)	—	0.0	—
Total FY 79 Base-Year \$	2554.9	-265.8	2289.1
Escalation	2320.9	-450.0	1870.9
Development (RDT&E)	(441.9)	(- 34.8)	(407.1)
Procurement	(1879.0)	(-415.2)	(1463.8)
Construction	(—)	(0.0)	(—)
Total Then-Year \$	\$4875.8	-715.8	\$4160.0
b. Quantities			
Development (RDT&E)	129	0	129
Procurement	27210	0	27210
Total	27339	0	27339
c. Unit Cost --			
Procurement:			
FY 79 Base-Year \$	\$ 0.059	-0.008	\$ 0.051
Then-Year \$	0.128	-0.023	0.105
Program:			
FY 79 Base-Year \$	\$ 0.093	-0.009	\$ 0.084
Then-Year \$	0.178	-0.026	0.152

d. Approved Design to Cost Goal --

(Average Unit Flyaway Cost)

	<u>Dev Estimate/ Appr Program</u>	<u>Current Estimate</u>	<u>Latest Approved Threshold</u>
@ Qty: 27210			
@ Peak Rate: 390/mo			
FY 79 Base-Year \$	0.041/0.041	0.039	0.101
Then-Year \$	0.089/0.089	0.080	N/A

e. Foreign Military Sales -- Sales to date include 35 to West Germany for \$10.6M, 3 to Canada for \$.3M and 1 to Japan for \$.6M.

f. Nuclear Costs -- None.

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12. Program Acquisition/Current Procurement Unit Cost Summary:
Satellite (Air Force)

(Current (Then-Year) Dollars in Millions)

a. Program Acquisition --	Current Year		Budget Year
	SAR Current Estimate (Dec 86 SAR)	UCR Baseline Estimate (Dec 85 SAR)	UCR Baseline Estimate (Dec 86 SAR)
(1) Cost	2378.1	2611.6	2378.1
(2) Quantity	40	40	40
(3) Unit Cost	59.453	65.290	59.453
b. Current Procurement --			
(1) Cost	(FY 1987) 128.5	(FY 1987)* 128.5	(FY 1988) 92.6
Less CY Adv Proc	--	--	--
Plus PY Adv Proc	180.7	180.7	114.8
Net Total	309.2	309.2	207.4
(2) Quantity	8	8	4
(3) Unit Cost	38.650	38.650	51.850

12. Program Acquisition/Current Procurement Unit Cost Summary:
User Equipment (Tri-Service)

(Current (Then-Year) Dollars in Millions)

a. Program Acquisition --	Current Year		Budget Year
	SAR Current Estimate (Dec 86 SAR)	UCR Baseline Estimate (Sep 86 SAR)	UCR Baseline Estimate (Dec 86 SAR)
(1) Cost	4160.0	4875.8	4160.0
(2) Quantity	27339	27339	27339
(3) Unit Cost	0.152	0.178	0.152
b. Current Procurement --			
(1) Cost	(FY 1987) 130.3	(FY 1987)* 130.3	(FY 1988) 207.3
Less CY Adv Proc	--	--	--
Plus PY Adv Proc	--	--	--
Net Total	130.3	130.3	207.3
(2) Quantity	673	673	956
(3) Unit Cost	0.194	0.194	0.217

*Differs from the baseline SARs to reflect the FY 87 Appropriations act.

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13. Cost Variance Analysis: Satellite (Air Force)

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1172.5	1119.5	14.7	2306.7
Previous Changes:				
Economic	-34.8	-47.8	-1.4	-84.0
Quantity	--	--	--	--
Schedule	+6.8	+67.1	--	+73.9
Engineering	+106.4	+36.7	--	+143.1
Estimating	-227.9	-53.7	+0.5	-281.1
Other	--	--	--	--
Support	+13.0	+17.7	-6.5	+24.2
Subtotal	-136.5	+20.0	-7.4	-123.9
Current Changes:				
Economic	-2.2	-15.1	--	-17.3
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-50.5	+10.6	--	-39.9
Other	--	--	--	--
Support	+44.3	+208.2	--	+252.5
Subtotal	-8.4	+203.7	--	+195.3
Total Changes	-144.9	+223.7	-7.4	+71.4
Current Estimate	1027.6	1343.2	7.3	2378.1

(FY 1979 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	967.6	623.4	8.4	1599.4
Previous Changes:				
Quantity	--	--	--	--
Schedule	+4.5	--	--	+4.5
Engineering	+64.6	+25.3	--	+89.9
Estimating	-206.8	-5.7	+0.4	-212.1
Other	--	--	--	--
Support	+7.8	+5.3	-4.1	+9.0
Subtotal	-129.9	+24.9	-3.7	-108.7
Current Changes:				
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-30.0	+6.0	--	-24.0
Other	--	--	--	--
Support	+24.5	+103.8	--	+128.3
Subtotal	-5.5	+109.8	--	+104.3
Total Changes	-135.4	+134.7	-3.7	-4.4
Current Estimate	832.2	758.1	4.7	1595.0

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13. Cost Variance Analysis (Cont'd): Satellite (Air Force)

b. Previous Change Explanations --

RDT&E:

Economic: Revised economic escalation indices.

Schedule: One year acceleration in design/development of flexible modular interface for tailoring user equipment to host vehicles.

Engineering: Support requirement to develop and to integrate product improvement on the Block II space vehicle. Funds were deleted for GPS User Charges with the GPS Survivability Program also being redefined.

Estimating: Funding for additional year in support of Control and User Segments partially offset by funds reprogrammed for the NUDET Detection System (NDS) Ground Command terminal. Transfer of funds from aircraft procurement appropriation to RDT&E for integration studies on user equipment host vehicle platforms. Funds provided in FY87 to allow more Phase II host vehicle integration studies and in FY86-88 for necessary control segment modifications for interface with Block II satellites. Funds decreased due to reduced testing of Phase IIB User Equipment, FY84 contingent liabilities withdrawal, engineering change order reduction to absorb congressional/DoD unspecified funding cuts for FY86-91, and adjustment made for prior year escalation changes.

Support: Funding reduced for delay in Beneficial Occupancy Date for Master Control Station move into Consolidated Space Operations Center and decreased level of FCRC support.

Procurement:

Economic: Revised economic escalation indices.

Schedule: One year delay in satellite production start.

Engineering: Funding reduced with the deletion of crosslink ranging, additional hardening and autonomous housekeeping.

Estimating: Change in satellite procurement approach from an annual to a multiyear procurement. Savings partially offset by need to fully fund satellites by congressional direction. Adjustments made for prior year escalation changes. Intra-appropriation reprogramming to realign the funding levels between GPS, PAM-D and NDS within the approved multi-year funding. Realignment of funds between support equipment and satellite hardware to correctly reflect actual breakout. Funds added for Orbital Insertion Motor and Data Transfer System for GPS satellites. Funds of Engineering Change Orders (ECO) reduced to absorb congressional/DoD unspecified funding cuts for FY86-91.

Support: Flight operations associated with the one year extension in the satellite program and realignment of costs between support equipment and satellite hardware to reflect actual breakout.

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13. Cost Variance Analysis (Cont'd): Satellite (Air Force)Construction:

Economic: Revised economic escalation indices.

Estimating: Adjustment for difference between President's Budget and required funding.

Support: Deletion of Consolidated Space Operation Center (CSOC) contingency funding.

c. Current Change Explanations --

(Dollars in Millions)

Base-Year \$ Then-Year \$(1) RDT&E:Revised economic escalation indices.
(Economic)

N/A

-2.2

Adjustment for current and prior year
escalation change. (Estimating)

+0.7

+1.2

Adjustment to reflect only Block II
satellite costs in the SAR.
(Estimating)

-30.7

-51.7

Additional cost to continue Control
Segment until turnover to Space Command
(FY 91) and other program support
resulting from Space Shuttle launch
delays. (Support)

+24.5

+44.3

(2) Procurement:Revised economic escalation indices.
(Economic)

N/A

-15.1

Adjustment for current and prior year
escalation change.

+6.6

+11.7

Flyaway costs (Estimating)

(+6.0)

(+10.6)

Support Costs (Support)

(+0.6)

(+ 1.1)

Additional support costs required.

+103.2

+207.1

Shuttle Recovery Program (Support)

(+98.2)

(+197.0)

Required launch support costs in
FY90. (Support)

(+ 5.0)

(+ 10.1)

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13. Cost Variance Analysis (Cont'd): Satellite (Air Force)(3) MILCON: None.

d. References --

Development Estimate: Decision Coordinating Paper (DCP) #133,
Revision B, 1 Feb 1980.13. Cost Variance Analysis: User Equipment (Tri-Service)

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1383.7	3492.1	--	4875.8
Previous Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Current Changes:				
Economic	-7.9	-183.6	--	-191.5
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-64.8	-137.3	--	-202.1
Other	--	--	--	--
Support	--	-322.2	--	-322.2
Subtotal	-72.7	-643.1	--	-715.8
Total Changes	-72.7	-643.1	--	-715.8
Current Estimate	1311.0	2849.0	--	4160.0

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13. Cost Variance Analysis (Cont'd): User Equipment (Tri-Service)

(FY 1979 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	941.8	1613.1	--	2554.9
Previous Changes:				
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Current Changes:				
Economic	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-37.9	-68.1	--	-106.0
Other	--	--	--	--
Support	--	-159.8	--	-159.8
Subtotal	-37.9	-227.9	--	-265.8
Total Changes	-37.9	-227.9	--	-265.8
Current Estimate	903.9	1385.2	--	2289.1

b. Previous Change Explanations: None.

c. Current Change Explanations:

(Dollars in Millions)

	Base-Year \$	Then-Year \$
(1) <u>RDT&E</u>		
Revised economic escalation indices. (Economic)	N/A	-7.9
Adjustment for current prior year escalation change. (Estimating)	+1.6	+2.5
Decrease in aircraft integration efforts. (Estimating)	-39.5	-67.3

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13. Cost Variance Analysis (Cont'd): User Equipment (Tri-Service)(2) Procurement

Revised economic escalation indices. (Economic)	N/A	-183.6
Adjustment for current and prior year escalation change.	+3.7	+6.7
Flyaway costs (Estimating)	(+2.8)	(+5.1)
Support costs (Support)	(+0.9)	(+1.6)
Decrease in aircraft modification efforts.	-231.6	-466.2
Flyaway costs (Estimating)	(-70.9)	(-142.4)
Support costs (Support)	(-160.7)	(-323.8)

d. References --

Development Estimate: Decision Coordinating Paper (DCP), Jun 1986.
(User Equipment)

14. Program Acquisition Unit Cost (PAUC) History:

Satellite (Air Force) (Millions of Then-Year Dollars)

a. Initial SAR/Development Estimate to Current Estimate

PAUC (Initial SAR/ Development Estimate)	Changes								PAUC Current Estimate)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
57.668	-2.533	--	+1.847	+3.578	-8.025	--	+6.918	+1.785	59.453

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

User Equipment (Tri-Service)

a. Initial SAR/Development Estimate to Current Estimate

PAUC (Initial SAR/ Development Estimate)	Changes								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.178	-0.007	--	--	--	-0.007	--	-0.012	-0.026	0.152

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15. Contract Information: (Then-Year Dollars in Millions)

(Major Joint Project Office Contracts)

a. RDT&E --

<u>User Equipment</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Rockwell International Collins			
Cedar Rapids, Iowa	\$61.9M	\$66.3M	51
F04701-85-C-0038, FPIF,			
Award: April 1, 1985			
Definitized: April 1, 1985			

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$83.3M	\$89.0M	76	\$87.3M	\$82.9M

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	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance	-\$3.6M	-\$6.6M
Cumulative Variances to Date (10/31/86)	-\$3.5M	-\$5.5M
Net Change	+\$0.1M	+\$1.1M

Explanation of Change: The cumulative cost variance is (-\$3.5M) or -10.6% and is due to expending greater effort in analyzing test problems, designing and developing design corrections and re-laying out printed circuit boards.

The major reason for schedule delays is that the contractor underestimated the amount of specification changes required. This has forced the contractor to divert more senior personnel to these areas leaving less senior personnel to perform other contract work. The shortage of manpower has caused delays in the design of user equipment. The schedule variance reflects a 5 month slip to the contract. The program manager's assessment remains less optimistic than the contractor's reflecting a (-\$4.7M) overrun, or (-6.0%) EAC cost variance. The contractor is still predicting a negative variance at completion for the total contract. Large individual variances are evident for the system engineering and receiver cost accounts.

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b. Procurement --

<u>Satellite</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Rockwell International			
Seal Beach, CA	\$1,171.0	N/A	28
F04701-83-C-0031, FFP/CPFF			
Award: May 20, 1983			
Definitized: May 20, 1983			

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
1311.8	N/A	28	1313.2	1311.8

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15. Contract Information (Cont'd.): (Then-Year Dollars in Millions)

Explanation of Change: The CPFF portion of this contract is \$47.4M. Cost variance cannot be determined because CDRL requirements did not include all data necessary to track the CPFF portion of the contract. Efforts are being made to resolve this problem so cost variances can be tracked.

The CPFF portion of this contract is a level of effort tasking for launch support of the production satellites; therefore, there is no schedule variance applicable. Initial funding for the CPFF portion of this contract began in FY85. No impact to program.

<u>User Equipment</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Rockwell International Collins Cedar Rapids, Iowa F04701-85-C-0038, FPIF, Award: April 1, 1985 Definitized: April 1, 1985	\$55.3M	\$56.9M	356

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$56.4M	\$58.1M	356	\$60.6M	\$74.1M

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance	\$0.0M	\$0.0M
Cumulative Variances to Date (10/31/86)	-\$0.5M	-\$1.2M
Net Change	-\$0.5M	-\$1.2M

Explanation of Change: The overall cost variance is (-\$0.5M) or (-23.0%). Cost variances are due to the following: (1) Planning effort for both producibility and test equipment were more than planned, (2) Receiver VH integration test lack of progress, (3) Correlator project required more test equipment planning, (4) 1553 model and Collins Adaptive Processing System (CAPS) 7 card writing behind and (5) Drafting errors requiring rework.

Rockwell Collins cumulative schedule variance is (-\$1.2M) or (-35.1%). Negative variance is primarily caused by a delayed start of the construction of flexible test interfaces (FTI's), delayed definition of user equipment test requirements and hardware availability. Difficulty in software debugging, performance issues on commercial test equipment, subcontractor delays, CAPS 7 issue, and slow down of the 1533 model development also contributed to the variance.

Program manager's estimate at this time indicates that contract will complete above target price due to reasons listed above. There are sufficient funds available for this Joint Project Office (JPO) User Equipment Contract.

c. MILCON -- No MILCON contracts.

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16. Program Funding Summary: Satellite (Air Force)
(Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 73.7% (14 yrs/19 yrs)

(2) Percent Program Cost Appropriated: 83.9% (\$1995.0/\$2378.1)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY74-87)	Budget Year (FY88)	Balance To Complete FYDP (FY89-92)	Beyond FYDP N/A	Total
RDT&E	936.8	23.1	67.7	--	1027.6
Procurement	1050.9	92.6	199.7	--	1343.2
MILCON	7.3	--	--	--	7.3
Total	1995.0	115.7	267.4	--	2378.1

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

User Equipment (Tri-Service)

a. Program Status --

(1) Percent Program Completed: 51.9% (14 yrs/27 yrs)

(2) Percent Program Cost Appropriated: 24.2% (\$1006.9/\$4160.0)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY74-87)	Budget Year (FY88)	Balance To Complete FYDP (FY89-92)	Beyond FYDP (FY93-00)	Total
RDT&E	765.2	139.4	402.6	3.8	1311.0
AF Aircraft	131.1	148.2	1037.1	697.0	2013.4
Navy Aircraft	3.4	5.8	63.9	234.0	307.1
Army Aircraft	23.9	12.6	170.0	18.7	225.2
Total Aircraft	(158.4)	(166.6)	(1271.0)	(949.7)	(2545.7)
AF Other	20.2	14.0	30.9	0.0	65.1
Navy Other	48.9	15.5	78.6	21.7	164.7
Army Other	14.2	11.2	48.1	0.0	73.5
Total Other	(83.3)	(40.7)	(157.6)	(21.7)	(303.3)
Total Procurement	241.7	207.3	1428.6	971.4	2849.0
GRAND TOTAL	1006.9	346.7	1831.2	975.2	4160.0

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c. Annual Summary - Satellite

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Fiscal Year	Qty	FY79 Base-Year Dollars			Then-Year Dollars			Escl Rate %	
		Flyaway		Total	Advance Proc		Total		
		Nonrec	Rec		Debit	Credit			
Appropriation: RDT&E									
1974	-	-	-	9.4	-	-	6.4	N/A	
1975	-	-	-	25.5	-	-	19.1	9.8	
1976	-	-	-	72.2	-	-	58.9	9.4	
1977	-	-	-	12.0	-	-	10.6	4.9	
1977	-	-	-	56.3	-	-	50.2	4.6	
1978	-	-	-	55.9	-	-	53.3	7.1	
1979	-	-	-	53.9	-	-	56.0	7.1	
1980	-	-	-	88.3	-	-	101.9	9.4	
1981	-	-	-	78.8	-	-	100.7	11.9	
1982	-	-	-	100.6	-	-	137.4	9.2	
1983	-	-	-	67.3	-	-	96.2	4.9	
1984	-	-	-	67.8	-	-	100.7	3.9	
1985	-	-	-	49.0	-	-	75.2	3.4	
1986	-	-	-	28.5	-	-	45.1	2.9	
1987	-	-	-	15.4	-	-	25.1	3.1	
1988	-	-	-	13.7	-	-	23.1	3.5	
1989	-	-	-	15.6	-	-	27.3	3.5	
1990	-	-	-	11.0	-	-	19.8	3.3	
1991	-	-	-	5.6	-	-	10.3	2.9	
1992	-	-	-	5.4	-	-	10.3	2.4	
Subtotal	12	-	-	832.2	-	-	1027.6	-	
Appropriation: Procurement									
1982	-	0.7	-	13.3	19.0	-	20.1	9.5	
1983	-	21.9	-	69.5	111.5	-	111.5	9.0	
1984	1	-	25.7	152.6	217.6	4.7	256.0	8.0	
1985	6	-	128.7	191.9	183.0	76.3	331.4	3.4	
1986	9	-	188.4	113.9	-	154.6	203.4	2.9	
1987	8	-	158.6	69.6	-	180.7	128.5	3.1	
1988	4	-	68.7	48.6	-	114.8	92.6	3.5	
1989	-	-	11.2	31.2	-	-	61.2	3.5	
1990	-	-	9.4	33.1	-	-	66.7*	3.3	
1991	-	-	7.3	19.0	-	-	39.3*	2.9	
1992	-	-	5.7	15.4	-	-	32.5*	2.4	
Subtotal	28	22.6	603.7	758.1	531.1	531.1	1343.2	-	
* Does not include funding for replenishment satellites.									
Appropriation: MILCON									
1984	-	-	-	4.7	-	-	7.3	3.8	
Subtotal	-	-	-	4.7	-	-	7.3	-	
Total	40	22.6	603.7	1595.0	531.1	531.1	2378.1	-	

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c. Annual Summary - User Equipment

UNCLASSIFIED

Fiscal Year	Qty	FY79 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
		Appropriation: RDT&E (Tri-Service)						
1974	-	-	-	9.3	-	-	6.3	N/A
1975	-	-	-	19.5	-	-	14.6	9.8
1976	-	-	-	40.8	-	-	33.3	9.4
1977	-	-	-	6.7	-	-	5.9	4.9
1977	-	-	-	31.3	-	-	27.9	4.6
1978	-	-	-	25.5	-	-	24.3	7.1
1979	-	-	-	37.7	-	-	39.2	7.1
1980	-	-	-	50.3	-	-	58.0	9.4
1981	-	-	-	46.4	-	-	59.3	11.9
1982	-	-	-	47.6	-	-	65.0	9.2
1983	-	-	-	45.3	-	-	64.7	4.9
1984	-	-	-	57.1	-	-	84.9	3.9
1985	-	-	-	59.4	-	-	91.1	3.4
1986	-	-	-	58.4	-	-	92.5	2.9
1987	-	-	-	60.1	-	-	98.2	3.1
1988	-	-	-	82.4	-	-	139.4	3.5
1989	-	-	-	83.5	-	-	146.1	3.5
1990	-	-	-	77.3	-	-	139.0	3.3
1991	-	-	-	51.2	-	-	94.6	2.9
1992	-	-	-	12.1	-	-	22.9	2.4
1993	-	-	-	1.9	-	-	3.6	2.4
1994	-	-	-	0.1	-	-	0.2	2.4
Subtotal	129	-	-	903.9	-	-	1311.0	--

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16. Program Funding Summary (Cont'd): User Equipment

Navstar GPS, December 31, 1986

Fiscal Year	Qty	FY79 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E (Air Force)								
1974	-	-	-	1.5	-	-	1.0	N/A
1975	-	-	-	6.4	-	-	4.8	9.8
1976	-	-	-	19.5	-	-	15.9	9.4
1977	-	-	-	3.1	-	-	2.7	4.9
1977	-	-	-	15.5	-	-	13.8	4.6
1978	-	-	-	14.4	-	-	13.7	7.1
1979	-	-	-	18.9	-	-	19.6	7.1
1980	-	-	-	29.8	-	-	34.4	9.4
1981	-	-	-	19.2	-	-	24.5	11.9
1982	-	-	-	20.5	-	-	28.0	9.2
1983	-	-	-	18.1	-	-	25.9	4.9
1984	-	-	-	13.3	-	-	19.8	3.9
1985	-	-	-	13.5	-	-	20.7	3.4
1986	-	-	-	16.3	-	-	25.8	2.9
1987	-	-	-	17.7	-	-	29.0	3.1
1988	-	-	-	27.1	-	-	45.8	3.5
1989	-	-	-	35.3	-	-	61.7	3.5
1990	-	-	-	28.8	-	-	51.8	3.3
1991	-	-	-	22.6	-	-	41.8	2.9
1992	-	-	-	5.4	-	-	10.2	2.4
1993	-	-	-	1.9	-	-	3.6	2.4
1994	-	-	-	0.1	-	-	0.2	2.4
Total	52	-	-	348.9	-	-	494.7	

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16. Program Funding Summary (Cont'd): User Equipment

Navstar GPS, December 31, 1986

Fiscal Year	Qty	FY79 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E (Navy)								
1974	-	-	-	6.0	-	-	4.1	N/A
1975	-	-	-	8.7	-	-	6.5	9.8
1976	-	-	-	13.5	-	-	11.0	9.4
1977	-	-	-	1.8	-	-	1.6	4.9
1977	-	-	-	7.4	-	-	6.6	4.6
1978	-	-	-	3.8	-	-	3.6	7.1
1979	-	-	-	9.5	-	-	9.9	7.1
1980	-	-	-	8.8	-	-	10.1	9.4
1981	-	-	-	13.4	-	-	17.1	11.9
1982	-	-	-	22.0	-	-	30.0	9.2
1983	-	-	-	19.7	-	-	28.1	4.9
1984	-	-	-	39.9	-	-	59.3	3.9
1985	-	-	-	38.3	-	-	58.8	3.4
1986	-	-	-	35.5	-	-	56.2	2.9
1987	-	-	-	39.6	-	-	64.7	3.1
1988	-	-	-	47.2	-	-	79.9	3.5
1989	-	-	-	43.2	-	-	75.6	3.5
1990	-	-	-	43.9	-	-	79.0	3.3
1991	-	-	-	23.9	-	-	44.1	2.9
1992	-	-	-	6.7	-	-	12.7	2.4
Total	77	-	-	432.8	-	-	658.9	
Appropriation: RDT&E (Army)								
1974	-	-	-	1.8	-	-	1.2	N/A
1975	-	-	-	4.4	-	-	3.3	9.8
1976	-	-	-	7.8	-	-	6.4	9.4
1977	-	-	-	1.8	-	-	1.6	4.9
1977	-	-	-	8.4	-	-	7.5	4.6
1978	-	-	-	7.3	-	-	7.0	7.1
1979	-	-	-	9.3	-	-	9.7	7.1
1980	-	-	-	11.7	-	-	13.5	9.4
1981	-	-	-	13.8	-	-	17.7	11.9
1982	-	-	-	5.1	-	-	7.0	9.2
1983	-	-	-	7.5	-	-	10.7	4.9
1984	-	-	-	3.9	-	-	5.8	3.9
1985	-	-	-	7.6	-	-	11.6	3.4
1986	-	-	-	6.6	-	-	10.5	2.9
1987	-	-	-	2.8	-	-	4.5	3.1
1988	-	-	-	8.1	-	-	13.7	3.5
1989	-	-	-	5.0	-	-	8.8	3.5
1990	-	-	-	4.6	-	-	8.2	3.3
1991	-	-	-	4.7	-	-	8.7	2.9
Total	-	-	-	122.2	-	-	157.4	

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16. Program Funding Summary (Cont'd): User Equipment

Navstar GPS, December 31, 1986

Fiscal Year	Qty	FY79 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
		Appropriation: Procurement (Tri-Service)						
1985	-	2.6	-	4.6	-	-	8.0	3.4
1986	356	10.0	25.7	59.8	-	-	103.4	2.9
1987	673	7.9	34.7	72.7	-	-	130.3	3.1
1988	956	20.4	50.4	110.5	-	-	207.3	3.5
1989	2437	30.8	58.3	125.5	-	-	241.9	3.5
1990	4453	32.7	102.7	200.9	-	-	401.7	3.3
1991	4887	14.2	113.2	195.9	-	-	401.9	2.9
1992	4932	20.9	112.8	182.0	-	-	383.1	2.4
1993	3295	18.9	152.5	185.9	-	-	403.0	2.4
1994	1735	9.3	76.7	87.0	-	-	192.9	2.4
1995	1140	2.8	54.0	57.7	-	-	131.0	2.4
1996	794	-	42.0	42.1	-	-	97.9	2.4
1997	642	-	30.2	31.0	-	-	73.9	2.4
1998	354	-	11.1	14.2	-	-	34.7	2.4
1999	496	-	11.5	13.0	-	-	31.9	2.4
2000	60	-	1.5	2.4	-	-	6.1	2.4
Subtotal	27210	170.5	877.3	1385.2	-	-	2849.0	
Total	27339	-	-	2289.1	-	-	4160.0	

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16. Program Funding Summary (Cont'd): User Equipment

Navstar GPS, December 31, 1986

Fiscal Year	Qty	FY79 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: Aircraft Procurement (Air Force)								
1985	-	2.6	-	4.6	-	-	8.0	3.4
1986	70	0.3	8.2	27.4	-	-	49.1	2.9
1987	212	6.0	16.7	40.0	-	-	74.0	3.1
1988	356	20.2	24.4	77.6	-	-	148.2	3.5
1989	549	27.7	26.1	83.0	-	-	163.4	3.5
1990	1604	27.4	52.6	145.6	-	-	294.1	3.3
1991	1857	13.0	65.1	141.8	-	-	293.4	2.9
1992	1877	20.9	68.7	135.1	-	-	286.2	2.4
1993	1876	18.9	115.3	134.2	-	-	291.3	2.4
1994	990	7.3	50.3	57.6	-	-	127.9	2.4
1995	788	2.8	41.3	44.1	-	-	100.3	2.4
1996	566	-	34.1	34.1	-	-	79.5	2.4
1997	434	-	23.3	24.1	-	-	57.4	2.4
1998	210	-	6.9	10.0	-	-	24.4	2.4
1999	101	-	2.6	4.0	-	-	10.1	2.4
2000	60	-	1.5	2.4	-	-	6.1	2.4
Total	11550	147.1	537.1	965.6	-	-	2013.4	
Appropriation: Aircraft Procurement (Navy)								
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	22	-	-	1.8	-	-	3.4	3.1
1988	177	0.1	0.4	3.0	-	-	5.8	3.5
1989	441	-	0.5	2.5	-	-	4.9	3.5
1990	841	3.5	5.2	8.2	-	-	16.5	3.3
1991	992	1.0	7.3	10.3	-	-	21.3	2.9
1992	1151	-	8.4	10.0	-	-	21.2	2.4
1993	1019	-	26.7	41.2	-	-	89.3	2.4
1994	700	2.0	24.8	27.7	-	-	61.5	2.4
1995	307	-	11.2	12.1	-	-	27.5	2.4
1996	190	-	6.7	6.8	-	-	15.8	2.4
1997	183	-	6.5	6.5	-	-	15.6	2.4
1998	121	-	3.8	3.8	-	-	9.4	2.4
1999	186	-	5.9	6.0	-	-	14.9	2.4
2000	-	-	-	-	-	-	-	-
Total	6330	6.6	107.4	139.9	-	-	307.1	

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16. Program Funding Summary (Cont'd): User Equipment

Navstar GPS, December 31, 1986

Fiscal Year	Qty	FY79 Base-Year Dollars			Then-Year Dollars			Escal Rate %
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
		Appropriation: Aircraft Procurement (Army)						
1985	-	-	-	-	-	-	-	-
1986	67	2.6	4.3	7.6	-	-	13.7	2.9
1987	133	0.0	5.1	5.5	-	-	10.2	3.1
1988	107	0.1	6.4	6.6	-	-	12.6	3.5
1989	336	0.1	10.0	10.2	-	-	20.1	3.5
1990	934	1.4	23.2	24.7	-	-	49.9	3.3
1991	1095	-	24.3	24.4	-	-	50.5	2.9
1992	1112	-	23.2	23.4	-	-	49.5	2.4
1993	345	-	8.6	8.6	-	-	18.7	2.4
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-
Total	4129	4.2	105.1	111.0	-	-	225.2	
		Appropriation: Other Procurement (Air Force)						
1985	-	-	-	-	-	-	-	-
1986	87	1.4	2.0	5.7	-	-	9.3	2.9
1987	121	-	2.5	6.5	-	-	10.9	3.1
1988	188	-	4.0	8.0	-	-	14.0	3.5
1989	424	-	6.6	11.7	-	-	21.0	3.5
1990	362	0.1	5.0	5.4	-	-	9.9	3.3
1991	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-
Total	1182	1.5	20.1	37.3	-	-	65.1	

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16. Program Funding Summary (Cont'd): User Equipment

Navstar GPS, December 31, 1986

Fiscal Year	Qty	FY79 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
		Appropriation: Other Procurement (Navy)						
1985	-	-	-	-	-	-	-	-
1986	62	3.7	8.5	13.5	-	-	22.1	2.9
1987	125	1.9	8.6	15.9	-	-	26.8	3.1
1988	88	-	8.8	8.9	-	-	15.5	3.5
1989	378	-	12.7	12.7	-	-	22.8	3.5
1990	362	0.3	11.2	11.5	-	-	21.2	3.3
1991	267	0.2	8.2	11.1	-	-	21.0	2.9
1992	135	-	6.0	7.0	-	-	13.6	2.4
1993	55	-	1.9	1.9	-	-	3.7	2.4
1994	45	-	1.6	1.7	-	-	3.5	2.4
1995	45	-	1.5	1.5	-	-	3.2	2.4
1996	38	-	1.2	1.2	-	-	2.6	2.4
1997	25	-	0.4	0.4	-	-	0.9	2.4
1998	23	-	0.4	0.4	-	-	0.9	2.4
1999	209	-	3.0	3.0	-	-	6.9	2.4
2000	-	-	-	-	-	-	-	-
Total	1857	6.1	74.0	90.7	-	-	164.7	
		Appropriation: Other Procurement (Army)						
1985	-	-	-	-	-	-	-	-
1986	70	2.0	2.7	5.6	-	-	9.2	2.9
1987	60	-	1.8	3.0	-	-	5.0	3.1
1988	40	-	6.4	6.4	-	-	11.2	3.5
1989	309	3.0	2.4	5.4	-	-	9.7	3.5
1990	350	-	5.5	5.5	-	-	10.1	3.3
1991	676	-	8.3	8.3	-	-	15.7	2.9
1992	657	-	6.5	6.5	-	-	12.6	2.4
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-
Total	2162	5.0	33.6	40.7	-	-	73.5	

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d. Obligations and Expenditures - Satellite

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated <u>1/</u>	Expended <u>1/</u>
Appropriation: RDT&E			
1974	6.4	6.4	6.4
1975	19.1	19.1	19.1
1976	58.9	58.9	58.9
1977	10.6	10.6	10.6
1977	50.2	50.2	50.2
1978	53.3	53.3	53.3
1979	56.0	56.0	56.0
1980	101.9	101.9	101.9
1981	100.7	100.7	100.7
1982	137.4	137.4	137.4
1983	96.2	96.2	96.2
1984	100.7	100.7	100.7
1985	75.2	74.7	70.7
1986	45.1	38.3	18.2
1987	25.1	6.5	0.1
To Complete	90.8	N/A	N/A
Total	1027.6	910.9	880.4
Appropriation: Procurement			
1982	20.1	20.1	20.1
1983	111.5	111.5	111.5
1984	256.0	256.0	168.3
1985	331.4	331.4	216.2
1986	203.4	192.8	27.0
1987	144.0	59.0	0.0
To Complete	292.3	N/A	N/A
Total	1358.7	970.8	543.1
Appropriation: MILCON			
1984	7.3	7.3	7.3
Total	7.3	7.3	7.3

1/ As of 24 Dec 86 from Program Office Records**UNCLASSIFIED**

d. Obligations and Expenditures - User Equipment

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated 1/	Expended 1/
Appropriation: RDT&E			
1974	6.3	6.3	6.3
1975	14.6	14.6	14.6
1976	33.3	33.3	33.3
1977	5.9	5.9	5.9
1977	27.9	27.9	27.9
1978	24.3	24.3	24.3
1979	39.2	39.2	39.2
1980	58.0	58.0	58.0
1981	59.3	59.3	59.3
1982	65.0	65.0	65.0
1983	64.7	64.7	64.7
1984	84.9	84.9	78.7
1985	91.1	90.0	71.9
1986	92.5	90.4	33.0
1987	98.2	36.1	1.2
To Complete	545.8	N/A	N/A
Total	1311.0	699.9	583.3
Appropriation: Aircraft Procurement (3010)			
1985	8.0	8.0	0.6
1986	62.8	30.2	3.3
1987	87.6	13.9	0.0
To Complete	2387.3	N/A	N/A
Total	2545.7	52.1	3.9
Appropriation: Other Procurement (3080)			
1986	40.6	34.7	3.5
1987	42.7	22.4	0.2
To Complete	220.0	N/A	N/A
Total	303.3	57.1	3.7

1/ As of 24 Dec 86 from Program Office Records.

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Navstar GPS, December 31, 1986

17. Production Rate Data: Satellite (Air Force)

a. Annual Production Rates -- Annual production rates shown differ from the annual funded quantities because the funded delivery period is 39 months for FY84, 42 months for FY85, 54 months for FY86, 42 months for FY87 and 36 months for FY88.

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1984	.3	.3	.3	.3
1985	1.7	1.7	1.7	1.7
1986	2.0	2.0	2.0	2.0
1987	2.8	2.8	2.8	2.8
1988	1.3	1.3	1.3	1.3

b. Cost Variance -- Dollars in Millions -- Maximum production rate is being reached based on contractor's current two shifts and that the contractor is tooling up as fast as feasible.

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BY\$)	1490.7	+104.3	1595.0	0.0	1595.0
(TY\$)	2182.8	+195.3	2378.1	0.0	2378.1
PAUC (BY\$)	37.268	+2.607	39.875	0.0	39.875
(TY\$)	54.570	+4.883	59.543	0.0	59.543

c. Schedule Variance -- (Note: Subject to the limitations on production rates above.)

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	9/83	--	9/83	--	9/83
Duration (in Months)	85	--	85	--	85
End Date (Mo/Yr)	9/90	--	9/90	--	9/90

d. Deliveries (Plan/Actual) --

RDT&E
Procurement

To Date
12/12
0/0

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17. Production Rate Data: User Equipment (Tri-Service)

a. Annual Production Rates -- Annual production rates shown differ from the annual funded quantities because the funded delivery period is 30 months.

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1986	142.4	142.4	142.4	212.2
1987	269.2	269.2	269.2	784.2
1988	382.4	382.4	382.4	1168.4
1989	974.8	974.8	974.8	1192.4
1990	1731.2	1781.2	1781.2	2042.0
1991	1954.8	1954.8	1954.8	1954.8
1992	1972.8	1972.8	1972.8	1972.8
1993	1318.0	1318.0	1318.0	1972.8
1994	694.0	694.0	694.0	1972.8
1995	456.0	456.0	456.0	1972.8
1996	317.6	317.6	317.6	1972.8
1997	256.8	256.8	256.8	1972.8
1998	141.6	141.6	141.6	1972.8
1999	198.4	198.4	198.4	1972.8
2000	24.0	24.0	24.0	1972.8

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BY\$)	2554.9	-265.8	2289.1	0.0	2289.1
(TY\$)	4875.8	-715.8	4160.0	0.0	4160.0
PAUC (BY\$)	0.093	-0.009	0.084	0.0	0.084
(TY\$)	0.178	-0.026	0.152	0.0	0.152

c. Schedule Variance -- (Note: Subject to the limitations on production rates above.)

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	8/86	--	8/86	--	8/86
Duration (in Months)	200	--	200	--	200
End Date (Mo/Yr)	3/03	--	3/03	--	3/03

d. Deliveries (Plan/Actual) --

To Date

RDT&E 0/0
Procurement 0/0

18. Operating and Support Costs -- N/A

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: AV-8B

AS OF DATE: DECEMBER 31, 1986

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1. Designation and Nomenclature: AV-8B/Attack, V/STOL, Close Air Support
(Harrier II)
2. DoD Component: Department of the Navy
3. Responsible Office and Telephone Number:
 Harrier Program Office PM: COL L. C. Watt
 Naval Air Systems Command Assigned: Mar 20, 1986
 Washington, D.C. 20361 AV 222-8324; COMM (202) 692-5750
4. Program Elements:
 RDT&E: 64214N
 PROCUREMENT: 26110M; 26497M APPN 1506 ICN 0124
 MILCON: 26496M, 26497M

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AV-8B, December 31, 1986

5. Related Programs: F/A-18, F-15, GR5 (UK collaborative program), and AV-8B(~~S~~) Spanish program.
6. Mission and Description: The AV-8B (Harrier II) is a second generation vertical/short takeoff and landing (V/STOL) light attack jet aircraft to be utilized by the Marine Corps. The primary mission of the AV-8B is to provide responsive close air support for the ground forces. This single piloted advanced V/STOL aircraft can operate from short fields, forward sites, roads and surface ships providing minimum response time to target. The aircraft incorporates basic aerodynamic improvements such as a composite, super critical high lift wing leading edge root extension, engine inlet modification, lift improvement devices, composite forward fuselage as well as a modern avionics package. The AV-8B is a transonic aircraft designed to carry up to 9200 lbs. of conventional ordnance including 4 AIM-9 Sidewinder missiles and a 25mm high rate of fire gatling gun. The Marine Corps plans to replace all of its AV-8As and A-4M squadrons with the newer AV-8B, thus transitioning to an all Harrier II light attack force by the early 1990s. A two seat trainer is planned for 1987. A night attack version, incorporating a forward looking infrared sensor (FLIR), is in development for an early 1989 fleet introduction.

7. Program Highlights:

a. Significant Historical Developments: DSARC I (March 1976) authorized two prototype aircraft, designated YAV-8Bs, to be built in order to validate aspects of the AV-8B. As a result of this flight demonstration phase (FDP) trials involving the validation of maximum weight vertical takeoff's (VTO's) and short takeoff's (STO's) as well as sustained "G" and cruise performance, a Milestone II decision supported entering full scale development (FSD). FSD utilized the FDP validation phase results wherever possible. Laboratory and ground test results included over 13,000 wind tunnel hours, complete (static, drop, and fatigue) structural qualification, manned flight simulation, and functional avionics integration. FSD flight tests were conducted using one YAV-8B, 4 FSD AV-8B's and 2 production aircraft as required. Eleven Navy developmental test and evaluation periods were completed. DNSARC IIIA, July 1983, released funds for the limited production aircraft and approved long lead funding for 1984. Final technical evaluation (TECHEVAL) completed in October 1984. Operation evaluation (OPEVAL) Phase I (air-to-ground) completed 6 February 1985. Phase I quick look report was published on 11 March 1985 indicating the AV-8B OPEVAL "was the best OPEVAL conducted in nearly three years". OPEVAL Phase II (air-to-air) completed 30 March 1985. Milestone IIIB occurred in May 1985. Authorization for full production (AFP) was granted by the Secretary of the Navy on 9 September 1985. After the Milestone IIIB decision, DT-III final development phase began. DT for Maverick (AGM-65E) was completed September 1985 and confirmed readiness for FOT&E, DT for the F402-RR-406 engine was completed in December 1985 and provided an engine operating envelope clearance. DT for shore based VLA performance and aircraft compatibility was completed in December 1985 and warranted proceeding to shipboard evaluations. The FSD program for the TAV-8B and the AV-8B development program continued with all milestones met or exceeded.

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7. Program Highlights: (continued)

b. Significant Developments Since Last Report: DT-III has continued throughout the year. Six significant events have been completed successfully including DT&E for the ALR-67 (TEMP 521) and ALQ-164 (TEMP 592); DT&E for "Omnibus 3" which corrected OPEVAL discrepancies; shipboard AWLS performance and aircraft compatibility contributed to publication of an updated Shipboard Operating Bulletin (SOB); shipboard VLA performance and aircraft compatibility contributed to the updated SOB; DECS testing demonstrated performance compliance with the production specification and confirmed readiness for POT&E. Additionally, the TAV-8B began flight testing in October 1986 with no significant problems to date in flight quality and performance. Night attack AV-8B development is on track with first flight scheduled for June 1987. Total production deliveries through December 1986 number 67. The 30% CPUC increase from 16.9M to 22.2M from FY 87 to FY 88 is due to the following: Completion of the GR-5 aircraft causing the AV-8B to now carry all overhead burden on the production line at McDonnell Douglas; reduction in quantity from 42 aircraft in FY 87 to 32 aircraft in FY 88; night attack capability will be introduced in all FY 88 aircraft.

c. Changes Since "As Of" Date - - None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated 20 June 1979) threshold breaches.

9. Schedule:

a. (U) Milestones

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
Program Initiated (DSARC I)	Mar 76	Mar 76
First Flight YAV-8B Prototype	Dec 78	Nov 78
DSARC II (FSD)	Jun 79	Jul 79
FSD Contract Award	Jun 79	Aug 79
Critical Design Review	Jul 80	Jul 80
First Flight AV-8B (FSD)	Oct 81	Nov 81
Award of Production Contract	Apr 82	Apr 82
TECHEVAL Avionics	Sep 83	Oct 84
TECHEVAL Performance	Sep 83	Oct 84
OPEVAL	Dec 83	Mar 85
Milestone IIIB	Apr 85	May 85
IOC	Jun 85	Aug 85

b. Previous Change Explanations - Technical performance slipped 5 months due to lack of sufficient instrumented test program.

c. Current Changes Explanations: None

d. References: DCP 160 dtd 20 June 1979 and approved September 1979.
Approved Program: FY 1988 President's Budget.

10. ~~(S)~~ Technical/Operational Characteristics:

a. (U) Technical	Dev. Estimate/ Appvd. Program	Demonstrated Performance	Current Estimate
(U) Weight (lbs) Empty	12,750	12,835	13,126
(U) Speed Maximum (Mach No.)	0.91	0.905	.91
(U) Dimensions (ft)			
Length	46.33	46.33	46.33
Height	11.65	11.65	11.65
Span	30.33	30.33	30.33
(U) Spotting Factor (A-7=1.0)	.95	TBD	.95
b. (S) Operational			
(U) Maximum Vertical Gross Take-Off (VTO) Weight (lbs)	19,185	18,935	19,185
(U) Maximum Short Gross Take-off (STO) (Weight) (lbs) (1,000 ft. roll)	28,350	27,950	28,350
(U) Close Air Support Radius of Action (NM)			
VTO	50	TBD	50
STO	209	155	155
(U) Mean Flight Hours Between Failures (MFHBPF), (hrs.)	2.40	2.04	2.04
(U) Maintainability (DMMR/FH), (hrs.)	16.9	16.5	16.5
(U) Standard Depot Level Maintenance Cycle (Airframe Hours)			
1st Period	1,000	TBD	1,000
2nd Period	800	TBD	800
3rd Period	600	TBD	600
(U) VTO Close Air Support Payload (lbs)	2,850	TBD	2,850
(U) STO Close Air Support Payload (lbs) (600' 20 kts WOD 89°F Tropical Day)	7,980	TBD	7,980

(b)(1)

10. ~~(S)~~ Technical/Operational Characteristics: (continued)

c. (U) Previous Change Explanations - Current estimate reflects known weight growth to accommodate LERX, 25mm gun provisioning, and deficiencies corrections. Speed maximum (mach number), maximum vertical take off (VTO) weight (pounds) and maximum short gross take off (STO) demonstrated performance reflects RR-404 engine. Current estimate based upon production RR-406 engine. Close air support radius of action (NM) STO, current estimate and demonstrated performance changed to reflect specific mission profile from MS IIIA DNSARC and 5 Aug 1984 DCP. Mean flight hours between failures (MFHBF) (hrs), Maintainability (DMMH/FH), and gun accuracy (Mils) current estimate changed to reflect demonstrated performance.

d. Current Change Explanations - None

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Development		Current
a. Cost - -	<u>Estimate</u>	<u>Changes</u>	<u>Estimate</u>
Development (RDT&E)	\$ 872.7	\$+199.5	\$ 1072.2
Procurement	4862.4	-644.2	4218.2
Airframe	(2650.5)	(-205.2)	(2445.3)
Engine	(899.0)	(-439.3)	(459.7)
Avionics	(258.9)	(+9.7)	(268.6)
Other GFE	(145.5)	(-97.8)	(47.7)
Total Flyaway	(3953.9)	(-732.6)	(3221.3)
Other Wpn Sys Cost	(439.3)	(+244.2)	(683.5)
Initial Spares	(469.2)	(-155.8)	(313.4)
Construction (MILCON)	5.5	+5.0	10.5
Total FY79 Base-Year \$	\$ 5740.6	\$-439.7	\$ 5300.9
Escalation	3384.9	+800.3	4185.2
Development (RDT&E)	(185.3)	(+106.4)	(291.7)
Procurement	(3196.8)	(+690.0)	(3886.8)
Construction (MILCON)	(2.8)	(+3.9)	(6.7)
Total Then-Year \$	\$9125.5	\$+360.6	\$9486.1
b. Quantities - -			
Development (RDT&E)	6	-	6
Procurement	336	-8	328
Total	342	-8	334

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11. Program Acquisition Cost (continued)

c. Unit Cost - -

Procurement:

FY79 Base-Year \$	14.5	-1.6	12.9
Then-Year \$	24.0	+0.7	24.7

Program:

FY79 Base-Year \$	16.8	-0.9	15.9
Then-Year \$	26.7	+1.7	28.4

d. Approved Design to Cost Goal - - Not applicable.

e. Foreign Military Sales -- At present there is a Spanish FMS case for 12 aircraft. The planned recoupment was \$10,408,476. A waiver of \$5,204,232 was granted by DSAA. The revised recoupment is \$5,204,244.

f. Nuclear Cost - - None.

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	Current Estimate (Dec 86 SAR)	Baseline Estimate (Dec 85 SAR)	Baseline Estimate (Dec 86 SAR)
a. Program Acquisition - -			
(1) Cost	9486.1	9104.8	9486.1
(2) Quantity	334	334	334
(3) Unit Cost	28.4	27.3	28.4
<u>FY1987 Appropriation Act</u>			
b. Current Procurement - -	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	705.9	705.9	699.6
Less CY Adv Proc	-75.4	-75.4	-64.0
Plus PY Adv Proc	+77.4	+77.4	+75.4
Net Total	707.9	707.9	711.0
(2) Quantity	42	42	32
(3) Unit Cost	16.9	16.9	22.2

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13. Cost Variance Analysis:

a. Summary - - (Current (Then Year) Dollars in Millions)

	RDT&E	Proc	MILCON	Total
Development Estimate	1058.0	8059.2	8.3	9125.5
Previous Changes:				
Economic	+6.4	-853.7	-	-847.3
Quantity	-	-171.0	-	-171.0
Schedule	+17.7	+1110.8	-	+1128.5
Engineering	+181.1	+508.6	-	+689.7
Estimating	+95.3	-1109.6	-	-1014.3
Other	-	-	-	-
Support	-	+193.7	-	+193.7
Subtotal	+300.5	-321.2	-	-20.7
Current Changes:				
Economic	-2.7	-102.2	-	-104.9
Quantity	-	-	-	-
Schedule	-	+377.0	-	+377.0
Engineering	-	+43.4	-	+43.4
Estimating	+8.1	-208.2	+8.9	-191.2
Other	-	-	-	-
Support	-	+257.0	-	+257.0
Subtotal	+5.4	+367.0	+8.9	+381.3
Total Changes	+305.9	+45.8	+8.9	+360.6
Current Estimate	1363.9	8105.0	17.2	9486.1

(FY 1979 Constant (Base Year) Dollars in Millions)

	RDT&E	Proc	MILCON	Total
Development Estimate	872.7	4862.4	5.5	5740.6
Previous Changes:				
Quantity	-	-77.6	-	-77.6
Schedule	+10.8	+617.7	-	+628.5
Engineering	+115.7	+230.2	-	+345.9
Estimating	+68.0	-1669.7	-	-1601.7
Other	-	-	-	-
Support	-	+48.2	-	+48.2
Subtotal	+194.5	-851.2	-	-656.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+166.3	-	+166.3
Engineering	-	+19.1	-	+19.1
Estimating	+5.0	-91.8	+5.0	-81.8
Other	-	-	-	-
Support	-	+113.4	-	+113.4
Subtotal	+5.0	+207.0	+5.0	+217.0
Total Changes	+199.5	-644.2	+5.0	-439.7
Current Estimate	1072.2	4218.2	10.5	5300.9

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13. Cost Variance Analysis: (continued)

b. Previous Change Explanations:

RDT&E

Economic: Revised escalation rates.
 Schedule: Extend flight test program 2 years for follow-on flight test program.
 Engineering: Addition of design/fabrication/integration/test of 25mm gun pak, development of the TAV-8B. Increase for night attack capability with United Kingdom FLIR system.
 Estimating: Decreased currency conversion rate for engine procurement, decrease offset for new economic indices, and refinement of estimate, base year adjustment and prior year reprogrammings, prior year increase due to foreign exchange adjustment, and increase for TAV-8B. Anticipated savings in TAV-8B and night attack and correction of error in computation of inflation indices.

Procurement

Economic: Correction of application of procurement outlay factors and revised escalation rates.
 Quantity: Reduction in aircraft from 336 to 328.
 Schedule: Revised procurement schedule for 336 aircraft accelerated procurement schedule.
 From: FY86 FY87 FY88 FY89 FY90 FY91
 & Prior
 138 A/C 47 48 60 35
 To: 138 42 42 42 42 22
 Engineering: Addition of ASPJ. Increase due to night attack capability, ASPJ and ECPs which provide recurring systems for aircraft procured in FY-88 and subsequent years, and increase due to schedule change.
 Estimating: Decreased currency conversion rate for engine procurement, offset for new economic decrease, correction of procurement outlay factor, and refinement of estimate, decrease dollar pound exchange rate, quantity adjustment, base year adjustment, and FY-82/FY-83 reprogramming. Prior year contracts negotiated lower than anticipated (-32.2), exchange rate change (+536.6) and repricing based on negotiation of prior year airframe and engine contracts. Decrease due to overhead and labor rate decrease at MCAIR.

13. Cost Variance Analysis: (continued)

b. Previous Change Explanations: (continued)

Support: Increased spares and PSE due to redefinition and refinement of requirements, reduce spares required due to reduced aircraft buy. Outyear increases in GSE, pubs, ILS/ME and spares to accommodate night attack, ASPJ and other configuration ECP's. Decrease in pubs, ground support equipment, training due to refined pricing based on contract negotiated lower than anticipated. Decrease in spares due to refined prices because of airframe and engine contracts negotiated lower than anticipated. Support adjustment due to error in prior SARS in estimated variance category.

MILCON

Economic: Revised escalation rates.
Estimating: Base year adjustments. Increase due to hangar project at MCAS Cherry Point and hangar requirements at MCAS Yuma not previously reported for FY-85 and FY-86. Deletion of requirements for hangars at MCAS Yuma.

c. Current Change Explanations

	(Dollars in Millions)	
	<u>Base Year</u>	<u>Then-Year</u>
(1) <u>RD&E</u>		
Revised Jan 87 economic escalation rates. (Economic)	-	-2.7
Increase due to additional effort in FY-92 partially offset by reduced requirements in prior fiscal years. (Estimating)	+5.0	+8.1
(2) <u>Procurement</u>		
Revised Jan 87 economic escalation rates. (Economic)	N/A	-102.2
Schedule moved to the right adding 4 additional years to the program (FY 92 - 95). (Schedule)	+166.3	+377.0
Increase due to ECPs in Harrier program which provide recurring systems for aircraft procured in FY 88/89 and subsequent years. (Engineering)	+19.1	+43.4

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13. Cost Variance Analysis: (continued)
 c. Current Change Explanations (continued)

(2) Procurement (continued)

Decrease in currency conversion rate for engines and part of the airframe; prior years contract negotiated lower than anticipated; and refinement of estimate due to decrease in overhead and labor rates at MCAIR. (Estimating)	-91.8	-208.2
--	-------	--------

Increase sustaining ILS management and production support requirements for new out years in the program. Increased pubs update, spares and new/modified support equipment for all operational and support sites required by redefinition and refinement of production aircraft. This includes updating of test cells, PGSE, APE support (including required test program sets also) "I" and "D" level. Increase in ASPJ support requirements due to the adjustment of prior estimating errors. (Support)	+113.4	+257.0
--	--------	--------

(3) MILCON -

Forward Base Training Facility at MCAS Cherry Pt. NC. (Estimating)	+5.0	+8.9
--	------	------

d. References: Development estimate based on DCP #160 dtd 20 June 1979. Current estimate based on FY 1988/89 Presidential Budget.

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

a. Initial SAR Estimate to Current Estimate -

PAUC (Dev Est)	Changes								PAUC (Current) Est)
	Ecn	Qty	Sch	Eng	Est	Spt	Other	Total	
26.7	-2.8	+.1	+4.5	+2.2	-3.6	+1.3	-	+1.7	28.4

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15. Contract Information: (Then Year Dollars in Millions)

a. Procurement

AirframeInitial Contract Price
Target Ceiling Qty

McDonnell Douglas Corp., \$405.0 \$ N/A 27
 St. Louis, Missouri,
 N0001982-C-0359, FFP,
 Award: September 7, 1983
 Definitized: May 24, 1985

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 496.5	\$ N/A	27	\$ 496.5	\$ 496.5

Variance analysis does not apply to FFP contracts.

Engine Initial Contract Price
Target Ceiling Qty

Rolls Royce, Ltd. \$ 69.9 \$ N/A 27
 Bristol, England
 N0001982-C-0436, FFP,
 Award: May 19, 1983
 Definitized: March 27, 1985

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 81.1	\$ N/A	27	\$ 81.1	\$ 81.1

Variance analysis does not apply FFP contracts.

Airframe Initial Contract Price
Target Ceiling Qty

McDonnell Douglas Corp., \$ 363.0 \$ N/A 32
 St. Louis, Mo.
 N0001983-C-0267, FFP,
 Award: February 24, 1984
 Definitized: October 31, 1986

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 436.7	\$ N/A	32	\$ 436.7	\$ 436.7

Variance analysis does not apply to FFP contracts.

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15. Contract Information: (Then Year Dollars in Millions)

<u>Engine</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Rolls Royce, Ltd., Bristol, England N0001983-C-0255, FFP, Award: February 24, 1984 Definitized: July 21, 1986	\$ 99.3	\$ N/A	32

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 99.3	\$ N/A	32	\$ 99.3	\$ 99.3

Variance analysis does not apply to FFP contracts.

<u>Airframe</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
McDonnell Douglas Corp., St. Louis, Mo. N0001985-C-0109, FFP, Award: March 29, 1985 Definitized: Not Definitized	\$ 63.0	\$ N/A	46

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 63.0	\$ N/A	46	\$ 534.0	\$ 534.0

Variance analysis does not apply to FFP contracts.

<u>Engine</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Rolls Royce, Ltd., Bristol, England N0001984-C-0340, FFP, Award: August 19, 1985 Definitized: Not Definitized	\$ 149.0	\$ N/A	46

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 149.0	\$ N/A	46	\$ 148.0	\$148.0

Variance analysis does not apply to FFP contracts.

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16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 60.0% (12 yrs./20 yrs.)
(Years Funds Appropriated/Total Program Years)
- (2) Percent Program Cost Appropriated: 61.3% (\$5819.7/\$9486.1)
(Funds Appropriated to Date in Millions/Total Program Funding in Millions)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY76-87)	Budget Year (FY88)	FYDP (FY89-92)	Balance To Complete Beyond FYDP (FY93-95)	Total
RDT&E	1305.5	13.1	45.3	-	1363.9
Procurement	4505.9	699.6	1971.2	928.3	8105.0
MILCON	8.3	-	8.9	-	17.2
Total	5819.7	712.7	2025.4	928.3	9486.1

c. Annual Summary

Fiscal Year	Qty	FY79 Base-Year Dollars			Then-Year Dollars			Encl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1976			5.2		4.3	6.6
1977			2.2		1.9	2.9
1977			37.6		33.6	2.6
1978			61.2		58.9	6.8
1979	2		158.9		168.7	8.4
1980			155.4		182.4	10.5
1981			186.8		239.1	10.6
1982	4		167.8		226.1	7.6
1983			83.5		117.5	4.9
1984			69.7		101.9	3.8
1985			40.7		61.3	3.4
1986			42.1		65.3	2.9
1987			27.8		44.5	3.1
1988			7.9		13.1	3.5
1989			6.7		11.4	3.5
1990			6.5		11.4	3.3
1991			6.1		11.1	2.9
1992			6.1		11.4	2.4
Subtotal	6		1072.2		1363.9	

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16. Program Funding Summary: (continued)
 c. Annual Summary (continued)

Fiscal Year	Qty	FY79 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement

1981				59.1	86.6	-	86.6	11.6
1982	12	14.1	322.5	408.4	35.5	86.6	650.3	14.3
1983	21	3.7	284.3	482.1	59.9	35.5	817.2	9.0
1984	27	.8	268.2	448.5	95.8	59.9	793.9	8.0
1985	32	5.6	264.2	359.3	78.3	95.8	653.8	3.4
1986	46	.6	329.6	424.9	77.4	78.3	798.2	2.9
1987	42	8.0	298.7	363.5	75.4	77.4	705.9	3.1
1988	32	5.6	270.9	348.5	64.0	75.4	699.6	3.5
1989	32	1.4	266.8	356.1	33.5	64.0	736.7	3.5
1990	15		147.0	214.4	35.3	33.5	455.6	3.3
1991	15		142.5	199.4	36.1	35.3	433.7	2.9
1992	15		132.6	155.0	36.9	36.1	345.2	2.4
1993	15		127.1	153.5	38.6	36.9	350.3	2.4
1994	15		126.1	147.3	28.1	38.6	344.0	2.4
1995	9		84.2	98.2		28.1	234.0	2.4
Subtotal	328	39.8	3064.7	4218.2	781.4	781.4	8105.0	

Appropriation: MILCON

1983				3.2			4.6	4.9
1986				2.3			3.7	2.9
1989				5.0			8.9	3.5
Subtotal				10.5			17.2	
Total	334	39.8	3064.7	5300.9	781.4	781.4	9486.1	

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16. Program Funding Summary: (continued)

d. Obligations and Expenditures

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1976	4.3	4.3	4.3
1977	1.9	1.9	1.9
1977	33.6	33.6	33.6
1978	58.9	58.9	58.9
1979	168.7	167.0	167.0
1980	182.4	182.4	182.4
1981	239.1	239.1	235.9
1982	226.1	226.1	224.9
1983	117.5	117.5	108.1
1984	101.9	101.9	85.1
1985	61.3	61.3	57.6
1986	65.3	65.3	60.3
1987	44.5	14.2	11.0
To Complete	58.4	N/A	N/A
Subtotal	1363.9	1273.5	1231.0

d. Obligations and Expenditures

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: Procurement			
1981	86.6	86.6	86.2
1982	650.3	650.3	627.0
1983	817.2	807.4	716.7
1984	793.9	787.1	648.9
1985	653.8	613.2	308.6
1986	798.2	683.3	56.7
1987	705.9	76.3	-
To Complete	3599.1	N/A	N/A
Total	8105.0	3704.2	2444.1

Appropriation: MILCON			
1983	4.6	3.7	3.7
1986	3.7	3.6	-
To Complete	8.9	N/A	N/A
Total	17.2	7.3	3.7

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17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year	Production Rates (Quantity/Year)			Maximum Economic
	Development Estimate	Production Estimate	Current Estimate	
1981	-	-	-	-
1982	12	12	12	12
1983	24	21	21	21
1984	54	27	27	27
1985	54	32	32	32
1986	54	46	46	46
1987	54	42	42	42
1988	54	42	32	72
1989	30	42	32	72
1990		42	15	72
1991		22	15	72
1992			15	72
1993			15	72
1994			15	72
1995			9	72

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog. Acq. Cost (BY\$)	5300.9	-0-	5300.9	-265.9	5035.0
(TY\$)	9486.1	-0-	9486.1	-736.2	8749.9
PAUC (BY\$)	15.9	-0-	15.9	.8	15.1
(TY\$)	28.4	-0-	28.4	-2.2	26.2

c. Schedule Variance-- Dollars in Millions

	Production Estimate	Variance (CE vs. PdE)	Current Estimate	Variance (CE vs. Max)	Maximum Economic
Start Date (Mo/Yr)	4/87	-0-	4/87	N/A	4/87
Duration (in Months)	108	-0-	108	+47	61
End Date (Mo/Yr)	9/97	-0-	9/97	N/A	4/92

d. Deliveries (Plan/Actual) --

RDT&E
Procurement

To Date
6/ 6
67/66

18. Operating and Support Costs: Not Applicable.

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As of: 31 December 1986

SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A) 823)

PROGRAM: B-1B

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (DASD-PA)
DEPARTMENT OF DEFENSE

1. Designation/Nomenclature (Popular Name): B-1B
2. DoD Component: US Air Force
3. Responsible Office and Telephone Number:
B-1B Program Office PM: Maj Gen Elbert E. Harbour
Aeronautical Systems Division Assigned: 5 January 1987
Wright-Patterson AFB, OH AV 785-3281 COMM: (513) 255-3281
4. Program Elements:
RDT&E: PE 64226F APPN: 3600 (Baseline Program Content Only)
Procurement: PE 11126F APPN: 3010 ICN# B001B0
MILCON: None
5. Related Programs:
B-1B Simulator, Common Strategic Rotary Launcher (CSRL), Air Launched Cruise Missile (ALCM), Advanced Cruise Missile (ACM), B-1B Forward Looking Infrared Radar (FLIR) Development, B-1B Monopulse Development, MIL-STD-1760 Development, and B-1B Electronic Countermeasures (ECM) Updates

6. Mission and Description:

The major purpose of the B-1B is to modernize the aircraft leg of the Strategic Triad. The B-1B has the capability to perform the missions of conventional bomber, cruise missile launch platform and a nuclear weapon delivery system in both the strategic and tactical roles. The long range and

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Declassify On: 31 Oct 2001~~

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large payload of the B-1B make it an ideal aircraft to support the United States deterrent posture across the full spectrum of conflict. The B-1B uses the B-1A aerodynamic shape and structure, as well as many of the B-1A systems. The B-1B has a heavyweight landing gear and will be powered by four F101-GE-102 afterburning turbofan engines which are a direct derivative of the F101-GE-100 engines used on the original B-1A. The avionics systems are updated to accommodate revised B-1B missions, counter new threats, and employ currently available equipment and technology. The communications and traffic control group remains essentially the same as B-1A A/C, except current inventory replacements and AFSATCOM are used. The offensive systems group maximizes the use of B-52 Offensive Avionics System equipment as well as adding a new forward Looking Radar/Terrain Following Sensor and a new inertial system. The Defensive Systems Group improves on the capabilities of the ALQ-161 as well as adding smart jamming enhancements and a Tail Warning Function. The B-1B weapon system will be able to deliver conventional as well as nuclear ordnance. The 100 B-1B aircraft program will modernize the bomber leg of the Strategic Triad.

7. Program Highlights:

a. Significant Historical Developments —

The 1981 Defense Authorization Act directed the Department of Defense to vigorously pursue full scale engineering development of a strategic multirole bomber. As a result of the Joint OSD/Air Force Bomber Alternatives Study, the Administration directed in October 1981 that the B-1B be produced. The baseline configuration for the B-1B aircraft was established 4 November 1981 by the DepSecDef. Production and FSD contracts were awarded to Rockwell, General Electric, AIL, and Boeing in early 1982. B-1A A/C #2 started in the B-1B flight test program in March 1983 but was lost in a catastrophic crash in August 1984. Flight test continued with B-1A A/C #4. The rollout of the first B-1B occurred on 4 September 1984, five months ahead of schedule. First flight occurred 18 October 1984. The aircraft is currently performing flight test activities at Edwards AFB, CA.

A successful Functional Configuration Audit/Physical Configuration Audit (FCA/PCA) for the B-1B Crew Egress Maintenance Trainer was held in January 1985 and a configuration baseline was established. B-1A mission 4-99 flown on 28 March 1985 was configured with operational offensive and defensive avionics systems. The first B-1B production aircraft going to the Strategic Air Command (SAC), B-1B A/C #2, arrived at SAC HQ on 27 June 1985.

A major B-1B program milestone was achieved 25 September 1986 during flight tests at Edwards AFB when automatic terrain following runs were completed at the minimum set clearance of 200 feet. The Initial Operational Capability (IOC) milestone was met in September 1986.

b. Significant Development Since Last Report —

The second Primary/Secondary Flight Control Maintenance Trainer was formally accepted at Ellsworth AFB on 20 October 1986. Parts shortages are still impacting the 96th Bomb Wing's flight activity. Central Air Data Computer (CADC) production is making an excellent recovery and CADCs are no longer an imminent threat to the aircraft production line. We conducted our first Test Program Set (TPS) sell off at OC-ALC on 6 November 1986. B-1A Aircraft #4 completed its last flight when it landed at the Air Force Museum on 16 December 1986. On the same date, AFOTEC successfully separated two B-83 Joint Test Assemblies (JTAs) from aircraft #15 at the Tonapah test range. B-1B #1 successfully conducted the initial evaluation of Stall Inhibit System on 18 December 1986. A pre-requisite ground test for a SRAM live launch was accomplished on

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22 December 1986. B-1B rate production has been achieved! As of 31 December 1986, 22 B-1B aircraft were on station at Dyess AFB.

The B-1B is expected to meet all current mission requirements.

- c. Change Since "As of" Date-- A live launch from the mid bay of B-1B #1 was successfully accomplished on 16 January 1987.

8. Decision Coordinating Paper (DCP) Threshold Breaches:

There are currently no DCP (dated 30 Sep 83), or SDDM (dated 4 Nov 81) threshold breaches.

9. Schedule

a. Milestones --

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
R&D Contract Award	Jan 82/Jan 82	Jan 82
Production Contract Award	Jan 82/Jan 82	Jan 82
Engineering Review	Apr 82/Apr 82	Apr 82
OSD Program Review	Sep 82/Feb 83	Feb 83
Configuration Review	Jan 83/Jan 83	Jan 83
DT&E/IOT&E Start	Apr 83/Apr 83	Mar 83
First Flight B-1/Aircraft #2	Apr 83/Apr 83	Mar 83
First B-1B Flight	Mar 85/Mar 85	Oct 84
FOT&E Phase I Start	Oct 85/Oct 85	Jul 85
DT&E/IOT&E Complete	Jun 86/Jun 86	May 89 (Ch)
IOC (15th Aircraft Delivery)	Sep 86/Sep 86	Sep 86
FOT&E Phase I Complete	Oct 87/Oct 87	Mar 89
Production Complete (100 A/C)	Jun 88/Jun 88	Jun 88

b. Previous Change Explanations --

OSD Program Review changed to February 1983 by OSD direction. DT&E Start and First Flight of B-1A Aircraft #2 occurred in March 1983, one month ahead of schedule. Rollout of B-1B #1 was early, resulting in an early first flight. Delivery of B-1B Aircraft #2 to Dyess AFB was ahead of schedule and allowed early start of FOT&E Phase I. Extension of FOT&E Phase I reflect updated plans by AFOTEC. DT&E/IOT&E effort extended to fully demonstrate capabilities.

c. Current Change Explanation --

DT&E/IOT&E completion date extended due to flight test extension through Feb 89. Final reports due 90 days after completion of flight test.

d. References --

Development Estimate: DCP dated 30 September 1983.

Approved Program: PMD R-Q1010(14); 64226F/11126F, HQ USAF/RD msg 141145Z April 1986; DepSecDef B-1 Program Memorandum dated 4 November 1981 as amended by PMD R-Q1010(8), 64226F/11126F, 8 February 1984.

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10. (U) Technical/Operational Characteristics:

	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. (U) Technical			
(U) Speed (MACH #):			
(U) Best cruise at altitude	0.72/0.72	0.72	0.72

(b)(1)

(U) Weapon Carriage

(U) AGM-69A (Internal)	24/24	16	24
(U) AGM-86B (Internal/External)	8/14/8/14		8/12
(U) B61/B83 (Internal)	24/24	24	24
(U) MK-82 AIR/36DST(AIR) (Internal)	84/84		84

(U) Takeoff Distance (feet)

(U) 470,000 pound A/C	9,300/9,300		9,300
(U) 440,000 pound A/C	6,000/7,600		7,600

(b)(1)

(U) Weight empty (pounds)	186,000/186,000	181,400	186,000
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b. (U) Operational

(b)(1)

(U) Reliability	0.92/0.92		0.92
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(U) Readiness/Supportability:

(b)(1)

(U) Maintainability (B-1B Sys)	37.6/37.6	46.9	37.6
(U) Mean Time Between Unsched Maintenance Actions (Flight Hours)	1.0/1.0	0.32	1.0

c. (U) Previous Change Explanations -- Following USDR&E direction, the Air Force decided in Feb 86 to limit B-1B AGM-86B weapon carriages to ensure compliance with existing arms control policies.

d. (U) Current Change Explanations -- None

e. (U) References --

Development Estimate: DCP dated 30 Sep 83

Approved Program: -PMD R-Q1010(5); 64226F/11126F dated 28 May 82;
-DepSecDef B-1 Program Memorandum dated 4 Nov 81
as amended by PMD R-Q1010(8), 64226F/11126F,
8 Feb 84

Classified By: B-1B Security Classification Guide, 31 Oct 84
Declassify On: 31 December 2001

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11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. Cost --			
Development (RDT&E)	2538.9	406.4	2945.3
Procurement	17961.1	-727.5	17233.6
Airframe	(10584.9)	(-457.7)	(10127.2)
Engine	(1859.3)	(-595.4)	(1263.9)
Avionics	(2684.7)	(550.3)	(3235.0)
Total Flyaway	(15128.9)	(-502.8)	(14626.1)
Peculiar Support	(1768.0)	(-213.0)	(1555.0)
Initial Spares	(1064.2)	(-11.7)	(1052.5)
Construction (MILCON)*	0	0	0
TOTAL FY 81 Base-Year\$	20500.0	-321.1	20178.9
Escalation	9037.6	-1923.1	7114.5
Development (RDT&E)	(583.2)	(57.9)	(641.1)
Procurement	(8454.4)	(-1981.0)	(6473.4)
Construction (MILCON)*	0	0	0
TOTAL Then-Year\$	29537.6	-2244.2	27293.4
b. Quantities --			
Development (RDT&E)	0		0
Procurement	100		100
TOTAL	100		100
c. Unit Cost --			
Procurement:			
FY81 Base-Year \$	179.611	-7.275	172.336
Then-Year \$	264.155	-27.085	237.070
Program:			
FY81 Base-Year \$	205.000	-3.211	201.789
Then-Year \$	295.376	-22.442	272.934
d. Approved Design to Cost Goal -- None			
e. Foreign Military Sales. -- None			
f. Nuclear Costs -- None			

* The current estimate in Then-Year dollars of construction costs not included in the SAR is \$365.8M.

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12. Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est Dec 86 SAR	UCR Baseline Dec 85 SAR	UCR Baseline Dec 86 SAR
a. Program Acquisition --			
1) Cost	27293.4	27188.4	27293.4
2) Quantity	100	100	100
3) Unit Cost	272.934	271.884	272.934
b. Current Procurement --	(FY87)	(FY87)	(FY88)
1) Cost	0	0	0
Less CY Adv Proc	0	0	0
Plus PY Adv Proc	0	0	0
NET TOTAL	0	0	0
2) Quantity	0	0	0
3) Unit Cost	0	0	0

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	Total
Development Estimate	+3122.1	+26415.5	+29537.6
Previous Changes:			
Economic	-101.3	-1219.1	-1320.4
Quantity			
Schedule			
Engineering			
Estimating	+23.6	-1356.3	-1332.7
Other			
Support	0	-58.6	-58.6
subTOTAL	-77.7	-2634.0	-2711.7
Current Changes:			
Economic	-5.9	-324.0	-329.9
Quantity			
Schedule			
Engineering			
Estimating	+547.9	+235.3	+783.2
Other			
Support	0	+14.2	+14.2
subTOTAL	+542.0	-74.5	+467.5
TOTAL CHANGES	+464.3	-2708.5	-2244.2
Current Estimate	+3586.4	+23707.0	+27293.4

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(FY81 Constant Dollars (Base-Year) in Millions)

	RDT&E	PROC	Total
Development Estimate	+2538.9	+17961.1	+20500.0
Previous Changes:			
Quantity			
Schedule			
Engineering			
Estimating	+14.7	-644.6	-629.9
Other			
Support	0	-254.7	-254.7
subTOTAL	+14.7	-899.3	-884.6
Current Changes:			
Quantity			
Schedule			
Engineering			
Estimating	+391.7	+141.8	+533.5
Other			
Support	0	+30.0	+30.0
subTOTAL	+391.7	+171.8	+563.5
TOTAL CHANGES	+406.4	-727.5	-321.1
Current Estimate	+2945.3	+17233.6	+20178.9

b. Previous Change Explanations:

1) RDT&E

Economic: Revised economic escalation indices

Estimating: Congressional reduction during FY85 and FY86 enactment process; applied to reserves and other government costs

Reestimate based on impact of revised economic escalation rates on prior years

Transfer of ALCM and CSRL integration from Procurement and increases in airframe and avionics for ALCM and CSRL integration

Correction of typographical error in Dec 82 SAR

Realignment of fiscal phasing for other government costs

Gramm-Rudman-Hollings reduction during FY86 budget enactment process and Small Business Innovation Research (SBIR) assessment

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2) Procurement

Economic: Revised economic escalation indices

Estimating: Congressional reduction during FY85 and FY86 enactment process: applied to reserves and weapons equipment

Reestimate based on impact of revised economic escalation rates on prior years

One-time change resulting from a correction to the methodology for computing inflation on programs with advance procurement funding

Transfer of ALCM and CSRL integration from procurement to RDT&E

Congressionally directed reprogramming to Peacekeeper (FY85 enactment process); applied to reserves

Reestimate of engine requirements

Adjustment to refine the mix of previous support and estimating category changes primarily related to the impact of escalation changes in current and prior years

Gramm-Rudman-Hollings reduction of reserves during FY86 budget enactment process

Support: Reestimate of initial spares requirement

Adjustment to refine the mix of previous support and estimating category changes primarily related to the impact of escalation changes in current and prior years

Gramm-Rudman-Hollings reductions resulted in limiting of initial spares and peculiar support equipment

c. Current Change Explanations —

	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
1) <u>RDT&E</u>		
Revised economic inflation indices (economic)	-	-5.9
Adjustment for current & prior years escalation (estimating)	+4.6	+5.9
Extension of flight test program for flight controls, terrain following, and ECM systems (estimating)	+387.1	+542.0

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2) Production

	(Dollars in Millions)	
	Base-Year \$	Then-Year \$
Revised Economic Inflation Indices (economic)	-	-324.0
Adjustment for prior years escalation (estimating)	+189.7	+304.3
Undistributed Budget Cuts taken from engineering change orders (estimating)	-47.9	-69.0
Initial Spares Reduction (support)	-3.7	-5.5
Adjustment for prior years escalation (support)	+33.7	+19.7

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year dollars in Millions)

Development Estimate to Current Estimate

PAUC (Init SAR/Dev Est)	Changes (Then-Year Dollars in Millions)								PAUC (Current Estimate)
	ECON	QTY	SCH	ENG	EST	SP	Other	Total	
295.376	-16.503				-5.495	-0.444		-22.442	272.934

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E

Airframe	Initial Contract Price		
	Target	Ceiling	Qty
North American Rockwell F33657-81-C-0208, FPIF Award: 20 Jan 82 Definitized: 20 Jan 82	\$1,317.0	\$1,554.4	0

Target	Current Contract Price		Qty	Estimated Price At Completion	
	Target	Ceiling		Contractor	Program Manager
\$1652.3		\$1943.5	0	\$1652.3	\$1667.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$27.0	(\$7.6)
Cumulative Variances to Date (28 Nov 86)	\$19.9	(\$8.8)
NET CHANGE	(\$7.1)	(\$1.2)

Explanation of Change: The decrease in favorable cost variance is due to greater than planned purchased services costs and electronic data processing usage. The deterioration in schedule variance reflects delayed completion of nonrecurring design development and prequalification of equipment such as the Battery Charger System, Weapons Flares, and Vane Electrical Heater Controllers. No program impact.

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Avionics	Initial Contract Price		
	Target	Ceiling	Qty
Boeing Military Airplane Co. F33657-81-C-0212, FPIF Award: 8 Jun 82 Definitized: 8 Jun 82	\$435.0	\$512.5	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$658.7	\$733.9	1	\$660.2	\$660.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$11.6	(\$1.2)
Cumulative Variances to Date (27 Nov 86)	\$14.1	(\$1.0)
NET CHANGE	\$2.5	(\$0.2)

Explanation of Change: The slight increase in favorable cost variance results primarily from a continued favorable overhead position. The change in schedule variance is insignificant. No program impact.

b. Procurement

Airframe	Initial Contract Price		
	Target	Ceiling	Qty
North American Rockwell F33657-81-C-0210 Award: 20 Jan 82 Definitized: 20 Jan 82	\$886.0	\$1051.2	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$14129.7	\$16673.7	100	\$14528.0	\$14572.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	(\$86.7)	\$20.5
Cumulative Variances to Date (28 Nov 86)	(\$130.5)	(\$10.1)
NET CHANGE	(\$43.8)	(\$30.6)

Explanation of Change: Unfavorable change in CV is due to Wing Carry Thru and Nacelles fab rework, parts replacements, overtime, and expediting charges; trainers supplier overrun at time of termination; and direct material price/usage variances in Airframe Mate. Unfavorable change in SV due to late starts and late completion in assembly (Aft Fuselage, Aft Intermediate Fuselage, Wing) because of rework late receipt of materials, parts, and assemblies from subcontractors. No program impact.

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Avionics	Initial Contract Price		
	Target	Ceiling	Qty
	<u> </u>	<u> </u>	<u> </u>
Boeing Military Airplane Co.	\$172.0	\$183.1	9
F33657-81-C-0213, FPIF			
Award: 11 Jun 82			
Definitized: 11 Jun 82			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
\$1949.4	\$2203.9	100	\$1943.3	\$1920.8

	Cost Variance	Schedule Variance
	<u> </u>	<u> </u>
Previous Cumulative Variances	\$22.3	\$16.6
Cumulative Variances to Date (30 Nov 86)	\$24.5	\$12.6
	<u> </u>	<u> </u>
NET CHANGE	\$2.2	(\$4.0)

Explanation of Change: The unfavorable change in schedule variance is primarily due to slightly fewer early deliveries from subcontractors on Lot V. The favorable change in cost variance is due to a continued favorable overhead position. No program impact.

AIL Division of Eaton	Initial Contract Price		
	Target	Ceiling	Qty
	<u> </u>	<u> </u>	<u> </u>
F33657-81-C-0215, FPIF	\$143.8	\$171.1	4.6
Award: 22 May 82			
Definitized: 22 May 82			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
\$2429.5	\$2814.9	100	\$2447.1	\$2473.7

	Cost Variance	Schedule Variance
	<u> </u>	<u> </u>
Previous Cumulative Variances	(\$12.4)	(\$69.9)
Cumulative Variances to Date (16 Nov 86)	\$23.5	(\$56.4)
	<u> </u>	<u> </u>
NET CHANGE	\$35.9	\$13.5

Explanation of Change: Favorable change in cost variance resulted from late receipt of materials, less expensive than planned engineering support, improved manufacturing control system, and less material usage for installation and checkout than planned. Schedule variance improved after implementing a revised delivery schedule for Lot V. Program impact: insufficient contract reserves.

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Engine	Initial Contract Price		
	Target	Ceiling	Qty
General Electric Co. (Lots III, IV, V) F33657-81-C-2047, FFP Award: 20 Jul 84 Definitized: 20 Jul 84	\$1387.6	N/A	368

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$1415.3	N/A	368	\$1415.3	\$1415.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances to Date	N/A	N/A
NET CHANGE	N/A	N/A

Explanation of Change: N/A

c. MILCON - None.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- 1) Percent Program Completed: 77.8% (7yrs/9yrs)
- 2) Percent Program Cost Appropriated: 97.8% (\$26697.9/\$27293.4)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current \$ Prior Yrs (FY81-87)	Budget Year (FY88)	Balance to Complete FYDP (FY89-92)	Beyond FYDP	Total
RDT&E	\$2990.9	\$375.7	\$219.8	0	\$3586.4
Procurement	\$23707.0	0	0	0	\$23707.0
MILCON	0	0	0	0	0
TOTAL	\$26697.9	\$375.7	\$219.8	0	\$27293.4

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c. Annual Summary --

Fiscal Year	Qty	FY81 Base-Year Dollars			Then-Year Dollars			Escl
		Flyaway			Advance Proc			Rate
		Nonrec	Rec	Total	Debit	Credit	Total	%

Appropriation: RDT&E

1981				209.8			219.0	11.9
1982				422.0			470.9	9.2
1983				645.1			753.5	4.9
1984				603.1			731.6	3.8
1985				362.9			454.7	3.4
1986				192.1			248.4	2.9
1987				84.4			112.8	3.1
1988				271.9			375.7	3.5
1989				154.0			219.8	3.5
subTOTAL	N/A			2945.3			3586.4	

Appropriation: Procurement

1982	1	683.9	419.3	1312.7	257.0	0	1612.0	9.6
1983	7	895.2	1408.6	3037.6	660.0	257.0	3964.1	9.0
1984	10	646.4	1676.5	4362.3	1846.8	436.9	5950.2	8.0
1985	34	541.0	3753.1	5238.5	1544.0	1443.4	7391.5	3.4
1986	48	318.5	4283.6	3282.5	0	2170.5	4789.2	2.9
subTOTAL	100	3085.0	11541.1	17233.6	4307.8	4307.8	23707.0	

Appropriation: MILCON

subTOTAL				N/A			N/A	
TOTAL	100			20178.9			27293.4	

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d. Obligations and Expenditures —

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated*	Expended*
Appropriation: RDT&E			
81	219.0	219.0	219.0
82	470.9	470.6	470.6
83	753.5	748.6	732.1
84	731.6	730.9	722.1
85	454.7	452.0	240.7
86	248.4	178.3	36.6
87	112.8	12.5	0.6
88	375.7	0	0
To Complete	219.8	0	0
TOTAL	3586.4	2811.9	2421.7
Appropriation: Procurement			
82	1612.0	1598.2	1577.6
83	3964.1	3947.3	3621.5
84	5950.2	5937.3	5193.1
85	7391.5	6365.4	5007.9
86	4789.2	4164.8	981.3
TOTAL	23707.0	22013.0	16381.4
Appropriation: Construction			
N/A	N/A	N/A	N/A

* Reflects Program Office records as of 31 Dec 86

17. Production Rate Data:

a. Annual Production Rates —

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1982	1.0	1.0	1.0	1.0
1983	7.0	7.0	7.0	7.0
1984	24.0	24.0	24.0	24.0
1985	40.8	40.8	40.8	40.8
1986	44.3	44.3	44.3	44.3
1987				
1988				

The annual production rates differ from the annual funded quantities because the funded delivery period is 5 months for FY84, 10 months for FY85 and 13 months for FY86.

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b. Cost Variance — Dollars in Millions

	Production Estimate	Variance (CE less PDE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost(BYS)	20500.0	-321.1	20178.9		20178.9
(TYS)	29537.6	-2244.2	27293.4		27293.4
PAUC (BYS)	205.000	-3.211	201.789		201.789
(TYS)	295.376	-22.442	272.934		272.934

c. Schedule Variance

	Production Estimate	Variance (CE less PDE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	1/82*		1/82		1/82
Duration (in Months)	78		78		78
End Date (Mo/Yr)	6/88		6/88		6/88

* Date of contract award.

d. Deliveries (Plan/Actual) —

To Date: 31 Dec 86

RDT&E
Procurement

N/A
30/31

18. Operating and Support Costs: None

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**SELECTED ACQUISITION REPORT (RCS: DD-COMP[O&A] 823)
PROGRAM: PHOENIX (AIM-54C)**

AS OF DATE: December 31, 1986

SUBJECT	INDEX	PAGE
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FOR OPEN PUBLICATION
~~AS AMENDED~~ ~~AS AMENDED~~
FEB 27 1987 22
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (CASD-PA)
DEPARTMENT OF DEFENSE

1. Designation/Nomenclature (Popular Name): PHOENIX (AIM-54C)

2. DoD Component: U. S. Navy

3. Responsible Office and Telephone Number:

Naval Air Systems Command
PMA-259
Washington, D. C. 20361-1259

PM: CAPT J. J. Stewart
Assigned: July 24, 1985
(202) 692-0915
AUTOVON: 222-0915

4. Program Elements:

RDT&E: PE 64354N
PROCUREMENT: PE 24162N
MILCON: PE 72031N

ICN: 2212

APPN: 1507

5. Related Programs: F-14A/D

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~~Declassify on: OADR~~

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6. **Mission and Description:** The Phoenix Missile System is comprised of a long-range airborne weapons control system (AWCS) with multiple target handling capabilities and long-range missiles utilizing semi-active midcourse guidance and active terminal guidance. The mission is to kill multiple air targets with conventional warheads. Six such missiles can be carried aboard the F-14A/D. Near simultaneous launch is possible against six targets in all weather, heavy jamming environments. The improved Phoenix, the AIM-54C, provides improved lethality, stream raid discrimination, ECCM performance, high and low altitude performance, and improved reliability and maintainability. As a result of these improvements, the missile has greater capability to counter the projected tactical aircraft and cruise missile threats. The Phoenix does not replace any other missile.

7. **Program Highlights:**

a. **Significant Historical Developments:** The Phoenix AIM-54C is a major improvement over the AIM-54A which ended production in 1979. A major upgrade was required to meet a more sophisticated threat.

b. **Significant Developments Since Last Report:** Initial Operational Capability was reached in December, 1986. Hughes Aircraft (HAC) has corrected quality problems that resulted in a Phoenix production line shutdown from July 1984 through January 1985. HAC is currently in a production ramp-up and is presently producing at a nominal rate of 23 missiles per month.

In June 1986, Raytheon was selected as the winner of competition to second-source the Phoenix missile. The contract awarded to Raytheon calls for production of 10 validation units in FY1986, and production quantities of 56 and 180 in FY1987 and FY1988 respectively. Raytheon will be in a head-to-head competition with HAC in FY1989. The Second Source has received the approval of the OSD Cost Analysis Improvement Group (CAIG) and has been certified by the Secretary of Defense as being supportable in the current FYDP.

The AIM-54C Phoenix Missile system satisfies the mission requirement.

c. **Changes since "as of" Date:** none.

8. **Decision Coordinating Paper (DCP) Threshold Breaches:** There are currently no DCP (dated November 21, 1980) threshold breaches.

9. Schedule:

a. Milestones:

	Development Estimate/ Approved Program	Current Estimate
Full Development Go-Ahead	Oct 76/Oct 76	Oct 76
Development Contract Award	Sep 77/Sep 77	Sep 77
Complete Section Integration Test	Dec 78/Dec 78	Mar 79
Pilot Production Contract	Jul 79/Jul 79	Sep 79
First Low Rate Production Contract	Dec 79/Dec 79	Dec 79
Delivery of EDM Missiles	Dec 80/Dec 80	May 81
Complete Contractor Development	Apr 81/Apr 81	May 82
Pilot Production Missile Deliveries	Oct 81/Oct 81	Oct 81
Begin Navy Technical Evaluation	Oct 81/Oct 81	May 82
Complete Navy Technical Evaluation	Jun 82/Jun 82	Nov 82
Begin Navy Operational Evaluation	Jan 83/Jan 83	Mar 83
Complete Navy Operational Evaluation	Mar 84/Mar 84	Jun 84
Approval for Full Production	Mar 83/Mar 83	May 88 CH-1
Begin Full Rate Production	Oct 83/Oct 90	Oct 90
IOC	Oct 83/Oct 83	Dec 86 CH-2

b. Previous Change Explanations:

AIM-54C Section Integration Test slippage due to delay in component build-up caused by unanticipated design complexity. Award of Pilot Production Contract slippage caused by administrative delays. Navy Technical Evaluation slippage (Start & Complete) and Navy Operational Evaluation slippage (Start & Complete) due to delays in delivery of pilot production missiles and delay in completion of contractor development testing. Approval for Full Production delayed to August 1987 in order to evaluate ECCM engineering change (ECP-82) which was introduced with the 1984 production missiles. Full Rate Production delayed until first year of competition between Hughes and Raytheon (1989).

c. Current Change Explanations:

CH-1 Approval for Full Production was delayed beyond August 1987 to May 1988 due to slow ramp-up on the first 1984 production missiles.

CH-2 IOC was delayed from March 1986 to December 1986 due to a requirement to rework igniter safety mechanisms.

d. References:

Development Estimate: DCP, dated November 21, 1980, subject "AIM-54 Improvement Program".

Approved Program: FY1988 President's Budget.

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PHOENIX (AIM-54C), December 31, 1986

10. ~~(S)~~ Technical/Operational Characteristics:

	Development Approved	Estimate/ Program	Demonstrated Performance	Current Estimate
--	-------------------------	----------------------	-----------------------------	---------------------

a. (S) Technical				
(U) MTBF (Captive)	505 hours		550 hours	505 hours

(b)(1)

b.(U) Operational			
Launch wt (lbs)	1020	1018	1014
Length (inches)	156	156	156
Diameter (inches)	15	15	15
Guidance: Radar, Pulse Doppler, Semi-active/Active, HOJ Modes			
Propulsion: Solid Boost			

c.(U) Previous Change Explanations: none.

d.(U) Current Change Explanations: None.

e.(U) References:

Development Estimate: DCP, dated November 21, 1980, subject "AIM-54 Improvement Program".

Approved Program: FY1988 President's Budget.

f.(U) Approved Design to Cost Goal: none

g.(U) Foreign Military Sales: none

h.(U) Nuclear Costs: none

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PHOENIX (AIM-54C), December 31, 1986

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. Cost:			
Development (RDT&E)	73.8	49.3	123.1
Procurement	296.7	2,442.2	2,738.9
Total Flyaway	(231.6)	(2,238.8)	(2,470.4)
Other Wpn Syst Costs	(56.9)	(171.1)	(228.0)
Initial Spares	(8.2)	(32.3)	(40.5)
Construction	<u>1.5</u>	<u>-0.2</u>	<u>1.3</u>
Total FY77 Base-Year \$	372.0	2,491.3	2,863.3
Escalation	92.3	3,859.5	3,951.8
Development (RDT&E)	(11.4)	(37.3)	(48.7)
Procurement	(80.7)	(3,822.1)	(3,902.8)
Construction	(0.2)	(0.1)	(0.3)
Total Then-Year \$	464.3	6,350.8	6,815.1
b. Quantities			
Development (RDT&E)	30	15	45
Procurement	<u>705</u>	<u>6,499</u>	<u>7,204</u>
Total	735	6,514	7,249
c. Unit Cost			
Procurement			
FY77 Base-Year \$	0.421	-0.041	0.380
Then-Year \$	0.535	0.387	0.922
Program			
FY77 Base-Year \$	0.506	-0.111	0.395
Then-Year \$	0.632	0.308	0.940

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current [Then -Year] Dollars in Millions)

	Current Year		Budget Year	
	SAR Current Estimate	UCR Baseline Estimate	UCR Baseline Estimate	
	(Dec. 86 SAR)	(Dec. 85 SAR)	(Dec. 86 SAR)	
a. Program Acquisition:				
(1) cost	6,815.1	6,950.1	6,815.1	
(2) quantity	7,249	7,249	7,249	
(3) Unit Cost	.940	.959	.940	
	FY1987	FY1987*	FY1988	
b. Current Procurement:				
(1) Cost	289.3	289.3	398.6	
Less CY Adv Proc	20.0	20.0	0.0	
Plus PY Adv Proc.	<u>12.9</u>	<u>12.9</u>	<u>20.0</u>	
Net Total	282.2	282.2	418.6	
(2) Quantity	205	205	430	
(3) Unit Cost	1.377	1.377	.973	

* FY 87 Appropriated

13. Cost Variance Summary

a. Summary:

<i>[Current (Then-Year) Dollars in Millions]</i>					
		RDT&E	PROC	MILCON	TOTAL
Development	Estimate	85.2	377.4	1.7	464.3
	Previous Changes				
	Economic	11.7	-479.1	0.1	-467.3
	Quantity		7,098.7		7,098.7
	Schedule	10.1	380.6		390.7
	Engineering	23.6	314.2		337.8
	Estimating	41.2	-1,527.6	-0.2	-1,486.6
	Support		571.5		571.5
	Other		41.0		41.0
	Subtotal	86.6	6,399.3	-0.1	6,485.8
	Current Changes				
	Economic		-141.2		-141.2
	Quantity				0.0
	Schedule				0.0
	Engineering		9.8		9.8
	Estimating		-21.0		-21.0
	Support		17.4		17.4
	Other				0.0
	Subtotal	0.0	-135.0	0.0	-135.0
Total	Changes	86.6	6,264.3	-0.1	6,350.8
Current	Estimate	171.8	6,641.7	1.6	6,815.1

<i>[Current (Base-Year) Dollars in Millions]</i>					
		RDT&E	PROC	MILCON	TOTAL
Development	Estimate	73.8	296.7	1.5	372.0
	Previous Changes				
	Quantity		2,371.4		2,371.4
	Schedule	3.0	54.3		57.3
	Engineering	16.0	137.9		153.9
	Estimating	30.3	-330.1	-0.2	-300.0
	Support		196.9		196.9
	Other		20.5		20.5
	Subtotal	49.3	2,450.9	-0.2	2,500.0
	Current Changes				
	Quantity				0.0
	Schedule				0.0
	Engineering		4.2		4.2
	Estimating		-15.2		-15.2
	Support		2.3		2.3
	Other				0.0
	Subtotal	0.0	-8.7	0.0	-8.7
Total	Changes	49.3	2,442.2	-0.2	2,491.3
Current	Estimate	123.1	2,738.9	1.3	2,863.3

13. Cost Variance Summary (continued)

b. Previous Change Explanations:

RDT&E

Economic: Revised escalation indices.
 Schedule: Slippage due to technical problems in development.
 Engineering: Guidance, control and thermal conditioning changes.
 Estimating: Higher prototype and R&D effort costs.

Procurement

Economic: Revised escalation indices.
 Quantity: Revision of inventory objective.
 Schedule: Quantity shifts during the budget process
 Engineering: Guidance, control and thermal conditioning changes
 Estimating: Reduction due to introduction of contract actuals into model.
 Support: Reassessment of spares and support equipment requirements.

MILCON

Economic: Revised escalation indices.
 Estimating: Based on contract actual costs.

c. Current Change Explanations:

	Base Year\$	Then Year\$
Procurement		
Economic: Revised escalation indices.		-141.2
Engineering:		
FY86-88 Produceability upgrades.	4.2	9.8
Estimating:		
Model adjusted for contract actuals.	-15.2	-21.0
Support:		
Reflects test set requirements.	2.3	17.4

d. References:

Development Estimate: DCP, dated November 21, 1980, subject "AIM-54 Improvement Program".

Approved Program: FY1988 President's Budget.

14. Program Acquisition Unit Cost (PAUC) History:

a. Initial SAR Estimate to Current Baseline Estimate: same as current baseline.

b. Current Baseline Estimate to Current Estimate:

PAUC Dev Est	Changes (Then-Year Dollars in Millions)								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
0.632	-0.084	0.411	0.054	0.048	-0.208	0.081	0.006	0.308	0.940

15. Contract Information:

a. RDT&E: none

b. Procurement:

Guidance Control & Airframe	Target	Ceiling	Qty
Hughes Aircraft Company, Tucson	223.4	223.4	265
N00019-83-C-0014, FFP			

Award: June 8, 1983

Definitized: March 28, 1986

Current Contract Price			Estimate at Completion	
Target	Ceiling	Qty	Contract	Prog Manager
223.4	223.4	265	223.4	223.4

Explanation of Change: No variances are reported on FFP contracts.

Guidance Control & Airframe	Target	Ceiling	Qty
Hughes Aircraft Company, Tucson	378.0	378.0	530
N00019-84-C-0379, FFP			

Award: March 1, 1985

Definitized: September 15, 1986

Current Contract Price			Estimate at Completion	
Target	Ceiling	Qty	Contract	Prog Manager
378.0	378.0	530	378.0	378.0

Explanation of Change: No variances are reported on FFP contracts.

Guidance Control & Airframe	Target	Ceiling	Qty
Raytheon, Lowell, MA	49.5	49.5	56
N00019-86-C-0216, FPI			

Award: May 15, 1986

Definitized: May 15, 1986

Current Contract Price			Estimate at Completion	
Target	Ceiling	Qty	Contract	Prog Manager
49.5	49.5	56	49.5	49.5

Explanation of Change: None to date.

c. MILCON: none.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status:

Percentage of Program Completed: 50% (11/22 years)

Percent of Cost Appropriated: 30.9% (\$2,103.3/\$6,815.1)

b. Appropriation Summary:

Appropriation	Prior Yrs	Budg Yr	FYDP	Beyond FYDP	Total
RDT&E	1,71.8				171.8
Procurement	1,929.9	398.6	1,798.5	2,514.7	6,641.7
MILCON	1.6				1.6
Total	2,103.3	398.6	1,798.5	2,514.7	6,815.1

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PHOENIX (AIM-54C), December 31, 1986

16. Program Funding Summary: (Current Estimate in Millions of Dollars) (cont'd)

c. Annual Summary:

Fiscal Year	Quantity	FY77 Flyaway Nonrec	Base-Year Cost Rec	Dollars Total	Then-Year Adv Dr	Proc Cr	Dollars Total	Esc. Rate
Appropriation: RDT&E								
1977	-			9.2			9.5	2.58
1978	-			6.4			7.1	6.80
1979	15			19.1			23.5	8.39
1980	30			27.9			38.0	10.50
1981	-			23.9			35.4	10.60
1982	-			21.1			32.9	7.59
1983	-			14.0			22.8	4.90
1984	-			1.5			2.6	3.80
Subtotal	45			123.1			171.8	
Appropriation: WPN								
1979	-	0.0	0.0	7.7	10.7		10.7	8.72
1980	60	13.5	53.7	69.2	7.7	10.7	107.4	11.80
1981	60	6.2	59.6	72.7	5.6	7.7	125.6	11.60
1982	72	4.3	53.5	81.1	20.6	5.6	151.5	14.30
1983	300 108	20.3	70.4	110.5	24.4	20.6	218.8	9.00
1984	265	0.5	127.1	144.4	24.0	24.4	298.4	8.00
1985	265	50.9	105.4	188.4	23.2	24.0	399.1	3.40
1986	265	44.9	96.9	150.3	12.9	23.2	329.1	2.90
1987	205	53.0	61.6	127.9	20.0	12.9	289.3	3.10
1988	430	73.7	89.1	170.5	0.0	20.0	398.6	3.50
1989	560	2.9	175.2	193.5	0.0	0.0	465.2	3.50
1990	560	3.0	167.1	182.5	0.0	0.0	450.6	3.30
1991	560	3.0	159.7	170.9	0.0	0.0	432.3	2.90
1992	560	0.7	155.6	173.9	0.0	0.0	450.4	2.40
1993	560	0.7	147.2	161.1	0.0	0.0	427.4	2.40
1994	560	0.7	143.9	157.6	0.0	0.0	428.1	2.40
1995	560	0.8	141.1	154.8	0.0	0.0	430.6	2.40
1996	560	0.8	138.7	152.2	0.0	0.0	433.5	2.40
1997	560	0.8	136.5	149.9	0.0	0.0	437.3	2.40
1998	434	0.5	106.9	119.8	0.0	0.0	357.8	2.40
Subtotal	7204	281.2	2189.2	2738.9	149.1	149.1	6641.7	
Appropriation: MILCON								
1978	-			1.3			1.6	7.68
Subtotal	-			1.3			1.6	
TOTAL	7249	281.2	2189.2	2863.3	149.1	149.1	6815.1	

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16. Program Funding Summary: (Current Estimate in Millions of Dollars) (cont'd)

d. Obligations and Expenditures

Fiscal Year	Then-Year Total	\$ (in Millions)	
		Obligated	Expended

Appropriation: RDT&E

1977	9.5	9.5	9.5
1978	7.1	7.1	7.1
1979	23.5	23.5	23.5
1980	38.0	38.0	38.0
1981	35.4	35.4	35.4
1982	32.9	32.9	32.7
1983	22.8	22.8	19.7
1984	2.6	2.6	1.5
Total	171.8	171.8	167.4

Appropriation: WPN

1979	10.7	10.7	10.7
1980	107.4	107.4	106.7
1981	125.6	125.6	125.6
1982	151.5	151.5	146.0
1983	218.8	218.8	203.1
1984	298.4	296.1	238.3
1985	399.1	04.8	122.8
1986	329.1	259.9	58.0
To Complete	5001.1		
Total	6641.7	1474.8	1011.2

Appropriation: MILCON

1978	1.6	1.6	1.6
Total	1.6	1.6	1.6

17. Production Rate Data:

a. Annual Production Rates:

Fiscal Year	Production Rates (Quantity/Year)			
	Devel Estimate	Prod Estimate	Current Estimate	Maximum
1980	60	60	60	60
1981	60	60	60	60
1982	72	72	72	72
1983	220	108	108	108
1984	307	265	265	265
1985	307	265	265	265
1986	307	265	265	265
1987	97	205	205	420
1988		430	430	530
1989		560	560	720
1990		560	560	720
1991		560	560	720
1992		560	560	720
1993		560	560	720
1994		560	560	720
1995		560	560	720
1996		560	560	119
1997		560	560	
1998		434	434	

b. Cost Variance

Item		Prod Estimate	Variance CE - PdE	Current Estimate	Variance CE - Max	Max
Prog Cost	BY\$	2863.3	0.0	2863.3	205.5	2657.8
	TY\$	6815.1	0.0	6815.1	518.0	6297.1
PAUC	BY\$	0.395	0.000	0.395	0.028	0.367
	TY\$	0.940	0.000	0.940	0.071	0.869

c. Schedule

Item	Prod Estimate	Variance CE vs PdE	Current Estimate	Variance CE vs Max	Max
Start Date	8/82		8/82		8/82
Duration	218	0	218	24	194
End Date	9/98		9/98		9/98

d. Deliveries (Plan/Actual)

RDT&E	45/45
Procurement	382/470

18. Operating and Support Costs: Not Applicable.

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SAR-86-069

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: JTIDS Class 2 TDMA Terminal

AS OF DATE: December 31, 1986

<u>SUBJECT</u>	<u>INDEX</u>	<u>PAGE</u>
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 FOR OPEN PUBLICATION
AS AMENDED
FEB 4 1987 18

DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (DASD-PA)
 DEPARTMENT OF DEFENSE

1. Designation/Nomenclature (Popular Name): Joint Tactical Information Distribution System Time Division Multiple Access Terminal/JTIDS Class 2 TDMA Terminal

2. DoD Component: U.S. Air Force (Lead Service), U.S. Army, U.S. Navy

3. Responsible Office and Telephone Number:

JTIDS Joint Program Office	PM: Lt Col Dennis J. Berry
Electronics Systems Division	Assigned: April 15, 1985
Hanscom AFB, MA 01731-5000	AUTOVON: 478-5980 x3532
	Commercial: (617) 271-3532

4. Program Element/Procurement Line Items:

RDT&E: 64754F	(Shared funding)
64771D	(Shared funding)
64702A	
64232N	(Shared funding)
25604N	

5. Related Programs: E-3 (AWACS); NATO Airborne Early Warning and Control System; E-2C HAWKEYE Carrier-Based Airborne Early Warning Aircraft; Adaptable Surface Interface Terminal (ASIT); Tactical Air Operations Center (TAOC); Modular Control Equipment (MCE); JTIDS Class 1 TDMA terminal; F-15 Eagle;

~~Classified by: JTIDS Security Classification~~
~~Declassify on: OADR~~

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JTIDS Class 2 TDMA Terminal, December 31, 1986

5. Related Programs (Cont'd):

F-14 TOMCAT Carrier-Based Maritime Air Superiority Fighter; Joint Interoperability of Tactical Command and Control Systems (JINTACCS); Aircraft Carrier (CV); Guided Missile Cruiser (CG); Guided Missile Destroyer (DDG); Battle Force Information Management (BFIM) System; Army Data Distribution System (ADDS); Advance Combat Direction System (ACDS); HF Anti-Jam; Tactical Flag Command Center (TFCC); EHF SATCOM Terminal; C² Processor; EW Coordination Module; Amphibious OTH Command and Control; Link II Improvements; Afloat Correlation

6. Mission and Description:

The Family of JTIDS Class 2 TDMA terminals consists of the Class 2 (for Air Force tactical fighters, Navy sea and air platforms, and mobile Army platforms), the Class 2H (High-powered terminal - for AF Command and Control platforms, and Air Force and Marine ground shelters), and the Class 2M (miniaturized Class 2 - for mobile Army platforms). This family of JTIDS Class 2 TDMA terminals will provide mobile tactical platforms with the earliest jam-resistant, secure, digital communications (data and voice) capability, and will include Tactical Air Navigation (TACAN) (Air Force and Navy only) and Time-of-Arrival (TOA) positioning functions and an inherent identification (ID) capability. These terminals will enable sensor information from many sources to be displayed to Army, Navy, and Air Force units in a real-time coherent fashion. The Air Force and Army terminals will also be interoperable with Class 1 TDMA JTIDS terminals in air (currently in AWACS) and ground systems (ASIT) in both United States and North Atlantic Treaty Organization (NATO) forces. The size of the Class 2 TDMA terminal is 1.6 cubic feet, and the weight is 125 pounds. The Class 2 TDMA terminal does not replace any existing DoD system.

7. Program Highlights:

a. Significant Historical Developments -- The Class 2 Advanced Development Model (ADM) terminal underwent successful pod testing (completed January 1982) on F-4 and A-10 aircraft which demonstrated the utility of JTIDS in fighter aircraft. Following the DSARC IIA decision on 13 January 1981, the Under Secretary of Defense authorized FSED of the JTIDS Class 2 TDMA terminal to meet Air Force and Army requirements for jam-resistant tactical communications. Authorization was also given to develop a comprehensive fighter integration program to identify cost effective integration options. An FSED contract was awarded 14 January 1981 to the Singer Company, Kearfott Division, for Class 2 TDMA terminals for Air Force and Army test and evaluation. Class 2 Preliminary Design Review (PDR) was completed in October 1981 and Critical Design Review (CDR) in July 1982. In 1983, Singer began bilingual terminal development which will give the TDMA

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JTIDS Class 2 TDMA Terminal, December 31, 1986

Significant Historical Developments (Continued) — terminal the capability to communicate in either Interim JTIDS Message Specification (IJMS) or Tactical Digital Information Link J (TADIL J) message structure during the transition by all services to the TADIL J message standard.

The Government accepted the first Army Full Scale Development (FSD) Class 2 terminal in March of 1984 and the first Air Force terminal in June of 1984. All 46 Class 2 terminals have been delivered.

The Class 2 flight demonstration (F-15) on 18 June 1985 at McDonnell Aircraft (McAair) in St Louis MO demonstrated several major functions of the FSD terminals worked including digital data via TADIL J, 16 Kpbs digital voice, and internal terminal TACAN function. DT&E began in October 1985. On 16 October 1985, Secretary of the Navy John Lehman directed the Chief of Naval Operations to drop all plans to procure Navy DTDMA JTIDS terminals and to procure the Air Force developed TDMA family of modules through the JTIDS Joint Program Office (JPO) for incorporation into the E-2C, F-14D, CG, CV, and DDG. In February 1986, the Navy's Space and Naval Warfare Systems Command (SPAWARSSYSCOM) funded Singer Kearfott for a seven month study to assess the feasibility of integrating Class 2 TDMA terminals into Navy platforms. The results of that study formed the basis for a JPO Request for Proposal (RFP) to Singer Kearfott for Navy Class 2 terminals to be delivered beginning in July 1989.

On 31 December 1985, the Air Force let a contract to Singer, Kearfott Division for Follow-on Terminal Development. This contract is for Class 2M development terminals for the Army, and Class 2H development terminals for the Air Force (the Class 2H will go into the AWACS and MCE).

The JTIDS Class 2 TDMA Terminal is expected to satisfy the mission requirement.

b. Significant Developments Since Last Report -- Air Force DT&E was completed in October 1986 and IOT&E began in December 1986. Army DT&E continues with Multi-service IOT&E planned for February 1987. This is the first consolidated Tri-service SAR.

c. Changes Since "As Of" Date -- None

8. Decision Coordinating Paper (DCP) Threshold Breaches

The six month slip of DT&E in November 1984 caused an additional 2 month delay in IOT&E which pushed Milestone III into January of 1987 breaching the DCP threshold of December 1986. In October 1985, Milestone III slipped an additional two months to March of 1987 due to the late arrival of F-15s at Eglin AFB. In September 1986, Milestone III slipped an additional three months to June of 1987 because of a two month slip in the Class 2 DT&E/IOT&E. The DCP Threshold Breach was reported in the December 1984 Air Force SAR.

9. Schedule

a. Milestones	Development Estimate/ <u>Approved Program</u>	Current <u>Estimate</u>
Program Initiation	Mar 76/Mar 76	Mar 76
Class 2 TDMA ADM Delivery	Aug 78/Aug 78	Aug 78

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JTIDS Class 2 TDMR Terminal, December 31, 1986

9. Schedule (Cont'd)

a. Milestones	Development Estimate/ Approved Program	Current Estimate
Milestone II	Jan 81/Jan 81	Jan 81
TDMA Development Contract Award	Jan 81/Jan 81	Jan 81
Pod Preliminary OT&E	Jan 81/Jan 82	Jan 82
Delivery of First FSD Terminal		
Army	Apr 83/Apr 83	Mar 84
Air Force	Jul 83/Jul 83	Jun 84
Navy	N/A / N/A A/	Jul 89
IOT&E Complete		
Army	Dec 84/Jul 86	Apr 87 Ch-1
Air Force	Jan 86/Jan 87	Apr 87 Ch-1
Milestone III A		
Air Force/Army	Jun 86/Jun 87	Jun 87
Production Contract Award	Jun 86/Jun 87	Jun 87
Milestone III A (NPDM)		
LRIP (Navy)	N/A / N/A A/	Dec 91
Begin Navy TECHEVAL	N/A / N/A A/	Dec 91
Begin Navy OPEVAL	N/A / N/A A/	May 92
Milestone III B (NPDM)		
Full Production (Navy)	N/A / N/A A/	Dec 92
Delivery of First Production Unit		
Air Force/Army	Jun 88/Jun 89	Jun 89
Navy	N/A / N/A A/	Dec 93
IOC		
Air Force	Sep 88/Dec 89	Dec 89
Navy	N/A / N/A A/	Dec 93
Army	Oct 89/Oct 88	Jan 90

A/ The Navy has no Development Estimate or Approved Program at this time, but will be reviewed at the June 1987 Milestone IIIA review.

b. Previous Change Explanations —

In the December 1981 AF SAR, the DSARC Production Decision Milestone was revised from June 1986 to June 1985.

In the September 1982 AF SAR, the delivery of the Air Force and Army terminals was delayed one month. Also, the Army Unique Development and the AF Testing Complete Milestones were increased three months because the Test Program was reduced from a full production modification in the F-15 and F-16 DT&E/IOT&E to test-only modification of the F-15 only with a shortened test program (F-15 only IOT&E). This impacted the Production Decision which was changed to correspond with the end of DT&E testing. This in turn affected the Contract award date and first production terminal delivery.

In the June 1983 and September 1983 AF SARs, milestones for Delivery of First FSD Terminal (Army and AF), Army Unique Development, AF Testing Complete, Milestone III, Production Decision, and Contract Award were adjusted 3 months respectively in order to accomplish design work associated with the PACKED 4 message structure and June 1983 TADIL J message implementation.

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JTIDS Class 2 TDMA Terminal, December 31, 1986

9. Schedule (Cont'd)

b. Previous Change Explanations (Cont'd)--

In the December 1983 AF SAR, the IOC was redefined from initial terminal delivery to F-15 to a full squadron of F-15s having JTIDS capability moving the IOC to December 1989. Also, due to a delay in the initial terminal delivery, DT&E/IOT&E testing announced a six month schedule slip.

In the December 1984 AF SAR, the milestone for the completion of Air Force testing was delayed eight months - six months because of hardware/software integration problems with the terminal and 2 additional months because of test asset availability and schedule adjustments mandated by new test timeframe. This, in turn, caused an 8 month delay in Milestone III and the Production Decision. The Contract Award date Milestone was adjusted an additional two months because of anticipated delays in the new DT&E review cycle.

In the December 1985 AF SAR, Completion of Air Force Testing was delayed two months due to the late arrival of F-15s at Eglin AFB. This, in turn, caused a 2 month slip to the Production Decision and Milestone III.

In the September 1986 AF SAR, the Class 2 DT&E/IOT&E slipped 2 months which in turn caused a three month delay in JRMB III, Production Contract Award, and the Delivery of 1st Production Terminal.

The first production terminal will be delivered two years after the Production Contract Award.

c. Current Change Explanations:

Ch-1 - The end of Army testing slipped nine months from July 1986 to April 1987 and Air Force testing slipped one month from March 1987 to April 1987 because DT&E was extended. This will not impact any other SAR Milestones.

d. References --

Development Estimate: Secretary of Defense Decision Memorandum (SDDM), dated 16 January 1981, subject "JTIDS Milestone II Approval (Class 2 Terminal FSED)"; Decision Coordinating Paper (DCP), dated 31 March 1981.

Approved Program: Same as Development Estimate

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JTIDS Class 2 TDMA Terminal, December 31, 1986

10. (U) Technical/Operational Characteristics:

a. (U) Technical	Dev Estimate/ Appr Program	Demonstrated A/ Performance	Current A/ Estimate
(U) Coded/Uncoded Data Rate (double pulse Tx or Rx) (kbps)	28.8/59.5 57.6/119.0 B/	N/A	57.6/119.0 B/
(U) Number of Nets	4/4	N/A	128 Ch-1

(b)(1)

(U) Relay Range (nm)	1200/1200	N/A	1200
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(b)(1)

(U) Communication Range (nm)	300/300	N/A	300
(U) Voice Channels	3/3	N/A	3
(U) Coded Message Error Probability	.01/.01	N/A	.01

b. (U) Operational

(U) Mean Time Between Failure (hr) C/	120/120	N/A	120
(U) Mean Corrective Maintenance Time (min)	30/30	N/A	30

c. (U) Previous Change Explanation:
None

d. (U) Explanation of Changes:
Ch-1 - The updated Current Estimate for the Number of Nets increased from 4 to 128 because of enhanced technology.

e. (U) References --

Development Estimate: Secretary of Defense Decision Memorandum (SDDM), dated 16 January 1981, subject "JTIDS Milestone II Approval (Class 2 Terminal FSED)"; Decision Coordinating Paper (DCP), dated 31 March 1981.

Approved Program: Same as Development Estimate

A/ (U) Demonstrated Performance and Current Estimate will be updated after completion of Initial Operational Testing.

B/ (U) A new Air Force message packing structure accounts for increase in the data rate. The data rate for single pulse is 238 kbps.

C/ (U) Mean Time Between Maintenance was changed to Mean Time Between Failure to be consistent with the 16 Jan 81 SDDM.

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JTIDS Class 2 IDAM Terminal, December 31, 1986

11. PROGRAM ACQUISITION COST: (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. Cost --			
Development (RDT&E)	\$309.0	\$681.8	\$990.8
Procurement	N/A	N/A	N/A
Construction (MILCON)	N/A	N/A	N/A
Total FY 81 Base-Year \$	\$309.0	\$681.8	\$990.8
Escalation	\$73.5	\$271.2	\$370.3
Development (RDT&E)	73.5	271.2	(\$370.3)
Procurement	N/A	N/A	N/A
Construction (MILCON)	N/A	N/A	N/A
Total Then-Year \$	\$382.5	\$978.6	\$1361.1
b. Quantities --			
Development (RDT&E)	55	50	105
Procurement	N/A	N/A	N/A
Total	55	50	105
c. Unit Cost --	N/A		
d. Approved Design to Cost Goal --	N/A		
e. Foreign Military Sales --	None		
f. Nuclear Costs --	None		

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JTIDS Class 2 TDMA Terminal, December 31, 1986

12. Program Acquisition/Current Procurement Unit Cost Summary: N/A

13. Cost Variance Analysis

a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
DEVELOPMENT ESTIMATE	382.5	-	-	382.5
PREVIOUS CHANGES				
ECONOMIC	-36.6	-	-	-36.6
QUANTITY	+37.2	-	-	+37.2
SCHEDULE	+22.8	-	-	+22.8
ENGINEERING	+291.3	-	-	+291.3
ESTIMATING	-32.1	-	-	-32.1
OTHER	-	-	-	-
SUPPORT	+13.3	-	-	+13.3
SUBTOTAL	+295.9	-	-	+295.9
CURRENT CHANGES				
ECONOMIC	-4.2	-	-	-4.2
QUANTITY	+618.4	-	-	+618.4
SCHEDULE	-	-	-	-
ENGINEERING	+4.4	-	-	+4.4
ESTIMATING	+21.3	-	-	+21.3
OTHER	-	-	-	-
SUPPORT	+42.8	-	-	+42.8
SUBTOTAL	+682.7	-	-	+682.7
TOTAL CHANGES	+978.6	-	-	+978.6
CURRENT ESTIMATE	1361.1	-	-	1361.1

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JTIDS Class 2 TDMA Terminal, December 31, 1986

13. Cost Variance Analysis (Cont'd)
(FY 1981 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
DEVELOPMENT ESTIMATE	309.0	-	-	309.0
PREVIOUS CHANGES				
QUANTITY	+29.3	-	-	+29.3
SCHEDULE	-1.5	-	-	-1.5
ENGINEERING	+201.0	-	-	+201.0
ESTIMATING	-23.0	-	-	-23.0
OTHER	-	-	-	-
SUPPORT	+10.9	-	-	+10.9
SUBTOTAL	216.7	-	-	+216.7
CURRENT CHANGES				
QUANTITY	+420.7	-	-	+420.7
SCHEDULE	-	-	-	-
ENGINEERING	+3.2	-	-	+3.2
ESTIMATING	+13.5	-	-	+13.5
OTHER	-	-	-	-
SUPPORT	+27.7	-	-	+27.7
SUBTOTAL	+465.1	-	-	+465.1
TOTAL CHANGES	+681.8	-	-	+681.8
CURRENT ESTIMATE	990.8	-	-	990.8

b. Previous Change Explanation --

RDT&E

Economic: revised escalation indices

Quantity: revised for Air Force's initial quantity increase from 15 to 19 development terminals, and subsequent Air Force quantity increase from 19 to 37 to accomodate TADIL J efforts; revised for Army's quantity increase from 5 to 33 development terminals

Schedule: increase due to 6 month schedule slip of DT&E; deletion of Army FY 85 test support funds

Engineering: increased scope of Software Support Facility, Contractor Software support, F-15 Avionics Intermediate Shop, Sustaining F-16 planning effort, F-15 IOT&E, Class 2 Logistics, F-15 Group A; decrease in scope of F-16 and Bilingual Interface; added development of Class 2 terminal High Power Amplifier and interfaces for upgrade in E-3 and MCE platforms to TADIL J capability.

Estimating: original Cost Estimate included all future terminals, impact of revised indices for prior year dollars, Class 1 work removal, Undistributed Budget cuts; adjustments to correct errors in 31 Dec 83 and 31 Dec 84 SARs; correction of Administrative errors on 31 Dec 85 SAR; Gramm-Rudman budget cuts; out year inflation changes

Support: develop, demonstrate, and evaluate direct link between E-3A and HIMAD elements using Class 2 terminals

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JTIDS Class 2 TDMA Terminal, December 31, 1986

c. Current Change Explanations

	(Dollars in Millions)	
	Base Year \$	Then Year \$
(1) <u>RDT&E</u>		
Revised economic escalation Indices (Economic)	N/A	-4.2
F-15 Peculiar Support Equipment added to program in FY 92 (Support)	+27.7	+42.8
Increase cost for additional Army budget for Development/Operational testing (Engineering)	+3.2	+4.4
Addition of Navy participation in Joint JTIDS (Quantity)	+420.7	+618.4
Adjustments to reflect Army actuals (Estimating)	+1.2	+1.6
Inclusion of OSD funds for terminal development (Estimating)	+14.5	+23.3
FY 87 Congressional reduction resulting in MCF terminal schedule delay (Estimating)	-5.8	-7.8
Adjustment for Current and Prior Year escalation (Estimating)	+1.3	+1.4
Adjustment based on the assumed allocation from OSD resulting from differences in inflation assumptions (Estimating)	+2.3	+2.8

d. References --

Development Estimate: Secretary of Defense Decision Memorandum (SDDM), dated 16 January 1981, Subject "JTIDS Milestone II Approval (Class 2 Terminal FSED)"; Decision Coordinating Paper (DCP), dated 31 March 1981.

Approved Program: FY 88 President's Budget

14. Program Acquisition Unit Cost (PAUC) History: N/A

15. Contract Information: (Then Year Dollars in Millions)

a. RDT&E--

(1)	<u>PME</u>	Initial Contract Price	
		Target	Ceiling
	Singer-Kearfott Division, Little Falls NJ, F19628-81-C-0007, FFP Award: January 14, 1981 Definitization: January 14, 1981	\$49.7	\$49.7 20

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JTIDS Class 2 TDMA Terminal, December 31, 1986

15. Contract Information (Cont'd): (Then Year Dollars in Millions)

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$104.1	\$104.1	46	\$104.1	\$104.1

This is a joint Air Force/Army/Navy contract with the Air Force being the lead service. The current Air Force price is \$58.2M for 19 terminals, the Army price is \$43.8M for 27 terminals, and the Navy price is \$2.1M for a development Design and Commonality (DAC) study.

Explanation of Changes: Cost Performance Report is not on contract.

(2) <u>Follow-on Development</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Singer-Kearfott Division, Little Falls NJ, F19628-86-C-0035, PFP	\$23.6	N/A	6
Award: December 31, 1985			
Definitization: December 31, 1985			

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$122.0 (Ch-1)	N/A	27	\$122.0 (Ch-1)	\$122.0 (Ch-1)

Ch-1 - This is a joint Air Force/Army/Navy/Marine Corps contract with the Air Force being the lead service. The current Air Force price is \$93.0M (JTIDS - \$70.4M; AWACS - \$13.7M; Joint STARS - \$6.7M; JINTACCS - \$2.2M) for Class 2M and 2H development and long-lead parts buy. The current Army price is \$11.2M for 6 Class 2M terminals. The current Navy price is \$17.4M for long-lead parts buy, design of shipboard interface units (SBI) and cabinets, and 4 Class 2 terminals. The current Marine Corps price is \$0.4M for long-lead parts buy. The 27 terminals are distributed as follows: a) AF JTIDS - 11; AF JOINT STARS - 4; AF JINTACCS - 2; Army - 6; Navy - 4.

Explanation of Changes: Cost Performance Report is not on contract.

3) The following contracts are below the \$40M threshold and will not be shown in subsequent SARs:

McDonnell Douglas Corp., St Louis
Mo, F33657-81-C-2168, CPFF
Award: October 1, 1982
Definition: October 1, 1982

The Charles Stark Draper Labs Inc.,
Cambridge MA, F19628-84-C-0045
CPFF/LOE, Award: September 12, 1984
Definitization: September 12, 1984

b. Procurement -- None

c. Milcon -- None

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JTIDS Class 2 TDMA Terminal, December 31, 1986

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 57.1% (12/21)

(2) Percent Program Cost Appropriated: 38.3% (521.9/1361.1)

b. Appropriation Summary --

<u>Appropriation</u>	<u>Current & Prior Yrs (FY76-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance FYDP (FY89-92)</u>	<u>To Complete Beyond FYDP (FY93-96)</u>	<u>Total</u>
RDT&E	\$521.9	\$200.9	\$453.7	\$184.6	\$1361.1

c. Annual Summary --

PROGRAM: JTIDS CLASS 2 TDMA TOTAL PROGRAM

Fiscal Year	Qty	FY 81 Base-Year Dollars			Then Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1976	--	--	--	0.1	--	--	0.1	6.9
1977	--	--	--	1.4	--	--	1.0	2.9
1978	--	--	--	1.1	--	--	0.8	2.7
1979	--	--	--	7.5	--	--	6.4	6.8
1980	--	--	--	10.4	--	--	9.8	9.4
1981	--	--	--	20.1	--	--	21.0	11.9
1982	--	--	--	42.9	--	--	47.9	9.2
1983	--	--	--	37.5	--	--	43.8	4.9
1984	--	--	--	36.4	--	--	44.1	3.8
1985	--	--	--	64.7	--	--	81.1	3.4
1986	--	--	--	97.8	--	--	126.4	2.9
1987	--	--	--	104.4	--	--	139.5	3.1
1988	--	--	--	145.4	--	--	200.9	3.5
1989	--	--	--	124.4	--	--	177.6	3.5
1990	--	--	--	75.9	--	--	111.6	3.3
1991	--	--	--	56.8	--	--	85.8	2.9
1992	--	--	--	50.9	--	--	78.7	2.4
1993	--	--	--	33.3	--	--	52.7	2.4
1994	--	--	--	32.1	--	--	52.0	2.4
1995	--	--	--	30.2	--	--	50.2	2.4
1996	--	--	--	17.5	--	--	29.7	2.4
Total	105	--	--	990.8	--	--	1361.1	

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c. Annual Summary (Cont'd) --

PROGRAM: JTIDS CLASS 2 TDMA AIR FORCE PROGRAM

Fiscal Year	Qty	FY 81 Base-Year Dollars			Then Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1980	--	--	--	5.8	--	--	5.5	9.4
1981	--	--	--	17.3	--	--	18.1	11.9
1982	--	--	--	32.0	--	--	35.7	9.2
1983	--	--	--	20.5	--	--	23.9	4.9
1984	--	--	--	18.8	--	--	22.8	3.8
1985	--	--	--	46.6	--	--	58.4	3.4
1986	--	--	--	51.3	--	--	66.3	2.9
1987	--	--	--	48.8	--	--	65.2	3.1
1988	--	--	--	65.1	--	--	90.0	3.5
1989	--	--	--	63.3	--	--	90.4	3.5
1990	--	--	--	31.8	--	--	46.8	3.3
1991	--	--	--	29.6	--	--	44.7	2.9
1992	--	--	--	27.7	--	--	42.8	2.4
Total	37	--	--	458.6	--	--	610.6	

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c. Annual Summary (Cont'd) --

PROGRAM: JTIDS CLASS 2 TDMA ARMY PROGRAM

Fiscal Year	Qty	FY 81 Base-Year Dollars			Then Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1976	--	--	--	0.1	--	--	0.1	6.6
1977	--	--	--	1.4	--	--	1.0	2.9
1978	--	--	--	1.1	--	--	0.8	2.6
1979	--	--	--	7.5	--	--	6.4	6.8
1980	--	--	--	4.6	--	--	4.3	9.4
1981	--	--	--	2.8	--	--	2.9	11.9
1982	--	--	--	10.9	--	--	12.2	9.2
1983	--	--	--	17.0	--	--	19.9	4.9
1984	--	--	--	17.6	--	--	21.3	3.8
1985	--	--	--	18.1	--	--	22.7	3.4
1986	--	--	--	10.9	--	--	14.1	2.9
1987	--	--	--	11.6	--	--	15.5	3.1
1988	--	--	--	7.9	--	--	10.9	3.5
Total	33	--	--	111.5	--	--	132.1	

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c. Annual Summary (Cont'd) --

PROGRAM: JTIDS CLASS 2 TDMA NAVY PROGRAM

Fiscal Year	Qty	FY 81 Base-Year Dollars			Then Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1986	--	--	--	35.6	--	--	46.0	2.9
1987	--	--	--	44.0	--	--	58.8	3.1
1988	--	--	--	72.4	--	--	100.0	3.5
1989	--	--	--	61.1	--	--	87.2	3.5
1990	--	--	--	44.1	--	--	64.8	3.3
1991	--	--	--	27.2	--	--	41.1	2.9
1992	--	--	--	23.2	--	--	35.9	2.4
1993	--	--	--	33.3	--	--	52.7	2.4
1994	--	--	--	32.1	--	--	52.0	2.4
1995	--	--	--	30.2	--	--	50.2	2.4
1996	--	--	--	17.5	--	--	29.7	2.4
Total	35	--	--	420.7	--	--	618.4	

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JTIDS Class 2 TDMA Terminal, December 31, 1986

16. Program Funding Summary: (Cont'd) (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures -- A/

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1976	0.1	0.1	0.1
1977	1.0	1.0	1.0
1978	0.8	0.8	0.8
1979	6.4	6.4	6.4
1980	9.8	9.8	9.8
1981	21.0	21.0	21.0
1982	47.9	47.9	47.5
1983	43.8	43.8	42.4
1984	44.1	44.1	39.1
1985	81.1	81.1	62.4
1986	126.4	96.1	59.0
1987	139.5	20.3	1.3
To Complete	839.2	N/A	N/A
Total	1361.1	372.4	290.8

A/ Program Office records as of December 1, 1986.

17. Production Rate Data:

- a. Annual Production Rates -- N/A
- b. Cost Variance -- N/A
- c. Schedule Variance -- N/A
- d. Deliveries (Plan/Actual) --

RDT&E To Date
46/46

18. Operating and Support Costs: N/A

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A-18 OH-58D

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SELECTED ACQUISITION REPORT (RCS: DB-COMP(Q&A)823)

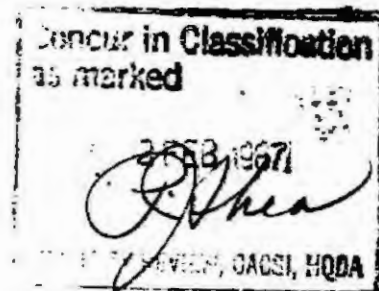
PROGRAM: ARMY HELICOPTER IMPROVEMENT PROGRAM (AHIP)

86-036

AS OF DATE: December 31, 1986

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1. (U) Designation and Nomenclature (Popular Name): OH-58D/Scout Helicopter (AHIP).
2. (U) DOD Component: Department of the Army.
3. (U) Responsible Office and Telephone Number:

Project Manager's Office
Army Helicopter Improvement Program
St. Louis, MO 63120-1798

Colonel John N. Tragesser
Assigned: April 15, 1985
AV: 693-1360; Commercial: (314) 263-1360

4. (U) Program Elements:

RDT&E: PE 64220 Project D518
PROCUREMENT: APPN 2031, SSN A22200
APPN 2031, SSN AA0961

CONCUR IN CLASSIFICATION
AS MARKED ATTY

FEB 25 1987

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

5. (U) Related Programs: None

6. (U) Mission and Description: The Army Helicopter Improvement Program (AHIP) OH-58D Aeroscout helicopter is a major modification of the existing OH-58A helicopter to incorporate improved hot-day and nap-of-the-earth (NOE) performance, a Mast Mounted Sight (MMS) day/night target acquisition designation system, improved NOE communication/navigation, and space, weight and power for later addition of the Air-to-Air Stinger. With these improvements, the AHIP scout will operate in air cavalry, attack helicopter and field artillery units and will provide a day/night/limited visibility command and control, surveillance, and target acquisition and laser designation system at stand-off ranges for Army and Air Force precision guided munitions. The MMS will enhance survivability by allowing surveillance, target acquisition and target designation from extended ranges with minimal exposure. The AHIP scout will be capable of worldwide deployment and will be a highly survivable, mobile, flexible system providing a full range of support to the ground commanders.

CLASSIFIED BY: CDR ANSON
REVIEW ON: 1 Sep 88

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Inclousures:

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OH-58D, December 31, 1986

7. (U) Program Highlights:

(U) a. Significant Historical Developments -- On 30 November 1979, an ASH Special ASARC reaffirmed the need for an Advanced Scout Helicopter (ASH). In July of 1980, an ASARC management review formally approved a program to compete a modification effort that would incorporate day/night target acquisition/designation capabilities; improved Nap-of-the-Earth (NOE) and tactical communication and navigation and an aircraft performance improvement which would permit operation with the AH-64A APACHE in the hot day, high altitude environment. A Required Operational Capability (ROC) document was approved on 9 January 1981. A formal solicitation was then issued to multiple helicopter manufacturers. Proposals were received by a Source Selection Evaluation Board in April 1981, with Hughes Helicopter Company, Inc. and Bell Helicopter Textron, Inc. being the only offerors. In September 1981, recommendations of the Source Selection Authority were provided to the Under Secretary of the Army and the Under Secretary of Defense. The recommendation was approved contingent upon the incorporation in the development contract of a "cap" on early production costs. An agreement for ceiling priced options for the first two years of production was incorporated in the contract and on 21 September 1981, a Full Scale Engineering Development (FSED) contract was awarded to BHTI for development and qualification of an improved scout helicopter to be identified as the OH-58D. The OH-58D results from major modification to the OH-58A observation helicopter. In March 1982, a formal ASARC II was conducted. The ASARC approved the FSED program acquisition strategy, including a degree of concurrency consistent with the reduced risk of a modification program. The acquisition strategy was designed to permit fielding of production aircraft in FY 1986. In April 1982, subsequent to a formal Preliminary Design Review (PDR), an OSD Program Go-Ahead review was conducted covering the OH-58D development and its associated concurrency. On 31 August 1982, a Secretary of Defense Decision Memorandum (SDDM) was signed, concurring in the AHIP program. A formal DA level In-Process Review (IPR) was conducted prior to each of the long lead releases. The OH-58D aircraft entered formal Government Development Testing (DT) II in July 1984. In September 1984, subsequent to a DA level IPR which included assessment of emerging DT II results, a low rate initial production contract was awarded for 16 OH-58D helicopters, associated support equipment and spare and repair parts. Operational Testing (OT) II of the OH-58D was conducted from September 1984 through February 1985. An Army Systems Acquisition Review Council (ASARC) was held on 23 July 1985 with Secretary of the Army decision to type classify to OH-58D as Standard A and to proceed into Full Scale Production, pending concurrence from OSD. On 7 October 1985 an SDDM was signed, type classifying Standard, the AHIP, approving it for the Field Artillery Aerial Observer role and directing that a Follow-On-Evaluation be conducted to demonstrate the OH-58D's contribution to the attack and air cavalry roles. A Lot 2 Production Contract for 44 aircraft was signed with BHTI on 28 October 1985. Production aircraft #1 and #2 were accepted in December 1985 IAW contract schedule.

(U) b. Significant Developments Since Last Report -- Aircraft procurement has been zeroed after 4th lot buy in FY87 with funds in FY88 for project termination. Lot #1 deliveries (16 aircraft total) were completed in July, just one month behind the original SAR forecast. Lot #2 deliveries are on schedule, with 24 aircraft delivered thru December. A Lot #3 production contract for 39 aircraft was signed 22 August 1986. All IKPT maintenance and operator courses are in process and scheduled for completion by February 1987.

The AHIP is expected to satisfy the mission requirements.

(U) c. Changes Since "As of" Date -- None.

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8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: None

9. (U) Schedule:

(U) a. Milestones	Development Estimate/ Approved Program	Current Estimate
FSD Contract Award	Sep 81/Sep 81	Sep 81
Long Lead Release	Jun 83/Jul 83	Jul 83
Initial Production Award	Oct 84/Sep 84	Sep 84
DT II/OT II Complete	Jan 85/Feb 85	Feb 85
Full Production Award	Jun 85/Oct 85	Oct 85
Start Follow-On Evaluation (FOE) ((Army Aerial Scout Test (AAST))	N/A /Mar 87	Mar 87
DSARC Review of FOE (AAST) Results	N/A /Sep 87	Sep 87
IOC	3QFY86/3QFY87	3QFY87

b. (U) Previous Change Explanations:

Long Lead Release slipped one month because of late arrival of contractor proposal and more extensive negotiations. To preserve favorable ceiling price options negotiated within the FSED contract, the first year production option had to be exercised on or before 1 Oct 84. It was signed on 25 Sep 84. OT II was extended two weeks to allow time for additional tests and because of weather delays. Full Production Award was delayed due to delay in the ASARC/DSARC process. The original IOC was scheduled for 3QFY86 but a VCSA decision was made to field AHIP on the basis of an entire AAH Battalion rather than a company as originally planned, thus slipping IOC 6 months. A delay of an additional 6 months to 3QFY87 was due to the SDDM decision to field initially to the Field Artillery Aerial Observer (FAAO) role and requiring a Follow-On Evaluation (FOE). The FOE, which required additional resources, was needed to qualify the AHIP for the Attack and Air Cavalry roles. The IOC will be a divisional General Support Aviation Company (GSAC) with 6 AHIPs in the FAAO role. The delayed IOC is not a result of any known or perceived problems with hardware/software production.

c. (U) Current Change Explanations: None

d. (U) References --

Development Estimate: SDDMs, dated 31 August 1982 and 7 October 1985, subject: "Army Helicopter Improvement Program (AHIP) for the Scout Helicopter."

Approved Program: FY88/89 President's Budget

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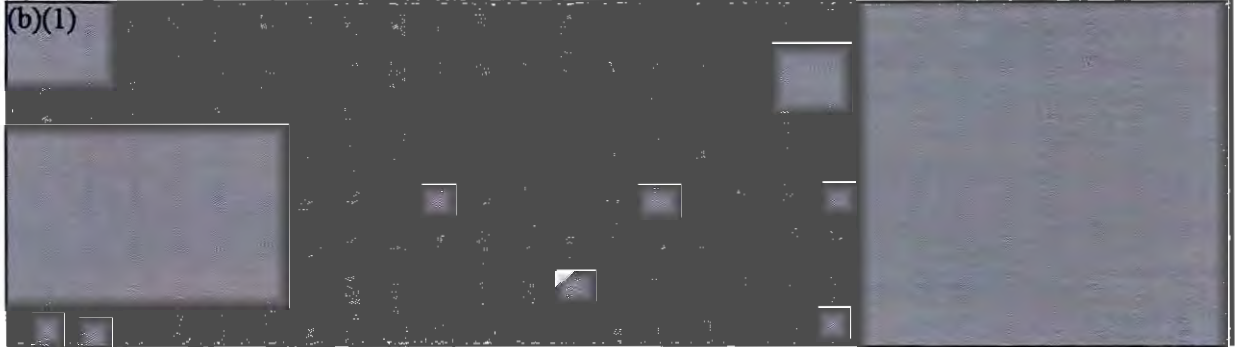
OH-58D, December 31, 1986

10. (U) Technical/Operational Characteristics:

(U) a. Technical	Dev Est/ Appr Pgm	Demonstrated Performance	Current Estimate
------------------	----------------------	-----------------------------	---------------------

Mast Mounted Sight (MMS) Performance

(b)(1)



(U) Mean Time Between Mission Affecting Failure (HR) (4 hour mission)	4.4/8.7	8.43	8.7
(U) Sortie Rate (Flight hours for Month)			
Peacetime	20/20	20	20
Wartime: Initial Surge	112/112	112	112
Sustained	65/65	65	65
(U) Maintenance Manhour/Flight Hr (AVUM)	3/3	1.07	3
(U) Mean Time to Repair (HRS) (AVIM)	2/2	.08	2
b. (U) Operational			
Vertical Rate of Climb (FT/MIN)			
2000 ft and 70°F	650/725	725	725
4000 ft and 95°F	500/560	560	560
Forward Flight Speed (KTAS)	112/120	120	120
Endurance (Hrs)	2.4/2.4	2.4	2.4

c. (U) Previous Change Explanation: Demonstrated Performance updated to reflect results of DT II/OT II. Current estimates reflect performance of production configuration. Nov 84 ROC revision defined reliability based on mean time between mission affecting failures in place of Operational Mission Reliability. Maintenance Reliability no longer used.

d. (U) Current Change Explanation: None

e. (U) References --

Development Estimate: SDDMs, dated 31 August 1982 and 7 October 1985, subject: "Army Helicopter Improvement Program (AHIP) for the Scout Helicopter."

Approved Program: FY88/89 President's Budget

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11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

		Development		Current
a. (U) Cost --		Estimate	Changes	Estimate
Development	\$	213.5	\$ -3.4	\$ 210.1
Procurement		1454.4	-747.4	707.0
Flyaway		(1152.9)	(-772.5)	(380.4)
Airframe		(329.7)	(-197.1)	(132.6)
Engine		(67.6)	(-50.9)	(16.7)
MMS/CDS		(559.1)	(-379.9)	(179.2)
Other Avionics		(148.9)	(-116.9)	(32.0)
Non Rec		(47.6)	(-27.7)	(19.9)
Other Wpn Sys Cost		(220.9)	(+16.0)	(236.9)
Initial Spares		(80.6)	(+9.1)	(89.7)
Total FY 82 Base Year \$		\$1667.9	\$-750.8	\$ 917.1
Escalation		863.7	-636.8	226.9
Development (RDT&E)		(14.6)	(-3.7)	(10.9)
Procurement		(849.1)	(-633.1)	(216.0)
<u>1/</u> Total Then-Year \$		\$2531.6	\$-1387.6	\$1144.0
b. (U) Quantities --				
Development (RDT&E)		5	N/A	5
Procurement		578	-443	135
Total		583	-443	140
c. (U) Unit Cost --				
Procurement:				
FY 82 Base-Year \$		\$2.52	\$+2.72	\$5.24
Then-Year \$		3.99	+2.85	6.84
Program:				
FY 82 Base-Year \$		2.85	+3.70	6.55
Then-Year \$		\$4.34	\$+3.83	\$8.17
d. (U) Approved Design to Cost Goal --				
(Average Unit Flyaway Cost)				
	Dev Estimate/ Appr Program	Current ^{2/} Estimate	Latest Approved Threshold	
@ Qty: 578				
@ Peak Rate: 10/mo				
FY 82 Base-Year \$	1.99/2.82	2.82	2.57	
Then-Year \$	3.19/3.64	3.64	3.67	
@ Qty: 116				
@ Peak Rate: 10/mo				
FY 82 Base-Year \$	2.80/3.25	3.25	3.61	
Then-Year \$	3.82/4.15	4.15	4.63	
e. (U) Foreign Military Sales -- None				
f. (U) Nuclear Costs -- None				

1/ FY85 and prior based on actuals; FY86 and out based on FYDP.

2/ Current estimate based on quantity of 135 versus 578.

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12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

		Current Year		Budget Year
		Current Estimate (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	UCR Baseline (Dec 86 SAR)
a.	(U) Program Acquisition--			
	(U) (1) Cost	1144.0	2943.4	1144.0
	(U) (2) Quantity	140	583	140
	(U) (3) Unit Cost	8.17	5.05	8.17
b.	(U) Current Procurement--	(FY 1987)	(FY 1987/APPN)	(FY 1988)
	(U) (1) Cost	175.8	179.3	48.1
	Less CY Adv Proc	22.0	22.5	N/A
	Plus PY Adv Proc	28.1	28.1	22.0
	Net Total	181.9	184.9	70.1
	(U) (2) Quantity	36	36	N/A
	(U) (3) Unit Cost	5.05	5.14	N/A

13. (U) Cost Variance Analysis:

a. (U) Summary--(Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	TOTAL
Development Estimate	228.1	2303.5	2531.6
Previous Changes:			
Economic	-5.3	-303.6	-308.9
Schedule	-	+177.0	+177.0
Engineering	+13.4	+33.7	+47.1
Estimating	-8.5	+242.2	+233.7
Support	-	+262.9	+262.9
Subtotal	- .4	+412.2	+411.8
Current Changes:			
Economic	-.1	-21.4	-21.5
Quantity	-	-1302.1	-1302.1
Estimating	-6.6	-	-6.6
Support	-	-469.2	-469.2
Subtotal	-6.7	-1792.7	-1799.4
Total Changes	-7.1	-1380.5	-1387.6
Current Estimate	221.0	923.0	1144.0

(FY 1982 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	TOTAL
Development Estimate	213.5	1454.4	1667.9
Previous Changes:			
Schedule	-	+ 73.0	+ 73.0
Engineering	+ 11.1	+ 21.0	+ 32.1
Estimating	- 8.9	+174.3	+165.4
Support	-	+156.0	+156.0
Subtotal	+ 2.2	+424.3	+426.5
Current Changes:			
Quantity	-	-857.0	-857.0
Estimating	- 5.6	-	-5.6
Support	-	-314.7	-314.7
Subtotal	- 5.6	-1171.7	-1177.3
Total Changes	- 3.4	-747.7	-750.8
Current Estimate	210.1	707.0	917.1

13. (U) Cost Variance Analysis (Cont'd):

b. (U) Previous Change Explanations--

RDTE

Economic: Revised escalation indices
 Engineering: Inclusion of Optical Improvement Program
 Estimating: Congressionally directed reduction in Total Risk Assessing Cost Estimate (TRACE).
 Revised computational method for FY 82 base year 82 \$.
 Turn-in of unused FSD contract contingency.

Procurement

Economic: Revised escalation indices
 Engineering: Inclusion of Optical Improvement Program
 Schedule: Program stretched in the FY 86-90 POM by Army.
 Program stretchout into FY92 due to POM restructuring and SDDM guidance.
 Estimating: Congressional Cuts (IR&D).
 HQS DA directed program changes (SINCGARS, GPS).
 Revised SPM based on first production contract cost
 Revised ECO costs for safety, RAM-D/O&S
 Support: Increased Initial Spares estimate based on refined configuration data, changing LSA results
 Inclusion of estimated warranty risk requirements

c. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(U) (1) <u>RDT&E</u>		
Revised Dec 86 economic escalation rates. (Economic)	N/A	- .1
Turn back of contract contingency funds and Gramm-Rudman cuts. (Estimating)	- 5.6	- 6.6
(U) (2) <u>Procurement</u>		
Revised Dec 86 economic escalation rates. (Economic)	N/A	- 21.4
Reduction of production program by 443 aircraft from 578 to 135.	-1171.7	-1771.3
o Deletion of 443 OH-58Ds (Quantity)	(-857.0)	(-1302.1)
o Initial spares and PGSE for deleted 443 OH-58Ds (Support)	(-314.7)	(-469.2)

d. (U) References --

Development Estimate: SDDMs, dated 31 August 1982 and 7 October 1985, subject: "Army Helicopter Improvement Program (AHIP) for the Scout Helicopter."

Approved Program: FY88/89 President's Budget.

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OH-58D, December 31, 1986

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

(U) Current Baseline Estimate to Current Estimate -

PAUC (Dev Est)	Changes								PAUC (Cur Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
4.3	-2.36	+4.51	+1.26	+.34	+1.62	-	-1.47	+3.9	8.2

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E - None

b. (U) Procurement -

Lot 2 Production
Bell Helicopter Textron, Inc.
Hurst, TX DAAJ09-85-C-A633
FFP.

Award: 25 Oct 85

Definitized: 25 Oct 85

Current Contract Price		
Target	Ceiling	Qty
189.3	N/A	44

Initial Contract Price		
Target	Ceiling	Qty
\$223.3	N/A	44

Estimated Price at Completion	
Contractor	Program Manager
189.3	189.3

Lot 3 Production
Bell Helicopter Textron, Inc.
Hurst, TX DAAJ09-86-C-0500
FFP

Award: 22 Aug 86

Definitized: 22 Aug 86

Current Contract Price		
Target	Ceiling	Qty
\$186.0	N/A	39.0

Initial Contract Price		
Target	Ceiling	Qty
\$185.3	N/A	39

Estimated Price at Completion	
Contractor	Program Manager
\$186.0	\$186.0

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(U) (1) Percent Program Completed: 89% (8 yrs/9 yrs)

(U) (2) Percent Program Cost Appropriated: 96% (\$1095.9/\$1144.0)
FY87 funds appropriated and authorized but have not been released.

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OH-58D, December 31, 1986

16. (U) Program Funding Summary (Cont'd):b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs</u>	<u>Budget Year</u>	<u>Balance to Complete FYDP</u>	<u>Beyond FYDP</u>	<u>Total</u>
RDT&E	221.0	-	-	-	221.0
Procurement	874.9	48.1	-	-	923.0
TOTAL	1095.9	48.1	-	-	1144.0

c. (U) Annual Summary -

Fiscal Year	Qty	FY 82 Base-Year Dollars			Then-Year Dollars		Total	Escl Rate (%)
		Flyaway		Total	Advance Proc Debit	Credit		
		Nonrec	Rec					
Appropriation: RDT&E								
1980				7.5			6.0	
1981	5	5.6	18.4	28.2			25.6	
1982		4.1	23.5	37.5			38.5	
1983		6.6	60.5	68.7			73.9	
1984		4.8	24.8	46.4			51.7	3.8
1985		2.3	3.4	15.0			17.2	3.4
1986		-	-	6.8			8.1	2.9
Subtotal	5	23.4	130.6	210.1			221.0	

Appropriation: Procurement

1983		2.4	30.2	32.6	17.3		38.3	9.0
1984	16	17.5	142.4	159.9	39.3	17.3	199.5	8.0
1985	44		181.2	181.2	47.8	39.3	233.1	3.4
1986	39		171.3	171.3	28.1	47.8	228.2	2.9
1987	36		128.1	128.1	22.0	28.1	175.8	3.1
1988			33.9	33.9		22.0	48.1	3.5
Subtotal	135	19.9	687.1	707.0	154.5	154.5	923.0	
Total	140	43.3	817.7	917.1	154.5	154.5	1144.0	

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OH-58D, December 31, 1986

16. (U) Program Funding Summary (Cont'd):

d. (U) Obligations and Expenditure --

Then-Year Dollars (Current Estimate in Millions)			
Fiscal Year	Total	Obligated	Expended
Appropriation: RDT&E			
1980	6.0	6.0	6.0
1981	25.6	25.6	25.6
1982	38.5	38.5	38.5
1983	73.9	73.9	73.9
1984	51.7	51.7	50.9
1985	17.2	16.5	11.2
1986	8.1	2.1	.9
TOTAL	221.0	214.3	207.0

Appropriation: Procurement

1983	38.3	38.3	38.3
1984	199.5	199.5	197.5
1985	233.1	228.6	183.4
To Complete	452.1	227.5	101.7
TOTAL	923.0	693.9	520.9

17. (U) Production Rate Data:

a. (U) Annual Production Rates -- (Note: The annual production rates shown below represent actual procurement buys in the given fiscal years. These rates do not reflect 12 month delivery periods).

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1984	16	16	16	16
1985	44	44	44	44
1986	56	39	39	39
1987	92	48	36	36
1988	120	32	-	
1989	130	81	-	
1990	120	116	-	
1991	-	120	-	-
1992	-	82	-	-

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OH-58D, December 31, 1986

17. (U) Production Rate Data (Cont'd):

b. (U) Cost Variance -- Dollars in Millions (NOTE: Subject to limitations on production rates above.)

Item	Production Estimate	Variance (CE less) PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (82 \$)	2094.4	-1177.3	917.1	0	917.1
(ESC \$)	2943.4	-1799.4	1144.0	0	1144.0
PAUC (82 \$)	3.6	+ 3.0	6.6	0	6.6
(ESC \$)	5.0	+ 3.2	8.2	0	8.2

c. (U) Schedule Variance -- (NOTE: Subject to the limitations on production rates above.)

	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum Economic
Start Date (Mo/Yr)	12/85	N/A	12/85	N/A	12/85
Duration (in Months)	86	-47	39	0	39
End Date (Mo/Yr)	11/92	N/A	02/89	0	02/89

d. (U) Deliveries (Plan/Actual) --

	<u>To Date</u>
RDT&E	5/5
Procurement	40/40

18. (U) Operating & Support Costs:

N/A

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

PROGRAM: OHIO CLASS D-5 CAPABLE SUBMARINE

AS OF DATE: DECEMBER 31, 1986

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CLEARED
FOR OPEN PUBLICATION
MAR 02 1987
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation/Nomenclature (Popular Name): OHIO Class Submarine.
2. DOD Component: U.S. Navy
3. Responsible Office and Telephone Number:

Strategic Systems Program Office
Department of the Navy
Washington, D.C. 20376-5002

PM: RADM K. Malley
Assigned: June 21, 1985
Telephone: 695-2064
Autovon: 225-2098

4. Program Elements:

RDT&E: 63371N, 64363N (J1546 only)
PROCUREMENT: 11228N, APPN 1611 ICN 1040

5. Related Programs:

TRIDENT I Backfit and TRIDENT II (D-5) Missile, and TRIDENT I System.

Classified by:
OPNAVINST S551-1 Enclosure (27)
Declassify on: OADR

(This Page is UNCLASSIFIED)

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6. Mission and Description: To provide an undersea strategic missile system to ensure that the U.S. continues to maintain a credible, survivable deterrent independent of foreseeable threats. The nuclear-powered OHIO Class D-5 capable submarine has 24 missile tubes. Incorporation of state-of-the-art technologies in submarine quietness, mobility, and self-defense make the submarine highly survivable. The submarine can patrol, transit, or evade enemy search forces at higher speeds than previous SSBNs. It has an integrated command and control system, including an integrated radio room designed to enhance the survivability of communication links in a hostile electromagnetic environment, and carries the latest submarine defense systems.

7. Program Highlights:

a. Significant Historical Developments -- The Deputy Secretary of Defense's Program Decision Memorandum (PDM) of 2 October 1981 directed the Navy to fund development of the TRIDENT II (D-5) missile with a December 1989 IOC. The design characteristics of the TRIDENT II (D-5) missile require modifications to the OHIO Class submarine. Efforts in FY 1982 included identification of the necessary subsystem changes to incorporate the TRIDENT II (D-5) missile in the OHIO Class submarine baseline. Required weapon support system and component developments were initiated.

On 29 April 1982, SECNAV maintained the December 1989 IOC for TRIDENT II (D-5), while rephrasing the introduction of the weapons system into the fleet. A decision was made to incorporate the D-5 Strategic Weapon System (SWS) starting with the ninth submarine (SSBN 734). The D-5 capability would be accomplished during initial construction of the ship, consequently the ninth ship delivery would be extended one year. The schedules of the tenth (SSBN 735) and the eleventh (SSBN 736) have also been extended. The twelfth (SSBN 737) and subsequent ship construction periods will not be affected by the change to TRIDENT II (D-5). On 1 June 1982 the SECDEF advised Congress of the decision to accelerate the rate of introduction of D-5 while maintaining the 1989 IOC.

In November 1982, the Navy executed modifications to the Electric Boat contract which incorporated the D-5 SWS into the ninth and tenth ships and revised their delivery dates to December 1988 and August 1989 respectively. On 21 November 1983 an option to acquire the eleventh ship (SSBN 736) was exercised. A contemporaneous modification to incorporate D-5 and extend delivery to April 1990 was also executed. The contract for the SSBN 737 (the twelfth ship) was awarded in August 1985.

b. Significant Development Since Last Report -- The December 1986 SAR Current Estimates are based on acquisition of eleven OHIO Class D-5 Capable Submarines at a shipbuilding rate of 1,0,1,1,1,1,1,1,1,1,1, beginning in FY 1981. To date, eight OHIO Class C-4 Capable submarines have been delivered seven of which have operationally deployed successfully. In March 1986 an option for the SSBN 738 (the thirteenth ship) was awarded to Electric Boat. The estimates contained in this report are based on the acquisition of eleven OHIO Class D-5 Capable Submarines through FY 1992.

c. Changes Since "As Of" Date -- None.

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8. Decision Coordinating Paper (DCP) Threshold Breaches:

a. DCP No. 67, 14 Sept 1971, as amended by Cover Sheet No. 3 of 17 Jan 1977.

b. There are currently no DCP threshold breaches.

9. Schedule:

a. Milestones --

	<u>Production Estimate/ Approved Program*</u>	<u>Current Estimate</u>
Complete Baseline Design	3/72	3/72
Characteristics Approved	1/73	1/73
Complete Ship Contract Design	8/84	8/84
Production Contract Award	1/82	1/82
Construction Started:		
(1) First Ship	1/82	1/82
(2) Last Ship	1/88	6/92 (CH-1)
Launch:		
(1) First Ship	11/86	12/86 (CH-2)
(2) Last Ship	7/92	11/96 (CH-1)
Acceptance Trials:		
(1) First Ship	12/88	12/88
(2) Last Ship	12/93	4/98 (CH-1)
Delivery:		
(1) First Ship	12/88	12/88
(2) Last Ship	12/93	4/98 (CH-1)
System IOC	12/89	12/89

* Production Estimate and Approved Program are the same therefore separate entries are not required.

b. Previous Change Explanations -- Program year 1987 and subsequent years start of construction and ship delivery dates have been delayed due to the deletion of advance procurement funding for contractor furnished equipment long leadtime items.

c. Current Change Explanation --

(CH-1) The Current Estimate is based on a total program of 11 submarines vice the 7 included in the Production Estimate.

(CH-2) The ceremonial launch of the SSBN 734 occurred on December 13, 1986.

d. References --

Production Estimate: USD (R&E) Memo of July 22, 1981, subject OHIO Class Submarine program.

Approved Program: FY 1988/1989 President's Budget.

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OHIO CLASS D-5 CAPABLE SUBMARINE, DECEMBER 31, 1986

10. ~~(S)~~ Technical/Operational Characteristics: The following characteristics are based on those of the currently deployed OHIO Class C-4 Configured Submarine. No change is anticipated in the Demonstrated Performance.

a. Technical --	<u>Production Estimate</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(U) Length Overall (Feet)	558		560
(U) Beam Max. (hull diameter in feet)	42	N O	42
(U) Draft Navigation (feet)	35.5	T	36.5
(U) Submerged Displacement (tons)	18,500		18,700
(b)(1)			
(U) Propulsion		V	
(1) (U) Type	Nuclear	A	Nuclear
(b)(1)			
(U) Accommodations, Crew	155	L A B	164
b. Operational --			
(b)(1)			
(U) Endurance			
(1) Range	Unlimited		Unlimited
(2) Stores (days)	90		90
(U) Armament			
(1) Missile Tubes	24		24
(2) Torpedo Tubes	4		4

c. Previous Change Explanations -- None.

d. Current Change Explanation -- None.

e. References --

Production Estimate: OPNAVINST C-9010.296, dated April 12, 1981, subject approved characteristics of the OHIO Class Submarine.

Approved Program: FY 1988/1989 President's Budget.

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11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Production Estimate (FY81-FY88)	Changes	Current Estimate (FY81-FY92)
a. Submarine Costs --			
Development (RDT&E)	49.3	23.0	72.3
Procurement (SCN)	9980.0	3790.1	13770.1
Construction (MILCON)	519.6	-103.1	416.5
Total FY83 Base-Yr \$	10548.9	3710.0	14258.9
Escalation	3536.3	-917.2	2619.1
Development (RDT&E)	3.6	3.6	7.2
Procurement (SCN)	3416.8	-878.6	2538.2
Construction (MILCON)	115.9	-42.2	73.7
Total Then-Yr \$	14085.2	2792.8	16878.0

*Excludes FY 92 Advance Procurement for the FY 93 ships.

b. Submarine Quantities --

Development (RDT&E)	0	0	0
Procurement (SCN)	7	4	11
Total	7	4	11

c. Submarine Unit Cost --

Procurement:			
FY83 Base-Yr \$	1425.7	-173.9	1251.8
Then-Yr \$	1913.8	-431.3	1482.6
Program:			
FY83 Base-Yr \$	1507.0	-210.7	1296.3
Then-Yr \$	2012.2	-477.8	1534.4

d. Approved Design to Cost Goal -- None.

e. Foreign Military Sales -- None.

f. Nuclear Costs -- The Current Estimate for Procurement includes \$1619.3 million for Nuclear Propulsion costs. The OHIO Class D5 Capable SSBN Program draws upon general reactor plan research and development work performed by the Department of Energy (DOE) but this contribution can not be quantified.

g. Excludes the following D5 Missile and General Support MILCON costs which are not applicable to the Submarine Acquisition Program:

TRIDENT II (D5) Missile -	668.4
General Support -	520.8
Total -	1189.2

Excludes FY1991 and FY1992 RDT&E costs (\$3.9M) which are beyond IOC and are not acquisition related.

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Yr) Dollars in Millions)

	Current Year (FY87)		Budget Year(FY88)
	SAR Current Estimate (Dec 86 SAR)	UCR Baseline Estimate (Dec 85 SAR)	UCR Baseline Estimate (Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	16878.0	16339.8	16878.0
(2) Quantity	11	10	11
(3) Unit Cost	1534.4	1634.0	1534.4
b. Current Procurement -	(FY87 APPROPRIATION ACT)		(FY 1988)
(1) Cost	1438.1	1438.1	1353.3
Less CY Adv Proc	-146.4	-146.4	-137.1
Plus FY Adv Proc	175.0	175.0	150.4
Less OF/PD	-6.0	-6.0	-22.5
Net Total	1460.7	1460.7	1344.1
(2) Quantity	1	1	1
(3) Unit Cost	1460.7	1460.7	1344.1

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	SCN	MILCON	TOTAL
Production Estimate	52.9	13396.8	635.5	14085.2
Previous Changes:				
Economic	-2.3	-2301.0	-27.3	-2330.6
Quantity		5783.8		5783.8
Schedule				0.0
Engineering				0.0
Estimating	-29.9	-1164.4	-64.1	-1198.6
Other				0.0
Support				0.0
Subtotal	27.6	2318.4	-91.4	2254.6
Current Changes:				
Economic	-0.6	-587.5	-4.9	-593.0
Quantity		1614.2		1614.2
Schedule				0.0
Engineering				0.0
Estimating	-0.4	-433.6	-49.0	-483.0
Other				0.0
Support				0.0
Subtotal	-1.0	593.1	-53.9	538.2
Total Changes	26.6	2911.5	-145.3	2792.8
Current Estimate	79.5	16308.3	490.2	16878.0

(FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	SCN	MILCON	TOTAL
Production Estimate	49.3	9980.0	519.6	10548.9
Previous Changes:				
Quantity		3825.8		3825.8
Schedule				0.0
Engineering				0.0
Estimating	23.3	-880.1	-62.1	-918.9
Other				0.0
Support				0.0
Subtotal	23.3	2945.7	-62.1	2906.9
Current Changes:				
Quantity		1188.0		1188.0
Schedule				0.0

Engineering				0.0
Estimating	-0.3	-343.6	-41.0	-384.9
Other				0.0
Support				0.0
Subtotal	-0.3	844.4	-41.0	803.1
Total Changes	23.0	3790.1	-103.1	3710.0
Current Estimate	72.3	13770.1	416.5	14258.9

13. Cost Variance Analysis (cont'd):

b. Previous Change Explanations --

RDT&E

Economic: revised escalation indices.

Estimating: transfer of certain efforts properly identified with D-5 capable SSBNs from the TRIDENT I program.

Procurement

Economic: revised escalation indices.

Quantity: three additional submarines.

Estimating: revised estimates for shipbuilding costs.

MILCON

Economic: revised escalation indices.

Estimating: recategorization of construction projects as unique to the General Support Program and revised estimates.

c. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised Jan 87 economic escalation rates. (Economic)	N/A	-.6
Revised estimates. (Estimating)	-.3	-.4
(2) <u>Procurement</u>		
Revised Jan 87 economic escalation rates. (Economic)	N/A	-587.5
Increase is the result of the addition of one ship (FY 1992) to the program. Current program includes eleven ships vice ten in the previous program. (Quantity)	1,188.0	1,614.2
Decrease due to revised estimates for shipbuilding and GFE costs. (Estimating)	-343.6	-433.6

13. Cost Variance Analysis (cont'd)(3) MILCON

Revised Jan 87 economic escalation rates. (Economic)	N/A	-4.9
Recategorization of some refit facility projects from the General Support Program and revised construction estimates. (Estimating)	-41.0	-49.0

14. Program Acquisition Unit Cost (PAUC) History:

a. Initial SAR Estimate to Current Baseline Estimate -- For the OHIO Class D5 Capable Submarine Program, the initial SAR estimate is the Current Baseline Estimate.

b. Current Baseline Estimate to Current Estimate --

PAUC BASELINE SAR EST. PdE	Changes (Then Year Dollars in Millions)								PAUC CURRENT ESTIMATE
	ECON	QTY	SCH	ENG	EST	SPT	OTHER	TOTAL	
2012.2	-265.8	-59.1	0.0	0.0	-152.9	0.0	0.0	-477.8	1534.4

15. Contract Information: (THEN-YEAR DOLLARS IN MILLIONS)

a. Procurement (SCN) --

Submarine:

General Dynamics Corp.,
Electric Boat Division
Groton, Ct.

N00024-81-C-2134/FPIF

Award Date: January 7, 1982

(Group IV Construction, FY81, 83
and 84 Ships)

INITIAL CONTRACT PRICE

Target	Ceiling	Qty
1,590.7	1,801.8	3

CURRENT CONTRACT PRICE

Target	Ceiling	Qty
1,686.4	1,910.5	3

ESTIMATED PRICE AT COMPLETION

Contractor	Program Manager
1,647.0	1,640.3

COST VARIANCE

SCHEDULE VARIANCE

PREVIOUS CUMULATIVE VARIANCE

(2.4)

4.3

CUMULATIVE VARIANCES as of Sept 86

14.8

(1.0)

NET CHANGE

17.2

(5.3)

Explanation of Change: The net changes reflected are not significant in relation to the current contract target price. The favorable net change in cost variance is a result of slightly lower labor and material costs in a wide variety of cost accounts. The negative net change in schedule variance as related to the previous cumulative variance and the cumulative variance to date does not represent construction progress which is on or slightly ahead of schedule but does reflect lower material progress not directly associated with construction progress. Program Manager's estimate at completion remains within approved budget.

Submarine:

General Dynamics Corp.,
Electric Boat Division
Groton, Ct.

N00024-85-C-2062/FPIF

Baseline Date: Sept 1985

Awarded: Aug 13, 1985

(Group V Construction, FY85
and 86 Ships)

INITIAL CONTRACT PRICE

Target	Ceiling	Qty
1,203.4	1,412.5	2

15. Contract Information (cont'd): (THEN-YEAR DOLLARS IN MILLIONS)

CURRENT CONTRACT PRICE			ESTIMATED PRICE AT COMPLETION	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
1,207.5	1,417.4	2	1,221.9	1,207.5

	<u>COST VARIANCE</u>	<u>SCHEDULE VARIANCE</u>
PREVIOUS CUMULATIVE VARIANCES	N/A	N/A
CUMULATIVE VARIANCES as of Sept 86	(4.8)	9.7
NET CHANGE	(4.8)	9.7

Explanation of Change: The cumulative cost and schedule variances are not significant in relation to the current contract target price. The Navy believes that this procurement is too new to draw meaningful cost or schedule trend conclusions at this time. Program Managers estimate at completion remains within approved budget.

Nuclear:

General Electric Company
 Niskayuna, N.Y.
 N00024-78-C-5235/CPFF
 Award Date: July 1, 1977

INITIAL CONTRACT PRICE	
<u>Target</u>	<u>Qty</u>
378.4	N/A

CURRENT CONTRACT		PM'S EST. PRICE
<u>Target</u>	<u>Qty</u>	<u>AT COMPLETION</u>
378.4	N/A	378.4

Explanation of Change: Under Naval Nuclear Propulsion Program prime contracts about 90 percent of the contract value is subcontracted in fixed price type subcontracts. In these circumstances, control of prime contract cost and measurement of planned vs. actual cost is exercised through detailed Government and prime contractor surveillance of subcontract obligations rather than through a cost-base "earned value" system such as that defined in DOD Instruction 7000.2. NAVMAT ltr MAT 0244:EAO of 18 Dec 1972 waives the requirements of DOD Instruction 7000.2 for Naval Nuclear Propulsion Program procurements. Program Manager's estimate at completion remains within approved budget.

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OHIO CLASS D-5 CAPABLE SUBMARINE, DECEMBER 31, 1986

15. Contract Information (cont'd): (THEN-YEAR DOLLARS IN MILLIONS)Nuclear:

Department of Energy

Germantown, MD

N00024-67-F-5110/EAO

Award Date: July 1, 1977

INITIAL CONTRACT PRICE

TargetQty

442.7

N/A

CURRENT CONTRACT

TargetQty

PM'S EST. PRICE

AT COMPLETION

442.7

N/A

442.7

Explanation of Change: See above.Nuclear:

General Electric Company

Schnectady, NY

N00024-85-C-4011/CPFF

Award Date: December 3, 1984

INITIAL CONTRACT PRICE

TargetQty

197.5

N/A

CURRENT CONTRACT

TargetQty

PM'S EST. PRICE

AT COMPLETION

197.5

N/A

197.5

Explanation of Change: See above.Nuclear:

Westinghouse

Pittsburg, PA

N00024-85-C-4015/CPFF

Award Date: October 29, 1984

INITIAL CONTRACT PRICE

TargetQty

65.2

N/A

CURRENT CONTRACT

TargetQty

PM'S EST. PRICE

AT COMPLETION

65.2

N/A

65.2

Explanation of Change: See above.

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16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 38.9% (7 yrs/18 yrs)

(2) Percent Program Cost Appropriated: 55.8% (\$9418.6/\$16878.0)

b. Appropriation Summary --

Appropriation	Current & Prior Yrs (FY81-87)	Budget Year (FY88)	Balance to Complete FYDP (FY89-92)	Beyond FYDP	Total
RD&E	58.4	7.7	13.4	0.0	79.5
SCN	8996.3	1353.3	5805.0	153.7	16308.3
MILCON	363.9	73.8	52.5	0.0	490.2
Total	9418.6	1434.8	5870.9	153.7	16878.0

16. Program Funding Summary (Cont'd): (Current Estimate in Millions)

c. Annual Summary --

Fiscal Year	Qty	FY 83 Base-Year Dollars			Then-Year Dollars			Escl
		Sailaway		Total	Advance Proc		Total	Rate
		Nonrec	Rec		Debit	Credit		(%)

Appropriation: RDT&E

1982				24.6			24.6	7.6
1983				0.0			0.0	4.9
1984				9.0			9.5	3.8
1985				8.6			9.4	3.4
1986				7.9			8.9	2.9
1987				5.2			6.0	3.1
1988				6.4			7.7	3.5
1989				6.1			7.6	3.5
1990				4.5			5.8	3.3
Subtotal				72.3			79.5	

Appropriation: SCN

1981	1		1455.6	1440.8	500.5	149.1	1466.6	9.6
1982	0			346.1	330.7		363.0	7.5
1983	1		1422.5	1254.1	81.3	286.0	1338.4	3.8
1984	1		1311.3	1575.3	308.8	322.4	1738.5	3.0
1985	1		1273.5	1253.9	265.4	287.8	1410.0	2.1
1986	1		1163.3	1071.7	150.4	266.4	1241.7	1.2
1987	1		1222.0	1203.1	146.4	175.0	1438.1	3.1
1988	1		1091.6	1099.1	137.1	150.4	1353.3	3.5
1989	1		1106.7	1124.1	144.1	146.4	1422.6	3.5
1990	1		1130.7	1163.1	151.5	137.1	1510.1	3.3

1991	1		1151.4	1063.1		144.1	1414.1	2.9
1992	1		1161.8	1070.6		151.5	1458.2	2.4
1993				25.2			35.1	2.4
1994				20.2			28.9	2.4
1995				20.2			29.6	2.4
1996				19.9			29.8	2.4
1997				11.2			17.1	2.4
1998				8.4			13.2	2.4
Subtotal	11		13490.4	13770.1	2216.2	2216.2	16308.3	

Appropriation: MILCON

1982				12.8			13.0	7.6
1983				14.0			14.8	4.9
1984				15.6			17.0	3.8
1985				85.5			96.2	3.4
1986				79.1			91.8	2.9
1987				109.3			131.1	3.1
1988				59.5			73.8	3.5
1989				27.0			34.5	3.5
1990				13.7			18.0	3.3
Subtotal				416.5			490.2	
Total	11		13490.4	14258.9	2216.2	2216.2	16878.0	

16. Program Funding Summary (Cont'd):

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1982	24.6	24.6	24.6
1983	0.0		
1984	9.5	9.5	9.3
1985	9.4	9.4	6.7
1986	8.9	3.2	1.5
1987	6.0	0.0	0.0
To Compl	21.1	N/A	N/A
Total	79.5	46.7	42.1

Appropriation: SCN			
1981	1466.6	1395.5	1193.8
1982	363.0	329.8	295.8
1983	1338.4	1043.1	609.5
1984	1738.5	1238.5	542.9
1985	1410.0	969.4	169.4
1986	1241.7	650.3	6.7
1987	1438.1	51.5	0.0
To Compl	7312.0	N/A	N/A
Total	16308.3	5678.1	2818.1

Appropriation: MILCON			
1982	13.0	13.0	13.0
1983	14.8	14.8	14.8
1984	17.0	17.0	17.0

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OHIO CLASS D5 CAPABLE SUBMARINE, DECEMBER 31, 1986

1985	96.2	96.1	96.1
1986	91.8	91.8	33.0
1987	131.1	0.0	0.0
To Compl	126.3	N/A	N/A
Total	490.2	232.7	173.9

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17. Production Rate Data: Not applicable. Programs that produce at a rate less than six per year are not required to complete section 17.
18. Operating and Support Costs: Not applicable since OHIO Class D5 Capable Submarine is not a new SAR.

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SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A)823)

PROGRAM: TRIDENT II (D-5) MISSILE

AS OF DATE: DECEMBER 31, 1986

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MAR 02 1987
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): Sea Launched Ballistic Missile-UGM 133A TRIDENT II (D-5) Missile.

2. DOD Component: U.S. Navy.

3. Responsible Office and Telephone Number:

Strategic Systems Program Office
Department of the Navy
Washington, D.C. 20376-5002

PM: RADM K. Malley
Assigned: June 21, 1985
Telephone: (202) 695-2064
Autovon: 225-2098

4. Program Elements:

RDT&E: PE 63371N, PE 64363N Project J0951 (Shared funding)

PROCUREMENT: PE 11228N, APPN 1507 ICM 1150

5. Related Programs: TRIDENT Submarine System, TRIDENT I (C-4) Missile System, Fleet Ballistic Missile System, and Department of Energy re-entry vehicle development.

Classified by: .
OPNAVINST 5512.5A-Enclosure (27)
Declassify by: OADR

(This page is unclassified)

~~SECRET RESTRICTED DATA~~

6. Mission and Description: The TRIDENT II (D-5) Strategic Weapons System program develops an improved Sea Launched Ballistic Missile (SLBM) with greater accuracy and payload capability at equivalent ranges as compared to the current TRIDENT I (C-4) system. TRIDENT II will enhance U.S. strategic deterrence by providing a survivable sea-based system capable of engaging the full spectrum of potential targets. It will enhance the U.S. position in strategic arms negotiation by providing a weapons system with performance and payload flexibility that will accommodate various treaty initiatives. TRIDENT II's increased payload allows the deterrent mission to be achieved with fewer submarines.

7. Program Highlights:

a. Significant Historical Developments -- In March 1980 the Secretary of Defense described to Congress a Sea Launched Ballistic Missile Modernization Advanced Development Program which would lead to an end of FY 1983 Defense System Acquisition Review Council Milestone II decision to select a weapon system option which would achieve specific performance objectives with an IOC of CY 1989. The Advanced Development phase included consideration of options which increased payload using Mark 4 and new higher yield Re-entry Bodies, enhanced range, and significantly improved accuracy over that of the currently deployed TRIDENT I (C-4) missile. The Secretary of Defense reaffirmed the need for an improved Sea Launch Ballistic Missile in his Decision Memorandum of 2 February 1981 and stated that the 7 March 1980 report to Congress "serves the role of a Mission Element Need Statement". The Deputy Secretary of Defense in his Program Decision Memorandum of 2 October 1981, directed the Navy to fund the development of the D-5 missile with a December 1989 IOC and in his Program Budget Decision of 29 December 1982 he approved funds for the development of a new higher yield Re-Entry Body for the TRIDENT II (D-5) Missile. The Deputy Secretary of Defense in his memorandum to the Secretary of the Navy of 28 October 1983, authorized the Navy to proceed to full scale Engineering Development of the TRIDENT II (D-5) SWS and initial production, as necessary, to meet a December 1989 IOC. All major D-5 weapon system subsystem completion development contracts were awarded as of March 1984. Subsystem development testing is successfully underway.

b. Significant Development Since Last Report -- Major missile subsystem effort was centered on fabrication, assembly and test of initial flight test vehicles scheduled for flight in 1987. During the course of FY 1986, a total of twenty-two development vehicles (flight test, development special vehicles, and active inert missiles) were either being completed or in fabrication. A major underground test to assess the survivability of the missile body, MK 5 reentry body, and Department of Energy components was completed. Flight confidence testing of flight configuration assemblies was conducted along with system level testing of first, second and third stage motors, missile structures, missile electrical and electronic systems, and the MK5 reentry system.

7. Program Highlights (cont'd):

Test and evaluation of MK 6 guidance system engineering models and assembly of the first lot of development guidance system prototypes were completed.

System level hardware tests of the development launcher subsystem were completed and underwater launcher closure tests started. Fire Control software development continued for support of the development flight test program and the fire control system that will support flat pad missile test firings was delivered. Pre-production navigation subsystem equipment and computer programs were delivered to the Navigation Test Vehicle (USNS VANGUARD) for a thorough checkout both dockside and at sea.

Installation and checkout of equipment at the launch and missile processing facilities at Cape Canaveral was completed, and telemetry and communications capabilities required to support development flight testing at the Eastern Test Range were installed. Established interfaces between the weapon system subsystems and between the weapon system and the submarine were modified to reflect the maturing of subsystem designs during engineering development. Procurement of tactical equipments for the TRIDENT Training Facility at Kings Bay, Georgia continued.

The estimates included in the December 31, 1986 SAR are based on:

(1) a development flight test program of twenty flat pad test missiles and ten Performance Evaluation Missiles (PEM) flown from an SSBN leading to a December 1989 Initial Operational Capability.

(2) acquisition of 815 TRIDENT II missiles through FY 1999 to support eventual deployment of nineteen OHIO Class submarines.

(3) a MILCON program to support establishment of a TRIDENT II missile processing capability at the Strategic Weapons Facility, Atlantic in Kings Bay, GA and the Strategic Weapons Facility, Pacific in Bangor, WA.

c. Changes Since "As Of" Date -- The first development flight test was successfully launched from a flat pad at Cape Canaveral on January 15, 1987.

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP threshold breaches.

9. Schedule:

a. Milestones --

	<u>Planning Estimate/ Approved Program*</u>	<u>Current Estimate</u>
Initiated Concept Definition	10/77	10/77
Commenced Advanced Development Phase	10/80	10/80
Commenced Full Scale Engineering Development	10/83	10/83
First Development Flight Test	1/87	1/87
Award Initial Missile Production Contract (Production Approval)	3/87	3/87

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TRIDENT II (D-5) MISSILE, DECEMBER 31, 1986

a. Milestones -- (Continued)	<u>Planning Estimate/ Approved Program*</u>	<u>Current Estimate</u>
First Demonstration and Shakedown (DASO) Missile Test Flight	8/89	8/89
Initial Operating Capability	12/89	12/89**

* Planning Estimate and Approved Program are the same, therefore separate entries are not required.

** May be less than full missile outload due to reduction of FY 1987 quantity to 21 D-5 missiles.

b. Previous Change Explanations -- None.

c. Current Change Explanations -- None.

d. References --

Planning Estimates:

SECDEF Report to Congress of March 7, 1980, subject SLEM Modernization Action Memorandum.

DEPSECDEF Memorandum to SECNAV of October 28, 1983, subject TRIDENT II Full Scale Engineering Development authorization.

DEPSECDEF Program Decision Memorandum of October 2, 1981, subject Funding of D-5 missile with December 1989 IOC.

Approved Program: FY 1988/FY 1989 President's Budget

10. Performance Characteristics:

a. Characteristics --	<u>Base Line Estimate DCP Threshold</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
-----------------------	---	-------------------------------------	-----------------------------

(b)(1)

b. Previous Change Explanations --

Current estimate for System Reliability reflects deletion of production continuity and life-of-type buys of critical components as changed in the December 31, 1985 SAR.

Latest estimate of military characteristics for the warhead for the TRIDENT II (D-5), MK-5 Reentry Body as cited by the joint DOD/DOE Military Liaison Committee in letter dated July 23, 1984.

c. Current Change Explanations --

(CH-1) Refinement of estimate based on detailed evaluation of hardware testing.

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TRIDENT II (D-5) MISSILE, DECEMBER 31, 1986

d. References --

Planning Estimates:

SECNAV Memorandum for DEPSECDEF, dated August 16, 1976, subject, TRIDENT II Missile Conceptual Goals and Tentative Milestones.

SECDEF Decision Memorandum, dated February 2, 1981, subject, SLBM Modernization.

CNO Memorandum, dated April 28, 1982, subject, TRIDENT II (D-5) Development Objectives.

DEPSECDEF Memorandum to SECNAV, dated October 28, 1983, subject, TRIDENT II (D-5) Full Scale Engineering Development authorization.

DOD/DOE Military Liaison Committee letter dated July 23, 1984, subject, Characteristics for the TRIDENT II (D-5) MK5 Reentry Body.

Approved Program: FY 1988/FY 1989 President's Budget

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1. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Planning Estimate (FY78-96)	Changes	Current Estimate (FY78-99)
a. Missile Costs --			
Development (RDT&E)	9057.2	-622.3	8434.9
Procurement (WPN)	14988.3	2600.2	17588.5
Missile	(14975.1)	(2579.0)	(17554.1)
Initial Spares	(13.2)	(21.2)	(34.4)
Construction (MILCON)	217.4	315.5	532.9
Total FY83 Base-Yr \$	24262.9	2293.4	26556.3
Escalation	13382.2	-4420.0	8962.2
Development (RDT&E)	(1739.5)	(-721.2)	(1018.3)
Procurement (WPN)	(11600.1)	(-3791.7)	(7808.4)
Construction (MILCON)	(42.6)	(92.9)	(135.5)
Total Then-Yr \$	37645.1	-2126.6	35518.5

b. Missile Quantities --

Development (RDT&E)	30	0	30
Procurement (WPN)	710	105	815
Total	740	105	845

c. Missile Unit Cost --

Procurement:			
FY83 Base-Yr \$	21.1	0.5	21.6
Then-Yr \$	37.4	-6.3	31.2
Program:			
FY83 Base-Yr \$	32.8	-1.4	31.4
Then-Yr \$	50.9	-8.8	42.0

d. Approved Design to Cost Goal -- None.

e. Foreign Military Sales -- Not Applicable.

f. Nuclear Costs -- The D5 Missile Program draws upon research and development work performed by the Department of Energy but this contribution cannot be quantified.

g. Excludes the following D5 Submarine and General Support MILCON current estimates which are not unique to the D5 Missile Acquisition Program:

D5 Submarine	-	\$490.2
General Support	-	\$520.8

TOTAL	\$1,011.0
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Excludes the following current estimates budgeted for research and development (RDT&E,N) of Ballistic Missile Defense Penetration System and RDT&E,N effort (FY1991 and FY1992) which are not considered acquisition related:

FY 1984 -1992	\$497.3
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12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Yr) Dollars in Millions)

	Current Year (FY87)		Budget Year(FY88)
	SAR Current Estimate	UCR Baseline Estimate (DEC 85 SAR)	UCR Baseline Estimate
a. Program Acquisition --			
(1) Cost	35518.5	34773.0	35518.5
(2) Quantity	845	818	845
(3) Unit Cost	42.0	42.5	42.0
b. Current Procurement -	(FY87)	(FY87)	(FY88)
(1) Cost	1348.7	1426.0	2254.2
Less CY Adv Proc	-266.4	-300.0	-320.0
Plus FY Adv Proc	235.3	244.5	273.7
Net Total	1317.6	1370.5	2207.9
(2) Quantity	21	21	66
(3) Unit Cost	62.7	65.3	33.5

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	WPN	MILCON	TOTAL
Planning Estimate	10796.7	26588.4	260.0	37645.1
Previous Changes:				
Economic	-486.9	-5705.0	-30.7	-6222.6
Quantity		2962.5		2962.5
Schedule		343.2		343.2
Engineering				0.0
Estimating	-677.3	490.9	253.5	67.1
Other				0.0
Support		-22.3		-22.3
Subtotal	-1164.2	-1930.7	222.8	-2872.1
Current Changes:				
Economic	-101.7	-552.5	-3.3	-657.5
Quantity		764.6		764.6
Schedule				0.0
Engineering				0.0
Estimating	-77.6	551.0	188.9	662.3
Other				0.0
Support		-23.9		-23.9
Subtotal	-179.3	739.2	185.6	745.5
Total Changes	-1343.5	-1191.5	408.4	-2126.6
Current Estimate	9453.2	25396.9	668.4	35518.5

(FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	WPN	MILCON	TOTAL
Planning Estimate	9057.2	14988.3	217.4	24262.9
Previous Changes:				
Quantity		1447.1		1447.1
Schedule		79.8		79.8
Engineering				0.0
Estimating	-550.3	312.3	172.1	-65.9
Other				0.0
Support		-17.6		-17.6
Subtotal	-550.3	1821.6	172.1	1443.4
Current Changes:				
Quantity		454.0		454.0

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TRIDENT II(D5) MISSILE, DECEMBER 31, 1986

Schedule				0.0
Engineering				0.0
Estimating	-72.0	344.4	143.4	415.8
Other				0.0
Support		-19.8		-19.8
Subtotal	-72.0	778.6	143.4	850.0
Total Changes	-622.3	2600.2	315.5	2293.4
Current Estimate	8434.9	17588.5	532.9	26556.3

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13. Cost Variance Analysis (cont'd):

b. Previous Change Explanations --

RD&E

Economic: Revised escalation indices.

Estimating: Final definitization of TRIDENT II (D-5)
 Operational Systems Development and
 Production Contracts and guidance
 development contract; revised
 estimating of potential change orders.

Procurement

Economic: Revised escalation indices.

Quantity: Additional missiles required for three
 additional submarines.

Schedule: Deferral of 24 missiles from FY 1987
 through FY 1990 to FY 1998; requali-
 fication costs resulting from deferral
 of Production Continuity material pro-
 curements until required on lead time
 away basis.

Estimating: Latest repricing estimates.

Support: Reduced initial spares.

MILCON

Economic: Revised escalation indices.

Estimating: Recategorization of construction projects
 as unique to the General Support Program;
 revised estimates.

c. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RD&E</u>		
Revised Jan 87 economic escalation rates. (Economic)	N/A	-101.7
Congressional reductions and revised estimates. (Estimating)	-72.0	-77.6
(2) <u>Procurement</u>		
Revised Jan 87 economic escalation rates. (Economic)	N/A	-552.5
Increases associated with addition of 27 missiles, which are required as a result of the OHIO Class Submarine Program quantity increase from eighteen to nineteen submarines. (Quantity)	454.0	764.6

13. Cost Variance Analysis (cont'd):

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised MK-6 Guidance cost estimates. (Estimating)	537.9	782.5
Congressional reductions and revised estimates. (Estimating)	-193.5	-231.5
Decreases based on minor repricing. (Support)	-19.8	-23.9
(3) <u>MILCON</u>		
Revised Jan 87 economic escalation rates. (Economic)	N/A	-3.3
Increases due to a recategorization of several projects from the General Support Program. (Estimating)	157.9	212.1
Revised construction estimates. (Estimating)	-14.5	-23.2

14. Program Acquisition Unit Cost (PAUC) History:

a. Initial SAR Estimate to Current Baseline Estimate -- For the Trident II (D5) Missile Program the initial SAR estimate is the Current Baseline Estimate.

b. Current Baseline Estimate to Current Estimate --

PAUC BASELINE SAR EST. PE	Changes (Then Year Dollars in Millions)								PAUC CURREN ESTIMAT
	ECON	QTY	SCH	ENG	EST	SPT	OTHER	TOTAL	
50.9	-8.1	-1.9	0.4	0.0	0.9	-0.1	0.0	-8.8	42.

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TRIDENT II (D-5) MISSILE, DECEMBER 31, 1986

15. CONTRACT INFORMATION: (THEN-YEAR DOLLARS IN MILLIONS)

a. RDT&E —

Launcher

Westinghouse Electric Corporation

Sunnyvale, CA

N00030-84-C-0105, CPIF

Award Date: October 14, 1983

Definitized Date: March 12, 1984

INITIAL CONTRACT PRICE

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
320.2	N/A	2

CURRENT CONTRACT PRICE

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
327.0	N/A	2

ESTIMATED PRICE AT COMPLETION

<u>Contractor</u>	<u>Program Manager</u>
332.2	333.1

	<u>COST VARIANCE</u>	<u>SCHEDULE VARIANCE</u>
PREVIOUS CUMULATIVE	(13.3)	(6.1)
CUMULATIVE VARIANCES TO DATE	(10.5)	(9.4)
(10/30/86)		
NET CHANGE	2.8	(3.3)

Explanation of Change: The \$2.8M improvement in the cost variance is a result of WEC's cost containment efforts. On the other hand, the unfavorable (\$3.3M) change in schedule is attributable to the continuing schedule delays in the Launch Tube Group, the Ejector Group and Missile Hoist areas. However, no TRIDENT II Program level milestones have slipped or are expected to slip.

Fire Control

General Electric Ordnance Systems

Pittsfield, MA

N00030-84-C-0022, CPIF

Award Date: October 14, 1983

Definitized Date: March 12, 1984

INITIAL CONTRACT PRICE

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
437.1	N/A	7

CURRENT CONTRACT PRICE

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
437.9	N/A	7

ESTIMATED PRICE AT COMPLETION

<u>Contractor</u>	<u>Program Manager</u>
428.1	437.9

	<u>COST VARIANCE</u>	<u>SCHEDULE VARIANCE</u>
PREVIOUS CUMULATIVE	2.4	(22.1)
CUMULATIVE VARIANCES TO DATE	.8	(13.0)
(11/02/86)		
NET CHANGE	(1.6)	9.1

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15. CONTRACT INFORMATION (cont'd): (THEN-YEAR DOLLARS IN MILLIONS)

Explanation of Change: The small decrease in the favorable cost variance over the past year is attributable to problems encountered in developing and producing several types of modules for the Fire Control subsystem. No variance at completion is anticipated. The improvement in the unfavorable schedule variance is attributable to GE's resolution of several major design problems, allowing Fire Control development to move forward. No major milestones are expected to be impacted.

Navigation:

Sperry Systems Management Group
Great Neck, NY

N00024-84-C-4003, CPIF

Award Date: December 21, 1983

INITIAL CONTRACT PRICE
Target Ceiling Qty

644.6 N/A 3

CURRENT CONTRACT PRICE
Target Ceiling Qty

652.5 N/A 3

ESTIMATED PRICE AT COMPLETION
Contractor Program Manager

662.8 712.0

COST VARIANCE SCHEDULE VARIANCE

PREVIOUS CUMULATIVE
CUMULATIVE VARIANCES TO DATE
(09/30/86)
NET CHANGE

(17.8)

(21.4)

(15.6)

(12.1)

2.2

9.3

Explanation of Change: The apparent cost and schedule variance improvements are the result of the contractor measuring progress against an over target baseline including a variance adjustment of 31.1M cost and 27.2M price. The contract has experienced schedule delays in developing both hardware and software. While these delays will not impact any major TRIDENT II Program milestones, they will result in a less thoroughly tested navigation system at TRIDENT II deployment and an RD7&E cost overrun of (\$59.5M).

Test Instrumentation

Interstate Electronics Corporation
Anaheim, CA

N00030-84-C-0090, CPIF

Award Date: October 21, 1983

Definitized Date: March 13, 1984

INITIAL CONTRACT PRICE
Target Ceiling Qty

237.5 N/A 20

CURRENT CONTRACT PRICE
Target Ceiling Qty

251.1 N/A 20

ESTIMATED PRICE AT COMPLETION
Contractor Program Manager

255.0 261.1

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TRIDENT II (D-5) MISSILE, DECEMBER 31, 1986

15. CONTRACT INFORMATION (cont'd): (THEN-YEAR DOLLARS IN MILLIONS)

	<u>COST VARIANCE</u>	<u>SCHEDULE VARIANCE</u>
PREVIOUS CUMULATIVE	(15.3)	(9.0)
CUMULATIVE VARIANCE TO DATE		
(10/30/86)	(26.2)	(4.4)
NET CHANGE	(10.9)	4.6

Explanation of Change: The unfavorable cost variance change is attributable primarily to cost growth in material. More material than planned has been needed, and planned-for material has also been more expensive than anticipated. Though cost containment efforts have been implemented most material costs are not recoverable, and the Program Manager foresees an overrun of (\$10.0M). Technical progress has, however, been satisfactory. The favorable schedule variance change is due mainly to recovery in the area of material receipts. Progress elsewhere on the contract is satisfactory, with all major milestones being met.

Missile:

Lockheed Missiles and Space Company, Inc.

Sunnyvale, CA

N00030-84-C-0100, CPIF

Award Date: October 21, 1983

Definitized Date: March 12, 1984

INITIAL CONTRACT PRICE

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
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4,224.5	N/A	30
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CURRENT CONTRACT PRICE

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
---------------	----------------	------------

4,238.3	N/A	30
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ESTIMATED PRICE AT COMPLETION

<u>Contractor</u>	<u>Program Manager</u>
-------------------	------------------------

4,238.3	4,238.3
---------	---------

	<u>COST VARIANCE</u>	<u>SCHEDULE VARIANCE</u>
PREVIOUS CUMULATIVE	(51.7)	(28.5)
CUMULATIVE VARIANCES TO DATE		
(11/02/86)	(157.2)	(16.7)
NET CHANGE	(105.5)	11.8

Explanation of Change: The cumulative cost variance is now an unfavorable (157.2M), (105.5M) worse this period. The variance is due to greater than planned costs for Missile Body engineering, material and subcontracted, specialized test equipment and boost propulsion manpower. Corrective measures have been put in place both at Lockheed and at the subcontractors, the effects of which recently started to be observed. No impact on the price at completion is expected. The cumulative schedule variance is now an unfavorable (16.7M), an 11.8M improvement since the last report. The improvement in the variance is due to delivery of hardware and production tooling. Recovery this past year has been steady and full recovery is likely.

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15. CONTRACT INFORMATION (cont'd): (THEN-YEAR DOLLARS IN MILLIONS)Guidance Development:Charles Stark Draper Laboratory
Cambridge, MA

N00030-84-C-0036, CPFF

Award Date: October 06, 1983

Definitized Date: March 07, 1984

INITIAL CONTRACT PRICETarget Ceiling Qty

846.4 N/A -

CURRENT CONTRACT PRICETarget Ceiling Qty

950.1 N/A -

ESTIMATED PRICE AT COMPLETIONContractor Program Manager

950.1 950.1

COST VARIANCESCHEDULE VARIANCE

PREVIOUS CUMULATIVE

(1.1)

(41.9)

CUMULATIVE VARIANCES TO DATE

(9/30/86)

(7.7)

(37.9)

NET CHANGE

(6.6)

4.0

Explanation of Change: The unfavorable cost variance continues to be due to higher than planned costs for material and fabrication. Workaround efforts to maintain schedule are continuing. No impact on program milestones or total contract final cost is expected by the Program Manager or contractor. The unfavorable schedule variance is due to continued delays in completing early design and the rework associated with this effort.

b. Procurement (WPN) --

Missile:Lockheed Missiles and Space Company, Inc.
Sunnyvale, CA

N00030-84-C-0100, CPIF

Award Date: October 21, 1983

Definitized Date: March 12, 1984

INITIAL CONTRACT PRICETarget Ceiling Qty

1,473.0 N/A 52

CURRENT CONTRACT PRICETarget Ceiling Qty

1,471.1 N/A 52

ESTIMATED PRICE AT COMPLETIONContractor Program Manager

1,471.1 1,471.1

COST VARIANCESCHEDULE VARIANCE

PREVIOUS CUMULATIVE

9.1

(12.1)

CUMULATIVE VARIANCES TO DATE

(11/02/86)

(10.7)

(37.6)

NET CHANGE

(19.8)

(25.5)

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15. CONTRACT INFORMATION (cont'd): (THEN-YEAR DOLLARS IN MILLIONS)

Explanation of Change: The cumulative cost variance is now an unfavorable (10.7M), this reflects a (19.8M) unfavorable cost variance growth this period. The additional variance is the result of greater than planned subcontracted engineering and material costs for submarine on-board test equipment. The cumulative schedule variance is an unfavorable (37.6M) which reflects a (25.5M) unfavorable schedule variance growth this period. The variance results from late placement of orders for subcontracted effort and material. It also reflects late delivery of buildings, at Kings Bay, to the contractor. While no impacts are likely to result from late placement of orders for material, impacts due to late buildings at Kings Bay will be difficult to avoid. At a minimum, the contractor will have to exert extra effort, with attendant added expense.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 45.4% (10 yrs/ 22 yrs)

(2) Percent Program Cost Appropriated: 28.1% (\$9971.3/\$35518.5)

b. Appropriation Summary --

Appropriation	Current & Prior Yrs	Budget Year	Balance to Complete FYDP	Beyond FYDP	Total
RDT&E	7644.2	1088.3	720.7	0.0	9453.2
WPN	2018.2	2254.2	8526.4	12598.1	25396.9
MILCON	308.9	18.1	257.6	83.8	668.4
Total	9971.3	3360.6	9504.7	12681.9	35518.5

16. Program Funding Summary (Cont'd): (Current Estimate in Millions)
c. Annual Summary --

Fiscal Year	Qty	FY 83 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1978				5.0			5.0	6.9
1979				5.0			5.0	8.4
1980				25.6			25.6	10.6
1981				96.7			96.7	10.6
1982				198.4			198.4	7.6
1983				343.9			351.0	4.9
1984				1365.4			1447.0	3.8
1985				1816.9			1983.0	3.4
1986				1730.3			1945.5	2.9
1987				1366.6			1587.0	3.1
1988				905.6			1088.3	3.5
1989				422.5			524.8	3.5
1990				153.0			195.9	3.3
Subtotal	30			8434.9			9453.2	

			Appropriation:		WPN			
1985			116.6	137.5	24.4	0.0	161.1	3.4 ✓
1986			225.3	420.1	235.7	0.0	508.4	2.9 ✓
1987	21		1051.5	1077.8	266.4	235.3	1348.7	3.1 ✓
1988	66		1705.7	1743.8	320.0	273.7	2254.2	3.5 ✓
1989	66		1718.8	1675.8	260.2	322.6	2232.1	3.5 ✓
1990	66		1628.7	1620.8	250.4	263.4	2217.3	3.3 ✓
1991	72		1497.6	1494.9	244.9	253.5	2095.2	2.9 ✓
1992	72		1368.1	1380.9	261.0	247.5	1981.8	2.4 ✓

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1993	72		1323.3	1318.6	249.5	263.8	1938.0	2.4
1994	72		1294.0	1295.6	249.7	252.5	1949.7	2.4
1995	72		1267.5	1272.7	249.9	249.7	1951.3	2.4
1996	72		1247.9	1250.2	248.1	249.9	1972.9	2.4
1997	72		1213.3	1197.2	219.4	248.1	1934.5	2.4
1998	72		1210.3	1085.6	13.0	219.4	1796.3	2.4
To Compl	20		624.8	617.0	0.0	13.2	1045.4	2.4
Subtotal	815		17493.4	17588.5	3092.6	3092.6	25396.9	

Appropriation: MILCON

1984				72.9			79.3	3.8
1985				73.2			82.4	3.4
1986				108.7			126.2	2.9
1987				17.5			21.0	3.1
1988				14.6			18.1	3.5
1989				21.0			26.8	3.5
1990				77.9			102.3	3.3
1991				12.2			16.4	2.9
1992				81.4			112.1	2.4
1993				3.9			5.5	2.4
1994				9.7			14.0	2.4
1995				2.6			3.9	2.4
1996				0.0			0.0	2.4
1997				0.0			0.0	2.4
1998				5.0			7.9	2.4
To Compl				32.3			52.5	2.4
Subtotal				532.9			668.4	
Total	845		17493.4	26556.3	3092.6	3092.6	35518.5	

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16. Program Funding Summary (Cont'd):
 d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1978	5.0	5.0	5.0
1979	5.0	5.0	5.0
1980	25.6	25.5	25.0
1981	96.7	96.4	93.6
1982	198.4	195.4	191.7
1983	351.0	346.6	340.9
1984	1447.0	1447.0	1130.7
1985	1983.0	1982.7	1929.9
1986	1945.5	1938.9	1585.9
1987	1587.0	1472.2	36.3
To Compl	1809.0	N/A	N/A
Total	9453.2	7514.7	5344.0
Appropriation: WPN			
1985	161.1	156.1	119.5
1986	508.4	495.3	50.9
1987	1348.7	557.5	3.9
To Compl	23378.7	N/A	N/A
Total	25396.9	1208.9	174.3
Appropriation: MILCON			
1984	79.3	43.9	43.5
1985	82.4	68.7	64.4
1986	126.2	113.0	46.4
1987	21.0	0.0	0.0
To Compl	359.5	N/A	N/A
Total	668.4	225.6	154.3

17. Production Rate Data:

a. Annual Production Rates -- (NOTE: The production rates shown are annualized rates which differ from the funded quantities because the 27 missiles in the Planning Estimate for FY87 funding were planned for delivery over a five month period and the 21 missiles in the Current Estimate are planned for delivery over a four month period.)

Fiscal Year Of Delivery	Production Rates (Quantity/Year)			
	Planning Estimate	Production Estimate	Current Estimate	Maximum
1989	65	n/a	63	n/a
1990	72	n/a	66	n/a
1991	72	n/a	66	n/a
1992	72	n/a	66	n/a
1993	72	n/a	72	n/a
1994	72	n/a	72	n/a
1995	72	n/a	72	n/a
1996	72	n/a	72	n/a
1997	72	n/a	72	n/a
1998	72	n/a	72	n/a
1999		n/a	72	n/a
2000		n/a	72	n/a
2001		n/a	72	n/a

b. Cost Variance -- Not applicable, since TRIDENT II has not yet begun production.

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BY\$)	N/A	N/A	26556.3	N/A	N/A
Prog Acq Cost (TY\$)	N/A	N/A	35518.5	N/A	N/A
PAUC (BY\$)	N/A	N/A	31.4	N/A	N/A
PAUC (TY\$)	N/A	N/A	42.0	N/A	N/A

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c. Schedule Variance -- Not applicable, since TRIDENT II has not yet begun production.

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	N/A	N/A		N/A	N/A
Duration (in Months)	N/A	N/A		N/A	N/A
End Date (Mo/Yr)	N/A	N/A		N/A	N/A

d. Deliveries (Plan/Actual) -- Not applicable, since TRIDENT II has not yet begun production.

18. Operating and Support Costs: Not applicable since TRIDENT II (D5) Missile is not a new SAR.

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N-10 DDG-51-4

SAR-86-001

SELECTED ACQUISITION REPORT (BCS: DD-COMP(Q&A)823)

PROGRAM: DDG 51 Guided Missile Destroyer

AS OF DATE: December 31, 1986

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1. Designation and Nomenclature (Popular Name): DDG 51 Guided Missile Destroyer Class; Guided Missile Destroyer: ARLEIGH BURKE CLASS

2. DoD Component: Department of the Navy

3. Responsible Office and Telephone Number:

AEGIS Shipbuilding Program Manager, PMS 400
Naval Sea Systems Command

PM: RADM J.F. Shaw, USN
ASSIGNED: September 3, 1985
AUTOVON: 222-7395 2-3476
COMMERCIAL: (202) 692-7395

4. Program Elements/Procurement Line Items:

RDT&E: PE 63589N Project 1337-001 changed to PE 64307 Project 1337/1937
PE 64567N Project 0857-565; Project 1803-065 (shared funding)

PROCUREMENT (SCN): PE 24222N/APPN 1611N

MILCON

5. Related Programs: CG 47, SM-2(MR), TOMAHAWK, HARPOON, PHALANX, AN/SQQ-89, MK-46, TACTAS, LAMPS MK-I/MK-III, VERTICAL LAUNCH, and VERTICAL LAUNCH ASROC

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6. Mission and Description: The Navy has a priority requirement for a battle force capable surface combatant as a replacement for retiring battle force guided missile destroyers. This program provides for FY 1988 and FY 1989 follow ships; includes a combat system with the capability to perform simultaneously in Anti-Air, Strike, Anti-Surface, and Anti-Submarine warfare areas; and operate as part of a Carrier Battle Group, Surface Action Group, Amphibious Task Force, and Underway Replenishment Group. The baseline ship will displace less than 8300 tons and is designed with a gas turbine propulsion system. This design provides outstanding combat capability and survivability characteristics while considering procurement and lifetime support costs.

7. Program Highlights:

a. Significant Historical Developments -- Funding for the lead ship, ARLEIGH BURKE, was provided in FY 85, with the lead ship construction contract awarded to Bath Iron Works (BIW) in April 1985.

b. Significant Developments Since Last Report -- Limited production approval was granted by the Milestone IIIA review decision memorandum of 30 October 1986 which granted production approval through FY 1989, and approval for long lead material for the FY 1990 lead ship. The ship as presently configured is expected to accomplish mission objectives. This SAR reflects the approved estimates and is rebaselined to FY 1987.

Bath Iron Works has submitted a revised DDG 51 construction schedule which would delay the delivery date of DDG 51. BIW's request attributes the delay to a number of factors including the impact of a 99 day strike at the shipyard in 1985. The BIW proposal is being evaluated by Navy.

The Gramm/Rudman/Hollings Act reduced the FY 1985 lead ship funding by \$24.6M and advance procurement funding for the FY 1987 ships by \$3.6M.

The 1987 full funding in the amount of \$1740.7M was provided for the procurement of 2 ships. This funding was reduced \$19.7M by application of the undistributed SCN inflation reduction contained in the FY 1987 appropriation.

FY 1987 advance procurement funding in the amount of \$79.8M was provided to support procurement of the FY 1988 lead ship.

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (#1337 Rev 1, dated 15 December 1983) or (#1337 Rev 1, Change 1, dated 22 August 1986), threshold breaches.

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9. Schedule:

a. Milestones --	<u>Development Estimate/ Approved Program</u>	<u>Current/PdE Estimate</u>
(1) Complete Concept Design	Dec 80/N/A	N/A/N/A
(2) DNSARC I	Jun 81/Jun 81	Jun 81/Jun 81
(3) Complete Preliminary Design	Mar 83/N/A	N/A/N/A
(4) DSARC II	Dec 83/Dec 83	Dec 83/Dec 83
(5) Complete Contract Design	Jun 84/N/A	Jun 84/N/A
(6) DDG 51 Contract Award	Apr 85/Apr 85	Apr 85/Apr 85
(7) DSARC III	Aug 86/Oct 86	Oct 86/Oct 86 (CH-1)
(8) DDG 52/53 Contract Award	Nov 86/Jan 87	Jan 87/Jan 87 (CH-2)
(9) Lay DDG 51 Keel	Jan 88/N/A	Jan 88/N/A
(10) Launch DDG 51	Sep 88/N/A	Sep 88/N/A
(11) IOC	N/A/Oct 90	Oct 90/Oct 90 (CH-3)

b. Previous Change Explanations -- None

c. Current Change Explanations --

(CH-1) - Administrative delay in scheduling Milestone III review.

(CH-2) - Award delayed due to RFP changes to strengthen solicitation provisions.

(CH-3) - New milestone.

d. References --

Development Estimate: DCP #1337 Rev 1, dated 15 December 1983.

Approved Program/Production Estimate: DCP #1337 Rev 1, Change 1, dated 22 August 1986.

Approved Program: FY 88/89 President's Budget.

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DDG 51 Guided Missile Destroyer Class, December 31, 1986

10. Technical/Operational Characteristics:

a. Technical --	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current/PdE Estimate</u>
(1)(U) <u>Ship:</u>		N/A	
a)(U) Length (Feet)	466/466		466/466
b)(U) Beam (Feet)	59/59		59/59
c)(U) Navigational Draft(Feet)	30.6/30.6		30.6/30.6
d)(U) Displacement (LT)	8,300/8,300		8,300/8,300
e)(U) Propulsion	LM 2500 Gas Turbine/ LM 2500 Gas Turbine		LM 2500 Gas Turbine/ LM 2500 Gas Turbine
f)(U) Accommodations	339/341		341/341 <u>1</u>
b. Operational --			
(1)(U) <u>Ship:</u>		N/A	
a)(U) Top Speed (Knots)	30/30		30/30
(b)(1)			
c)(U) <u>Armament</u>			
1(U) <u>Anti-Submarine Warfare</u>			
(U) Sonar	SQS-53C/N/A		N/A/N/A
(U) Underwater Battery	ASWCS MK 116 Mod 7/N/A		N/A/N/A
Fire Control System			
(U) Torpedo Tubes	2 MK 32/N/A		N/A/N/A
(U) Towed Sonar	SQR-19/N/A		N/A/N/A
(U) ASW System	N/A/SQQ-89		SQQ-89/SQQ-89
(U) ASROC	VLA/VLA		VLA/VLA
(U) Helo	SEAHAWK Land & Refuel; LAMPS Electronics/ SEAHAWK Land & Refuel; LAMPS Electronics		SEAHAWK Land & Refuel LAMPS Electronics/ SEAHAWK Land & Refuel LAMPS Electronics
2(U) <u>Anti-Air Warfare</u>			
(U) Launchers	MK 41 VLS/MK 41 VLS		MK 41 VLS/MK 41 VLS
(U) Missiles	SM-2 MR/SM-2 MR		SM-2 MR/SM-2 MR
(U) Missile Fire Control	3 MK 99/3 MK 99		3 MK 99/3 MK 99
System			
(U) Guns	2 PHALANX/2 PHALANX		2 PHALANX/2 PHALANX
3(U) <u>Anti-Surface/Strike Warfare</u>			
(U) Guns	1 5" 54/1 5" 54		1 5" 54/1 5" 54
(U) Gunfire Control	MK 160 with SEAFIRE/ MK 160		MK 160/MK 160 (CH-1)
System			
(U) Anti-Ship Cruise	HARPOON/HARPOON		HARPOON/HARPOON
Missile			
(U) Cruise Missile	TOMAHAWK/TOMAHAWK		TOMAHAWK/TOMAHAWK

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10. Technical/Operational Characteristics (Cont'd):

	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current/PdE Estimate</u>
b. Operational --			
4(U) <u>Electronic Warfare</u>	SLQ-32,SRBOC/ SLQ-32,SRBOC		SLQ-32,SRBOC/ SLQ-32,SRBOC
5(U) <u>Radars</u>			
(U) Surface	SPS-67/SPS-67		SPS-67/SPS-67
(U) 3D	SPY-1D/SPY-1D		SPY-1D/SPY-1D

c. Previous Change Explanations --

1/ Accommodations increased to 341.

d. Current Change Explanations --

(CH-1) SEAFIRE has been deleted from DDG 51.

e. References --

Development Estimate: DCP #1337 Rev 1 dated 15 December 1983.

Approved Program/Production Estimate: DCP #1337 Rev 1, Change 1, dated 22 August 1986.

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current/PdE Estimate</u>
a. Cost --			
Development (RDT&E)	919.4	-26.2	893.2/Same
Procurement (SCN)	11,507.1	+3,464.2	14,971.3/Same
Basic Ship Costs	(4,360.5)	(+693.3)	(5,053.8)/Same
HM&E and Combat			
System Elements	(6,052.2)	(+2,798.1)	(8,850.3)/Same
Other Costs	(705.9)	(-122.1)	(583.8)/Same
OF/PD	(388.5)	(+94.9)	(483.4)/Same
Construction (MILCON)	27.9	-4.6	23.3/Same
Total FY 84 Base-Year \$	12,454.4	+3,433.4	15,887.8/Same
Adj from FY 84 to FY 87 \$			1,065.9 1/
Total FY 87 Base-Year \$			16,953.7/Same
Escalation	6,025.2	-2,861.4	3,163.8/Same
Development (RDT&E)	(40.8)	(-104.0)	(-63.2)/Same
Procurement (SCN)	(5,977.5)	(-2,752.7)	(3,224.8)/Same
MILCON	(6.9)	(-4.7)	(2.2)/Same
Total Then-Year \$	18,479.6	+1,637.9	20,117.5/Same 2/

1/ Under the new baseline, the base year changes from 1984 to 1987. The Current/Production Estimate base year is 1987. The base year conversion factors are shown on Page 7.

2/ Excludes \$49.1 million of FY 92 Advance Procurement for the FY 93 ships.

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DDG 51 Guided Missile Destroyer Class, December 31, 1986

11. Program Acquisition Cost (Cont'd) (Current Estimate in Millions of Dollars)

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current/PdE Estimate</u>
b. Quantities --			
Development (RDT&E)	-	-	-
Procurement	18	+5	23
Total	18	+5	23
c. Unit Cost --			
Procurement: (SCN)			
FY 84 Base-Year \$	639.3	+11.6	650.9
Then-Year \$	971.4	-137.8	833.6
Program:			
FY 84 Base-Year \$	691.9	-1.1	690.8
Then-Year \$	1026.6	-151.9	874.7
d. Approved Design to Cost Goal --			
There is no design to cost goal which has been established for DDG 51. In DCP 1337 an average follow ship cost threshold of \$700M in FY 83\$ was established for ships 6-10. This threshold is shown below. The current average cost estimate for ships 6-10 is \$632.8M in FY 83\$. The current estimate shown below is the average unit sailaway cost for the 23 ships in the current FYDP.			

(Average Unit Sailaway Cost)

	<u>DCP 1337</u>	<u>Current Estimate</u>
FY 84 Base Year \$	721.0	629.9
Then-Year \$	822.6	806.8

e. Foreign Military Sales -- None

f. Nuclear Costs -- None

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current</u>	<u>UCR Baseline Estimate</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition --			
(1) Cost	20,117.5	16,476.3	20,117.5
(2) Quantity	23	18	23
(3) Unit Cost	874.7	915.3	874.7
		<u>(FY 87 Budget)</u>	
b. Current Procurement --	<u>(FY 1987)</u>	<u>(FY 1987)</u>	<u>(FY 1988)</u>
(1) Cost	1,730.4	1,730.4	2,198.5
Less CY Adv Proc	-79.8	-79.8	-74.6
Plus PY Adv Proc	+70.4	+70.4	+78.2
Less OP/PD	0.0	0.0	-1.5
Net Total	1,721.0	1,721.0	2,200.5
(2) Quantity	2	2	3
(3) Unit Cost	860.5	860.5	733.5

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13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	SCN	MILCON	TOTAL
Development Estimate	960.2	17,484.6	34.8	18,479.6
Previous Changes:				
Economic	-5.5	-1,997.4	-0.9	-2,003.8
Quantity	-	-	-	-
Schedule	-	+129.7	-	+129.7
Engineering	-	-	-	-
Estimating	-23.8	-152.4	-	-176.2
Other	-	-	-	-
Support	-	+51.6	-4.6	+47.0
Subtotal	-29.3	-1,968.5	-5.5	-2,003.3
Current Changes:				
Economic	-9.3	-582.2	-0.4	-591.9
Quantity	-	+4,097.0	-	+4,097.0
Schedule	-	+97.8	-	+97.8
Engineering	-	-	-	-
Estimating	-5.0	-45.9	-	-50.9
Other	-	-	-	-
Support	-	+90.3	-1.1	+89.2
Subtotal	-14.3	+3,657.0	-1.5	+3,641.2
Total Changes	-43.6	+1,688.5	-7.0	+1,637.9
Current Estimate	916.6	19,173.1	27.8	20,117.5

(FY 1984/1987 Constant (Base-Year) Dollars in Millions)

Development Estimate	919.4	11,507.1	27.9	12,454.4
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-21.1	+317.0	-	+295.9
Other	-	-	-	-
Support	-	+37.0	-4.1	+32.9
Subtotal	-21.1	+354.0	-4.1	+328.8
Current Changes:				
Quantity	-	+3,098.2	-	+3,098.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-5.1	-49.9	-	-55.0
Other	-	-	-	-
Support	-	+61.9	-0.5	+61.4
Subtotal	-5.1	+3,110.2	-0.5	+3,104.6
Total Changes	-26.2	+3,464.2	-4.6	+3,433.4
Current Estimate (FY84\$)	893.2	14,971.3	23.3	15,887.8
Adj from FY84 to FY87\$	+86.6	+977.0	+2.3	+1,065.9
Current estimate (FY87\$)	979.8	15,948.3	25.6	16,953.7
Conversion Factors				
Base Year 1987	1.0970	1.0653	1.0970	

UNCLASSIFIED**13. Cost Variance Analysis (Cont'd):****b. Previous Change Explanations --****RD&E****Economic:** Revised escalation indices.**Estimating:** Revised funding requirements and transfer of Contract Design to SCN.**SCN****Economic:** Revised escalation indices.**Schedule:** Profile FY 87 through FY 90 adjusted to accommodate reduced funding levels.**Estimating:** Reflects offsets to revised escalation rates, the adjusted procurement profile and revised estimates for Government Furnished Equipment**Support:** Transfer of Contract Design to SCN and revised Outfitting and Post Delivery requirements.**MILCON****Economic:** Revised escalation indices.**Estimating:** Revised program funding requirements.**c. Current Change Explanations --**(Dollars in Millions)
Base-Year Then-Year**(1) RD&E**

Revised Jan 87 economic escalation rates (Economic)

N/A -9.3

Transfer of Contract Design to RD&E (Support)

+12.4 +14.7

Revised program funding requirements (Estimating)

-17.5 -19.7

(2) SCN

Revised Jan 87 economic escalation rates (Economic)

N/A -582.2

Addition of FY 92 ships (Quantity)

+3,098.2 +4,097.0

Revised Procurement Profile (Schedule)

-- +97.8

Revisions to procurement estimates reflecting revised profile and revised estimates for all ship systems (Estimating)

-33.4 -43.4

Changes to the program reflecting Congressional action on the FY 87 budget, Gramm-Rudman-Hollings transfers and adjustments during the budget review cycle (Estimating)

-9.9 -2.5

Adjustments during impact to Base Year 84 End Costs due to adjustments of projected escalation requirements reflecting lower inflation indices (Estimating)

-6.6 N/A

Outfitting and post delivery requirements for the revised procurement schedule, addition of the FY92 ships, and transfer of Contract Design to RD&E (Support)

+61.9 +90.3

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DDG 51 Guided Missile Destroyer Class, December 31, 1986

13. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(3) <u>MILCON</u>		
Revised Jan 87 economic escalation rates (Economic)	N/A	-0.4
Revised program funding requirements (Support)	-0.5	-1.1

d. References --

Development Estimate: - FY 1985 President's Budget Estimate, DDG 51 Ship Data Sheets

Current/Production Estimate: - FY 1988/89 President's Budget Estimate, DDG 51 Ship Data Sheets
Includes the following Program Elements:
RDT&E,N: 63589N changed to 64307N, 64567N
SCN: FE 24222N/APPN 1611N

14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Development Baseline Estimate --

PAUC (Initial SAR Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1217.1	-120.3	-218.2	+5.2	-25.1	+155.6	--	+12.3	-190.5	+1026.6

b. Development Baseline Estimate to Current/Production Estimate --

PAUC (Dev Est)	Changes								PAUC (Current/ PdE Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1026.6	-112.9	-45.0	+9.9	--	-9.8	--	+5.9	-151.9	874.7

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DDG 51 Guided Missile Destroyer Class, December 31, 1986

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

<u>Combat System Development</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
RCA Government Systems Moorestown, N.J. N00024-84-5105, CPAF February 1984	\$233.0	N/A	N/A
	<u>Current Contract Price</u>		<u>Estimated Price At Completion</u>
	<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>
	<u>Qty</u>		<u>Program Manager</u>
	\$218.2	N/A	N/A
			\$218.2
		<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances		\$ + 1.4	\$ - 0.3
Cumulative Variances To Date (10/86)		\$ + 6.5	\$ - 1.5
Net Change		\$ + 5.1	\$ - 1.2

Explanation of Change: Cost variance results from the contractor's favorable performance. Schedule variance is not significant. Program manager's assessment remains at the estimated price and is within approved funding.

b. SCN --

<u>Ship Construction (DDG 51) ^{1/}</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Bath Iron Works Bath, Maine N00024-85-C-2144, FPI April 1985	\$322.0	\$399.1	1
	<u>Current Contract Price</u>		<u>Estimated Price At Completion</u>
	<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>
	<u>Qty</u>		<u>Program Manager</u>
	\$334.8	\$414.5	1
			\$377.5
			\$397.6
		<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances		\$ + 0.1	\$ - 1.0
Cumulative Variances To Date (9/86)		\$ - 4.0	\$ - 0.1
Net Change		\$ - 4.1	\$ + 0.9

Explanation of Change: Cost and schedule variances are not significant.

^{1/} BIW has submitted a revised DDG 51 construction schedule which would delay the delivery date of DDG 51. BIW's request attributes the delay to a number of factors including the impact of a 99 day strike at the shipyard in 1985. The BIW proposal is currently being evaluated.

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DDG 51 Guided Missile Destroyer Class, December 31, 1986

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)b. SCN --

AEGIS Weapon System
(DDG 51 and CG 60,61,62) 2/

RCA Government Systems
 N00024-85-5100 FPI
 Moorestown, NJ
 December 23, 1985

Initial Contract Price
Target Ceiling Qty

\$372.4 \$414.0 4

Current Contract Price
Target Ceiling Qty

\$394.1 \$431.3 4

Estimated Price At Completion
Contractor Program Manager

\$409.6 \$409.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$ --	\$ --
Cumulative Variances To Date (11/86)	\$ - 0.7	\$ - 8.5
Net Change	\$ - 0.7	\$ - 8.5

Explanation of Change: Current target and ceiling have been adjusted to reflect negotiated changes. Estimate to complete includes amounts for authorized but not negotiated changes of \$15.5M. The program manager's assessment remains at the target price and is within the approved funding.

2/ This is a combined procurement contract for the DDG 51 and CG 47 class ships, and is reported in the SARs of each program.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)a. Program Status --

(1) Percent Program Completed: 44.4% (8 yrs/18 yrs)

(2) Percent Program Cost Appropriated: 18.0% (\$3,620.0/\$20,117.5)

b. Appropriation Summary --

<u>Appropriation</u>	<u>Current & Prior Yrs (FY80-87)</u>	(Then-Year Dollars in Millions)			<u>Total</u>
		<u>Budget Year (FY88)</u>	<u>Balance FYDP (FY89-92)</u>	<u>To Complete Beyond FYDP (FY93-97)</u>	
RDT&E	759.5	85.7	71.4	0.0	916.6
SCN	2,855.9	2,198.5	13,740.5	378.2	19,173.1
MILCON	4.6	14.7	8.5	0.0	27.8
Total	3,620.0	2,298.9	13,820.4	378.2	20,117.5

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DDG 51 Guided Missile Destroyer Class, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 87 Base-Year Dollars		Then-Year Dollars			Escl Rate (\$)	
		Sailaway		Total	Advance Proc			Total
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1980				14.9			10.5	10.6
1981				45.4			35.3	10.6
1982				121.8			102.0	7.6
1983				171.6			150.7	4.9
1984				132.8			121.1	3.8
1985				146.8			138.4	3.4
1986				100.4			99.1	2.9
1987				100.4			102.4	3.1
1988				81.2			85.7	3.5
1989				42.5			46.4	3.5
1990				14.3			16.0	3.3
1991				4.4			5.1	2.9
1992				3.3			3.9	2.4
Subtotal				979.8			916.6	

Appropriation: SCN

1984			-	-		78.6	78.6	3.6
1985	1	172.1	832.1	1004.2	112.3	-	942.8	2.1
1986			-	-		104.1	104.1	1.2
1987	2	55.5	1482.9	1538.4	70.4	79.8	1730.4	3.1
1988	3		1908.7	1910.2	78.2	76.2	2198.5	3.5
1989	3		1858.5	1878.1	68.0	94.0	2225.5	3.5
1990	3		1985.8	2035.1	81.2	119.1	2448.8	3.3
1991	5		3215.1	3278.0	64.7	120.7	4044.2	2.9
1992	6		3922.6	3998.9	49.1	89.0	5022.0	2.4
1993			-	65.3		78.0	78.0	2.4
1994			-	85.1		104.0	104.0	2.4
1995			-	88.4		110.7	110.7	2.4
1996			-	63.3		81.2	81.2	2.4
1997			-	3.3		4.3	4.3	2.4
Subtotal	23	227.6	15205.7	15948.3	523.9	1139.7	19173.1	

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DDG 51 Guided Missile Destroyer Class, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 87 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: MILCON

1986				4.5			4.6	2.9
1987				-			-	3.1
1988				13.5	-	-	14.7	3.5
1989				7.6	-	-	8.5	3.5
Subtotal				25.6	-	-	27.8	
Total	23	227.6	15205.7	16953.7	523.9	1139.7	20117.5	

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1980	10.5	10.5	10.5
1981	35.3	35.3	35.3
1982	102.0	102.0	102.0
1983	150.7	150.7	150.7
1984	121.1	121.1	121.1
1985	138.4	138.4	126.1
1986	99.1	93.1	47.9
1987	102.4	42.2	0.6
To Complete	157.1	N/A	N/A
Subtotal	916.6	693.3	594.2

Appropriation: SCN

1984	78.6	77.6	48.5
1985	942.8	705.0	204.4
1986	104.1	67.5	9.8
1987	1,730.4	48.6	
To Complete	16,317.2	N/A	N/A
Subtotal	19,173.1	898.7	262.7

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DDG 51 Guided Missile Destroyer Class, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: MILCON

1986	4.6	3.4	0.6
To Complete	23.2	N/A	N/A
Subtotal	27.8	3.4	0.6
Total	20117.5	1595.4	857.5

17. Production Rate Data: Not Applicable (Exempt: Less than six ships per year).18. Operating and Support Costs: Not Applicable.

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: KC-135R

AS OF DATE: December 31, 1986

INDEX

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- Designation and Nomenclature (Popular Name): KC-135R Modernization Program
- DoD Component: U. S. Air Force
- Responsible Office and Telephone Number:
C/KC-135 Reengine System Program Management Office
Tanker/Cargo Division
OC-ALC/MMSGC, Tinker AFB OK 73145-5990
PM: Mr Art Skiles
Assigned: 6 June 1986
Autovon: 336-3064
Commercial: (405) 736-3064
- Program Elements/Procurement Line Items:
RDT&E: 11142F (Shared Funding)
PROCUREMENT: 11142F APPN 3010 ICN C13500 (Shared Funding)
O&M (Installation): 72207F (Shared Funding)
- Related Programs: None

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DEPARTMENT OF DEFENSE

SAF/PAS

87-0029-T

87-0183

6. Mission and Description: The KC-135R is a modification to KC-135A strategic tanker aircraft being developed and procured to provide increased aerial refueling capabilities. Modification includes four fuel efficient turbofan CFM56/F108 engines and strengthened main landing gear and other system improvements. The reengined KC-135 is characterized by increased fuel off-load capability, improved fuel efficiency, enhanced takeoff performance, and reduced environmental impact compared to the KC-135A. This system replaces the KC-135A.

7. Program Highlights:

a. Significant Historical Developments--In December 1977, Boeing Military Airplane Company was selected as prime contractor to provide technical and cost information for replacing engines and modernizing KC-135A tanker aircraft. In January 1980, the CFM56/F108 engine was selected and Boeing was awarded a contract leading to the design and production of hardware for converting KC-135A into KC-135R aircraft. In January 1981, the Government of France entered into agreement with the U.S. Government to provide a portion of the development funding and to fund conversion of French C-135F aircraft on the KC-135R modification line. The first modified aircraft was rolled-out on 22 June 1982. The first production contract for nine modification kits was awarded on 28 February 1982. KC-135R Development Test and Evaluation (DT&E) was conducted at Wichita, KS, and Edwards AFB CA, from 4 August 1982 to 5 April 1983, in a combined DT&E and Operational Test and Evaluation (OT&E) program. A total of 55 flights, 315.4 hours were flown. The KC-135R demonstrated satisfactory compliance with performance, flying qualifications, and propulsion specifications. In May 1984, Boeing Military Airplane Company (BMAC) was awarded a follow-on production contract for thirty shippable airframe kits. In July 1984, a contract for kit installation on one KC-135A airplane was awarded to Hayes International to establish a qualified competitive source for kit installation. The first modified KC-135R airplane was delivered to the U.S. Air Force on 29 June 1984. The PMRT from AFSC to AFLC for the airframe portion of the program occurred 30 October 1984. In August 1985, delivery of 27 KC-135R aircraft assigned to McConnell AFB, Kansas was completed. The installation contract for FY86 was awarded to Boeing in October 1985 as a result of competition with Hayes International.

b. Significant Developments Since Last Report--The PMRT from AFSC to AFLC for the F-108 engine occurred in June 1986. Sixty-nine KC-135R aircraft have been delivered to date. Delivery has been completed to three Main Operating Bases, the fourth received its first aircraft in December 1986. A total of 145 kits and 99 installations have been procured to date. This report has been revised to include the total number of KC-135 aircraft planned for modification to KC-135R.

The KC-135R satisfies the mission requirement.

c. Changes Since "As of" Date - None

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated 1 April 1981) threshold breaches.

9. Schedule:

a. Milestones --	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
Program Initiation (Strategic Air Command Required Operational Capability (ROC 1-77))	Mar 77/Mar 77	Mar 77
Engine Source Selection	Jan 80/Jan 80	Jan 80
Contract Award (Production Certification A/C)	Jan 80/Jan 80	Jan 80
Begin Full Scale Production (Milestone III)	Jul 81/Jul 81	Jul 81
Contract Award (First Production Lot)	Feb 82/Feb 82	Feb 82
First Flight (Certification Flight)	Aug 82/Aug 82	Aug 82
Start DT&E/OT&E	Sep 82/Sep 82	Sep 82
Complete DT&E/OT&E	May 84/May 84	May 84
First Delivery to SAC	Jun 84/Jun 84	Jun 84
IOC (1st KC-135R Squadron Deployed)	Jun 85/Jun 85	Jun 85

b. Previous Change Explanations -- None

c. Current Change Explanations -- None

d. References --

Production Estimate: Program Management Directive (PMD) Number 7021 (14)/11142F, 31 August 1981

Approved Program: Program Management Directive (PMD) Number 7021(14)/11142F, 31 August 1981

10. Technical/Operational Characteristics:

a. Technical --	<u>Production Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Max Gross Weight (lbs)	322,500/322,500	322,500	322,500
Fuel Load at Max takeoff Gross Weight (lbs)	203,300/203,300	203,300	203,300

b. Operational --

Critical Field Length (ft)	11,000/11,000	10,400	10,400
Takeoff Distance (ft)	9,000/9,000	8,100	8,100
Fuel Offload (2000 NM Radius) (lbs)	114,000/114,000	114,000	114,000

c. Previous Change Explanation -- The demonstrated performance and current estimate of the critical field length and takeoff distance were changed from 11,000 ft to 10,400 ft and from 9,000 ft to 8,100 ft respectively based on actual experience during the test program.

d. Current Change Explanations -- None

e. References --

Production Estimate: Decision Coordination Paper (DCP), KC-135R Re-engine Program, April 1, 1981 and Program Management Directive (PMD) number 7021(14)/11142F, August 31, 1981.

Approved Program: Decision Coordination Paper (DCP), KC-135R Reengine Program, April 1, 1981 and Program Management Directive (PMD) Number 7021 (14)/11142F, August 31, 1981.

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	<u>Production Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	91.6	- 1.9	89.7
Procurement	4941.5	+2513.6	7455.1
Airframe	(2033.0)	(+431.5)	(2464.5)
Engine	(2348.0)	(+1890.7)	(4238.7)
Total Flyaway	(4381.0)	(+2322.2)	(6703.2)
Other Weapon System Costs	(208.0)	(-28.6)	(179.4)
Initial Spares	(352.5)	(+220.0)	(572.5)
O&M (Installation)	196.0	+ 27.4	223.4
Total FY81 Base-Year \$	5229.1	+2539.1	7768.2
Escalation	2600.1	+2488.9	5089.0
Development (RDT&E)	(5.6)	(- 0.6)	(5.0)
Procurement	(2515.2)	(+2440.1)	(4955.3)
O&M (Installation)	(79.3)	(+ 49.4)	(128.7)
Total Then-Year \$	7829.2	+5028.0	12857.2
b. Quantities --			
Development (RDT&E)	-	-	-
Procurement	334	+307	641
Total	334	+307	641
c. Unit Cost --			
Procurement:			
FY81 Base-Year \$	14.795	-3.165	11.630
Then Year \$	22.325	-2.964	19.361
Program:			
FY81 Base-Year \$	15.656	-3.537	12.119
Then-Year \$	23.441	-3.383	20.058
d. Approved Design to Cost Goal -- None			
e. Foreign Military Sales -- Sales to date total eleven (11) for an estimated cost of \$207,506,391 which includes two years of initial spares, support equipment, French peculiar design changes and eleven (11) installations.			
f. Nuclear Costs -- None			

12. Program Acquisition/Current Procurement Unit Cost Summary: Current
 (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>
	(Dec 86 SAR)	(Dec 85 SAR)	(Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	12857.2	7596.7	12857.2
(2) Quantity	641	395	641
(3) Unit Cost	20.058	19.232	20.058
b. Current Procurement --	(FY 1987)	*(FY 1987)	(FY 1988)
(1) Cost	779.1	779.1	627.7
Less CY Adv Proc	-	-	-
Plus PY Adv Proc	-	-	-
Net Total	779.1	779.1	627.7
(2) Quantity	50	50	36
(3) Unit Cost	15.582	15.582	17.436

*Differs from December 1985 SAR to reflect the FY87 Appropriations Act.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RD&E	PROC	O&M	TOTAL
Production Estimate	97.2	7456.7	275.3	7829.2
Previous Changes:				
Economic	-0.2	- 339.6	- 9.4	- 349.2
Quantity	-	+1259.7	+37.4	+1297.1
Schedule	-	+ 301.5	+ 7.6	+ 309.1
Engineering	-	-	-	-
Estimating	-2.3	-1434.4	-90.9	-1527.6
Other	-	-	-	-
Support	-	+ 38.1	-	+ 38.1
Subtotal	-2.5	- 174.7	-55.3	- 232.5
Current Changes:				
Economic	-	- 155.9	- .9	- 156.8
Quantity	-	+4791.8	+151.6	+4943.4
Schedule	-	+ 65.7	+ 2.1	+ 67.8
Engineering	-	-	-	-
Estimating	-	+ 40.5	-20.7	+ 19.8
Other	-	-	-	-
Support	-	+ 386.3	-	+ 386.3
Subtotal	0.0	+5128.4	+132.1	+5260.5
TOTAL CHANGES	-2.5	+4953.7	+76.8	+5028.0
CURRENT ESTIMATE	94.7	12410.4	352.1	12857.2

(FY 1981 CONSTANT DOLLARS (BASE-YEAR) IN MILLIONS)

	RD&E	PROC	O&M	TOTAL
Production Estimate	91.6	4941.5	196.0	5229.1
Previous Changes:				
Quantity	-	+ 724.1	+ 25.6	+ 749.7
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	- 1.9	- 919.1	- 65.7	- 986.7
Other	-	-	-	-
Support	-	- 1.5	-	- 1.5
Subtotal	- 1.9	- 196.5	- 40.1	- 238.5
Current Changes:				
Quantity	-	+2494.1	+ 83.4	+2577.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+ 23.1	- 15.9	+ 7.2
Other	-	-	-	-
Support	-	+192.9	-	+ 192.9
Subtotal	0.0	+2710.1	+ 67.5	+2777.6
Total Changes	- 1.9	+2513.6	+ 27.4	+2539.1
Current Estimate	89.7	7455.1	223.4	7768.2

13. Cost Variance Analysis (Cont'd):

b. Previous Change Explanations --

RDT&E

Economic: revised economic escalation indices

Estimating: reduction of management reserve to cover approved reprogrammings and comply with approved funding levels

PROCUREMENT

Economic: revised economic escalation indices

Quantity: increased quantity of modification kits from 334 to 392 based on lower than anticipated costs for the kits and installation; decreased quantity from 392 to 389 to enable a constant six per month outyear production schedule; increased quantity by six based on outyear procurement rate of 50 per year

Schedule: procurement program stretchout

Estimating: impact of revised economic escalation indices on current and prior years; decrease in kit price based on favorable firm fixed price contract proposals; estimating changes applicable to the kit reduction from 392 to 389; one-time change resulting from a correction to the methodology for computing inflation on programs with advance procurement funding; reduced estimate based on actual contract experience; estimating changes applicable to increase of six aircraft

Support: reduced spare engine and support costs based on lower kit costs and refinement of the estimate; reduction and rephasing of initial spares estimate; increase and rephasing of the peculiar support equipment and tech data estimates; impact of revised economic escalation indices on prior year support costs

O&M Installation

Economic: revised economic escalation indices

Quantity: increased installation costs associated with the increase in quantity of modification kits from 334 to 392; reduced installation costs associated with the decrease in quantity of modification kits from 392 to 389; installation of 6 additional aircraft

Schedule: installation schedule stretchout associated with kit procurement stretchout

Estimating: removal of interim contract support costs from the SAR; refinement of estimate based on contract negotiations; revised estimate of "Over and Above" contingency costs; estimating changes applicable to increase of six aircraft; adjustment for impact of revised economic indices on prior years

13. Cost Variance Analysis (Cont'd):c. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(1) <u>RD&E</u> -- None		
(2) <u>Procurement</u> --		
Revised economic escalation indices (Economic)	0.0	- 155.9
Quantity increased by 246 modification kits to total the 641 aircraft planned for modification	+ 2763.1	+5300.1
o Addition of 246 aircraft modification kits (Quantity)	(+ 2494.1)	(+4791.8)
o Increase in Other Weapon System Costs and Initial Spares associated with increase of 246 aircraft (Support)	(+ 269.0)	(+ 508.3)
Schedule change associated with a change in the procurement rate from 50 to 36 kits per year due to budget constraints (Schedule)	0.0	+ 65.7
Revised estimate based on actual contract experience (Estimating)	+ 16.6	+ 31.7
Adjustment for prior year inflation indices (Estimating)	+ 6.5	+ 8.8
Revised estimate based on actual contract experience on procurement of support equipment and tech data (Support)	- 77.7	-125.9
Adjustment for prior year inflation indices (Support)	+ 1.6	+ 3.9

13. Cost Variance Analysis (Cont'd):

	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(2) <u>O&M (Installation)</u>		
Revised economic escalation indices (Economic)	N/A	- .9
Increased installation costs associated with procurement of the 246 additional aircraft modification kits (Quantity)	+83.4	+151.6
Installation schedule rephased (stretchout) to accommodate the kit procurement schedule change (Schedule)	0.0	+ 2.1
Reduced installation cost estimate based on contract experience and competition (Estimating)	- 15.9	-20.7

d. References --

Production Estimate: FY 1984 President's Budget, January 1983

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

Initial SAR/Production Estimate (PdE) to Current Estimate (CE)

PAUC (Initial SAR/PdE)	Changes								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
23.441	-0.789	-1.491	+0.588	0.000	-2.352	+0.661	0.000	-3.383	20.058

15. Contract Information: (Then Year Dollars in Millions)

a. RDT&E - no active contracts

b. Procurement --

(1) Airframe Modification Kits
Boeing Military Airplane Co
F33657-82-C-2068, FFP
Award: February 26, 1982
Definitized: N/A

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
213.9	N/A	9

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
584.7	N/A	28

Estimated Price at Completion	
<u>Contractor</u>	<u>Program Manager</u>
584.7	584.7

15. Contract Information (Cont'd): (Then Year Dollars in Millions)(2) Airframe Modification Kits

Boeing Military Airplane Company
 F34601-84-C-1135, FFP
 Award Date: August 28, 1984
 Definitized: N/A

Initial	Contract	Price
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
187.6	N/A	30

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
186.4	N/A	30

Estimated Price at Completion

<u>Contractor</u>	<u>Program Manager</u>
186.4	186.4

(3) Airframe Modification Kits

Boeing Military Airplane Co
 F34601-85-C-0135, FFP
 Award Date: March 25, 1985
 Definitized: N/A

Initial	Contract	Price
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
174.8	N/A	43

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
176.2	N/A	43

Estimated Price at Completion

<u>Contractor</u>	<u>Program Manager</u>
176.2	176.2

(4) Engine

CFM International
 F33657-84-C-2128, Basic, FFP
 Award Date: December 7, 1984
 Definitized: N/A

Initial	Contract	Price
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
293.8	N/A	137

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
294.9	N/A	137

Estimated Price at Completion

<u>Contractor</u>	<u>Program Manager</u>
294.9	294.9

(5) Engine

CFM International
 F33657-84-C-2128, Opt 1, FFP
 Award Date: April 10, 1985
 Definitized: N/A

Initial	Contract	Price
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
396.9	N/A	175

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
352.0	N/A	175

Estimated Price at Completion

<u>Contractor</u>	<u>Program Manager</u>
352.0	352.0

15. Contract Information (Cont'd): (Then Year Dollars in Millions)

(6)	<u>Engine</u>	<u>Initial Contract Price</u>		
		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	CFM International	425.0	N/A	181
	F33657-84-C-2128, Opt II, FFP			
	Award Date: March 21, 1986			
	Definitized: N/A			
		<u>Estimated Price at Completion</u>		
		<u>Contractor</u>	<u>Program Manager</u>	
		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	Current Contract Price	376.9	N/A	181
		376.9	376.9	

- d. Cost/Schedule Variances -- All contracts are Firm Fixed Price (FFP). Cost Performance is not a contractual requirement and CPR data is not available.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 42.3% (11 yrs/26 yrs)
- (2) Percent Program Cost Appropriated: 28.2% (\$3631.8/12,857.2)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs</u>	<u>Budget Year</u>	<u>Balance To Complete</u>		<u>Total</u>
	<u>(FY77-87)</u>	<u>(FY88)</u>	<u>FYDP</u>	<u>Beyond FYDP</u>	
			<u>(FY89-92)</u>	<u>(FY93-02)</u>	
RDT&E	94.7	-	-	-	94.7
Procurement	3479.0	627.7	2719.2	5584.5	12410.4
O&M	58.1	12.5	70.3	211.2	352.1
Total	3631.8	640.2	2789.5	5795.7	12857.2

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY81 Base-Year Dollars		Then-Year Dollars			Escl Rate (%)	
		Flyaway		Total	Advance Proc			Total
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1977	-			2.6			1.9	6.9
1978	-			3.3			2.6	6.8
1979	-			8.2			7.0	8.4
1980	-			10.6			10.0	9.4
1981	-			15.5			16.2	11.9
1982	-			22.2			24.9	9.2
1983	-			21.8			25.5	4.9
1984	-			5.5			6.6	3.8
Subtotal	-			89.7			94.7	

Appropriation: Procurement

1980	-	4.7		4.7			5.0	9.7
1981	1	47.9	19.8	93.3	22.2		108.9	11.9
1982	9	31.7	154.2	193.2		11.5	238.0	9.6
1983	19	11.4	239.2	354.3		10.7	463.4	9.0
1984	30	4.7	330.3	401.9			548.2	7.9
1985	43	1.5	429.7	484.2			683.2	3.4
1986	43	1.0	429.6	447.7			653.2	2.9
1987	50		476.0	516.6			779.1	3.1
1988	36		368.8	403.1			627.7	3.5
1989	36		353.0	398.4			638.6	3.5
1990	36		366.6	412.8			679.1	3.3
1991	36		368.9	411.7			693.7	2.9
1992	36		367.3	410.1			707.8	2.4
1993	36		365.0	398.4			704.0	2.4
1994	36		365.0	391.8			709.2	2.4
1995	36		365.0	391.9			726.2	2.4
1996	36		365.0	392.0			743.6	2.4
1997	36		365.0	392.2			762.0	2.4
1998	36		365.0	392.3			780.7	2.4
1999	36		365.0	393.7			802.4	2.4
2000	14		141.9	170.8			356.4	2.4
Subtotal	641	102.9	6600.3	7455.1	22.2	22.2	12410.4	

16. Program Funding Summary (Con't): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY81 Base-Year Dollars			Then-Year Dollars			Esci Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriate: O&M (Installation)

1982	1			2.6			2.9	9.4
1983	-			2.1			2.4	4.6
1984	5			8.4			10.1	4.0
1985	28			15.9			19.8	3.4
1986	33			9.0			11.6	2.9
1987	32			8.5			11.3	3.1
1988	34			9.1			12.5	3.5
1989	45			12.0			17.0	3.5
1990	36			11.3			16.6	3.3
1991	36			12.0			18.0	2.9
1992	36			12.2			18.7	2.4
1993	36			12.2			19.2	2.4
1994	36			12.2			19.7	2.4
1995	36			12.2			20.2	2.4
1996	36			12.2			20.6	2.4
1997	36			12.2			21.1	2.4
1998	36			12.2			21.7	2.4
1999	36			12.2			22.2	2.4
2000	36			12.2			22.7	2.4
2001	36			12.2			23.3	2.4
2002	31			10.5			20.5	2.4
Subtotal	641			223.4			352.1	
Total	641	102.9	6600.3	7768.2	22.2	22.2	12857.2	

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated <u>1/</u>	Expended <u>1/</u>

Appropriation: RDT&E

1977	1.9	1.9	1.9
1978	2.6	2.6	2.6
1979	7.0	7.0	7.0
1980	10.0	10.0	10.0
1981	16.2	15.9	15.7
1982	24.9	24.3	24.3
1983	25.5	24.8	20.3
1984	6.6	5.9	3.5
Total	94.7	92.4	85.3

Appropriation: Procurement

1980	5.0	5.0	5.0
1981	108.9	108.9	108.9
1982	238.0	222.0	215.3
1983	463.4	462.3	462.3
1984	548.2	548.2	510.3
1985	683.2	660.4	434.3
1986	653.2	607.2	206.9
1987	779.1	0.0	0.0
TO COMPLETE	8931.4		
TOTAL	12410.4	2614.0	1943.0

Appropriation: O&M (Installation)

1982	2.9	2.9	2.9
1983	2.4	2.4	2.4
1984	10.1	10.1	10.1
1985	19.8	19.8	19.3
1986	11.6	11.6	11.6
1987	11.3	-	-
TO COMPLETE	294.0		
Total	352.1	46.8	46.3

1/ Reflects program office records as of 31 December 1986.

17. Production Rate Data (Cont'd):

a. Annual Production Rates ---

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1981	1	1	1	1
1982	9	9	9	9
1983	19	19	19	19
1984	31	31	30	30
1985	65	65	43	43
1986	65	65	43	43
1987	72	72	50	72
1988	72	72	36	72
1989			36	72
1990			36	72
1991			36	72
1992			36	72
1993			36	64
1994			36	
1995			36	
1996			36	
1997			36	
1998			36	
1999			36	
2000			14	

b. Cost Variance — Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BY\$)	5229.1	+2539.1	7768.2	+ 581.3	7186.9
(TY\$)	7829.2	+5028.0	12857.2	+1650.0	11207.2
PAUC (BY\$)	15.656	-3.537	12.119	+.907	11.212
(TY\$)	23.441	-3.383	20.058	+2.574	17.484

c. Schedule Variance ---

Item	Production Estimate	Variance (SE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	7/81	-	7/81	-	7/81
Duration (in Mos)	98	+154 mos	252	+105 mos	147
End Date (Mo/Yr)	9/89	+154 mos	6/02	+105 mos	9/93

D. Deliveries (Plan/Actual)

To Date

RD&E
Procurement

N/A
69/69

18. Operating and Support Costs -- Not applicable

AF-1 AMRAAM

SAR-86-079

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SELECTED ACQUISITION REPORT [RCS: DD-COMP (Q & A)823]

PROGRAM: AMRAAM (AIM 120A)

AS OF DATE: December 31, 1986

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AND SECURITY REVIEW (ORSL-PAT)
DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name): AIM-120A Advanced Medium Range Air-to-Air Missile (AMRAAM)

2. (U) DoD Component: U.S. Air Force/Navy

3. (U) Responsible Office and Telephone Number:

AMRAAM Joint System Program Office
Armament Division
Eglin AFB FL 32542

Brigadier General Thomas R. Ferguson, Jr.
Assigned: July 2, 1984
AV 872-2307; COMM (904) 882-2307

Naval Air Systems Command (PMA-268)
AMRAAM Joint System Program Office
Armament Division (Navy)
Eglin AFB, FL 32542

Captain Norbert W. Melnick, USN
Assigned: January 31, 1986
AV 872-2412; COMM (904) 882-2412

4. (U) Program Elements/Procurement Line Items:

RDT&E,AF:	PE64314F
PROCUREMENT,AF:	APPN 3020 ICN MAMRAO PE 27163F
MILCON:	None
RDT&E,N:	PE 64314N PROJ W0981
Procurement,N:	APPN 1507 ICN 2206 PE 26138M
	APPN 1507 ICN 2206 PE 24162N
MILCON:	None

SAF/PAS

87-0066-1

5. (U) Related Programs: F-14, F-15, F-16, F/A-18, A6F, NATO Aircraft

87-0042

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AIM-120A, December 31, 1986

6. (U) Mission and Description: The AMRAAM Program provides for the acquisition of the next generation all-weather, all-environment medium range air-to-air missile system in response to USAF, USN, and NATO operational requirements for the 1989-2005 time period. The system is designed so that AMRAAM can be employed within and beyond visual range, with or without an operational aircraft radar. Compared to the existing AIM-7 SPARROW which it replaces, AMRAAM design features provide increased firepower and combat utility/effectiveness while significantly reducing aircraft/aircrew vulnerability. Increased average velocity provides the capability to outshoot threat aircraft by increasing the separation between the launch aircraft and the target at AMRAAM intercept. Reduced miss distance and improved fusing combine to increase missile probability of kill. The active radar seeker provides a launch-and-maneuver capability and multiple target engagement on a single intercept. Improved clutter rejection and inherent ECCM capability enhance the performance at low altitudes and in a countermeasure environment. Improved system reliability, maintainability, and logistic supportability increase overall operational availability and effectiveness.

7. (U) Program Highlights:

a. Significant Historical Developments: DSARC (JRMB) Milestone I validated the requirement for AMRAAM. DSARC (JRMB) Milestone II (September 1982) authorized Full-Scale Development (FSD) and delegated the production decision responsibility to the Air Force. The FSD contract with two priced production lots was competitively awarded to Hughes Aircraft Company in December 1981. In July 1982, Raytheon was selected as the follower contractor for eventual competitive production of AMRAAM. In December 1983, with Hughes Aircraft Company behind schedule, the Air Force elected not to proceed with the production options. In January 1985, after the Air Force negotiated a reduced scope contract, and re-estimated the procurement cost, the Office of the Secretary of Defense directed that the FSD contracted program retain its full content and the Assistant Secretary of the Air Force for Research, Development, and Logistics to establish an OSD/multi-service Blue Ribbon committee to investigate alternatives to AMRAAM and methods for reducing costs. In February 1985, the F-15 was established as the lead aircraft for the Initial Operational Capability. In June 1985 the Joint System Program Office (JSPO) negotiated a revised FSD schedule complying with the direction to retain all elements of the original program. The Blue Ribbon Committee independently established that the AMRAAM program should be continued, and identified producibility enhancement projects and management initiatives which would significantly reduce acquisition costs.

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7. (U) Program Highlights (cont'd):

b. Significant Developments Since Last Report: In February 1986, the Secretary of Defense certified to Congress a revised AMRAAM program which incorporated a set of cost reduction measures and a procurement cost of \$7.0 billion (FY84\$). Through December 1986 twenty-three FSD guided AMRAAM Air Vehicle Instrumented (AAVI) launches have been completed. They were launched from F-16, F-15 and F/A-18 aircraft at WSMR, NM; Eglin AFB, FL; PMTC, CA and NWC, CA. The success rate for these launches is greater than 80 percent. A successful mission in December 1986 demonstrated the launch of two missiles from an F-16C against two QF-100 drones. The operation of a third simultaneous test site has been negotiated with contract award scheduled mid January 1987. Producibility enhancement contracts were awarded to Hughes and Raytheon in July and August 1986 respectively and long lead Lot I production contracts were awarded in November and December respectively.

The 1987 Authorization Bill for procurement states that missile cost may not exceed \$7 billion (in fiscal year 1984 dollars) based upon procurement of 24,000 missiles. However, this amount (\$7.0B) may be adjusted to reflect the effects of the FY1987 Congressional funding actions. Any such adjustment will be reported to Congress in this report. The FY1987 Congressional funding actions which reduced Lot I from 260 to 180 missiles and Lot II from 833 to 630 missiles (resulting in extending the ramp-up of Lot IV into Lot V) did increase the congressional cap from \$ 7.000B to \$7.172B in fiscal year 1984 dollars. The Low Rate Initial Production (milestone IIIA) decision is scheduled for 3rd Qtr FY87. Following that milestone, the next selected acquisition report will be submitted to reflect the procurement baseline established at that time and the base year will be changed from 1978 to 1984. Footnotes are used in this report to convert "current estimate" dollars to a 1984 base year for tracking purposes.

This is the first joint Air Force/Navy SAR submittal.

AMRAAM is expected to meet all mission requirements.

c. Changes since "As Of" Date: None.

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8. (U) Decision Coordination Paper (DCP) Threshold Breaches: There are currently no DCP (dated 27 November 1985) or SDDM (dated 5 November 1986) threshold breaches.

9. (U) Schedule:

a. Milestones:

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>	
Preliminary Design Review	Aug 82/Aug 82	Aug 82	
DSARC II (JRMB) (SDDM)	Nov 82/Nov 82	Nov 82	
Advance Buy Long Lead for Lot I	NA/Dec 86 (CH-1)	Dec 86	(CH-1)
JRMB IIIA (Lot I Low Rate Initial Production)	NA/Apr 87	Apr 87	
Production Contract Full Go-Ahead for Lot I	NA/Jul 87 (CH-1)	Jul 87	(CH-1)
JRMB IIIB (Lot III - Rate Production)	NA/Mar 89	Mar 89	
IOC	Sep 86/Oct 89 (CH-1)	Oct 89	(CH-1)

b. Previous Change Explanations:

Pre-priced options for Lots I and II expired July 1984 and were not negotiated. Milestones were updated to reflect the restructured Program. OSD approved revised schedules and decision milestones have been incorporated into this initial joint Air Force/Navy SAR submission.

c. Current Change Explanations:

(CH-1) Lot I advance buy/long lead contract awards, Lot I full go-ahead, and IOC were delayed 3-4 months because of missile quantity reduction and late approval of the FY87 budget by Congress.

d. References:

Development Estimate: SDDM dated 3 November 1982, #X22681

Approved Program: FY 1988 Presidents Budget, dated January 1987

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AIM-120A, December 31, 1986

10. ~~(S)~~ Technical/Operational Characteristics:

a. (U) Technical	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(U) Weight (lbs)	327/350		335
(U) Length (in)	143/144.2	143.9	143.9
(U) Reliability <u>1/</u> Ready Storage (hrs) <u>2/</u>	60000/45000		45000
Availability (%)	86/82		93
Captive-Carry (MTEM- Type 1) (Hrs) <u>3/</u>	600/450		1000

(b)(1)



c. (U) Previous Change Explanations:

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Reliability Ready Storage (hrs), Probability of Kill, Multiple Target Separation Range and Range Rate, F-Pole Range, and Look-Down Shoot-Down -- current estimate revised to reflect approved and required program as documented in Decision Coordinating Paper, 27 November 1985.

Reliability Availability and Captive Carry (MRM-Type I) -- current estimate revised to reflect results of FSD test and analysis.

Multiple Launch Capability -- current estimate in previous report reflected missile maximum range capability. The estimate has been updated to show prime range of the missile based on Air Force and Navy aircraft operational characteristics.

d. (U) Current Change Explanations: None.

e. (U) Reference:

Development Estimate: SDDM, 3 November 1982, #X22681.

Approved Program: Decision Coordinating Paper, 27 November 1985.

11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	Nov 82 Development Estimate	Changes	Current Estimate
a. Cost			
Development (RDT&E)	730.2	1.3	731.5
Procurement	4031.6	105.1	4136.7 *
Air Vehicle Flyaway	3508.2	255.8	3764.0
Other Wpn Sys			
Cost	264.0	-66.6	197.4
Initial Spares	84.9	-29.8	55.1
Other Procurements	174.5	-54.3	120.2
Construction	--	--	--
Total FY 78 Base-Year \$	4761.8	106.4	4868.2
Escalation	6829.8	-1236.3	5593.5
Development (RDT&E)	447.9	-42.3	405.6
Procurement	6381.9	-1194.0	5187.9
Construction (MILCON)	--	--	--
Total Then-Year \$	11591.6	-1129.9	10461.7
b. Quantities --			
Development (RDT&E)	169	-58	111
Procurement	24335	-15	24320
Total	24504	-73	24431
c. Unit Cost --			
Procurement:			
FY 78 Base-Year \$	0.166	0.004	0.170
Then-Year \$	0.428	-0.045	0.383
Program:			
FY 78 Base-Year \$	0.194	0.005	0.199
Then-Year \$	0.473	-0.045	0.428

*This equates to \$7,122.8M (FY84\$).

11. (U) Program Acquisition Cost (cont'd):

d. Approved Design to Cost Goal:

(Average Unit Flyaway Cost)

	<u>Dev Estimate/ Appr Program</u>	<u>Current Estimate</u>	<u>Latest Appr Threshold*</u>
Air Force			
Qty: 17,108			
Peak Rate: 250/mo			
FY78 Base-Year \$	.154/.171	0.171	0.171
Then-Year \$	.397/.381	0.381	0.381
Navy			
Qty: 7,212			
Peak Rate: 250/mo			
FY78 Base-Year \$	.122/.116	0.116	0.116
Then-Year \$	.315/.273	0.273	0.273

*FY1988 President's Budget.

e. Foreign Military Sales: None.

f. Nuclear Costs: None.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions) **

	<u>Current Est Dec 86 SAR</u>	<u>Current Year UCR Baseline Dec 85 SAR</u>	<u>Budget Year UCR Baseline Dec 86 SAR</u>
a. Program Acquisition			
(1) Cost	10461.7	10401.2	10461.7
(2) Quantity	24431	24431	24431
(3) Unit Cost	0.428	0.426	0.428
b. Current Procurement --	<u>FY 1987</u>	<u>FY 1987***</u>	<u>FY 1988</u>
(1) Cost	582.4	582.4	837.0
Less CY Adv Proc	42.2	42.2	0.0
Plus PY Adv Proc	56.1	56.1	42.2
Net Total	<u>596.3</u>	<u>596.3 ***</u>	<u>879.2</u>
(2) Quantity	180	180	630
(3) Unit Cost	3.313	3.313	1.396

**Unit cost baselines have been computed by dividing the total Air Force and Navy costs by the total Air Force and Navy quantities.

***Differs from the December 1985 SAR to reflect the FY 1987 Appropriations Act in accordance with the Congressional change to the SAR law.

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13. (U) Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1178.1	10413.5	-	11591.6
Previous Changes:				
Economic	-36.9	-1895.5		-1932.4
Quantity	-39.2			-39.2
Schedule	-19.1	243.9		224.8
Engineering	5.1	170.3		175.4
Estimating	60.2	523.0		583.2
Other				
Support		-202.2		-202.2
Subtotal	-29.9	-1160.5	-	-1190.4
Current Changes:				
Economic	-6.2	-170.7		-176.9
Quantity				
Schedule		33.3		33.3
Engineering				
Estimating	-4.9	310.4		305.5
Other				
Support		-101.4		-101.4
Subtotal	-11.1	71.6	-	60.5
Total Changes	-41.0	-1088.9	-	-1129.9
Current Estimate	1137.1	9324.6	-	10461.7

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13. (U) Cost Variance Analysis (cont'd):

(FY 1978 Constant (Base Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	730.2	4031.6	-	4761.8
Previous Changes:				
Quantity	-18.7			-18.7
Schedule	-12.0	-146.2		-158.2
Engineering	2.3	64.3		66.6
Estimating	33.4	215.1		248.5
Other				
Support		-99.8		-99.8
Subtotal	5.0	33.4	-	38.4
Current Changes:				
Quantity				
Schedule				
Engineering				
Estimating	-3.7	122.6		118.9
Other				
Support		-50.9		-50.9
Subtotal	-3.7	71.7	-	68.0
Total Changes	1.3	105.1	-	106.4
Current Estimate	731.5	4136.7	-	4868.2

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13. (U) Cost Variance Analysis (cont'd):

b. Previous Change Explanations:

RDT&E

Economic: Revised economic escalation indices.
Schedule: Revised estimate due to reduction of evaluation missiles.
Engineering: Addition and subsequent deletion of P3I effort.

Estimating: Funds transferred from P3I procurement budget to FY87 development budget to extend the FSD program into FY88. Reduction in government support to live within approved funding. Additional unique analysis for tradeoffs, shipboard use, aircraft integration, and variations.

PROCUREMENT

Economic: Revised economic escalation indices.
Schedule: Rephased production quantities in FY90 through FY93. Production delayed by one year.
Engineering: Extension of production funds and deletion of HAVE SPEAR, a limited access program.
Estimating: Increased missile hardware costs and the addition of warranty provisions. Adjustment for Congressional transfer of of Adv Proc TY\$ funding from FY84 to FY86. Reestimate based on impact of revised escalation indices.

Support: Revised support cost requirements resulting from revised schedule. Incorporated contractor maintenance support and deferred organic depot until completion of production. Re-estimate of initial spares support.

MILCON

N/A

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13. (U) Cost Variance Analysis (cont'd):

c. Current Variance Analysis

	(Dollars in Millions)	
	<u>Base Year</u>	<u>Then Year</u>
(1) <u>RDT&E</u>		
Revised economic escalation indices. (Economic)	-	-6.2
Addition of FY92 to the Navy R&D program for additional unique analysis. (Estimating)	1.9	3.9
Adjustment for current and prior year escalation. (Estimating)	1.5	2.5
Directed cuts at no direct impact but with increased risk to the program. (Estimating)	-7.1	-11.3
(2) <u>PROCUREMENT</u>		
Revised economic escalation indices. (Economic)	-	-170.7
Adjustment due to Congressional quantity realignment from FY87 and FY88 to outyears.	99.9	279.1
Direct schedule impact of Congressional realignment of quantity. (Schedule)	(0.0)	(33.3)
Adjustment to flyaway caused by the schedule change due to Congressional realignment of quantity. (Estimating)	(99.9)	(245.8)
Adjustment for current and prior year escalation.* (Estimating)	11.7	23.2
Adjustment for current and prior year escalation.* (Support)	1.5	3.0
Adjustments to live within approved funding at no direct impact but with increased risk to the program. (Estimating)	-23.8	-29.0
Reevaluation of support equipment and government analysis. (Support)	-16.4	-35.8

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13. (U) Cost Variance Analysis (cont'd):

c. Current Variance Analysis

(2) PROCUREMENT (cont'd)

Reevaluation and rephasing of spares requirements. (Support)	-1.2	1.8
Correction for realignment between SAR categories.	0.0	0.0
Amount to be removed from estimating to balance to proper mix. (Estimating)	(+34.8)	(+70.4)
Amount to be added to support to balance to proper mix. (Support)	(-34.8)	(-70.4)

* This is an after the fact adjustment to constant year dollars beyond the control of the program office. It is anticipated that this amount will go to zero over time but is identified as an addition to the program in the current estimate.

d. References: Secretary of Defense Decision Memorandum, 3 November 1982, X22681.

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR/Development Estimate to Current Estimate --

PAUC (Initial SAR/Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.473	-0.086	.000	0.011	0.007	0.036	--	-0.013	-0.045	0.428

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15. (U) Contract Information: (Then Year Dollars in Millions)

a. RDT&E

<u>AMRAAM (AIM-120A):</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Hughes Aircraft Company Missiles Systems Group Canoga Park, CA FO8635-82-C-0001, FPIF Award: 11 December 1981	398.1	526.5	94

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>QTY</u>	<u>Contractor</u>	<u>Program Manager</u>
415.7	555.4	94	807.0	811.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances *	0.0	0.0
Cumulative Variances to Date (Oct 86)	-4.4	-20.5
Net Change	-4.4	-20.5

EXPLANATION OF CHANGE: Development of the AMRAAM air vehicle continues to be the primary cost and schedule variance driver. Major sources of the variances are problems encountered in developing the Guidance Section, Missile Integration and Assembly, and Control Section. Impact on contract: Although the contractor is behind his program management baseline delivery schedule of sixty-six months, he remains ahead of the contract delivery schedule of seventy-five months (actual FSD duration, to support the test program, will extend four months beyond final missile delivery). The governments liability is limited to the ceiling price.

* Due to the implementation of an over-target-baseline, previous cumulative variances do not apply.

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15. (U) Contract Information (cont'd):Below Chassis Level STE

Raytheon Company
Bedford, MA
F08635-85-C-0084, FPIF
Award: 8 July 1985
Definitization: 3 Jan 86

Current Contract Price		
Target	Ceiling	Qty
45.5	52.6	0

Initial Contract Price		
Target	Ceiling	Qty
45.5	52.6	0

Previous Cumulative Variances
Cumulative Variances to Date (Oct 86)
Net Change

Estimated Price at Completion	
Contractor	Program Manager
47.3	52.6

Cost Variance	Schedule Variance
0.0	0.0
-1.1	-1.3
-1.1	-1.3

Explanation of Change: Initial submission of performance data, therefore there are no previous cumulative variances. Additional effort due to design deficiency problems coupled with delayed receipt of Acceptance Requirements Documents (ARDs) from Hughes has caused schedule slips and additional costs. The contractor and program office have revised their EACs. There is no impact to the program or to the contract at completion.

Qualification Lot

Raytheon Company
Bedford, MA
F09635-86-C-0002, FPIF
Award: 4 November 1985
Definitization: 10 June 1986

Current Contract Price		
Target	Ceiling	Qty
76.2	89.9	15

Initial Contract Price		
Target	Ceiling	Qty
76.2	89.9	15

Previous Cumulative Variances
Cumulative Variances to Date (OCT 86)
Net Change

Estimated Price at Completion	
Contractor	Program Manager
75.4	76.2

Cost Variance	Schedule Variance
0.0	0.0
-0.3	-0.9
-0.3	-0.9

Explanation of Change: Initial submission of performance data, therefore there are no previous cumulative variances. The unfavorable schedule variance to date is primarily a result of lower than anticipated receipt of material from vendors and the high volume of Engineering Change Order activity and management problems associated with engineering documentation. The unfavorable cost variance is primarily the result of higher than anticipated hardware support activities. There is no impact to the program or to the contract at completion.

The Raytheon Full Scale Development and Above Chassis level STE contracts do not meet the revised threshold for SAR reporting and have been deleted.

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16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 55.0% (11 yrs/20 yrs)

(2) Percent Program Cost Appropriated: 18.4% (\$1925.8/\$10461.7)

b. Appropriation Summary --

<u>Appropriation</u>	<u>Current & Prior Yrs (FY77-87)</u>	<u>Budget Year (FY88)</u>	(Then-Year Dollars in Millions)		<u>Total</u>
			<u>FYDP (FY89-92)</u>	<u>Balance to Complete Beyond FYDP (FY93-96)</u>	
RDT&E	1052.2	55.4	29.5	-	1137.1
Procurement	873.6	837.0	3964.6	3649.4	9324.6
MILCON	-	-	-	-	-
Total	<u>1925.8</u>	<u>892.4</u>	<u>3994.1</u>	<u>3649.4</u>	<u>10461.7</u>

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16. (U) Program Funding Summary: (Cont'd)

c. Annual Summary —

Fiscal Year	Qty*	FY 78 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E (Air Force/Navy)								
1977				5.0			4.8	--
1978				12.5			12.7	6.0
1979				30.6			34.4	8.4
1980				42.7			53.5	9.4
1981				34.0			47.1	11.9
1982				95.1			140.9	9.2
1983				138.0			213.8	4.9
1984				122.9			197.9	3.8
1985				126.9			211.1	3.4
1986				54.7			93.9	2.9
1987				23.7			42.1	3.1
1988				30.2			55.4	3.5
1989				7.4			14.0	3.5
1990				4.0			7.8	3.3
1991				1.9			3.8	2.9
1992				1.9			3.9	2.4
Subtotal	111	**	**	731.5			1137.1	

*Of the 111 total RDT&E quantity, only Guided Test Vehicles are reported for the Air Force. Other contractor deliverables include Special Test Vehicles [i.e., Jettison Test Vehicles (JTV), AMRAAM Captive Equipment (ACE), Separation Control Test Vehicles (SCTV), Integration Test Vehicles (ITV)] and Class V aircraft integration test vehicles. Twelve missiles are being procured for Navy Initial Operational Test and Evaluation.

** Not Available

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16. (U) Program Funding Summary (cont'd):

Appropriation: Procurement (Air Force/Navy)

1984	--	15.2	--	15.2	--	--	27.8	8.0
1985	--	37.3	--	37.3	--	--	70.0	3.4
1986	--	70.7	--	99.7	56.1	--	193.4	2.9
1987	180	73.2	213.7	290.3	42.2	56.1	582.4	3.1
1988	630	93.7	310.1	404.2	--	42.2	837.0	3.5
1989	1800	48.0	378.8	468.4	--	--	999.2	3.5
1990	2900	31.2	400.9	503.5	--	--	1102.3	3.3
1991	3000	9.8	373.3	436.4	--	--	978.7	2.9
1992	3000	2.8	359.6	385.0	--	--	884.4	2.4
1993	3000	0.3	354.1	401.0	--	--	943.1	2.4
1994	3000	--	315.4	344.9	--	--	830.7	2.4
1995	3000	--	307.1	343.0	--	--	845.8	2.4
1996	3510	--	368.8	407.8	--	--	1029.8	2.4
Subtotal	24320	382.2	3381.8	4136.7	98.3	98.3	9324.6	
Total	24431	--	--	4868.2	98.3	98.3	10461.7	

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16. (U) Program Funding Summary: (Cont'd)

c. Annual Summary --

Fiscal Year	Qty*	FY 78 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E (Air Force)

1977				5.0			4.8	--
1978				6.6			6.7	6.0
1979				14.3			16.1	8.4
1980				20.9			26.2	9.4
1981				16.5			22.9	11.9
1982				92.9			137.6	9.2
1983				135.2			209.5	4.9
1984				118.4			190.6	3.8
1985				122.2			203.3	3.4
1986				52.2			89.6	2.9
1987				20.8			36.9	3.1
1988				15.4			28.2	3.5
Subtotal	94	**	**	620.4			972.4	

*Only Guided Test Vehicles are reported. Other contractor deliverables include Special Test Vehicles [i.e., Jettison Test Vehicles (JTV), AMRAAM Captive Equipment (ACE), Separation Control Test Vehicles (SCTV), Integration Test Vehicles (ITV)] and Class V aircraft integration test vehicles.

** Not Available

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16. (U) Program Funding Summary (cont'd):

Appropriation: Procurement (Air Force)

1984	--	15.2	--	15.2	--	--	27.8	8.0
1985	--	37.3	--	37.3	--	--	70.0	3.4
1986	--	70.7	--	99.7	56.1	--	193.4	2.9
1987	180	73.2	213.7	290.3	42.2	56.1	582.4	3.1
1988	630	93.7	310.1	404.2	--	42.2	837.0	3.5
1989	1750	41.2	359.6	412.9	--	--	880.8	3.5
1990	2500	31.2	343.0	393.9	--	--	862.3	3.3
1991	2200	9.8	269.6	302.8	--	--	679.1	2.9
1992	1800	2.8	216.5	226.3	--	--	519.9	2.4
1993	1800	0.3	213.0	243.2	--	--	571.9	2.4
1994	1800	--	189.2	192.9	--	--	464.6	2.4
1995	1800	--	184.2	187.8	--	--	463.0	2.4
1996	2048	--	256.6	260.3	--	--	657.3	2.4
Subtotal	17108	375.4	2555.5	3066.8	98.3	98.3	6809.5	
Total	17202	--	--	3687.2	98.3	98.3	7781.9	

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16. (U) Program Funding Summary: (Cont'd)

c. Annual Summary --

Fiscal Year	Qty	FY 78 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E (Navy)

1978				5.9			6.0	6.0
1979				16.3			18.3	8.4
1980				21.8			27.3	9.4
1981				17.5			24.2	11.9
1982				2.2			3.3	9.2
1983				2.8			4.3	4.9
1984				4.5			7.3	3.8
1985				4.7			7.8	3.4
1986				2.5			4.3	2.9
1987				2.9			5.2	3.1
1988				14.8			27.2	3.5
1989				7.4			14.0	3.5
1990				4.0			7.8	3.3
1991				1.9			3.8	2.9
1992				1.9			3.9	2.4
Subtotal	17	**	**	111.1			164.7	

** Not Available

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16. (U) Program Funding Summary (cont'd):

Appropriation: Procurement (Navy)

1989	50	6.8	19.2	55.5	--	--	118.4	3.5
1990	400	--	57.9	109.6	--	--	240.0	3.3
1991	800	--	103.7	133.6	--	--	299.6	2.9
1992	1200	--	143.1	158.7	--	--	364.5	2.4
1993	1200	--	141.1	157.8	--	--	371.2	2.4
1994	1200	--	126.2	152.0	--	--	366.1	2.4
1995	1200	--	122.9	155.2	--	--	382.8	2.4
1996	1162	--	112.2	147.5	--	--	372.5	2.4
Subtotal	7212	6.8	826.3	1069.9	--	--	2515.1	
Total	7229	--	--	1181.0	0.0	0.0	2679.8	

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16. (U) Program Funding Summary (cont'd):

d. Obligations and Expenditures* --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E (Air Force/Navy)

1977	4.8	4.8	4.8
1978	12.7	12.7	12.7
1979	34.4	34.4	34.4
1980	53.5	53.5	53.5
1981	47.1	47.1	47.1
1982	140.9	140.9	140.9
1983	213.8	213.8	212.4
1984	197.9	197.9	192.4
1985	211.1	211.1	133.2
1986	93.9	59.8	13.8
1987	42.1	4.8	0.4
To Complete	84.9	N/A	N/A
Total	1137.1	980.8	845.6

Appropriation: Procurement (Air Force/Navy)

1984	27.8	27.8	13.7
1985	70.0	61.8	25.6
1986	193.4	175.1	2.7
1987	582.4	171.9	0.0
To Complete	8451.0	N/A	N/A
Total	9324.6	436.6	42.0

*Reflects latest program office records as of January 12, 1986.

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17. (U) Production Rate Data:

a. Annual Production Rates:

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1985	249	N/A		N/A
1986	1067	N/A		N/A
1987	1964	N/A	196.4 *	N/A
1988	3000	N/A	630	N/A
1989	3000	N/A	1800	N/A
1990	3000	N/A	2900	N/A
1991	3000	N/A	3000	N/A
1992	3000	N/A	3000	N/A
1993	3000	N/A	3000	N/A
1994	3055	N/A	3000	N/A
1995		N/A	3000	N/A
1996		N/A	3810	N/A

*Funded delivery period is eleven months.

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17. (U) Production Rate Data: (cont'd)

b. Cost Variance:

Item	Production Estimate	Variance (CE less) PdE)	Current Estimate	Variance (CE less) Max)	Maximum
Prog Acq Cost(BY\$)	N/A	N/A	4868.2	N/A	N/A
(TY\$)	N/A	N/A	10461.7	N/A	N/A
PAUC (BY\$)	N/A	N/A	0.199	N/A	N/A
(TY\$)	N/A	N/A	0.428	N/A	N/A

c. Schedule Variance:

Item	Production Estimate	Variance (CE less) PdE)	Current Estimate	Variance (CE less) Max)	Maximum
Start Date(Mo/Yr)	N/A	N/A	12/86	N/A	N/A
Duration (in Mos)	N/A	N/A	139	N/A	N/A
End Date (Mo/Yr)	N/A	N/A	07/98	N/A	N/A

d. Deliveries (Plan/Actual):

	To Date
RDT&E	64/69
Procurement	0/0

18. (U) Operating and Support Costs: N/A

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: IUS

AS OF DATE: DECEMBER 31, 1986

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1. Designation and Nomenclature (Popular Name): Inertial Upper Stage (IUS)

2. DoD Component: U.S. Air Force

3. Responsible Office and Telephone Number:
Upper Stages Program Office PM: Col Dennis E. Beebe
Space Division Assigned: January 31, 1985
Los Angeles AFS, CA 90009 AUTOVON: 833-2268
Commercial: (213) 643-2268

4. Program Elements/Procurement Line Items:
RDT&E: PE64411F (Shared Funding)
PE63411F (Shared Funding)
PE35171F (Shared Funding)
PROCUREMENT: APPN 3020 ICN MLASUP
MILCON: PE12449F (Shared Funding)

5. Related Programs:
Space Transportation System (STS - NASA), Titan IV, Defense Satellite Communications System (DSCS), Defense Support Program (DSP), NASA scientific and communications satellites, Air Force Special Projects (SP)

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DIRECTORATE FOR FREEDOM OF INFORMATION
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DEPARTMENT OF DEFENSE

87-0052-1

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6. Mission and Description:

The Inertial Upper Stage (IUS) is a two-stage, solid propellant, high altitude rocket booster. It can be used in conjunction with the Space Transportation System (Shuttle) or Titan IV launch vehicle. It is used to deploy payloads from low earth orbit to a higher energy mission orbit. These orbits are higher than the Space Shuttle or Titan IV rocket alone can provide. The primary users are NASA and DoD. The IUS replaced the Transtage as the primary upper stage vehicle.

7. Program Highlights:

a. Significant Historical Developments -- In April 1972, the Inertial Upper Stage was born as the NASA concept of the "Space Tug". By October 1973, the Air Force had taken over responsibility of what was then called the "Interim Upper Stage" with the agreement that we would accommodate NASA requirements as needed.

The concept validation phase began in 1975 and resulted in selection of the solid rocket motor (SRM) concept for the now designated Inertial Upper Stage. It was agreed that the IUS would support DOD/NASA missions in the 1980 - 1986 time frame. In 1976 Boeing Aerospace Company won the competition to develop the IUS, commencing the 18 month-long validation phase. In this time period, the IUS grew from the idea of adapting an existing stage to the concept of developing a new generic upper stage to accommodate improved reliability parameters and increased mission requirements.

The program moved into Full-Scale Development in 1978 with Boeing Aerospace Company as the prime contractor. Component and vehicle qualification testing was completed in mid 1982, ending with 26 consecutive successful solid rocket motor firings. The contract was let for nine vehicles with heavy emphasis on reliability and system redundancy. At that time, poor cost and schedule analysis as well as inexperience in procuring high qualification piece parts led to significant cost overruns and therefore, two separate contract restructures. Two of those FSD vehicles have been launched. In October 1982 a 3871 lb. DSCS II/III satellite launched on Titan T34-D booster was completely successful. The second launch, in April 1983, was a NASA TDRS-A satellite in the first IUS/Shuttle mission ever. Although the payload reached nominal mission orbit, in-flight technical problems initiated the 'IUS Anomaly Recovery Plan' and the third restructure of the FSD contract. Eventually, the problem was successfully recognized and resolved.

In 1983 the program entered into a follow-on production contract. The total quantity to be produced was reduced from 18 to 10 due to the transfer of some payloads to the Centaur Upper Stage. The procurement strategy was also changed to annual buy. Thus far two of those production vehicles have flown DOD payloads successfully to nominal mission altitudes from the Space Shuttle park orbit. On 6 Feb 84, the SECAF determined that the production quantity decrease from 18 to 10 vehicles would result in a Program Acquisition Unit Cost (PAUC) Breach, and notified Congress.

In 1985 the IUS successfully launched a number of classified payloads. In September of that year the program began work on the second follow-on production and launch services contract to produce three IUS vehicles to be delivered in 1988 and 1989. On 28 January 1986 the Space Shuttle orbiter "Challenger" exploded moments after takeoff which caused the IUS and its payload to be completely destroyed before deployment.

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b. Significant Developments Since Last Report -- Since the last SAR report was submitted, there have been no IUS missions. The Shuttle/Centaur program cancellation resulted in an additional future classified DoD payload for the IUS. The Inertial Upper Stage system is expected to satisfy mission requirements.

c. Changes Since "As of" Date -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches:
There are currently no DCP (dated 29 March 1978) threshold breaches.

9. Schedule:

a. Milestones --	Development Estimate/ Approved Program	Current Estimate
JRMB II (Full Scale Dev.)	Mar 78/Mar 78	Mar 78
Development Contract Award	Mar 78/Mar 78	Mar 78
Engine Qualification Test		
(1) Titan Configured	Oct 82/Oct 82	Oct 82
(2) STS Configured	Jan 83/Jan 83	Jan 83
First Flight Vehicles		
(1) Titan Configured	Oct 82/Oct 82	Oct 82
(2) STS Configured	Mar 83/Mar 83	Mar 83
First Production Contract Award	Jan 83/Jan 83	Jan 83
Initial Launch Capability (ILC)*		
(1) Titan Configured	Oct 82/Oct 82	Oct 82
(2) STS Configured	Mar 83/Apr 83	Apr 83
Delivery of First Production Contract Vehicle	Nov 83/Jun 84	Jun 84

*ILC is defined as the first IUS launch of each configuration.

b. Previous Change Explanations -- The initial launch of an STS configured IUS was delayed from March 1983 to April 1983 due to Shuttle related technical problems. The first production vehicle delivery was delayed 19 months until after the anomaly investigation and subsequent design changes.

c. Current Change Explanations -- None. No current changes in approved program or current estimate.

9. Schedule (Cont'd):

d. References --

Development Estimate: PMD R-S 5068(26), 2 December 1982, Space Transportation System; R-S 7123(10), 21 June 1982, Space Launch Support.

Approved Program: PMD R-S 5068(27), 22 February 1983; R-S 7123(13), 19 December 1983.

10. Technical/Operational Characteristics:

	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. Technical			
Reliability (%)			
(1) Titan 34D	96/96	100	99.3
(2) Space Shuttle	96/96	67	98.5
(3) Titan IV	96/96 (Ch-1)	N/A (Ch-1)	99.3 (Ch-1)
Accuracies			
(1) GSO Position (NM)	+/-92/ +/-92	+/-28.0	+/-91
(2) GSO Velocity (ft/s)	+/-78/ +/-78	+/- 7.8	+/-38
(3) GSO Inclination (Degrees)	+/-0.12/ +/-0.12	+/-0.02	+/-0.10

	<u>Dev Estimate Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
b. Operational			
Payload Wt. to Geosynch. Orbit (GSO) from the Space Shuttle (lb.)	5,000/5000	5,133	5,002
Payload Wt. to GSO from Titan 34D (lb.)	4,000/4,000	3,871	3,853
Payload Wt. to GSO from Titan IV (lb.)	5,300/5,300 (Ch-1)	N/A (Ch-1)	5,364 (Ch-1)

c. Previous Change Explanations --

Payload Wt. to GSO for the STS and Titan changed from 5000 to 5133 and from 4000 to 4008 respectively, due to an extendable exit on the stage solid rocket motor that increases thrust, and weight reduction engineering changes. Reliability for the Titan and the STS changed from 96 to 99.3 and 96 to 98.5 respectively and reflect maximum use of high reliability piece parts, stringent test requirements, and redundancy. In addition, all probable single point failures have been eliminated. The 67% demonstrated performance for the STS reflects two-thirds of the missions being said to be 100% successful. Position, velocity and inclination first changed from +/-92, 78 and 0.12 to +/-58, 50 and 0.055 respectively, due to the use of sophisticated gamma guidance techniques. Last year they became +/-28.0, 7.8 and 0.02. The newer parameters were taken from STS missions as opposed to Titan 34D. The estimated payload weight to GSO from the Space Shuttle changed from 5089 pounds to 5002 pounds.

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10. Technical/Operational Characteristics (Cont'd):

c. Previous Change Explanations (Cont'd) --

There are two causes: 1. SRM-1 and SRM-2 specific impulses are approximately 0.5% lower than predicted (accounting for about 45 pounds). 2. Vehicle weight increased due to the IUS anomaly fix (accounts for about 40 pounds). The estimated payload weight to GSO on the Titan 34D changed from 4000 to 3924 to reflect the maximum predicted satellite payload weight. The SRM-1 and SRM-2 specific impulse change (see (1) above) accounts for about 35 pounds. The current estimate of 3853 pounds will still accommodate all payload requirements.

d. Current Change Explanations --

(Ch-1): The new entries are for Titan IV. The Titan IV is a new expendable launch vehicle to be used with the IUS. Demonstrated performance figures are not included as the Titan IV has yet to fly.

e. References --

Development Estimate: PMD R-S 5068(26), 2 December 1982, Space Transportation System; R-S 7123(10), 21 June 1982, Space Launch Support.

Approved Program: PMD R-S 5068(27), 22 February, 1983; R-S 7123(13) 19 December, 1983.

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11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Changes	Current Estimate
Development (RDT&E)	\$424.2	\$ -4.5	\$419.7
Procurement	533.6	-253.7	279.9
Flyaway	(437.0)	(-242.5)	(194.5)
Other	(96.6)	(- 11.2)	(85.4)
Initial Spares	(-)	(-)	(-)
Construction (MILCON)	<u>5.2</u>	<u>-0.6</u>	<u>4.6</u>
Total FY 75 Base-Year \$	963.0	-258.8	704.2
Escalation	1049.3	-472.6	576.7
Development (RDT&E)	(269.0)	(-10.9)	(258.1)
Procurement	(777.2)	(-461.3)	(315.9)
Construction (MILCON)	(3.1)	(-0.4)	(2.7)
Total Then-Year \$	\$2012.3	\$-731.4	\$1280.9
b. Quantities --			
Development (RDT&E)	1	-	1
Procurement	<u>17</u>	<u>-10</u>	<u>7</u>
Total	18	-10	8
c. Unit Cost --			
Procurement:			
FY 75 Base-Year \$	\$31.388	+\$8.598	\$39.986
Then-Year \$	77.106	+8.008	85.114
Program:			
FY 75 Base-Year \$	53.500	+34.525	88.025
Then-Year \$	\$111.794	+\$48.319	\$160.113
d. Approved Design to Cost Goal --	None		
e. Foreign Military Sales --	None		
f. Nuclear Costs --	None		

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12. Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>			<u>Budget Year</u>		
	<u>SAR Current</u>		<u>UCR Baseline</u>	<u>UCR Baseline</u>		
	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	
	<u>Dec 86</u>	<u>SAR</u>	<u>Dec 85</u>	<u>SAR</u>	<u>Dec 86</u>	<u>SAR</u>
a. Program Acquisition --						
(1) Cost	1280.9		1265.7		1280.9	
(2) Quantity	8		8		8	
(3) Unit Cost	160.113		158.213		160.113	
b. Current Procurement --	(FY 1987)		(FY 1987)*		(FY 1988)	
(1) Cost	5.3		5.3		26.8	
Less CY Adv Proc	-		-		-	
Plus PY Adv Proc	-		-		-	
Net Total	5.3		5.3		26.8	
(2) Quantity	0		0		0	
(3) Unit Cost	N/A		N/A		N/A	

* - Differs from December 1985 SAR based on FY87 Appropriation Act.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Development Estimate	693.2	1310.8	8.3	2012.3
Previous Changes:				
Economic	-1.6	-10.2	-	-11.8
Quantity	-	-673.3	-	-673.3
Schedule	-	-	-	-
Engineering	-	+3.6	-	+3.6
Estimating	-21.1	-18.4	-1.0	-40.5
Other	-	-	-	-
Support	+8.1	-32.7	-	-24.6
Subtotal	-14.6	-731.0	-1.0	-746.6
Current Changes:				
Economic	-0.9	-4.8	-	-5.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.1	+20.8	-	+20.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.8	+16.0	-	+15.2
Total Changes	-15.4	-715.0	-1.0	-731.4
Current Estimate	677.8	595.8	7.3	1280.9

13. Cost Variance Analysis (Cont'd)

(FY 1975 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	424.2	533.6	5.2	963.0
Previous Changes:				
Quantity	-	-241.4	-	-241.4
Schedule	-	-	-	-
Engineering	-	+1.5	-	+1.5
Estimating	-7.5	-10.7	-0.6	-18.8
Other	-	-	-	-
Support	+3.2	-11.4	-	-8.2
Subtotal	-4.3	-262.0	-0.6	-266.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.2	+8.3	-	+8.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.2	+8.3	-	+8.1
Total Changes	-4.5	-253.7	-0.6	-258.8
Current Estimate	419.7	279.9	4.6	704.2

b. Previous Change Explanations --

RDT&E

Economic: Revised economic escalation indices.

Estimating: Changes to absorb the impact of revised economic rates in prior years. Launch mission model changes caused launches to be spread over more years than planned. Elimination of performance improvements to increase the IUS payload throw weight. Design changes due to on-orbit anomaly experienced in April 1983. Over estimated development activity associated with the IUS-1 anomaly. Additional analysis of first flight after anomaly. Additional tasks associated with integrating IUS-4, 6 and 8 to a Titan IV.

Support: Additional 2 years of technical effort (1991 and 1992).

Procurement

Economic: Revised economic escalation indices.

Quantity: Deletion of ten vehicles.

Engineering: Engineering changes associated with ten deleted vehicles.

13. Cost Variance Analysis (Cont'd)

Estimating: Changed from multi-year to annual buy strategy. Engineering changes to second stage motors relating to on-orbit anomaly experienced in April 1983. Estimating changes associated with two deleted vehicles. Changed to an annual buy strategy. Cancellation of an STS to Titan Mod Kit. Reduction of production closeout. Contractor reduced the unit cost of IUS vehicles to be more competitive with Centaur. Decrease in IUS production costs due to favorable negotiations on Production and Launch Support Contract. Adjustment for prior year escalation. Deleted IUS Titan-to-Shuttle conversion kits. Solid Rocket Motor replacement eliminated as a requirement. Reduced close-out costs to reflect actuals. Estimating category adjustment.

Support: Support change associated with Quantity change. Federally funded Research Center support for extra years launches. Support category adjustment. Reduced IUS technical effort in FY 85-90 to a level consistent with an "Operational Program". Additional 2 years of technical effort in FY91 and FY92. Additional year of Aerospace Co. support.

MILCON

Estimating: Adjustment for prior year actuals.

c. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(1) <u>RDT&E</u>		
Revised economic escalation indices.		
(Economic)	N/A	-0.9
Adjustment for prior year escalation.		
(Estimating)	+0.1	+0.4
Adjustment of engineering support to reflect NASA buy of additional IUS vehicles.		
(Estimating)	-0.3	-0.3
(2) <u>Procurement</u>		
Revised economic escalation indices.		
(Economic)	N/A	-4.8

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13. Cost Variance Analysis (Cont'd)

c. Current Change Explanations (Cont'd)--

(Dollars in Millions)

	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(2) <u>Procurement (Cont'd)</u>		
Adjustment for prior year escalation. (Estimating)	+1.3	+3.0
Adjustment of engineering support to reflect NASA buy of additional IUS vehicles. (Estimating)	-0.8	-2.2
Increased cost for hardware due to increase in number of flights per year from 3 to 6. This is due to the STS-51L disaster. (Estimating)	+7.8	+20.0
(3) <u>MILCON</u>		
No current changes.		

d. References --

Development Estimate: President's FY 84 Budget.

14. Program Acquisition Unit Cost (PAUC) History: (Millions of (Then-Year) Dollars)

Initial SAR/Development Estimate to Current Estimate

PAUC (Init. SAR/ DEV Estim)	Changes								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
111.794	-2.188	+55.582	-	+0.450	-2.450	-	-3.075	+48.319	160.113

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15. Contract Information: (Then Year Dollars in Millions)

a. RDT&E -- No RDT&E Contracts

b. Procurement --

IUS Vehicle:

Boeing Aerospace Company, Seattle, WA

F04701-82-C-0110, FPIF

Award: July 30, 1980

Definitized: January 27, 1983

Initial Contract Price

Target	Ceiling	Qty
130.9	138.6	6

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
347.1	366.1	6 1/	326.8	327.0

1/ Of the six vehicles on contract, five are program office funded and one is user funded.

	Cost Variance	Schedule Variance
Previous Cumulative Variances	-0.5	-7.9
Cumulative Variances To Date (11/29/86)	-2.3	-4.0
Net Change	-1.8	+3.9

Explanation of Change:

Cost Variance - IUS-10's avionics computers are being reworked by Delco due to a structural problem.

Schedule Variance - Chemical Systems Division (CSD) is behind schedule with the Thrust Vector Control (TVC) mechanical stops due to retrofit difficulties encountered during reassembly.

No impact to program or contract.

+ = Favorable

- = Unfavorable

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15. Contract Information (Cont'd): (Then Year Dollars in Millions)

b. Procurement (Cont'd) —

IUS Vehicle:
Boeing Aerospace Company, Seattle, WA
F04701-85-C-0101, FPIF/AF/PI
Award: July 3, 1985
Definitized: September 11, 1985

Initial Contract Price
Target Ceiling Qty
350.0 416.5 3

Current Contract Price				Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		<u>Contractor</u>	<u>Program Manager</u>
389.8	317.6	3	1/	292.6	274.5

1/ Note: The contract price as listed here should not be used in computing a unit price for the IUS. Over half of this figure represents Launch Support which is budgeted for in O&M.

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	+1.4	+0.3
Cumulative Variances To Date (11/29/86)	+5.0	-1.3
Net Change	+3.6	-1.6

Explanation of Changes:

Cost Variance - This is due to a slowdown in support and labor and a decrease in overhead costs.

Schedule Variance - This is due to various Boeing Electronics Co. (BECO) procured parts are behind schedule in terms of deliveries.

No impact to program or contract.

c. MILCON -- No MILCON contracts.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 70.6% (12 yrs/ 17 yrs)

(2) Percent Program Cost Appropriated: 94.2% (\$ 1206.4/\$ 1280.9)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY76-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93)</u>	<u>Total</u>
RDT&E	655.5	7.1	15.2	-	677.8
Procurement	543.6	26.8	25.4	-	595.8
MILCON	7.3	-	-	-	7.3
Total	1206.4	33.9	40.6	0.0	1280.9

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary —

Fiscal Year	Qty	FY 75 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1976				4.5			4.9	7.0
1977				21.9			25.7	7.4
1978				55.0			69.8	7.0
1979				74.7			103.3	8.4
1980				64.2			98.8	9.4
1981				63.4			108.0	11.9
1982				24.1			43.9	9.2
1983				60.8			115.9	4.9
1984				18.1			35.8	3.8
1985				16.1			33.0	3.4
1986				3.2			6.8	2.9
1987				4.4			9.6	3.1
1988				3.1			7.1	3.5
1989				1.6			3.7	3.5
1990				1.6			3.8	3.3
1991				1.5			3.8	2.9
1992				1.5			3.9	2.4
Subtotal	1		*	419.7			677.8	

Appropriation: Procurement

1978			--	0.7			1.0	7.0
1979			14.4	35.6			54.6	8.7
1980			12.6	24.0			41.9	9.7
1981			--	8.8			16.8	11.9
1982	2		32.6	38.4			78.4	9.6
1983	2		33.9	38.8			84.1	9.0
1984			4.8	37.4			84.8	8.0
1985			34.2	34.2	72.4		79.8	3.4
1986	3		40.2	40.2		72.4	96.9	2.9
1987			2.1	2.1			5.3	3.1
1988			10.4	10.4			26.8	3.5
1989			3.1	3.1			8.2	3.5
1990			2.1	2.1			5.6	3.3
1991			2.0	2.0			5.7	2.9
1992			2.1	2.1			5.9	2.4
Subtotal	7		194.5	279.9	72.4	72.4	595.8	

* - Not available.

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 75 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: MILCON

1979				4.6			7.3	9.6
Subtotal				4.6			7.3	
Total	8			704.2	72.4	72.4	1280.9	

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated A/	Expended A/

Appropriation: RDT&E

1976	4.9	4.9	4.9
1977	25.7	25.7	25.7
1978	69.8	69.8	69.8
1979	103.3	103.3	103.3
1980	98.8	98.8	98.8
1981	108.0	108.0	108.0
1982	43.9	43.9	43.6
1983	115.9	114.6	102.5
1984	35.8	35.3	30.6
1985	33.0	31.1	27.7
1986	6.8	5.6	3.0
1987	9.6	0.4	-
To Complete	22.3	N/A	N/A
Total	677.8	641.4	608.7

A/ Obligated and expended amounts are based on program office records as of 31 Dec 86.

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated A/	Expended A/

Appropriation: Procurement

1978	1.0	1.0	1.0
1979	54.6	54.6	54.6
1980	41.9	41.9	34.7
1981	16.8	16.8	16.8
1982	78.4	77.2	68.0
1983	84.1	79.5	73.7
1984	84.8	62.4	29.0
1985	79.8	78.8	2.7
1986	96.9	41.4	2.8
1987	5.3	-	-
To Complete	52.2	N/A	N/A
Total	595.8	453.6	270.8

Appropriation: MILCON

1979	7.3	7.3	7.3
To Complete	-	N/A	N/A
Total	7.3	7.3	7.3

A/ Obligated and expended amounts are based on program office records as of 31 Dec 86

17. Production Rate Data:

No report. Production less than six per year.

18. Operating and Support Costs: N/A

LANTIRN, December 31, 1986

SELECTED ACQUISITION REPORT (RCS: DD COMP(OLA)823)

PROGRAM: LANTIRN

AS OF DATE: December 31, 1986

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CLEARED
FOR OPEN PUBLICATION

FEB 4 1987 18

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE1. Designation/Nomenclature (Popular Name): Low Altitude Navigation and Targeting Infrared System for Night (LANTIRN)2. DOD Component: U.S. Air Force3. Responsible Office and Telephone Number:Strike System Program Office
Aeronautical Systems Division
Wright-Patterson AFB, OH 45433PM: Col P. Gideon
Assigned: 12 Dec 86
AUTOVON: 785-7273
(513) 255-72734. Program Elements/Procurement Line Items:RDT&E: (3600) PE 63249F
PE 64249F

PROCUREMENT: APPN 3010 PE 27249F ICN - None

SAF/PAS

87-0069-T

5. Related Programs: Infrared Maverick
F-16 Aircraft
F-15E Aircraft
Additional Aircraft TBD

6. Mission and Description: The LANTIRN program was initiated in August 1979 to develop a system to allow low altitude navigation and manual terrain following at night and under adverse weather, as well as automating target acquisition and weapon delivery tasks to allow a higher probability of successful single pass attack. The LANTIRN system is composed of a wide field of view raster Head-Up Display (HUD) and an externally mounted Fire Control System (FCS) consisting of a Navigation Pod and a Targeting Pod. Both the HUD and FCS contracts were awarded competitively in 1980, July and September respectively. The first FSD HUD was delivered in February 1982, and the first FSD Navigation Pod was delivered in February 1983 with an FSD Targeting Pod following in June 1983. Direction was given in July 1984 to integrate the LANTIRN system on the F-15E aircraft.

LANTIRN is an integrated system. The HUD displays wide field of view infrared video imagery and terrain following cues. The Navigation Pod provides infrared video to the HUD for night navigation and contains Ku band terrain following radar. The Targeting Pod has the capability to track targets, automatically cue the AGM-65D IR Maverick missile to the target and interface with the aircraft to accomplish automatic AGM-65 delivery upon pilot consent. It also contains a laser designator/ranger for delivery of laser guided ordnance. The Targeting Pod has been designed with growth provisions for an automatic target recognizer.

7. Program Highlights:

a. Significant Historical Developments--Direction from HQ USAF for the LANTIRN Full Scale Development (FSD) program was issued in December 1979. The Request for Proposal was issued in February 1980 with a competitive source selection following from April-September 1980. Marconi Avionics Ltd. was awarded the Head-Up Display contract in July 1980. Martin Marietta Corporation was awarded the Fire Control System contract in September 1980. In 1984, the program was restructured to match the revised President's Budget for FY85, 86, and 87. Recognizing that the Targeting Pod would require more development work and testing before production, the Air Force allowed a one-year delay for Targeting Pod production in the restructure. During 1983 and 1984, the Navigation Pod successfully completed fifteen months of flight testing at Edwards AFB and two months flying over Canada, in a weather/terrain environment similar to Western Europe. The ability to fly very low at night and attack targets was fully demonstrated. In Feb 1985, the Navigation Pod received AFSARC III production approval. The production contract was awarded to Martin Marietta Corp on 1 Apr 85. A highly successful AFSARC update report on IOT&E deficiencies/fixes took place in September. As a result, the first production option was exercised for an additional seven Navigation Pods and four sets of intermediate level support equipment in Dec 85.

The targeting Pod successfully accomplished DT&E flight testing at Edwards AFB, CA., accumulating over 530 operating flying hours. In July 1985, the program received direction to transfer the HUD portion of the system to the F-16 Program Office, where it will be supplied as contractor furnished equipment.

LANTIRN, 31 December, 1986

b. Significant Developments Since Last Report--Targeting POD successfully completed IOT&E flight testing and all contract milestones were met. May 1986 AFSARC III production decision was obtained for 2 targeting pods. Contract option exercised June 86.

Navigation Pod AFSARC IIIB rate production decision was approved 30 Nov 86 for 143 Navigation Pods and 6 sets of intermediate-level support equipment.

Concurrent with Navigation Pod AFSARC IIIB rate production decision, authority was received to exercise option for Lot II targeting pods, quantity of 7.

The LANTIRN system is expected to satisfy the mission requirement.

c. Changes since AS OF Date: NONE

8. Decision Coordinating Paper Threshold Breaches: There are currently no DCP threshold breaches.

9. Schedule:

a. Milestones--	DEVELOPMENT EST./ APPROVED PROGRAM	CURRENT ESTIMATE
1. Program Initiation (PMD)	Dec 79/Dec 79	Dec 79
2. Contract Award (HUD)	Jul 80/Jul 80	Jul 80
3. Contract Award (FCS)	Sep 80/Sep 80	Sep 80
4. FCS Program Restructure	Sep 81/Sep 81	Sep 81
5. HUD F-16 Flight Test Complete	Dec 82/Dec 82	Dec 82
6. HUD A-10 Flight Test Complete	Dec 82/Dec 82	Dec 82
7. HUD F-16 Production Decision	Jan 83/Jan 83	Dec 84
8. HUD A-10 Production Decision	May 83/May 83	
9. First FSD Navigation Pod Delivery	Feb 83/Feb 83	Feb 83
10. First FSD Targeting Pod Delivery	Jul 83/Jul 83	Jul 83
11. Auto Target Recognizer	Oct 84/Oct 84	Oct 84
12. Adv Dev Tech Eval		
13. Competitive Targeting Pod Fly Off	Dec 84/Dec 84	N/A
14. FCS F-16 Flight Test Complete	Dec 84/Dec 84	Mar 86
15. Navigation Pod		Sep 85
16. Targeting Pod		Mar 86
17. Production Decision	Feb 85/Feb 85	
18. Navigation Pod		Mar 85
19. Targeting Pod		May 86
20. FCS F-15E Flight Test Complete	May 88/May 88	Aug 88
21. FCS A-10 Flight Test Complete	Sep 87/Sep 87	
22. First FCS Production Delivery	Aug 87/TBD	
23. Navigation Pod		Apr 87
24. Targeting Pod		Jul 88 (CH-1)
25. IOC	TBD/TBD	
26. Navigation Pod		FY 89
27. Targeting Pod		FY 90 (CH-1)

b. Previous Change Explanations:

HUD F-16 Production Decision was delayed from Jan 83 to Feb 85 to reflect actual need, then changed to Dec 84. F-16 flight testing extended to allow additional time for flight test improvements. The August 1984 restructure delayed Targeting Pod program 1 year. F-15E was added to program scope. A-10 aircraft program changed to meet 1991 TAC IOC. A-10 Aircraft requirement has been deleted. Prior dates were Jul 88 for 8 and Dec 89 for 21. Additional time was required for flight test improvements. Date of actual production decision slipped from Feb 85 to Mar 85. Completion of IOT&E changed from Feb 86 to May 86. Changed IOC date for Nav Pod from TBD to FY89 to reflect current contractual commitment. Changed items 23 & 26 from TBD to current estimate to reflect contractual commitment.

c. Current Change Explanations:

(CH-1) Changed from TBD to current estimate to reflect contractual commitment.

- d. References: DEVELOPMENT ESTIMATE: Secretary of the Air Force Review, 18 Nov 82. Original PMD R-Q0023(1)/63249F, 21 Dec 79.
APPROVED PROGRAM ESTIMATE: Secretary of the Air Force, Review, 12 Dec 86. Current PMD R-P0023(13)/63249F/64249F/27249F, 14 Apr 86.

10. Technical/Operational Characteristics:

a. Technical	DEV EST/ APPR PROG	DEM * PERF	CURR EST
	-----	-----	----
<u>HUD</u>			
Transmissivity (Percent)	70/65/70/65	70/65	70/65
Display Contrast (Ratio)	1.20/1.20	1.38	1.38
<u>MTBF</u>			
Mature Requirement			
A-10	250/250		250
F-16	250/250		250
<u>Field Projections</u>			
Interim Goal (End of DT&E/IOT&E)	31/31	40	40
Mature Requirement (10,000 Hours)	125/125		125
<u>Weight (Lb)</u>			
A-10	95/95	95	95
F-16	82/82	80	80
<u>FCS</u>			
Maximum Total Weight (lbs)	985/985	978	990
Maximum Total AC Power (kilovolt amperes)	10.8/10.8	10.8	10.7

LANTIRN, December 31, 1986

	DEV EST/ APPR PROG	DEM * PERF	CURR EST
	-----	----	-----
MTBF			
FCS:			
Mature Requirement	50/50		50
Field Projection			
Interim Threshold (end DT&E/IOT&E)	9/9		9
Mature Requirement (10,000 hrs)	34/34		34
Navigation Pod:			
Lab Lower Test Limit-Mature Reqmt	73/73		73
Field Projection			
Interim Threshold (end DT&E/IOT&E)	13.2/13.2	11.2	11.2
Mature Requirement (10,000 hrs)	50/50		50
Targeting Pod:			
Lab Lower Test Limit-Mature Reqmt	159/159		159
Field Projection			
Interim Threshold (end DT&E/IOT&E)	28.5/28.5	40.1 (ch-1)	40.1 (ch-1)
Mature Threshold (10,000 hrs)	108/108		108

* Average Values

b. Operational

HUD

Total Field of View (Degrees)

Horizontal	25/25	30	30
Vertical	20/20	20	20
Instantaneous Field of View (Horizontal)	25/25	30	30

FCS

Terrain Following Altitude
(Ft Manual)

Automatic IR Maverick

Handoffs per pass

200/200	200	200
1/1	2 (ch-2)	2 (ch-2)

c. Previous Change Explanations:

Automatic Target Recognizer deleted. Minor changes to HUD technical characteristics. FCS MTBF modified to reflect field projection. HUD weight revised to measured value. HUD MTBF revised to reflect impact of DT&E/IOT&E performance. Navigation and Targeting Pod reliability data was added as a result of separating procurement of these two pods. Additional weight allowed in specifications for F-15E integration. Prior estimate was 978. Target Pod reliability growth curve restructured in March 1985. Prior estimate was 28.5

d. Current Change Explanations:

CH-1 Demonstrated performance from IOT&E. Prior value was 26.3.

CH-2 Reflects demonstrated performance. Prior value was 1.

e. References: DEVELOPMENT ESTIMATE: Secretary of the Air Force Review, 18 Nov 82. Original PMD R-Q0023(1)/63249F, 21 Dec 79.

APPROVED PROGRAM ESTIMATE: Secretary of the Air Force Review, 12 Dec 86. Current PMD R-P0023(13)/63249F/64249F/27249F, 14 Apr 86.

* Average Values

LANTIRN, December 31, 1986

11. Program Acquisition Cost (Current Estimate in Millions of Dollars):

	Development Estimate	Changes	Current Estimate
	-----	-----	-----
a. Cost --			
Development (RDT&E)	420.4	-16.4	404.0
Procurement	1681.7	+371.9	2053.6
Pod Sets	(1297.9)	(+345.1)	(1643.0)
Total Flyaway	(1297.9)	(+345.1)	(1643.0)
Other Weapon System Cost	(311.7)	(+ 20.3)	(332.0)
Initial Spares & Repair	(72.1)	(+ 6.5)	(78.6)
Parts			
Construction (MILCON)	--	--	--
Total FY80 Base-Year \$	\$2102.1	\$+355.5	\$2457.6
Escalation	1721.1	-70.1	1651.0
Development (RDT&E)	(128.5)	(-2.7)	(125.8)
Procurement	(1592.6)	(- 67.4)	(1525.2)
Construction (MILCON)	--	--	--
Total Then-Year \$	\$3823.2	\$+285.4	\$4108.6
b. Quantities --			
Development (RDT&E)	12	--	12
Procurement	1316	+ 84	1400
Total	1328	+ 84	1412
c. Unit Cost --			
Procurement:			
FY80 Base-Year \$	\$1.278	\$+.189	\$1.467
Then-Year \$	2.488	+.068	2.556
Program:			
FY80 Base-Year \$	\$1.583	+.158	\$1.741
Then Year \$	2.879	+.031	2.910
d. Approved Design to Cost Goal -- N/A.			
e. Foreign Military Sales -- None.			
f. Nuclear Costs -- None.			

12. Program Acquisition/Current Procurement Unit Cost Summary:
 (Current [Then-Year] Dollars in Millions)

	CURRENT YEAR		BUDGET YEAR
	Current Estimate Dec 86 SAR	UCR Baseline Dec 85 SAR	UCR Baseline Dec 86 SAR
	-----	-----	-----
a. Program Acquisition --			
(1) Cost	4108.6	4100.0	4108.6
(2) Quantity	1412	1412	1412
(3) Unit Cost	2.910	2.904	2.910
b. Current Procurement --	(FY87)	(FY87)	(FY88)
(1) Cost	791.1	786.1	797.3
Less CY Adv Proc	0.0	0.0	0.0
Plus FY Adv Proc	0.0	0.0	0.0
Net Total	791.1	786.1	797.3
(2) Quantity	150	150	250
(3) Unit Cost	5.274	5.241	3.189

13. Cost Variance Analysis:**a. Summary -- (Current [Then Year] Dollars in Millions)**

	RDT&E	PROC	MILCON	TOTAL
-Development Estimate Previous Changes:	548.9	3274.3	--	3823.2
Economic	-10.5	-199.7	--	-210.2
Quantity	--	+71.4	--	+71.4
Schedule	+28.5	+ 4.3	--	+32.8
Engineering	-67.7	--	--	-67.7
Estimating	+17.8	+405.4	--	+423.2
Other	--	--	--	--
Support	+18.0	+ 9.3	--	+27.3
Subtotal	-13.9	+290.7	--	+276.8
Current Changes:				
Economic	- 1.6	-140.6	--	-142.2
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	+ 5.0	--	+ 5.0
Estimating	- 3.6	+114.5	--	+110.9
Other	--	--	--	--
Support	--	+ 34.9	--	+ 34.9
Subtotal	- 5.2	+ 13.8	--	+ 8.6
Total Changes	-19.1	+304.5	--	+285.4
Current Estimate	529.8	3578.8	--	4108.6

13. Cost Variance Analysis (Cont'd):

FY 1980 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	420.4	1681.7	--	2102.1
Previous Changes:				
Quantity	--	+35.4	--	+ 35.4
Schedule	+ 19.8	--	--	+ 19.8
Engineering	- 49.0	--	--	- 49.0
Estimating	+ 6.0	+242.0	--	+248.0
Other	--	--	--	--
Support	+ 9.3	+6.6	--	+ 15.9
Subtotal	13.9	+284.0	--	+270.1
Current Changes:				
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	+ 3.0	--	+ 3.0
Estimating	- 2.5	+ 64.7	--	+ 62.2
Other	--	--	--	--
Support	--	+ 20.2	--	+ 20.2
Subtotal	- 2.5	+ 87.9	--	+ 85.4
Total Changes	-16.4	+371.9	--	+355.5
Current Estimate	404.0	2053.6	--	2457.6

b. Previous Change Explanations --

RDT&E

Economic: Revised OSD inflation/escalation indices.
 Schedule: A-10 slipped to out years to compensate for FY84 program reductions.
 Engineering: Funding and technology for the ATR deleted from the program. Adjustment for prior year escalation A-10 Aircraft removed from program.
 Estimating: Program restructure due to FY84 congressional cuts and increased test requirements. Also adjusted for changes in prior year escalation indices. Corrected error from 31 Dec 84 SAR. Reestimate of program.
 Support: Support equipment program restructured to reflect \$30M FY84 congressional cut.

Procurement

Economic: Revised OSD inflation/escalation indices.
 Quantity: Change in the number of pod sets from 658 to 700 (1316 pods to 1400 pods).
 Schedule: Target Pod production start date delayed by one year. Total buy schedule extended one year. Moved production up from FYs 90-91 to FYs 88-89.
 Estimating: Adjustment for prior year escalation. Corrected error from 31 Dec 84 SAR. Include additional R&M/Warranty requirements.
 Support: Added 4 Support Equipment and revised initial spares in FY83 SAR. Subsequently, SE sets have been reduced from 40 to 29 based on user requirements.

MILCON - None.

c. Current Change Explanations

RDT&E

	BY 80	TY
Revised economic escalation indices (Economic)	N/A	-1.6
Adjustment for current and prior year escalation (Estimating).	+ .8	+1.2
FY86-87 Refinement of estimate. (Estimating).	-3.3	-4.8

Procurement

Revised economic escalation indices (Economic).	N/A	-140.6
Additional funds to initiate Eye Safe Laser (Engrg).	+ 3.0	+ 5.0
Adjustment for current and prior year escalation (Estimating).	+17.7	+29.3
Reestimate of spares requirement (Support).	+ 5.0	+ 8.8
Restoration of FY88-91 FFP Contract (Estimating).	+47.0	+85.2
Adjustment for curr & prior yr escalation (Support).	+ 5.4	+ 9.1
Restoration of FY88-91 FFP contract (Support).	+ 9.8	+17.0

d. References --

Development Estimate: President's FY84 Budget, Jan 83.

14. Program Acquisition Unit Cost (PAUC) History:
(Millions of Then-Year Dollars)

a. Initial SAR Estimate to Current Estimate --

PAUC Initial SAR Estimate	Changes								PAUC (Cur Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
2.879	-.250	-.120	+.023	-.044	+.378	.000	+.044	+.031	2.910

15. Contract Information: (Then-Year Dollars in Millions)a. RDT&E --
Pods:

Initial Contract Price		
Target	Ceiling	Qty

Martin-Marietta Corporation
P.O. Box 5837
Orlando, FL 32855
Contract F33657-80-C-0441
Award: FFP, September 1980
(Fire Control System)

\$94.0	N/A	12
--------	-----	----

Current Contract Price		
Target	Ceiling	Qty
\$384.5 (Ch-1)	N/A	12 Pods

Estimated Price At Completion	
Contractor	Program Manager
\$384.5 (Ch-1)	\$384.5

b. Procurement --
Pods:

Initial Contract Price		
Target	Ceiling	Qty

Martin-Marietta Corporation
P.O. Box 5
Orlando, FL 32855
Contract F33657-84-C-0004
Award: FFP, April 1985
(Pod Prod & SE)

\$ 87.3	N/A	2 Pods *
---------	-----	----------

Current Contract Price		
Target	Ceiling	Qty
1217.2 (Ch-2)	N/A	161 Pods 10 SE

Estimated Price At Completion	
Contractor	Program Manager
\$3195.8	\$3195.8

* Corrects Dec 85 SAR. Basic contract price \$87.3M.

c. Current Change Explanations:

(Ch-1) Added F-15/F-16 flight test/integration.
ATA integration/software

(Ch-2) Current contract price is the value of the FY85 Basic (\$87.4M), -
FY86 options (\$413.8M) and FY87 options (\$716.0M).

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 69.2% (9 Yrs/13 Yrs)

(2) Percent Program Cost Appropriated: 44.1% (1811.2/4108.6)

b. Appropriation Summary -- (Then-Year Dollars in Millions)

Appn	Current & Prior Yrs	Budget Year	Balance FYDP	To Complete Beyond FYDP	Total
	(FY79-87)	(FY88)	(FY89-91)	(N/A)	
RDT&E	500.2	19.9	9.7	--	529.8
Procurement	1311.0	797.3	1470.5	--	3578.8
MILCON	0	0	0	--	0
To	1811.2	817.2	1480.2	--	4108.6

16.. Program Funding Summary (Cont'd): (Current Estimate IN Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty Nav/Tgt	FY 80 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1979				11.2			10.6	8.4
1980				30.0			31.7	9.4
1981				35.4			41.4	11.9
1982				68.9			86.1	9.2
1983				76.4			99.8	4.9
1984				42.2			57.3	3.8
1985				69.7			97.7	3.4
1986				25.4			36.8	2.9
1987				26.0			38.8	3.1
1988				12.9			19.9	3.5
1989				2.9			4.7	3.5
1990				2.1			3.5	3.3
1991				.9			1.5	2.9
SUBTOTAL	6/6			404.0			529.8	

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty Nav/Tgt	FY 80 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement

1981		.8		.8			1.0	11.9
1982		3.6		3.6			5.0	9.6
1983								
1984								
1985	2/0	30.2	25.4	57.0			90.0	3.4
1986	7/2	102.3	100.5	259.6			423.9	2.9
1987	143/7	110.5	238.9	468.7			791.1	3.1
1988	169/81	36.8	272.8	457.7			797.3	3.5
1989	240/231	7.6	323.0	404.0			724.7	3.5
1990	139/240	4.9	270.1	284.5			523.8	3.3
1991	0/139	2.0	113.6	117.7			222.0	2.9
SUBTOTAL	700/700	298.7	1344.3	2053.6			3578.8	
TOTAL	706/706	298.7	1344.3	2457.6			4108.6	

Appropriation: MILCON -- N/A

16. Program Funding Summary (Cont'd):

d. Obligations and Expenditures --

Appropriation: RDT&E

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated *	Expended *
1979	10.6	10.6	10.6
1980	31.7	31.7	31.7
1981	41.4	41.4	41.4
1982	86.1	86.1	86.1
1983	99.8	99.8	95.8
1984	57.3	57.3	55.8
1985	97.7	95.6	82.9
1986	36.8	35.6	29.1
1987	38.8	19.2	.1
To Complete	29.6	N/A	N/A
TOTAL	529.8	477.3	433.5

Appropriation: Procurement

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated *	Expended *
1981	1.0	1.0	1.0
1982	5.0	5.0	5.0
1983	N/A	N/A	N/A
1984	N/A	N/A	N/A
1985	90.0	89.0	52.2
1986	423.9	413.8	101.4
1987	791.1	716.0	-0-
To Complete	2267.8	N/A	N/A
TOTAL	3578.8	1224.8	159.6

* Reflects program office records as of 31 Dec .

17. Production Rate Data:

a. Annual Production Rates (NAV/TGT) *

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1987	2/2	2/0	2/0	2/0
1988	14/14	7/2	7/2	7/2
1989	142/142	107/7	107/7	107/7
1990	376/376	203/81	203/81	203/81
1991	384/384	240/231	240/231	240/231
1992	522/522	238/240	238/240	238/240
1993	N/A	N/A /238	N/A /238	N/A /238

b. Cost Variance -- Dollars In Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
PAC (BY \$)	2457.6	0	2457.6	0	2457.6
(TY \$)	4108.6	0	4108.6	0	4108.6
PAUC (BY \$)	1.741	0	1.741	0	1.741
(TY \$)	2.910	0	2.910	0	2.910

* The annual production rates shown differ from the annual funded quantities because the funded delivery period in months is as shown below:

FY	Navigation Pod	Targeting Pod
87	16	12
88	10	12
89	12	12
90	7	12

17. Production Rate (Cont'd):

c. Schedule Variance --

Item	Production Estimate (Nav/Tgt)	Variance (CE less PdE)	Current Estimate (Nav/Tgt)	Variance (CE less Max)	Maximum (Nav/Tgt)
Start Date (Mo/Yr)	4/85 5/86	0	4/85 5/86	0	4/85 5/86
Duration (In Months)	90/89 *	0	90/89 *	0	90/89 *
End Date (Mo/Yr)	9/92 9/93	0	9/92 9/93	0	9/92 9/93

* Corrects clerical error.

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	6/6
Procurement	0/0

18. Operating and Support Costs -- N/A

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N-1 A-6E/F

SAR-86-104

AS OF DATE: 31 December 1986

SELECTED ACQUISITION REPORT (RCS: DD-COMP(O&A)823) (U)
PROGRAM: A-6E/A-6F

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
FEB 27 1987
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-ISA)
DEPARTMENT OF DEFENSE

1. (U) DESIGNATION/NOMENCLATURE (POPULAR NAME):
A-6E/F LONG RANGE ALL-WEATHER (DAY/NIGHT) CARRIER ATTACK AIRCRAFT
(INTRUDER)
2. (U) DOD COMPONENT: U.S. NAVY
3. (U) RESPONSIBLE OFFICE AND TELEPHONE NUMBER:
NAVAL AIR SYSTEMS COMMAND PROGRAM MANAGER: CAPT R. R. *Kenny* ~~BUENHLE~~
WASHINGTON, DC 20361 ASSIGNED: 13 SEPT 1984
TELEPHONE: Autovon 222-8083
4. (U) PROGRAM ELEMENTS:
NDT&E: 63257N, 24134N
PROCUREMENT: 24134N, 26112M APPN: 1506 ICN 0112
MILCON: 24696N 0115
5. (U) RELATED PROGRAMS: EA-6, F-14, F/A-18 and E-2
6. (U) MISSION AND DESCRIPTION

(U) Mission: The A-6E mission is the destruction, in all weather conditions and during darkness, of both moving and fixed sea and land targets, especially at low-level and in direct support of ground operations.

(U) Description: The A-6E is the Navy's only all weather attack aircraft. Its avionics includes a micro-miniaturized digital computer, a solid state weapon release system, a single integrated track and search radar, a Carrier Airborne Inertial Navigation System (CAINS) and a Communication, Navigation and Identification System (CNI). The A-6E is powered by two (2) J52-P-8B engines. An added capability, Target Recognition Attack Multisensor (TRAM),

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~~Declassify on: OADR~~

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has been procured since FY 1976. This major subsystem of the A-6E is procured under a multiyear production contract and includes an infrared sensor, laser ranger/designator and laser receiver. It provides for delivery of laser guided weapons and increased night surveillance and identification capability. The aircraft is a long range, twin-jet, carrier-based, attack aircraft capable of very accurate navigation and delivery of nuclear and non-nuclear weapons from its five external store stations. Beginning in FY 1988 the A-6F will commence production. The A-6F will be an improved version of the A-6E which incorporates improvements in reliability, performance, and survivability through improved avionics, propulsion, and minor airframe changes. It will maintain or enhance all the capabilities of the A-6E, but incorporates the following improvements: a high resolution radar for improved stand-off targeting, higher thrust engines, modern integrated digital avionics, and minor airframe changes. Limited production begins in FY 1988 with full production scheduled for FY 1990.

7. (U) PROGRAM HIGHLIGHTS:

a. (U) Significant Historical Developments -- In 1984 an upgraded version of the A-6E, identified as the A-6F was approved. The A-6F incorporates improvements in reliability, performance, and survivability through improved avionics, propulsion, and airframe safety features. It retains or enhances all the operational capabilities of the A-6E, but incorporates the following improvements: a high resolution radar for improved stand-off targeting, higher thrust engines, modern integrated digital avionics, and significant airframe changes. Limited production begins in FY 1988 with full production scheduled for FY 1990. Based upon current projections the A-6F is expected to fulfill all mission requirements.

(1) (U) Boeing Military Airplane Company, Seattle, Washington, was awarded a competitive contract to develop a new composite material wing for installation into existing A-6E aircraft and subsequent production A-6E and A-6F aircraft produced by Grumman Aerospace Corporation, beginning with the Navy's FY 1987 buy. The contract is firm fixed price throughout and is structured in a series of options, designed to be exercised at certain program milestones. The program is structured into these basic categories of work: (1) Design, Fabrication and Qualification (DFQ) to develop and prove, through hardware testing, adequacy of the design; (2) production to fabricate and assemble wing kits, and (3) installation of some composite wing kits into existing A-6E aircraft. The contract was initiated by Government invitation for bids. Two submissions were received. The award will result in a more reliable and maintainable A-6 replacement wing with a service life of 8,800 hours, an improvement of 4800 hours over the FY 1986 wing warranty.

Initial funding for this replacement wing was a \$240 million FY 1985 Supplemental Appropriations Bill which was composed of both FY 1985 and prior fiscal year aircraft procurement funding.

Delivery of prototype composite wings is scheduled to begin in April 1987 while production wings are scheduled for the November 1987 through the September 1992 timeframe.

b. (U) Significant Developments Since Last Report

(1) (U) A-6E SWIP -- The A-6E System Weapons Integration Program (SWIP) began TECHEVAL in November 1986 with OPEVAL planned for the summer of 1987. This block upgrade to the A-6 includes HARM, HARPOON 1C, LASER and and INFRARED MAVERICK and provisions for future stand off weapons. Initial Operational Capability (IOC) is projected for second quarter FY 1988.

(2) (U) A-6F "ECP-1" -- A block upgrade (ECP-1) to enhance the A-6F capabilities based on Libyan "lessons learned" was approved to provide the following additional operational capabilities: Night Attack Navigation Systems (NANS) to enhance night visual tactics; Integrated Defensive Avionics Program (IDAP) and upward firing Chaff to improve electronic warfare and self protection; and Pilot's Target Designator Control and Forward Air Control - Target Data Communicator to increase crew interoperability and mission effectiveness. ECP-1 incorporation is planned for FY 1989 A-6F limited production.

c. (U) Changes Since "As Of" Date: None

8. (U) DECISION COORDINATING PAPER (DCP) THRESHOLD BREACHES: None

9. (U) SCHEDULE:

a. (U) MILESTONES

	<u>PRODUCTION ESTIMATE/ APPROVED PROGRAM</u>	<u>CURRENT ESTIMATE</u>
(U) <u>A-6E</u>		
(U) Contract Executed (Prototype)	Aug 69	Aug 69
(U) First Flight (Prototype A/C)	Mar 70	Mar 70
(U) NPE (begin/end)	Apr/May 71	Apr/May 71
(U) First Production Contract Executed	Dec 70	Dec 70
(U) First Flight (Production A/C)	Jul 71	Jul 71
(U) Acceptance Flight Production A/C	Sep 71	Sep 71
(U) BIS (begin/end)	Sep 71/Jan 72	Sep 71/Jan 72
(U) Fleet Introduction - LANT, CRAW	Dec 71	Dec 71
(U) Navy Support Date	Sep 71	Sep 71
(U) First Deployment	Sep 72	Sep 72
(U) <u>A-6E TRAM</u>		
(U) Development Contract	Jun 72	Jun 72
(U) Design Completion	May 73	May 73
(U) Pilot Production Deliveries (begin/end)	Apr 76	Apr 76
(U) IOT&E Completion	Jun 76	Jun 76
(U) Production Go-Ahead (Limited)	Jul 76	Jul 76
(U) Production Go-Ahead (Full)	Nov 79	Nov 79
(U) First Aircraft Delivery - Full TRAM	Sep 79	Sep 79
(U) IOC	Dec 79	Dec 79

	DEVELOPMENT/ PRODUCTION ESTIMATE	CURRENT ESTIMATE
(U) A-6F		
(U) Development Contract	Jul 84	Jul 84
(U) Limited Production ^{2/}	1988	1988
(U) Full Production	1990	1990

(b)(1)

- 1/ Three FY 1974 Production Aircraft
2/ Beginning Oct 1989 and Ending in July 1990

b. (U) Previous Change Explanation: None

c. (U) Current Change Explanation: None

d. (U) References:

A-6E

OSD PBD of
1 Dec 1970

FY 1988
President's
Budget

A-6F

SECNAV memo
of 6 July 1983

FY 1988
President's
Budget

10. (U) TECHNICAL/OPERATIONAL CHARACTERISTICS:

a. (U) Technical/Operational

	PRODUCTION ESTIMATE	DEMONSTRATED PERFORMANCE	CURRENT ESTIMATE
<u>A-6E</u>			
Long Range Strike Store Delivery 4-300 Gal Tanks <u>+1 MK 43</u>			
Takeoff Weight	53,863 lb.	53,863 lb.	53,863 lb.
Length/Span	54'7"/53'0"	54'7"/53'0"	54'7"/53'0"
Height/Height Folded	16'3"/21'11"	16'3"/21'11"	16'3"/21'11"
Engine No./Type	2/J-52-P-8A/B	2/J-52-P-8A/B	2/J-52-P-8A/B
Crew	2	2	2
Combat Speed/Alt	563 kts/SL	563 kts/SL	563 kts/SL
Combat Ceiling	41,000'	41,000'	41,000'
Rad/Mission Time	864 nm/4.82 hrs	864 nm/4.82 hrs	864 nm/4.82 hrs
Spd Max @ SL Stores Retained	563 kts	563 kts	563 kts

Close Support
4 MK 56 Mines
+1-300 Gal Tank

Takeoff Weight	54,759 lb.	54,759 lb.	54,759 lb.
Length/Span	54'7"/53'0"	54'7"/53'0"	54'7"/53'0"
Height/Height Folded	16'3"/21'11"	16'3"/21'11"	16'3"/21'11"
Engine No./Type	2/J-52-P-8A/B	2/J-52-P-8A/B	2/J-52-P-8A/B
Crew	2	2	2
Combat Speed/Alt	429 kts/15,000'	429 kts/15,000'	429 kts/15,000'
Combat Ceiling	26,000'	26,000'	26,000'
Rad/Mission Time	461 nm/3.1 hrs	461 nm/3.1 hrs	461 nm/3.1 hrs
Spd Max @ SL Stores Retained	407 kts	407 kts	407 kts

Close Support
30 MK-81 SNAKEYE BOMBS

Takeoff Weight	52,520 lb.	52,520 lb.	52,520 lb.
Length/Span	54'7"/53'0"	54'7"/53'0"	54'7"/53'0"
Height/Height Folded	16'3"/21'11"	16'3"/21'11"	16'3"/21'11"
Engine No./Type	2/J-52-P-8A/B	2/J-52-P-8A/B	2/J-52-P-8A/B
Crew	2	2	2
Combat Speed/Alt	502 kts/5,000'	502 kts/5,000'	502 kts/5,000'
Combat Ceiling	37,500'	37,500'	37,500'
Rad/Mission Time	383 nm/2.09 hrs	383 nm/2.09 hrs	383 nm/2.09 hrs
Spd Max @ SL Stores Retained	504 kts	504 kts	504 kts

DEVELOPMENT
ESTIMATE

DEMONSTRATED
PERFORMANCE

CURRENT
ESTIMATE

A-6F

Long Range Strike
3-300 Gal Tanks
2 MK 84 LGDB
2 Sidewinders

Takeoff Weight	58,260 lb.	TBD	58,305 (Ch-1, Ch-5)
Length/Span	54'7"/53'0"	TBD	54'7"/53'0"
Height/Height Folded	16'3"/21'11"	TBD	16'3"/21'11"
Engine No./Type	2/GE 404-400D	2/GE 404-400D	2/GE 404-400D
Crew	2	2	2
Combat Speed/Alt	563/SL	TBD	563/SL
Combat Ceiling	38,740'	TBD	38,740'
Mission Radius	610 nm	TBD	604 nm (Ch-2)
Spd Max @ SL Stores Retained	563 kts	TBD	555 kts (Ch-2)

Anti Ship Strike

1-300 Gal Tank

2 HARM

2 HARPOON

2 Sidewinders

	DEVELOPMENT ESTIMATE	DEMONSTRATED PERFORMANCE	CURRENT ESTIMATE
Takeoff Weight	53,899 lb.	TBD	54,011 (Ch-1, Ch-6)
Length/Span	54'7"/53'0"	TBD	54'7"/53'0"
Height/Height Folded	16'3"/21'11"	TBD	16'3"/21'11"
Engine No./Type	2/GE 404-400D	2/GE 404-400D	2/GE 404-400D
Crew	2	2	2
Combat Speed/Alt	563/SL	TBD	563/SL
Combat Ceiling	36,750'	TBD	36,750'
Mission Radius	655 nm	TBD	653 nm (Ch-2)
Spd Max @ SL Stores Retained	407 kts	TBD	507 kts (Ch-3)

Close Air Support (CAS)

22 MK 82 LGDB

2 Sidewinders

Takeoff Weight	60,754 lb.	TBD	59,885 (Ch-4, Ch-7)
Length/Span	54'7"/53'0"	TBD	54'7"/53'0"
Height/Height Folded	16'3"/21'11"	TBD	16'3"/21'11"
Engine No./Type	2/GE 404-400D	2/GE 404-400D	2/GE 404-400D
Crew	2	2	2
Combat Speed/Alt	563/SL	TBD	563/SL
Combat Ceiling	31,000'	TBD	31,000'
Mission Radius	215 nm	TBD	240 nm
Spd Max @ SL Stores Retained	504 kts	TBD	504 kts

b. (U) Previous Changes Explanations

- (Ch-1) Take-off weight for both long range strike and Anti-ship Strike increased because of configuration changes listed in the weight and balance status report (CDM-A6-85-L-946 of 18 Dec 1985 for contract N00019-84-C-0098).
- (Ch-2) The increase in weight decreased Mission Radius and SPD MAX at sea level, stores on board.
- (Ch-3) The development estimate for SPD MAX at sea level stores retained for Anti-ship Strike should have been 507 kts. (407 kts. was a typographical error).
- (Ch-4) The decrease in CAS take-off weight was due to the change from carrying thermal coated vice non-thermal coated bombs. Therefore, mission radius increased.

c. (U) Current Change Explanations

(Ch-5) The take-off weight, 59,275 for Long Range Strike was a typographical error. In accordance with weight and balance status report No. 9 (COM-A6-EL-L-947) of 24 Nov 1986, the proper weight should be reflected as 58,305 lbs.

(Ch-6) The take-off weight reduction for the Anti-ship Strike mission included the change indicated below for the Close Air Support (CAS) mission plus an additional reduction of 17 lbs. due to the removal of the drop tank fin.

(Ch-7) The take-off weight change from 59,833 lbs. to 59,885 lbs. for the CAS mission was due to the negotiated adjustments in manufacturing weight allowance of +150 lbs. and a simultaneous contractor weight reduction program which deleted 90 lbs.

- d. (U) References: Production Estimate:
 OSDPBD of 1 December 1970
 SECNAV Memo of 6 July 1983
 Current Estimate: FY 88 President's Budget

11. (U) PROGRAM ACQUISITION COST (Current Estimate in Millions of Dollars)

	<u>PRODUCTION ESTIMATE</u>	<u>CHANGES</u>	<u>CURRENT ESTIMATE</u>
a. (U) Cost --			
Development (RDT&E)	142.4	681.1	823.5
Procurement	2,957.3	6,777.6	9,734.9
Airframe	(1,205.0)	(2,559.0)	(3,764.0)
Engine	(208.0)	(486.6)	(694.6)
Avionics	(446.3)	(2,319.3)	(2,765.6)
Total Flyaway	(1,859.3)	(5,364.9)	(7,224.2)
Other Weapon System Cost	(838.7)	(1,160.5)	(1,999.2)
Initial Spares	(259.3)	(252.2)	(511.5)
Construction (MILCON)	<u>1.4</u>	<u>14.9</u>	<u>16.3</u>
Total FY 1984 Base-Year \$	3,101.1	7,473.6	10,574.7
Escalation	123.3	-38.6	+84.7
Development (RDT&E)	(6.6)	(+44.6)	(+51.2)
Procurement	(116.7)	(-85.3)	(+31.4)
Construction (MILCON)	<u>0</u>	<u>+2.1</u>	<u>+2.1</u>
Total Then-Year \$	3,224.4	7,435.0	10,659.4
b. (U) Quantities --			
Development (RDT&E)	0	0	0
Procurement	<u>173</u>	<u>+172</u>	<u>345</u>
Total	173	+172	345

c. (U) Unit Cost --

Procurement:

FY 1984 Base-Year \$	17.094	+11.123	28.217
Then-Year \$	17.769	+10.357	28.126

Program:

FY 1984 Base-Year \$	17.925	+12.726	30.651
Then-Year \$	18.638	+12.258	30.897

d. (U) Approved Design to Cost Goal -- N/A

e. (U) Foreign Military Sales -- N/A

f. (U) Nuclear Costs -- N/A

12. (U) PROGRAM ACQUISITION/CURRENT PROCUREMENT UNIT COST SUMMARY:
 (Current (Then-Year) Dollars in Millions)

	<u>CURRENT YEAR</u>		<u>BUDGET YEAR</u>
	<u>SAR CURRENT</u>	<u>UCR BASELINE</u>	<u>UCR BASELINE</u>
	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>
a. (U) Program Acquisition -- (DEC 86 SAR)	(DEC 86 SAR)	(DEC 1985)	(DEC 1986)
(1) Cost	10,659.4	10,291.0	10,659.4
(2) Quantity	345	345	345
(3) Unit Cost	30.897	29.829	30.897
b. (U) Current Procurement -- (FY 1987)	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	358.7	358.7	853.2
Less CY ADV Proc.	-79.3	-79.3	-109.9
Plus FY ADV Proc.	+79.3 +80.4	+79.3 +80.4	+79.3
Net Total	358.7 357.8	358.7 359.2	822.6
(2) Quantity	11	11	12
(3) Unit Cost	32.609	32.609	68.550
	32.724	32.731	

13. (U) COST VARIANCE ANALYSIS:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
DEVELOPMENT ESTIMATE	149.0	3,074.0	1.4	3,224.4
PREVIOUS CHANGES:				
ECONOMIC	-7.0	-268.3		-275.3
QUANTITY	-	+3,056.3	-	+3,056.3
SCHEDULE	-	-	-	-
ENGINEERING	+641.9	-	-	+641.9
ESTIMATING		+1,189.1	+11.8	+1,200.9
OTHER	-	-	-	-
SUPPORT	-	+2,442.8	-	+2,442.8
SUBTOTAL	+634.9	+6,419.9	+11.8	7,066.6
CURRENT CHANGES:				
ECONOMIC	-9.0	-907.8	-	-916.8
QUANTITY	-		-	
SCHEDULE	-	-	-	-
ENGINEERING	+99.8	+255.9	-	+355.7
ESTIMATING		-170.4 +1,033.3	+5.2	+1,038.5
OTHER	-	-	-	-
SUPPORT	-	-109.0	-	-109.0
SUBTOTAL	+90.8	+272.4	+5.2	+368.4
TOTAL CHANGES	725.3	6,692.3	17.0	7,435.0
CURRENT ESTIMATES	874.7	9,766.3	18.4	10,659.4

13. (U) COST VARIANCE ANALYSIS (CONT'D):

(FY 84 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
DEVELOPMENT ESTIMATE	142.4	2,957.3	1.4	3,101.1
PREVIOUS CHANGES:				
ECONOMIC	-	-	-	-
QUANTITY	-	+2,940.1	-	+2,940.1
SCHEDULE	-	-	-	-
ENGINEERING	+600.9	-	-	600.9
ESTIMATING	-	+2,012.3	+11.1	+2,023.4
OTHER	-	-	-	-
SUPPORT	-	+1,514.8	-	+1,514.8
SUBTOTAL	+600.9	+6,467.2	+11.1	+7,079.2
CURRENT CHANGES:				
ECONOMIC	-	-	-	-
QUANTITY	-	-	-	-
SCHEDULE	-	-	-	-
ENGINEERING	+80.2	+191.4	-	+271.6
ESTIMATING	-	+192.1	+3.8	+195.9
OTHER	-	-	-	-
SUPPORT	-	-73.1	-	-73.1
SUBTOTAL	+80.2	+310.4	+3.8	+394.4
TOTAL CHANGES	+681.2	6,777.6	14.9	7,473.6
CURRENT ESTIMATES	823.5	9,734.9	16.3	10,574.7

b. (U) Previous Change Explanations

RDT&E

Engineering: Congress approved development of an upgraded A-6E aircraft (A-6F) and increased funds to complete full scale development.

Economic: Revised escalation indices.

Estimating: Refinement of estimates based upon approval of A-6F aircraft.

Procurement

Economic: Revised escalation indices.

Quantity: 22 additional A-6E and 150 A-6F aircraft approved for production.

Estimating: Refinement of estimates based upon approval of A-6F aircraft.

Support: Primarily due to additional support added for new production aircraft (A-6F). Also includes refinement of A-6E support requirements.

Milcon:

Refinement of estimates based upon approval of A-6F aircraft and addition of trainer facilities at NAS Whidbey Island and NAS Oceana.

c. (U) Current Change Explanation

		BASE YEAR	THEN YEAR
<u>RDT&E</u>		+80.2	+90.8
Economic:	Revised economic indices	--	(-9.0)
Engineering:	Addition of ECP #1 (See Para 7. Program Highlights)	(+80.2)	(+99.8)
<u>Procurement</u>		+310.4	+272.4
Economic: *	Reflects correction or previous economic computation from +723.8 to -13.1	--	-907.8
	and		
	-170.9 due to revised indices. Current amount arrived at as follows:		
	Difference between +723.8 shown in Dec 84 SAR and correct amount of -13.1	--	(-736.9)
	Current economic computation	--	(-170.9)
Engineering:	Addition of ECP-1 (See Para. 7 Program Highlights)	+191.4	+255.9
	Recurring	(+174.6)	(+233.5)
	Nonrecurring	(+16.8)	(+22.4)
Estimating:		+192.1	+1,033.3
	Reflects correction of "Economic" (above)	--	(+736.9)
	Repricing of A-6F CFE	(+225.6)	(+277.5)
	Estimating of labor and overhead rates.	(-33.5)	(+18.9)
Support:		-73.1	-109.0
	Reassessment of spares requirement	(-24.3)	(-38.9)
	Revised support estimate	(-48.8)	(-70.1)
<u>MILCON</u>		+3.8	+5.2
	For funding trainer facilities at NAS Whidbey IS, NAS Oceana, and to provide funding for planned MARCORPS training facility. (ESTIMATING)	(+3.8)	(+5.2)

* To summarize the current changes noted in para. c, analysis of previous A-6 SARs indicates that the Dec 84 SAR had an Economic change of \$+723.8 from the Dec 83 baseline. The correct amount is \$-13.1. The error was caused by failure to net the previous economic change. The \$723.9 in this SAR corrects the erroneous \$+723.8 entry.

- d. (U) References -- Production Estimate: SECNAV memo of 6 July 1983
Current Estimate: FY 88 President's Budget

14. (U) PROGRAM ACQUISITION UNIT COST (PAUC) HISTORY: (Millions of then-year dollars)

a. (U) Initial SAR Estimated to Current Baseline Estimate --

PAUC (INITIAL									PAUC (CURRENT
SAR EST)	ECON	QTY	SCH	ENG	EST	SPT	OTHER	TOTAL	EST)
18.638	-3.455	-.433	-	+2.891	+6.491	+6.765	-	+12.259	30.897

15. (U) CONTRACT INFORMATION: (Then-Year Dollars in Millions)

a. (U) RDT&E

A-6F Full Scale Development
 Grumman Aerospace, Bethpage, NY
 N00019-84-C-0098 (NTE/FFP)
 Award: 31 July 1984

<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
397.8	N/A	-

<u>Current Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>

<u>Estimated Price at Completion</u>	
<u>Contractor</u>	<u>Program Manager</u>

397.8	N/A	-
-------	-----	---

397.8	397.8 (in 1990)
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Not to exceed/fixed price contract for A-6F modification. Current Limit of Government Liability is \$335,900,000 through January 1986.

Previous Cumulative Variance -- None
 Cumulative Variance to Date -- None

Explanation of change: Previous Program Manager's estimate should have read 397.8 in lieu of 397.0.

Common Wing
 Boeing Military Aircraft Company,
 Wichita, KA
 N00019-85-C-0311 (FFP)
 Award: 29 July 1985

<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
1,221.6	N/A	-

<u>Current Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>

<u>Estimated Price at Completion</u>	
<u>Contractor</u>	<u>Program Manager</u>

1,221.6	N/A	-
---------	-----	---

1,221.6	1,221.6
---------	---------

Previous Cumulative Variance -- None
 Cumulative Variance to Date -- None

Explanation of change: None

Airframe (FY 1985)
 Grumman Aerospace, Bethpage, NY
 N00019-84-C-0003 (FFP)
 Award: 17 October 1986

<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
84.1	N/A	6

<u>Current Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
84.1	N/A	6

<u>Estimated Price at Completion</u>	
<u>Contractor</u>	<u>Program Manager</u>
84.1	84.1

Previous Cumulative Variance -- None
 Cumulative Variance to Date -- None

Explanation of change: Two avionics interface sets were added.

b. (U) Procurement

Airframe (FY 1986)
 Grumman Aerospace, Bethpage, NY
 N00019-84-C-0334 (FFP)
 Award: 30 April 1986

<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
142.8	N/A	11

<u>Current Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
142.8	N/A	11

<u>Estimated Price at Completion</u>	
<u>Contractor</u>	<u>Program Manager</u>
142.8	142.8

Previous Cumulative Variance -- None
 Cumulative Variance to Date -- None

Explanation of change: Original target of 88.0 was estimated price. 77.7 is FFP negotiated price.

Engine
 General Electric Corp., Lynn, MA
 N00019-83-C-0368 (FFP)
 Award: 1 January 1985

<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
37.4	N/A	12

<u>Current Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
37.4	N/A	12

<u>Estimated Price at Completion</u>	
<u>Contractor</u>	<u>Program Manager</u>
37.4	37.4

Previous Cumulative Variance -- None
 Cumulative Variance to Date -- None

Explanation of change: None

TRAM System
 Hughes Aircraft, Culver City, CA
 N00019-84-C-0047 (FFP/MYP)
 Award: February 1984

<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
192.9	N/A	165

<u>Current Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
192.9	N/A	165

<u>Estimated Price at Completion</u>	
<u>Contractor</u>	<u>Program Manager</u>
192.9	192.9

Previous Cumulative Variance -- None
 Cumulative Variance to Date -- None

Explanation of change: None

16. (U) PROGRAM FUNDING SUMMARY: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

- (1) Percent Program Completed: 72% (18 yrs/25 yrs)
- (2) Percent Program Cost Appropriated: 37.7% (\$4,020.5/\$10,659.4)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY69-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance FYDP (FY88-92)</u>	<u>To Complete Beyond FYDP (FY93-)</u>	<u>Total</u>
RD&E	574.1	126.8	173.8	-	874.7
Procurement	3,445.0	853.2	4,227.8	1,240.3	9,766.3
MILCON	1.4	4.4	12.6	-	18.4
Total	4,020.5	984.4	4,414.2	1,240.3	10,659.4

c. (U) Annual Summary --

Appropriation: APN/Procurement

Fiscal Year	Qty	FY84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
1969	-		15.2	15.2	5.3	-	5.3	3.2
1970	12		163.3	227.6	2.2	5.3	82.8	4.0
1971	12		185.1	334.1	3.2	2.2	126.7	4.6
1972	12		143.5	263.8	3.5	3.2	104.8	3.8
1973	21		224.1	360.3	1.6	3.5	157.9	4.2
1974	13		194.0	293.8	3.4	1.6	134.9	5.8
1975	12		165.5	278.6	5.4	3.4	135.0	8.8
1976	11	14.7	193.5	326.8	12.4	5.4	168.9	6.6
1977	6		139.1	148.1	9.5	12.4	84.9	3.8
1978	12		220.0	289.1	20.3	9.5	181.7	6.8
1979	12	1.1	206.4	232.5	-	20.3	163.5	8.7
1980	6		126.4	195.8	-	-	153.6	11.8
1981	12		221.0	300.1	10.9	-	262.1	11.6
1982	12	2.5	224.8	291.5	6.8	10.9	276.5	14.3
1983	8	2.6	145.2	217.2	7.6	6.8	219.2	9.0
1984	6	17.2	136.8	221.3	10.1	7.6	233.4	8.0
1985	6	9.8	129.1	277.3	64.2	10.1	300.4	3.4
1986	11	13.0	201.5	263.4	24.3	8.1	294.7	2.9
1987	11	37.2	262.4	310.0	79.3	80.4	358.7	3.1
1988	12	73.9	434.9	713.6	109.9	79.3	853.2	3.5
1989	18	19.3	536.4	722.0	137.0	109.9	889.6	3.5
1990	24	23.9	639.0	737.7	137.6	137.0	933.5	3.3
1991	24	7.7	631.2	766.4	187.6	137.6	993.6	2.9
1992	36	.9	823.5	1062.9	196.5	187.6	1411.1	2.4
1993	36	0	858.5	912.6	0	196.5	1240.5	2.4
TOTAL	345	223.8	7220.8	9734.9	1038.6	1038.6	9766.3	

16. (U) PROGRAM FUNDING SUMMARY (Cont'd): (Current Estimate in Millions of Dollars)

c. (U) Annual Summary (Cont'd) --

Appropriation: RDT&E

Fiscal Year	Qty	<u>FY84 Base-Year Dollars</u>			<u>Then-Year Dollars</u>			Escl Rate (%)
		<u>Flyaway</u>		Total	<u>Advance Proc</u>			
		Nonrec	Rec		Debit	Credit	Total	
1972				5.5			2.4	4.6
1973				12.0			5.6	4.4
1974				22.7			11.5	8.0
1975				21.8			12.0	10.9
1976				10.5			6.1	6.6
1977				3.0			1.9	2.6
1978				4.3			2.9	6.8
1979				9.9			7.3	8.4
1980				3.8			3.1	10.6
1981				-			-	10.6
1982				-			-	7.6
1983				8.3			8.2	4.9
1984				22.3			22.8	3.8
1985				49.8			52.4	3.4
1986				235.7			255.3	2.9
1987				163.2			182.6	3.1
1988				109.5			126.8	3.5
1989				72.4			86.8	3.5
1990				22.9			28.2	3.3
1991				23.0			29.1	2.9
1992				<u>22.6</u>			<u>29.7</u>	2.4
Total				823.9			874.7	

Appropriation: MILCON

Fiscal Year	Qty	<u>FY84 Base-Year Dollars</u>			<u>Then-Year Dollars</u>			Esc1 Rate (%)
		<u>Flyaway</u>		Total	<u>Advance Proc</u>		Total	
		Nonrec	Rec		Debit	Credit		
1975				1.0			.5	16.1
1978				.7			.4	7.7
1979				.8			.5	7.3
1988				3.7			4.4	2.4
1989				5.7			7.0	2.4
1990				2.9			3.7	
1992				<u>1.5</u>			<u>1.9</u>	
Total				16.3			18.4	

d. (U) Obligations and Expenditures --

Appropriation: APN/Procurement

Then-Year Dollars (Current Estimate in Millions)

Fiscal Year	Total	Obligated	Expended
1969	5.3	5.3	5.3
1970	82.8	82.6	82.6
1971	126.7	126.7	126.7
1972	104.8	104.8	105.3
1973	157.9	157.9	155.4
1974	134.9	134.9	134.5
1975	135.0	135.0	134.4
1976	168.9	168.9	165.1
1977	84.9	84.9	84.7
1978	181.7	181.8	181.6
1979	163.5	161.9	163.7
1980	153.6	153.3	152.3
1981	262.1	262.1	255.5
1982	276.5	276.5	274.1
1983	219.2	219.2	206.5
1984	233.4	235.7	201.9
1985	300.4	286.2	134.4
1986	294.7	234.3	55.8
1987	358.7	67.9	N/A
To Complete	6321.3	N/A	N/A
TOTAL	9766.3	3079.9	2619.9

Appropriation: RDT&E

Then-Year Dollars (Current Estimate in Millions)

Fiscal Year	Total	Obligated	Expended
1972	2.4	2.4	2.4
1973	5.6	5.6	5.6
1974	11.5	11.5	11.5
1975	12.0	12.0	12.0
1976	6.1	6.1	6.1
1977	1.9	1.9	1.9
1978	2.9	2.9	2.9
1979	7.3	7.3	7.3
1980	3.1	3.1	3.1
1981	-	-	-
1982	-	-	-
1983	8.3	8.3	8.0
1984	22.8	22.8	21.3
1985	89.8	89.8	72.5
1986	255.3	255.3	204.0
1987	182.6	115.0	11.5
To Complete	263.1	N/A	N/A
TOTAL	874.7	535.7	370.1

Appropriation: MILCON

Then-Year Dollars (Current Estimate in Millions)

Fiscal Year	Total	Obligated	Expended
1975	.5	.5	.5
1978	.4	.4	.4
1979	.5	.5	.5
To Complete	17.0	N/A	N/A
TOTAL	18.4	1.4	1.4

17. (U) PRODUCTION RATE DATA:

a. (U) Annual Production Rates --

Production Rates (Quantity/Year)

Fiscal Year	Development Est	Production Est	Current Est	Maximum* Economic
1984	-	6	6	72
1985	-	6	6	72
1986	-	0	11	72
1987	-	0	11	72
1988	-	0	12	72
1989	-	0	18	72
1990	-	0	24	72
1991	-	0	24	72
1992	-	0	36	72
1993	-	0	36	72

* The maximum production rate is not currently attainable due to the actual production of the EA-6B at the rate of 12 per year.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BY \$)	3,101.1	7,473.6	10,574.7	-	10,574.7
(TY \$)	3,224.4	7,435.0	10,659.4	-	10,659.4
PAUC (BY \$)	17.925	12.726	30.651	-	30.651
(TY \$)	18.638	12.259	30.897	-	30.897

c. (U) Schedule Variance --

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum*
Start Date	Sep 83	N/A	Oct 86	N/A	Oct 86
Duration	45	27	72	45	27
End Date	Aug 87	N/A	Oct 95	N/A	Oct 88

* Subject to limitations set forth above under "Annual Production Rates".

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	169/169

18. (U) OPERATING AND SUPPORT (O&S) COSTS:

Not Applicable

A-1 ADDS

SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A)823)
PROGRAM: Army Data Distribution System (ADDS)

86-020

AS OF DATE: December 31, 1986 -

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1. Designation/Nomenclature (Popular Name): Not Assigned/Army Data Distribution System (ADDS) (Enhanced Position Location Reporting System (EPLRS))

2. DOD Component: U.S. Army

3. Responsible Office and Telephone Number:

Project Manager
PLRS/TIDS
Ft Monmouth, NJ 07703-5216

PM: COL STANLEY M. CLOUGH
Assigned: 1 Feb 86
AUTOVON: 992-4251
Commercial: (201) 532-4251

4. Program Elements/Procurement Line Items:

RDT&E: 63713A Project D370

Procurement: APPN 2035 - BU1400, TO6200, TO6400, TO1600 (Shared), BA960A, BL5264

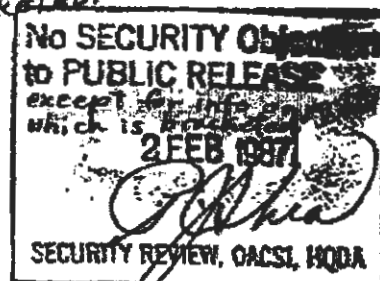
MILCON: N/A

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (DASO-PA)
DEPARTMENT OF DEFENSE

1



87-0391

5. Related Programs: Position Location Reporting System (PLRS) and Joint Tactical Information Distribution System (JTIDS).

6. Mission and Description: The Army Data Distribution System (ADDS), formerly known as PLRS/JTIDS Hybrid (PJH), is a CORPS based system composed of two similar systems, the Enhanced Position Location Reporting System (EPLRS) and the Joint Tactical Information Distribution System (JTIDS). The EPLRS, deployed at the Brigade level, is used to satisfy low and medium rate data communications within the Division. The JTIDS, deployed at the Division level, is used to satisfy medium and high rate data communications within the CORPS and echelons Above CORPS (EAC). By taking advantage of the advanced development of these two projects, the Army will produce an integrated and synergistic system to satisfy the Army's stated requirement for near-real-time, secure, jam resistant data communications. The ADDS will support data communications requirements in the five functional areas of maneuver control, fire support, air defense, intelligence/electronic warfare and combat service support.

7. Program Highlights:

a. Significant Historical Developments - On 8 August 1979 the Under Secretary of Defense for Research and Engineering approved the Report of the Ad Hoc Working Group on the PLRS/JTIDS Hybrid (PJH) and Division Area Communications Concept (DACC) and authorized the Army to proceed with development of the PJH. In July of 1980 the Training and Doctrine Command (TRADOC) approved an Operational and Organizations (O&O) Concept which established PJH as a Division-based system and identified fielding requirements for sixteen (16) Army divisions. In September 1982, the Army System Acquisition Review Council (ASARC) approved PLRS production and endorsed the accelerated, overlapping five-phase development strategy for PJH. In August 1984, TRADOC approved a revised O&O Plan which established PJH as a Corps-based system instead of a Division-based system and expanded the fielding requirement to eighteen (18) divisions and five (5) Corps. In February 1985, a DA "Why 3?" study was completed in response to questions by the Under Secretary of Army (USA) concerning the concurrent developments of PJH, Single Channel Air-Ground Radio System (SINGARS) and the Mobile Subscriber Equipment (MSE). The study proved that all three systems satisfied different, distinct and valid requirements. Based on the "Why 3" results, the Under Secretary of Army approved in March 1985 continued acquisition of the PJH. Concurrent approval was given for development of VHSIC technology in the Enhanced PLRS User Unit (EPUU), and downsizing of the Net Control Station (NCS). In February 1985, the Assistant Secretary of Defense for Command, Control Communications and Intelligence (ASD-C³I) approved the development of the downsized version of the JTIDS Terminal, the Class 2M. The first two phases of the JTIDS Class 2M development program were completed in October 1985. Phase 3 was awarded to Singer Kearfott Division on 31 December 1985. The objective of this development effort is to fabricate five Engineering Development Models for technical and operational tests scheduled for the ADDS program in FY88. In the September to December 1985 timeframe, the Combined Arms Center conducted the Battlefield Command and Control System Review (BC²SR). The BC²SR revisited and revalidated PJH user requirements and determined that the Army Air Defense community was the only user requiring JTIDS Terminals.

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b. Significant Developments Since Last Report - Work on Phase 3/4/5 of the ADDS development continued to make satisfactory progress during FY86 consistent with planning estimates. Work on Phase 3 of the JTIDS Class 2M development is also in progress according to plan. The Class 2 Investigative Operational Assessment (IOA) IIA slipped 8 months (from July 86 to March 87) which in turn caused a 3 month delay in the JTIDS production decision, production contract award, and the delivery of the first production terminal. The full impact of this delay on the ADDS program is not known at this time. Reliability Growth Testing (RGT) on the PLRS system's Basic User Units was completed on the surface vehicle configuration in April 86. Reliability testing of the aviation vehicle configuration unit will be completed in January 87. This has caused a realignment of the ADDS program milestones resulting in an 11 month slip of the First Unit Equipped date from September 88 to Aug 89. ADDS Technical Test/Initial Operational Test and Evaluation is in the planning phase. Active testing will begin February 88. TRADOC revised the ADDS O&O plan in June 86. On 8 September 1986, the Army approved a Required Operational Capability (ROC) for the ADDS. Program changes which are reflected in these documents are as follows: The number of JTIDS Terminals required for a typical Army division decreased from 40-60 to 20 or less; separate Net Control Stations are required for Enhanced PLRS (NCS-E) and JTIDS (NCS-J); a requirement was established for Dedicated JTIDS Relay Units (DJRUs); development of Intermediate Forward Test Equipment (IFTE) is required for PJH maintenance; the requirement to downsize the NCS-E was reaffirmed; the requirement for development of an Enhanced PLRS User Unit (EPUU) Channel adapter for Continuity Of Operations (CONOPS) was established; an NCS-J trainer is required, data base control measures are now required between EPUU operators and the NCS-E data base; the EPUU must be compatible with MIL-STD-1553B; Over The Air Rekeying (OTAR) is required for both EPLRS and JTIDS. Also, increased quantity requirements were established for the NCS-E and the EPUU at division and Corps levels. The funding Summary in this SAR is the result of a cost estimating excursion performed on the ADDS BCE for 18 Divisions and 5 Corps that was validated prior to DA approval of the 8 September 1986 ROC. Procurement objective is to estimate the cost of an 18 Division and 5 Corps which incorporates the requirements of the approved ROC. Information presented in this SAR may be revised upon conclusion of a validated cost estimate based on the 8 September 1986 ROC. The ADDS system is expected to satisfy the mission requirement.

c. Changes Since "As Of" Date - None

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP or SDDM (dated 8 August 1979) threshold breaches.

9. Schedule:

a. Milestones <u>1/</u>	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>
Phase 1 Contract Completed	Dec 80/Aug 81	Aug 81
Phase 2 Contract Completed	Feb 82/Jul 82	Jul 82
Phase 3/4 Contract Award	Mar 82/Mar 82	Mar 82
ASARC Program Review	Sep 84/Not Req'd	Not Req'd
Phase 5 Contract Award	Sep 84/Apr 85	Apr 85
O&O Plan Approval	Jul 84/Jun 86	Jun 86
ROC Approval	Jul 84/Sep 86	Sep 86
MDR IIIA	Feb 86/Apr 87	Apr 87
Type Class Approved (LP)	Feb 86/Apr 87	Apr 87 (Ch-1)
Pre-Planned Product Improvement	Sep 86/Aug 87	Aug 87 (Ch-1)
DT Start	Aug 87/Feb 88	Feb 88
OT Start	Aug 87/Jun 88	Jun 88
MDR IIIB	Sep 87/Apr 89	Apr 89 (Ch-1)
Type Class Approved (STD)	Sep 87/Apr 89	Apr 89 (Ch-1)
Full Scale Prod Award	Jul 88/Apr 89	Apr 89 (Ch-1)
First Unit Equipped (FUE)	Sep 88/Aug 89	Aug 89

b. Previous Change Explanations --

Phase 1 was completed in August 81 (vs December 80). This is the date of the Final Report with the DD 250 Pyment Form from the contractor.

Phase 2 was completed July 82 not Jun 82 as stated in Current Estimate, Dec 84 SAR.

The ASARC Program Review scheduled for Apr 85 (Dec 84 SAR) was cancelled following a service review of the total Army battlefield data distribution requirement. The scope and result of this review negated the need for an additional assessment of the ADDS program.

Program was on hold pending issuance of Under Secretary of the Army Memo, 4 Mar 85, Subj: PJH, 4 which announced the decision to move forward with the ADDS development program.

Milestone for Full Scale Production Award was added to correlate with the ADDS acquisition strategy and to differentiate the production effort associated with bottoms up production from the Pre-Planned Product Improvement of existing PLRS equipment.

1/ Definition of Phases:

Phase 1 - System definition and concept evaluation was completed in 1981.

Phase 2 - Verifies the interoperability of PLRS and JTIDS. Completed in 1982.

Phase 3/4 Establishes an interface capability and the design of the Net Control Station (NCS), Enhanced PLRS User Unit (EPUU), EPUU Interface Unit and the JTIDS Class 2/2M Terminal. Provides a mini prototype system for contract or Engineering Development Tests.

Phase 5 - Completes the development of a division level system for developmental/operational testing.

c. Current Change Explanations:

(Ch-1) The ADDS program has been realigned to account for the slip in PIRS production contract and ADDS development.

d. References:

Planning Estimate: SDDM, dated 8 Aug 79

Approved Program: FY88 President's Budget

10. Technical/Operational Characteristics:

a. Technical	Plan Estimate/ Approved Program	Demo Perf	Current Estimate
<u>Size (Length x Width x Height)</u>			
NCS (S-280)	12'x73"x7'/12'x7.5'x7.5'		12'x7.5'x7.5'
Downsized NCS (S-250)	7'x6.5'x6'/7'x6.5'x6'		7'x6.5'x6'
EPUU	10.1"x10.7"x4"/10.1"x10.7"x4"		10.1"x10.7"x4"
JTIDS Class 2 Terminal	22"x19"x24"/22"x19"x24"		22"x19"x24"
JTIDS Class 2M Terminal	/15"x10"x23"		15"x10"x23"
<u>Weight (lbs)</u>			
NCS (S-280)	6200/6200		6200
Downsized NCS (S-250)	2300/2300		2300
EPUU	17/17		17
JTIDS Class 2 Terminal	213/233		233
JTIDS Class 2M Terminal	/105		105
	Plan Estimate/ Approved Program	Demo Perf	Current Est
<u>Power Requirements (NCS)</u>			
Voltage (AC)	208/208		208
Frequency	60/60		60
Phase	3/3		3
Frequency Band (MHZ)	420-450/420-450		420-450
	960-1215/960-1215		960-1215
<u>Power Requirements (EPUU)</u>			
Voltage (DC)	20-28/20-28		20-28
Frequency Band (MHZ)	420-450/420-450		420-450

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10. Technical/Operational Characteristics (Continued):

	<u>Plan Estimate/ Approved Program</u>	<u>Demo Perf</u>	<u>Current Est</u>
<u>Power Requirements (JTIDS)</u>			
Voltage (AC)	120-208/120-208	NA	120-208
Frequency	50-60-400/50-60-400	NA	50-60-400
Phase	3/3	NA	3
Frequency Band (MHZ)	960-1215/960-1215	NA	960-1215
b. Operational--			
<u>MTBF (Hrs)</u>			
NCS	100/100	NA	100
EPUU	500/500	NA	500
Class 2 Terminal	120/120	NA	120
<u>MTTR (Min)</u>			
NCS	35/35	NA	35
EPUU	35/35	NA	35
Class 2 Terminal	30/30	NA	30
<u>Time Slots/Sec</u>			
EPUU	512/512	NA	512
Class 2 Terminal	128/128	NA	128
<u>Bits/Slot</u>			
EPUU	75/75	NA	75
Class 2 Terminal	225/225	NA	225

10. Technical/Operational Characteristics (Con't):

<u>Data Rate (KBS)</u>		
EPUU	1.2/1.2	1.2
Class 2/2M Terminal	238/238	238
<u>Channels</u>		
EPUU	8/8	8
Class 2/2M Terminal	128/128	128

c. Previous Change Explanations -

Current Estimate reflects performance characteristics in the MSRS, dated July 1985. Current Estimate reflects size and weight for JTIDS Class 2M Terminal per MSRS, dated July 1985.
Correcting an error - ICD's weight was omitted in Dec 84 SAR.

d. Current Change Explanations - None.

e. References --

Planning Estimate: SDDM, dated 8 August 1979.
Approved Program: FY88 President's Budget.

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development(RDT&E) 1/	\$175.3	+56.1	231.4
Procurement	1806.2	+606.8	2413.0
NCS	(229.7)	+647.2	(417.5)
Other Components	(1270.6)	+599.6	(1870.2)
Total Flyaway	(1500.3)	+787.4	(2287.7)
Other Wpn Sys Cost	(121.3)	-91.8	(29.5)
Initial Spares	(184.6)	-88.8	(95.8)
Construction(MILCON)	-	-	-
Total: Constant FY 1983 \$	1981.5	+662.9	2644.4
Escalation	1056.7	-85.8	970.9
Development(RDT&E)	(13.7)	+10.4	(24.1)
Procurement	(1043.0)	-96.2	(946.8)
Construction	-	-	-
Total Program Cost (Then-Year)	3038.2	+577.1	3615.3

1/ R&D Planning Estimate was adjusted in Dec 84 SAR to reflect true FY83 base year dollars.

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	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
b. Quantities--			
Development (RDT&E)	3	-	3
Procurement	85	+58	143
Total	88	+58	146
c. Unit Cost--			
Procurement: 1/			
Constant FY 1983 \$	21.2	-4.3	16.9
Current (Then-Year) \$	33.5	-10.0	23.5
Program:			
Constant FY 1983 \$	22.5	-4.4	18.1
Current (Then-Year) \$	34.5	-9.7	24.8
d. Approved Design to Cost Goal --			
	(Average Unit Flyaway Cost)		
	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>	<u>Latest Approved Threshold</u>
	NA	NA	NA
e. Foreign Military Sales - - None			
f. Nuclear Costs - - None			

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current Estimate</u>	<u>UCR Baseline Estimate</u>	<u>UCR Baseline Estimate</u>
	(Dec 86 SAR)	(Dec 85 SAR)	(Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	3615.3	2764.7	3615.3
(2) Quantity	146	120	146
(3) Unit Cost 2/	24.8	23.0	24.8

b. Current Procurement: NA due to year to year changes in the mix of hardware components being purchased under this program.

1/ Initial SAR did not show procurement unit cost for ADDS Representative Network.

2/ The unit of measure for the program unit cost is the Representative ADDS Network which is the NCS.

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13. Cost Variance Analysis:

a. Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	189.0	2849.2	-	3038.2
Previous Changes:				
Economic	-4.4	-395.2	-	-399.6✓
Quantity	-	+473.9	-	+473.9✓
Schedule				
Engineering	+55.8	-339.2	-	-283.4
Estimating	-7.6	-56.8	-	-64.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+43.8	-317.3	-	-273.5
Current Changes:				
Economic	-2.6	-13.4	-	-16.0
Quantity	-	+444.3	-	+444.3✓
Schedule				
Engineering	+25.3	-	-	+25.3
Estimating	-	+397.0	-	+397.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+22.7	+827.9	-	+850.6
Total Changes	+66.5	+510.6	-	+577.1
Current Estimate	255.5	3359.8	-	3615.3

244.6
16
413.6

13. Cost Variance Analysis (Cont'd):

(FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	175.3	1806.2	-	1981.5
Previous Changes:				
Quantity	-	+320.7	-	+320.7 ✓
Schedule	-	-	-	-
Engineering	+45.6	-244.9	-	-199.3
Estimating	-8.6	-54.8	-	-63.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+37.0	+21.0	-	+58.0
Current Changes:				
Quantity	-	+310.3	-	+310.3 ✓
Schedule	-	-	-	-
Engineering	+19.1	-	-	+19.1
Estimating	-	+275.5	-	+275.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+19.1	+585.8	-	+604.9
Total Changes	+56.1	+606.8	-	+662.9
Current Estimate	231.4	2413.0	-	2644.4

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.
 Engineering: New work - NCS Downsizing, VHSIC insertion and development of EPTS.
 Estimating: Additional funds needed for Phase 5 contract award.

Procurement

Economic: Revised escalation indices.
 Quantity: Increased from 16 Divisions to 18 Divisions and 5 Corps.
 Engineering: Change to NCS downsizing and to JTIDS Class 2 M.
 Estimating: O&M funds incorrectly included in initial SAR; reduction to reflect data from PLRS Production Contract. Elimination of ASIOE requirements reported in 31 December 1984 SAR.

MILCON: NA

13. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

(1) <u>RDT&E</u>	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
Revised Jan 87 economic escalation rates. (Economic)	NA	-2.6
New work - 1553 interface, Continuity Of Operations Dedicated Relay Unit SYSCON interface, NCS-J, Intermediate Forward Test Equipments and DATABASE Command and Control (Engineering) (Source: 8 Sep 86 ROC)	19.1	25.3
(2) <u>Procurement</u>		
Revised Jan 87 economic escalation rates. (Economic)	NA	-13.4
Change in NCS Quantity from 4 per Division to 5 per Division and from 6 per Corp to 8 (Quantity) <u>1/</u>	30.4	43.0
Change in EPUU Quantity from 22,003 in the previous SAR to 24,875 in this SAR due to ROC changes (Quantity) <u>1/</u>	170.6	243.9
Adding Dedicated JTIDS Relay Unit <u>1/</u> (DJRU) (Quantity)	167.5	239.6
Adding NCS-J (Quantity) <u>1/</u>	22.7	32.1
Adding NCS-J trainer (Quantity) <u>1/</u>	4.2	6.0
Increase in QTY for other receiver components (Quantity) <u>1/</u>	19.6	27.7
Reduction in JTIDS terminal quantity (Quantity) <u>1/</u>	-104.7	-148.0
Estimating error in calculating the first unit cost in Dec 85 and Sep 86 SARs (Estimating)	45.0	65.5

1/ Increase in quantities to meet Army's decision for additional ADDS requirements.

ADDS, December 31, 1986

Interface Unit was erroneously omitted 220.2 316.9
from Dec 85 and Sep 86 SARs (Estimating).

Selecting a second source (Estimating) 10.3 14.6

(Source: June 86 O&O and 8 Sep 86 ROC)

(3) MILCON

NA

NA

d. References — SDDM, dated 8 Aug 79.

14. Program Acquisition Unit Cost (PAUC) History:

Planning Estimate to Current Baseline Estimate --

PAUC (Planning Estimate)	Changes (Then-Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
34.525	-2.846	-7.427	-	-1.768	+2.278	-	-	- 9.763	24.762

(b)(4)

b. Procurement - NA.

c. MILCON - NA.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 50.0% (7 yrs/14 yrs)
(Years Funds Appropriated/Total Program Years)
- (2) Percent Program Cost Appropriated: 8.4% (\$302.5/\$3615.3)
(Funds Appropriated To Date in Millions/
Total Program Funding in Millions)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY81-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance FYDP (FY89-92)</u>	<u>To Complete Beyond FYDP (FY93)</u>	<u>Total</u>
RD&E	183.1	33.9	38.5	-	255.5
Procurement	119.4	142.2	1318.3	1779.9	3359.8
MILCON	-	-	-	-	-
Total	302.5	176.1	1356.8	1779.9	3615.3

ADDS, December 31, 1986

16. PROGRAM FUNDING SUMMARY (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty 1/	FY83 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway						
		Nonrec	Rec	Total			Total	

APPROPRIATION: RDT&E

1981				17.8			15.8	N/A
1982				18.1			17.3	N/A
1983				33.3			34.1	N/A
1984				21.6			22.9	3.8
1985				21.7			23.9	3.4
1986				29.6			33.4	2.9
1987				30.6			35.7	3.1
1988				28.1			33.9	3.5
1989				20.5			25.5	3.5
1990				10.1			13.0	3.3
Subtotal	3			231.4			255.5	N/A

APPROPRIATION: Procurement (OPA)

1986				15.1			17.7	2.9
1987				83.9			101.7	3.1
1988				113.6			142.2	3.5
1989				131.7			169.7	3.5
1990				176.7			233.7	3.3
1991				284.1			385.0	2.9
1992				381.9			529.9	2.4
1993				477.0			677.8	2.4
1994				397.6			578.5	2.4
1995				351.4			523.6	2.4
Subtotal	143			2413.0			3359.8	N/A
Total	146			2644.4			3615.3	

1/ Because measurement is based on an equivalent network and the year to year mix of components will vary it is not appropriate to report unit procurement of ADDS components.

ADDS, December 31, 1986

d. Obligations and Expenditures--

Appropriation: RDTE

(Then Year Dollars)

<u>Fiscal Year</u>	<u>Total</u>	<u>Obligated</u>	<u>Expended</u>
1981	15.8	15.8	15.8
1982	17.3	17.3	17.3
1983	34.1	34.1	34.1
1984	22.9	22.9	22.9
1985	23.9	23.9	23.9
1986	33.4	33.4	33.4
1987	35.7	16.5	0.2
1988	33.9		
1989	25.5		
1990	13.0		
Subtotal	255.5	163.9	147.6

Appropriation: Procurement (OPA)

<u>Fiscal Year</u>	<u>Total</u>	<u>Obligated</u>	<u>Expended</u>
1986	17.7	9.6	0.0
1987	101.7		
1988	142.2		
1989	169.7		
1990	233.7		
1991	385.0		
1992	529.9		
1993	677.8		
1994	578.5		
1995	523.6		
Subtotal	3359.8	9.6	0.0
Total	3615.3	173.5	147.6

7. Production Rate Data: Because measurement is based on an equivalent network and the year to year mix of components will vary it is not appropriate to report production rate data for ADDS components.

18. Operating and Support Costs: N/A

SELECTED ACQUISITION REPORT (RCS: DD-COMP (O) B23 (7700))
PROGRAM: MK 50 TORPEDO

AS OF DATE: Dec 31, 1986

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1. (U) Designation and Nomenclature (Popular Name): Torpedo, MK 50 (MK 50 Torpedo)
2. (U) DoD Component: Department of the Navy
3. (U) Responsible Office and Telephone Number:

MK 50 Torpedo Program Office,
 Naval Sea Systems Command
 Washington, D.C. 20362

CAPT Ned Mayo USN
 Assigned: June 1986
 AV 222-0710; COMM (202) 692-0710

4. (U) Program Elements/Procurement Line Items:

RDT&E: PE 63610N Project S0199 (Prior Years Only)
 PE 64610N Project S0199
 PE 63610N Project S1873

PROCUREMENT: APPN: 1507 ICN 3118

MILCON: PE 72096N

5. (U) Related Programs: Vertical Launch ASROC; ASW Standoff Weapon; LAMPS MK III; P-3C; SH-2F; SH-3; ASW Ship In-Service Programs.

Classified by OPNAVINST 83513.5A Encl (71)
 I.D. 05A-71
 Declassify on: OADR

(b)(1)

7. (U) Program Highlights:

a. (U) Significant Historical Developments - The MK 50 Program started with a technology assessment phase in 1975 to review various conceptual designs from industry for the next generation lightweight torpedo. DSARC I was held in July 1979 and approval was given in August 1979 to commence Advanced Development with two competitive designs. The competing prime contractors, Honeywell and McDonnell Douglas, were awarded contracts to develop and test prototype models with the expectation that the contractor with the preferred design would be awarded a Full Scale Development contract. In January 1981, the competition was terminated due to cost growth and excessive technical risk in the McDonnell Douglas design. The program was restructured to form a Navy-industry team composed of Honeywell, Garrett (propulsion subcontractor), the Naval Ocean Systems Center, and the Applied Research Laboratory, Pennsylvania State University. The D&V Phase of the program was successfully completed in July 1983. All required operational and technical characteristics were demonstrated. In-water tests against an SSN were conducted in September and December 1983 to demonstrate terminal homing. The tests were successful, demonstrating all required homing maneuvers. The MK 50 Torpedo demonstrated weapon system integration with surface vessel torpedo tubes and fire control system during a high speed surface vessel launch. The program underwent DSARC Milestone II review on January 20, 1984. On March 15, 1984, the Deputy Secretary of Defense issued approval for the program to proceed into the Full Scale Development Phase.

(U) During FY 85 the program continued with the in-water testing of the tactical computer logic algorithms and fabrication of the first fleet prototype. Warhead lethality tests were continued and the warhead design was finalized. Industrial Symposiums for prospective second-source contractors were conducted and a formal request for proposal for a second-source contractor was issued. Proposals from two prospective contractors have been received and are currently under evaluation. Source selection is estimated to be completed in April 1987.

(U) FY 86 Budget reductions necessitated replanning the MK 50 Torpedo Baseline Program such that Engineering Qualification Trials (EQT) were emphasized to save money in preparing for the Milestone IIIA decision. This approach uses torpedoes purchased with RDT&E funds for an extensive engineering trials program which achieves program thresholds with a combination of test stand and sea run efforts. The test stand effort concentrates on new, successful initiatives which have been finding development problems formerly found only with sea runs. Therefore, overall sea runs and early sea run torpedo quantities are modestly reduced and a more efficient testing program inserted. While overall sea runs are reduced, an increase in FY 87 planned runs is required to support the Milestone IIIA decision.

(b)(1)

b. ~~(S)~~ Significant Developments Since Last Report

1. (U) Under the DT-IIB effort, the 100S extended run program continued with tactical computer program development. The first 200A series prototype launch occurred and a total of seven 200A sea runs were conducted which included the first aircraft launch. Six of the seven in-water tests ran as programmed.

2. (U) Efforts commenced to initiate a two phased OT-IIA. Three 100S series torpedoes were launched on runs designed to evaluate tactical logic. Two of the torpedoes had propulsion problems which prevented logic evaluation and were classified "no test". The third launch ran but did not achieve objectives due to problems in the tactical computer program. Additional OT-IIA sea runs, evaluating improved tactical logic in the 100S model and torpedo physical performance in the 200A model, will be conducted during the second quarter FY 87.

(b)(1)

c. (U) Changes since "As of" Date - None.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: None.

9. ~~(S)~~ Schedule:

a. (U) Milestones-

	<u>Development Estimate/ Approved Program</u>	<u>Current Approved Schedule</u>
(U) Milestone I (DSARC I)	Jul 79/Jul 79	Jul 79
(U) Milestone II (DSARC II)	Dec 83/Jan 84	Jan 84
(U) FSD Contract Award	Aug 83/Sep 83	Sept 83
(U) Critical Design Review	Apr 86/Feb 87	Feb 87
(U) Milestone IIIA (NPDM/JRMB)	Oct 86/Apr 87	Apr 87
(U) Milestone IIIB (NPDM/JRMB)	- /Feb 88	Feb 88 Ch-1
(U) OT II Completed	Dec 88/Dec 88	Dec 88
(U) Milestone IIIC (NPDM/JRMB)	Apr 89/Apr 89	Apr 89 Ch-1

(b)(1)

b. (U) Previous Change Explanations -

- o DSARC II was delayed one month due to requirements for additional in-water testing to demonstrate terminal homing.
- o Critical Design Review was delayed three months due to late release of Level 3 drawings (Apr - Jun 86).
- o Milestone IIIA was delayed three months due to delay in software development (Oct - Dec 86).
- o A series of FY 86 budget reductions have caused a schedule slip and disrupted FY 86 execution. A new transition to production

~~SECRET~~

MK 50 Torpedo, Dec 31, 1986

program has been established which institutes a more cost effective test program. The current approved program results in a six-month program slip and extends the RDT&E program into the first quarter of FY 89.

- c. (U) Current Change Explanations - Ch-1 New Milestone IIIB (ALP). Old Milestone IIIB changed to Milestone IIIC due to extension of program. Approval for third year of low rate production (IIIB) required prior to AFP decision at Milestone IIIC.
- d. (U) References -

Development Estimate: SDDM, dated March 15, 1984, subject "MK 50 Torpedo (Full Scale Development Approval)."

Approved Program: FY 1988 President's Budget

10. (U) Technical/Operational Characteristics: Thresholds 1/ for the Advanced Lightweight Torpedo (Torpedo MK 50) Program were approved during the DSARC Milestone II review in January 1984.

a. (U) TECHNICAL

<u>Dev Estimate/</u>	<u>Demonstrated</u>	<u>Current</u>
<u>Appr Program</u>	<u>Performance</u>	<u>Estimate</u>

- 1. (U) Acoustic Acquisition Range (yds)
50% Probability of Acquisition

(b)(1)



(b)(1)



~~SECRET~~

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b. (U) OPERATIONAL

1. (U) PROBABILITY OF HIT 13-19/

Dev Estimate/
Appr Program

Demonstrated
Performance

Current
Estimate

(b)(1)

(c) (U) Acceptance rate for
storage breakout 22/

.90/.95

TBD

.95

(d) (U) Auxiliary equipment
(MTBF) (Hrs)

175/175

TBD

175

3. (U) MAINTAINABILITY

(a) (U) Organizational

No internal
access Assembly
& disassembly of
accessories only.

TBD No internal
access Assembly
& disassembly of
accessories only.

(b) (U) IMA Torpedo Turn-
around Time max.

16 hrs with
100 man-hours

TBD 16 hrs with
100 man-hours

Notes:

1/ (U) It is the policy of the Department of the Navy to specify performance values in terms of thresholds only.

(b)(1)

3/ (U) Predicted range for isothermal water, absorption coefficient 4
dB/Kyd.

~~SECRET~~

4/ (U) Sea state 3 or less.

(b)(1)

8/ (U) Target radiated level higher than DCP specification. Current estimate shows calculated value (based on demonstrated performance) when target radiated level is reduced.

9/ (U) Local normal is defined as the perpendicular to the plane tangent to the hull at the point of impact.

10/ (U) Total solid angle not to exceed 40° from local normal.

(b)(1)

12/ (U) Maximum length and weight are measured with air launch accessories less nose cap.

(b)(1)

14/ (U) Reliability is not included in P_H because OPNAVINST 3960.10A calls for measuring reliability as an independent factor.

(b)(1)

(b)(1)



20/ (U) Includes performance of torpedo, flight accessories, and any crew preparation required.

21/ (U) Performance of torpedo only.

22/ (U) Rate of IMA test acceptance from storage.

c. ~~(S)~~ Previous Change Explanations -

(b)(1)



(U) o Demonstrated performance and current estimate for maximum weight is based on 200A prototype hardware configuration.

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MK 50 Torpedo, Dec 31, 1986

d. ~~(S)~~ Current Change Explanations -

(b)(1)

e. (U) References-

Development Estimate: SDDM, dated March 15, 1984, subject "MK 50 Torpedo (Full Scale Development Approval)."

Approved Program: FY 1988 President's Budget

11. ~~(S)~~ Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a.	(U) Cost -	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
	Development (RDT&E)	1,117.7	+364.7	1,482.4
	Procurement	3,609.1	-12.4	3,596.7
	Swimaway	(2,976.6)	(-138.4)	(2,838.2)
	Other Weapon System Cost	(386.8)	(+136.9)	(523.7)
	Initial Spares	(245.7)	(-10.9)	(234.8)
	Construction (MILCON)	<u>8.9</u>	<u>+3.0</u>	<u>11.9</u>
	Total FY 84 Base-Year \$	4,735.7	+355.3	5,091.0
	Escalation			
	Development (RDT&E)	49.2	+22.6	71.8
	Procurement	1,868.8	-518.0	1,350.8
	Construction (MILCON)	<u>-</u>	<u>+4</u>	<u>.4</u>
	Total Then-Year \$	6,653.7	-139.7	6,514.0

(b)(1)

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MK 50 Torpedo, Dec 31, 1986

e. (U) Foreign Military Sales--None.

f. (U) Nuclear Costs--None.

12. ~~(S)~~ Program Acquisition/Current Procurement Unit Cost Summary:

(Current (Then Year) Dollars in Millions)

	<u>Current Year</u>	<u>Budget Year</u>
	Current Est.	UCR Baseline
	(DEC 86 SAR)	(DEC 85 SAR)
		UCR Baseline
		(DEC 86 SAR)

(b)(1)

	(Current Est. FY 87 Approp. Act)	(FY 87 Approp. Act)	(FY 88)
(b) (U) Current Procurement--			
(1) Cost	70.6	70.6	226.8
Less CY Adv Proc	-	-	-
Plus PY Adv Proc	-	-	-
Net Total	70.6	70.6	226.8
(2) Quantity	39	39	153
(3) Unit Cost	1.810	1.810	1.482

13. (U) Cost Variance Analysis:

(a) Summary - (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1,166.9	5,477.9	8.9	6,653.7
Previous Changes:	-	-	-	-
Economic	-7.7	-622.6	-	-630.3
Quantity	-39.1	-	-	-39.1
Schedule	+12.0	-15.3	-	-3.3
Engineering	+19.9	-	-	+19.9
Estimating	-1.3	+188.7	-	+187.4
Other	-	-	-	-
Support	-2.2	-1.2	-	-3.4
Subtotal	-18.4	-450.4	-	-468.8
Current Changes:				
Economic	-	-87.8	-	-87.8
Quantity	+16.0	-	-	+16.0
Schedule	+23.1	+551.0	-	+574.1
Engineering	+8.2	-	-	+8.2
Estimating	+358.4	-543.2	-	-184.8
Other	-	-	-	-
Support	-	-	+3.4	+3.4
Subtotal	+405.7	-80.0	+3.4	+329.1
Total Changes	+387.3	-530.4	+3.4	-139.7
Current Estimate	1,554.2	4,947.5	12.3	6,514.0

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13. (U) Cost Variance Analysis: (Cont.)

(FY 1984 Constant (Base Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1,117.7	3,609.1	8.9	4,735.7
Previous Changes:	-	-	-	-
Quantity	-35.8	-	-	-35.8
Schedule	+11.0	-13.4	-	-2.4
Engineering	+18.2	-	-	+18.2
Estimating	+65.7	+142.2	+2	+208.1
Other	-	-	-	-
Support	-1.5	-1.1	-	-2.6
Subtotal	+57.6	+127.7	+2	+185.5
Current Change:				
Quantity	+14.6	-	-	+14.6
Schedule	+20.8	+308.6	-	+329.4
Engineering	+7.5	-	-	+7.5
Estimating	+264.2	-448.7	-	-184.5
Other	-	-	-	-
Support	-	-	+2.8	+2.8
Subtotal	+307.1	-140.1	+2.8	169.8
Total Changes	+364.7	-12.4	+3.0	+355.3
Current Estimate	1,482.4	3,596.7	11.9	5,091.0

b. Previous Change Explanations-

(1) RDT&E

Economic: Revised Escalation Indices.

Quantity: Reduction of 52 Prototype Torpedoes.

Schedule: Six-month schedule slip in RDT&E program due to FY 86 budget reductions.

Engineering: Increased Reliability and Test Equipment Effort. Establishment of Engineering Qualification Test Program to allow increased reliability testing with fewer torpedo assets.

Estimating: Change to "True" FY 84 Constant \$ and general reduction by House Appropriations Committee.

Support: Navy Industrial Fund Adjustment/CSS Reduction.

(2) Procurement

Economic: Revised Escalation Indices.

Schedule: Shift of 533 Torpedoes to FY 95. This allows more torpedoes to be produced under competition.

Estimating: Increase in First Unit (T1) Cost on Learning Curve.

Estimating: IR&D Adjustment.

Support: Navy Industrial Fund Adjustment/CSS Reduction.

(3) MILCON:

Estimating: Change to "True" FY 84 Constant \$.

c. Current Change Explanations-

(Dollars in Million's)

Base Year Then Year(1) RDT&E

Quantity:	Restoration of 11 Prototype Torpedoes to accommodate OPEVAL testing requirements	+14.6	+16.0
Schedule:	Delay in schedule of six months.	+20.8	+23.1
Engineering:	Increased Sea Runs for FY 87 Program to recover from FY 86 budget reductions and to support Milestone IIIA decision.	+7.5	+8.2
Estimating:	Addition of Preplanned Product Improvement Program (P ³ I) PE 63610N Project S 1873 to baseline which was not included in prior SARs.	+266.2	+361.2
	Navy Industrial Fund Rate Adjustment.	-2.0	-2.8

(2) Procurement

Economic:	Revised Escalation Indices	N/A	-87.8
Schedule:	Reduced Annual quantities from 1,260 per year to 800 per year based on affordability. This resulted in a 4 year program extension.	+308.6	+551.0
Estimating:	Started competition earlier resulting in more torpedoes produced under full competition with resultant savings.	-448.7	-543.2

(3) MILCON

Support:	Addition of new program specific Intermediate Maintenance Activity at Charleston S.C. for MK 50. Development Estimate planned for dual use of existing facilities.	+2.8	+3.4
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d. References-

Development Estimate: SDDM, dated 15 March 1984, subject "MK 50 Torpedo" (Full-Scale Development Approval.)Current Estimate: FY 1988 Presidents Budget14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate-

PAUC (Initial SAR Est)	Changes (Then Year Dollars in Millions)								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
(b)(4)									

b. Current Baseline Estimate to Current Estimate

PAUC (Dev Est)	Changes (Then Year Dollars in Millions)								PAUC (Cur Est)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
(b)(4)									

* = less than \$1K

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. RDT&E -

<u>Torpedo</u>	<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>
Honeywell, USD, Hopkins, MN N00024-83-C-6254, CPAF Award: August 1, 1983 Definitized: April 25, 1984 Current Contract Price	491.1	N/A	90
<u>Target</u> <u>Ceiling</u> <u>Quantity</u>	<u>Estimated Price at Completion</u>		
490.1 N/A 49	<u>Contractor</u>	<u>Program Manager</u>	
	585.0	560.3	
	<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances	-21.0	-12.4	
Cumulative Variances to Date (11/30/86)	-4.1	-7.2	
Net Change	+16.9	+5.2	

Explanation of Change: The Honeywell contract has undergone a reprogramming and a new contract baseline has been established per agreement with PMS 406, and authorized by NAVSEA on 2 September 1986. The MK 50 Torpedo Program set BCWS and BCWP equal to ACWP as of July month-end and the approved Performance Measurement Baseline was implemented through FY 87. Negative schedule variance since reprogramming is primarily the result of contractors inability to staff to new plan. Negative cost variance is due to work in process and temporary shift in program priorities which should resolve in near future.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status -

- (1) Percent Program Completed: 48.1% (13 yrs/27 yrs)
 (2) Percent Program Cost Appropriated: 17.9% (\$1,166.6M/\$6,509.7M)

b. (U) Appropriation Summary-

<u>Appropriation</u>	<u>Current to Prior Years (FY 75-87)</u>	<u>(Then-Year Dollars in Millions)</u>			<u>Total</u>
		<u>Budget Year (FY 88)</u>	<u>Balance FYDP (FY 89-92)</u>	<u>To Complete Beyond FYDP</u>	
RDT&E	1,096.0	85.2	80.9	292.1	1,554.2
Procurement	70.6	226.8	1,638.8	3,011.3	4,947.5
MILCON	8.9	-	3.4	-	12.3
Total	1,175.5	312.0	1,723.1	3,303.4	6,514.0

(b)(1)

Appropriation: MILCON

1982	-	-	-	9.1	-	-	8.9	5.8
1989	-	-	-	2.8	-	-	3.4	3.4
Subtotal	-	-	-	11.9	-	-	12.3	-
TOTAL				5,091.0			6,514.0	

d. (U) Obligations and Expenditures-

Fiscal Year	Then-Year Dollar (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1975-82	363.9	363.9	363.9
1983	115.1	115.1	115.1
1984	143.5	143.5	143.5
1985	148.5	148.5	141.1
1986	152.0	152.0	144.4
1987	173.0	35.4	16.0
To Complete	458.2	N/A	N/A
Total	1,554.2	958.4	924.0

Appropriation: WPN

1987	70.6	0	0
To Complete	4,876.9	N/A	N/A
Total	4,947.5	N/A	N/A

Appropriation: MILCON

1982	8.9	8.9	8.9
To Complete	3.4	N/A	N/A
Total	12.3	8.9	8.9

17. (U) Production Rate Data:

- a. Annual Production Rates (Funded Delivery Period is 6 months for FY 87 Current Estimate only. All other FDP's are 12 months.)

Production Rates (Quantity/Year)				
Fiscal Year	Development Estimate	Production Estimate	Current Estimate	Maximum
1987	84	N/A	78	N/A
1988	352	N/A	153	N/A
1989	504	N/A	224	N/A
1990	1,260	N/A	520	N/A
1991	1,260	N/A	800	N/A
1992	1,260	N/A	600	N/A
1993	1,260	N/A	800	N/A
1994	1,260	N/A	800	N/A
1995	503	N/A	800	N/A
1996	N/A	N/A	800	N/A
1997	N/A	N/A	800	N/A
1998	N/A	N/A	800	N/A
1999	N/A	N/A	607	N/A

b. Cost Variance - Dollars in Millions.

Item		Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog. Acq. Cost	(BY\$)	N/A	N/A	5,091.0	N/A	N/A
	(TY\$)	N/A	N/A	6,514.0	N/A	N/A
PAUC	(BY\$)	N/A	N/A	.7	N/A	N/A
	(TY\$)	N/A	N/A	.8	N/A	N/A

c. Schedule Variance-

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	N/A	N/A	41/87	N/A	N/A
Duration (in Months)	N/A	N/A	161	N/A	N/A
End Date (Mo/Yr)	N/A	N/A	9/02	N/A	N/A

d. Deliveries (Plan/Actual)

	<u>To Date</u>
RDT&E	28/23
Procurement	0/0

18. (U) Operating and Support Costs. N/A

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
 PROGRAM: SPACE DEFENSE AND OPERATIONS (ASAT)

AS OF DATE: December 31, 1986

INDEX

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1. (U) Designation and Nomenclature (Popular Name): Air Launched Antisatellite System (ASAT)
2. (U) DoD Component: U.S. Air Force
3. (U) Responsible Office and Telephone Number:

Space Defense Systems
 Space Division
 Los Angeles AFS, CA 90009

PM: Col Pete Wilkinson
 Assigned: April 4, 1986
 AV 833-0740; COMM (213)643-0740

4. (U) Program Elements/Procurement Line Items:

RDT&E: PE 64406F/12450F

PROCUREMENT: APPN 3010 ICN FOJ500
 APPN 3020 ICN MSLWR
 APPN 3080 ICN 833160

MILCON: PE 12450F

5. (U) Related Programs: North American Air Defense Command Cheyenne Mountain Complex Space Defense Systems; SPACETRACK; F-15 Multistage Improvement Program.

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6. Mission and Description: The mission of the air-launched miniature vehicle (MV) antisatellite (ASAT) system is two-fold: (1) to deter the Soviets from using their operational co-orbital antisatellite weapon system, or other weapon systems which have inherent antisatellite capability, against U.S. or Allied satellites. (2) If necessary, to destroy low altitude Soviet satellites which can provide data used to develop targeting information for Soviet combat forces. This targeting information could place U.S. and Allied ground, air, and sea forces at grave risk during armed conflict. The MV ASAT system consists of three segments: (1) surveillance, (2) command and control, and (3) weapon. The existing Space Surveillance Network provides the information necessary to determine the orbit of target satellites. The command and control segment, known as the ASAT Control System, uses the orbital information provided by the surveillance system and generates intercept profiles for an F-15 aircraft. The MV, which is mounted atop the second stage, acquires the target satellite using the satellite's infrared (heat) emission. After acquisition, the MV is deployed from the second stage and continues to track the oncoming satellite. Maneuver motors on the MV are fired at the appropriate time to effect a direct collision with the satellite. The satellite is destroyed by the collision with the MV. This system will not replace any existing system.

7. Program Highlights:

a. Significant Historical Development - The President directed the initiation of a space defense program in 1978 in response to the threat posed by the Soviet co-orbital ASAT and low altitude Soviet satellites used to develop targeting information against U.S. and Allied sea, land, and air forces. A program office was established in 1978 to address these threats. After considering a number of different options, the MV ASAT was chosen as the antisatellite system to meet the threat posed by low altitude Soviet satellites. Contracts for the current development phase were signed in Jun 1980. In Jan 1984, the first live launch was conducted; a very successful point-in-space test which demonstrated mission planning and missile performance. The second live launch, an infrared probe, was conducted in Nov 1984 and demonstrated mission planning, missile performance, and sensor performance. The first intercept was conducted in Sep 1985 against an Air Force aging scientific satellite. The flight was "flawless," demonstrating all aspects of the system: missile performance, mission planning, miniature vehicle performance, and lethality. In Dec 1985, the first two Instrumented Test Vehicles (ITV's) were launched. The ITV's have been on orbit since that time.

b. Significant Developments Since Last Report - Since the 31 Dec 85 SAR, two successful point-in-space flight tests were conducted, one at low altitude and one at a medium altitude. These tests further demonstrated mission planning, as well as missile and miniature vehicle performance. The ITV was successfully characterized, the test verified operability and confirmed signature. As a result of Congressional action, the program has been restructured twice since the last report. The FY86 appropriation cut over \$60M from planned funding, prohibited intercept testing, and prohibited work on the Mission Control Center (MCC). The FY87 appropriation bill cut an additional \$90M, continued the moratorium on intercept testing, and prohibited production verification work which had begun in Dec 85. These Congressional actions resulted in major cost and schedule impacts and a restructuring of the program. Development of an enhanced altitude capability was added. These impacts are reflected in this report.

The ASAT system is expected to meet the directed mission requirements.

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7. (U) Program Highlights (Cont'd):

c. (U) Changes Since "As Of" Date - None.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: N/A

9. (U) Schedule

a. (U) <u>Milestones</u>	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
(U) Concept Definition Contracts	Sep 75/Sep 75	Sep 75
(U) MV Development/Ground Test Contract	Sep 77/Sep 77	Sep 77
(U) Prototype Decision	Feb 80/Feb 80	Feb 80
(U) ASAT Development Contract Award	Jun 80/Jun 80	Jun 80
(U) Critical Design Review	Dec 81/Dec 81	Dec 81
(U) First Captive Flight Test	Dec 82/Dec 82	Dec 82
(U) First Live Launch	Jan 84/Jan 84	Jan 84
(U) AFSARC IIIA (Limited Production Decision	Nov 84/N/A	N/A
(U) First Successful Intercept	Sep 85/Sep 85	Sep 85

(b)(1)

(U) Full Production Decision Sep 86/Jul 88(Ch-2) Jul 88(Ch-2)

(b)(1)

b. (U) Previous Change Explanations -

(b)(1)

c. (U) Current Change Explanations -

(Ch-1) (U) Revised program direction deletes requirement for limited capability.

(Ch-2) (U) New date established per expected new program direction which delays the start of the production program by one year.

(Ch-3) (U) New date established due to deletion of military construction funding by Congress in FY87.

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ASAT, December 31, 1986

9. (U) Schedule (Cont'd):

d. (U) References -

Development Estimate: FY85 President's Budget.

Approved Program: FY88 President's Budget.

10. (U) Technical/Operational Characteristics:

a. (U) Technical -	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance *</u>	<u>Current Estimate</u>
(U) Missile Length (Ft)	17.8/17.8	17.8	17.8
(U) Missile Diameter (Ft)			
Upper Stage	1.7/1.7	1.7	1.7
Lower Stage	1.5/1.5	1.5	1.5
(U) Missile Weight (Lbs)	2706/2651	2716	2651
(Launch Weight)			
Upper Stage (Including Dispenser)	983/961	1007	961
Lower Stage	1723/1690	1709	1690

(b)(1)



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ASAT, December 31, 1986

10. (U) Technical/Operational Characteristics:

(b)(1)

2/(U) Chances of sufficient missiles being available at start of war to meet system negation requirements.

3/(U) The period the ASAT system can stand ready to negate required targets.

* (U) Based on latest flight test results.

c. (U) Previous Change Explanations -

(b)(1)

d. (U) Current Change Explanations -

(b)(1)

e. References -

Development Estimate: FY85 President's Budget.

Approved Program: FY88 President's Budget.

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11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a. (U) Cost -	Development Estimate	Changes	Current Estimate
Development (RDT&E)	851.9	+596.8	1448.7
Procurement	1001.9	-280.9	721.0
(3010) CAE Flyaway	(65.9)	(-1.6)	(64.3)
Other Weapon System Costs	(12.4)	(+1.1)	(13.5)
Spares	(5.6)	(-1.2)	(4.4)
(3020) Missile Flyaway	(720.5)	(-215.2)	(505.3)
Other Weapon System Costs	(93.9)	(-29.3)	(64.6)
Spares	(103.6)	(-38.9)	(64.7)
(3080) Other Flyaway	(-)	(+2.9)	(2.9)
Other Weapon System Costs	(-)	(+1.2)	(1.2)
Spares	(-)	(+0.1)	(0.1)
Total Flyaway	(786.4)	(-213.9)	(572.5)
Construction (MILCON)	18.7	-10.9	7.8
Total FY77 Base-Year \$	1872.5	+305.0	2177.5
 Escalation	2014.9	+19.1	2034.0
Development (RDT&E)	(498.2)	(+582.0)	(1080.2)
Procurement	(1496.3)	(-550.7)	(945.6)
Construction (MILCON)	(20.4)	(-12.2)	(8.2)
 Total Then-Year \$	3887.4	+324.1	4211.5
 b. (U) Quantities -			
(U) Development (RDT&E)	15	+6	21
(S) Procurement	112	-77	35
(S) Total	127	-71	56

c. (U) Unit Cost -

(b)(1)

d. (U) Approved Design to Cost Goal - None.

e. (U) Foreign Military Sales - None.

f. (U) Nuclear Costs - None.

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12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	Current Est	UCR Baseline	UCR Baseline
	Dec -86 SAR	Dec 85 SAR	Dec 86 SAR

a. (U) Program Acquisition -

(1) (U) Cost	4211.5	3835.7	4211.5
--------------	--------	--------	--------

(b)(1)

b. (U) Current Procurement - (FY87) (FY87) * (FY88)

(1) (U) Cost	0	0	30.3
(U) Less CY Adv Proc	0	0	21.8
(U) Plus PY Adv Proc	0	0	0
(U) Net Total	0	0	8.5

(b)(1)

13. (U) Cost Variance Analysis:

a. (U) Summary - Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1350.1	2498.2	39.1	3887.4
Previous Changes:				
Economic	-13.2	-178.7	-1.3	-193.2
Quantity	+304.0	-1158.6	-20.9	-875.5
Schedule	+174.3	+445.0	-	+619.3
Engineering	+68.0	+37.0	-	+105.0
Estimating	+113.8	+155.4	-1.3	+267.9
Other	-	-	-	-
Support	+131.1	-106.3	-	+24.8
Subtotal	+778.0	-806.2	-23.5	-51.7
Current Changes:				
Economic	-11.3	-74.2	-0.3	-85.8
Quantity	-	+26.2	-	+26.2
Schedule	+5.7	+35.0	+0.5	+41.2
Engineering	+175.1	+31.3	-	+206.4
Estimating	+281.6	+2.4	+0.2	+284.2
Other	-	-	-	-
Support	-50.3	-46.1	-	-96.4
Subtotal	+400.8	-25.4	+0.4	+375.8
Total Changes	+1178.8	-831.6	-23.1	+324.1
Current Estimate	2528.9	1666.6	16.0	4211.5

* Differs from 31 Dec 85 SAR to reflect the FY87 Appropriation Act.

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13. Cost Variance Analysis (Cont'd):

(FY77 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	851.9	1001.9	18.7	1872.5
Previous Changes:				
Quantity	+158.0	-453.6	-10.1	-305.7
Schedule	+88.7	+121.2	-	+209.9
Engineering	+36.0	+16.0	-	+52.0
Estimating	+57.1	+68.9	-0.9	+125.1
Other	-	-	-	-
Support	+67.9	-52.3	-	+15.6
Subtotal	+407.7	-299.8	-11.0	+96.9
Current Changes:				
Quantity	-	+12.8	-	+12.8
Schedule	-	-	-	-
Engineering	+88.7	+12.1	-	+100.8
Estimating	+125.6	+8.7	+0.1	+134.4
Other	-	-	-	-
Support	-25.2	-14.7	-	-39.9
Subtotal	+189.1	+18.9	+0.1	+208.1
Total Changes	+596.8	-280.9	-10.9	+305.0
Current Estimate	1448.7	721.0	7.8	2177.5

b. Previous Change Explanations -

RDT&E

Economic: Revised economic escalation indices.
 Quantity: In Dec 85 SAR six flight test missiles were added.
 Schedule: In Dec 83 and Dec 84 SARs flight test schedule was extended due to Congressional withhold of advanced procurement funds and Congressional testing restrictions. In Dec 85 SAR flight test extended to FY90 due to production verification - addition of six missiles/ flights and engineering upgrades.
 Engineering: Configuration changes in Mod Blocks 1 and 2 in Dec 85 SAR.
 Estimating: Reprogramming in Dec 83 SAR, addition of Mission Control support funds in Dec 85 SAR, and impact of revised economic escalation indices on prior years.
 Support: Addition of production verification tasks to include; support equipment development, first article, logistic planning, and training in Dec 85 SAR.

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13. (U) Cost Variance Analysis (Cont'd):

(U) Procurement

(U) Economic: Revised economic escalation indices.

(b)(1)

(U) Schedule: In Dec 83 and Dec 84 SARs funding constraints slipped procurement of missiles and program level support build-up in manyears increased. In Dec 85 SAR production was delayed by three years due to incorporation production verification effort with corresponding program support for 900 manyears.

(U) Engineering: In Dec 85 SAR engineering change orders dollars were added to allow for uncertainties of concurrency.

(U) Estimating: Cost improvement curve changed to reflect directed program in Dec 85 SAR. Impact of revised economic escalation indices on prior years.

(U) Support: In Dec 83 SAR and Dec 84 SAR support items slipped in conjunction with the change in procurement schedule and program level support build-up in manyears increased. In Dec 85 SAR implementation of the production verification phase and quantity reduction resulted in changes to support equipment and deletion of rate tooling.

(U) MILCON

(U) Economic: Revised economic escalation indices.

(U) Quantity: Decreased from two bases to one base in Dec 85 SAR.

(U) Estimating: Revised facility cost based on 35% in Dec 83 SAR and 60% in Dec 84 SAR design reviews. Impact of revised economic escalation indices on prior years.

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13. (U) Cost Variance Analysis (Cont'd):

c. (U) Current Change Explanations -

	(Dollars in Millions)	
	<u>Base Year</u>	<u>Then-Year</u>
(1) (U) <u>RDT&E</u>		
(U) Revised Jan 87 economic escalation indices. (Economic)	N/A	-11.3
(U) Development program schedule replanned due to impact of the FY86 and FY87 appropriation budget cuts, Congressional testing restrictions, production verification restriction, and Mission Control Center restriction.	+171.8	+367.1
(U) Production verification effort replanned due to FY87 budget cut. (Schedule)	(N/A)	(+5.7)
(U) Congressionally imposed flight testing restriction forced rescheduling of program. (Estimating)	(+171.8)	(+361.4)
(U) Addition of enhanced altitude capability development. (Engineering)	+88.7	+175.1
(U) Change in distribution of production verification costs between RDT&E and procurement. (Estimating)	-47.3	-81.8
(U) Impact of revised economic escalation indices on prior years. (Estimating)	+1.1	+2.0
(U) Transfer of support equipment costs to procurement funding. (Support)	-25.2	-50.3
(2) (U) <u>Procurement</u>		
(U) Revised Jan 87 escalation indices. (Economic)	N/A	-74.2

(b)(1)

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13. Cost Variance Analysis (Cont'd) :

	(Dollars in Millions) <u>Base Year</u>	<u>Then-Year</u>
Production program schedule replanned due to new SECDEF direction.	-29.8	-44.6
Profile change (4 vs 5 year buy) changes procurement schedule and reduces program sustaining engineering/program management by 300 manyears for one year. (Estimating)	(-43.4)	(-105.8)
Production delay of one year. (Schedule)	N/A	(+35.0)
Change from Block Buy Advanced Procurement to Conventional Advanced Procurement. (Estimating)	(+13.6)	(+26.2)
Addition of Engineering Change Orders (ECO) dollars to allow for uncertainties of concurrency. (Engineering)	+12.1	+31.3
Change in distribution of production verification costs between procurement and RDT&E. (Estimating)	+38.4	+81.8
Impact of revised economic escalation indices on prior years. (Estimating)	+0.1	+0.2
Transfer of support equipment costs from RDT&E funding. (Support)	+23.7	+50.3
Decrease in factory spares and factory support/test equipment requirement due to updated requirements analysis. (Support)	-38.4	-96.4

(3) MILCON

Revised Jan 87 escalation indices. (Economic)	N/A	-0.3
Restructured program; slip one year. (Schedule)	0.0	+0.5
Increased cost for revised estimate. (Estimating)	+0.1	+0.2

d. References

Development Estimate: FY85 President's Budget
Approved Program : FY88 President's Budget

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14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

(U) Initial SAR/Development Estimate to Current Estimate

(b)(1)

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. RDT&E -

Miniature Vehicle and
Upper Stage:

LTV Aerospace and Defense Co.,
Dallas, TX
FO4701-80-C-0041, CFIF/AF,
Award: June 15, 1980
Definitized: December 15, 1980

Initial Contract Price		
Target	Ceiling	Qty
\$268.2M	N/A	15

Current Contract Price			Estimated Price at Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$355.3M	N/A	15	\$697.9M	\$697.9M

	Cost Variance	Schedule Variance
Previous Cumulative Variances	-\$6.8M	-\$17.8M
Cumulative Variances to Date (11/30/86)	-\$23.9M	-\$23.7M
Net Change	-\$17.1M	-\$5.9M

+ = favorable

- = unfavorable

Explanation of Change: Cumulative cost and schedule variances are primarily due to problems in the assembly of the Miniature Vehicle/Dispenser and Congressional testing restrictions. Impact was an increase in the estimate at completion. The increase was anticipated and is within program budget. Additional work/costs are anticipated as a result of Congressional testing restrictions, budget cuts, and production verification restriction.

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15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

<p><u>F-15, Lower Stage and</u> <u>Mission Control:</u> The Boeing Company, Seattle, WA, FO4701-80-C-0040, CPIF/AF Award: June 15, 1980 Definitized: December 30, 1980</p>	<p>Initial Contract Price</p> <table border="0"> <tr> <td><u>Target</u></td> <td><u>Ceiling</u></td> <td><u>Qty</u></td> </tr> <tr> <td>\$150.9M</td> <td>N/A</td> <td>15 L/S</td> </tr> </table>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$150.9M	N/A	15 L/S
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>					
\$150.9M	N/A	15 L/S					

<p>Current Contract Price</p> <table border="0"> <tr> <td><u>Target</u></td> <td><u>Ceiling</u></td> <td><u>Qty</u></td> </tr> <tr> <td>\$275.5M</td> <td>N/A</td> <td>2 CAE 15 L/S</td> </tr> </table>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$275.5M	N/A	2 CAE 15 L/S	<p>Estimated Price at Completion</p> <table border="0"> <tr> <td><u>Contractor</u></td> <td><u>Program Manager</u></td> </tr> <tr> <td>\$305.0M</td> <td>\$305.0M</td> </tr> </table>	<u>Contractor</u>	<u>Program Manager</u>	\$305.0M	\$305.0M
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>									
\$275.5M	N/A	2 CAE 15 L/S									
<u>Contractor</u>	<u>Program Manager</u>										
\$305.0M	\$305.0M										

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	-\$1.0M	-\$1.0M
Cumulative Variances to Date (11/27/86)	+\$2.5M	-\$0.0M
Net Change	+\$3.5M	+\$1.0M

Explanation of Change: Cost variance improved due to improved overhead rates and stretch out of TCP 293-Initiation of production verification. Schedule variance improved due to a reduction in materials requirements, and a change in the contractors earned value method from point of issue to point of payment. Additional work/costs are anticipated as a result of Congressional testing restrictions, budget cuts, and production verification restriction.

<p><u>Instrumented Test</u> <u>Vehicle</u> AVCO Corporation, Wilmington, MA FO4701-78-C-0125, FPIF, Award: August 31, 1978 Definitized: November 20, 1978</p>	<p>Initial Contract Price</p> <table border="0"> <tr> <td><u>Target</u></td> <td><u>Ceiling</u></td> <td><u>Qty</u></td> </tr> <tr> <td>\$36.9M</td> <td>\$40.4M</td> <td>10</td> </tr> </table>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$36.9M	\$40.4M	10
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>					
\$36.9M	\$40.4M	10					

<p>Current Contract Price</p> <table border="0"> <tr> <td><u>Target</u></td> <td><u>Ceiling</u></td> <td><u>Qty</u></td> </tr> <tr> <td>\$52.2M</td> <td>\$57.4M</td> <td>10</td> </tr> </table>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$52.2M	\$57.4M	10	<p>Estimated Price at Completion</p> <table border="0"> <tr> <td><u>Contractor</u></td> <td><u>Program Manager</u></td> </tr> <tr> <td>\$61.6M</td> <td>\$61.6M</td> </tr> </table>	<u>Contractor</u>	<u>Program Manager</u>	\$61.6M	\$61.6M
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>									
\$52.2M	\$57.4M	10									
<u>Contractor</u>	<u>Program Manager</u>										
\$61.6M	\$61.6M										

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	-\$13.8M	-\$1.8M
Cumulative Variances to Date (11/30/86)	-\$14.2M	-\$1.8M
Net Change	-\$ 0.4M	\$0M

Explanation of Change: Cumulative cost and schedule variances are due to piece part problems and late subcontractor deliveries. Negative cost variance has increased as a result of piece part reorders, retesting, and rescreening activity. Schedule variance has improved due to rescheduling remaining effort in a more realistic time period. Contractor estimate at completion is over ceiling. Program schedule slipped. Increased costs due to the schedule slip are included in program budget. Additional work/costs are anticipated as a result of Congressional testing restrictions, budget cuts, and production verification restriction.

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15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

Software Verification and Validation
Logicon, Incorporated, San Pedro, CA
FO4701-80-C-0048

Deleted. FY87 DOD Appropriation Act now requires reporting on the six largest contracts over \$40M.

b. Procurement -

Upper Stage
LTV Aerospace and Defense Co., Dallas, TX
FO4701-84-C-0060

Deleted. FY87 DOD Appropriation Act now requires reporting on the six largest contracts over \$40M.

Lower Stage
The Boeing Company, Seattle, WA
FO4701-84-C-0059

Deleted. FY87 DOD Appropriation Act now requires reporting on the six largest contracts over \$40M.

c. MILCON -- No military construction contracts.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status -

(1) Percent Program Completed: 76.2% (16 yrs/21 yrs)

(2) Percent Program Cost Appropriated: 37.0% (\$1558.3/\$4211.5)

b. Appropriation Summary -

<u>Appropriation</u>	<u>Current & Prior Yrs (FY72-87)</u>	(Then-Year Dollars in Millions)			<u>Total</u>
		<u>Budget Year FY88</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93)</u>	
RDT&E	1426.1	355.7	747.1	-	2528.9
Procurement-CAE	42.3	-	144.6	-	186.9
Procurement-Missile	89.9	21.8	1359.5	-	1471.2
Procurement-Other	-	8.5	-	-	8.5
MILCON	-	16.0	-	-	16.0
Total	1558.3	402.0	2251.2	-	4211.5

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. (U) Annual Summary -

Fiscal Year	Qty	FY77 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

(U) Appropriation: RDT&E

1972	-	-	-	3.8	-	-	2.7	-
1973	-	-	-	.3	-	-	.2	4.1
1974	-	-	-	.1	-	-	.1	7.9
1975	-	-	-	3.0	-	-	2.7	10.8
1976	-	-	-	4.0	-	-	3.8	7.0
1977	-	-	-	2.2	-	-	2.2	3.3
1977	-	-	-	10.2	-	-	10.4	6.8
1978	-	-	-	36.7	-	-	39.7	6.1
1979	-	-	-	66.0	-	-	78.8	8.4
1980	-	-	-	61.7	-	-	81.9	9.4
1981	-	-	-	99.7	-	-	146.5	11.9
1982	-	-	-	116.0	-	-	182.3	9.2
1983	-	-	-	130.4	-	-	214.5	4.9
1984	-	-	-	118.4	-	-	202.2	3.8
1985	-	-	-	76.7	-	-	135.3	3.4
1986	-	-	-	82.5	-	-	150.2	2.9
1987	-	-	-	91.8	-	-	172.6	3.1
1988	-	-	-	182.8	-	-	355.7	3.5
1989	-	-	-	167.6	-	-	337.0	3.5
1990	-	-	-	95.4	-	-	197.6	3.3
1991	-	-	-	74.8	-	-	159.0	2.9
1992	-	-	-	24.6	-	-	53.5	2.4
Subtotal	21	-	-	1448.7	-	-	2528.9	

(U) Appropriation: Procurement (Carrier Aircraft Equipment)

(U)	(b)(1)	(U)	(U)	(U)	(U)	(U)	(U)	(U)
1985		-	-	4.3	-	-	8.6	3.4
1986		-	11.9	16.3	-	-	33.7	2.9
1987		-	-	-	-	-	-	3.1
1988		-	-	-	-	-	-	3.5
1989		4.5	8.3	15.0	-	-	33.9	3.5
1990		5.1	9.3	16.9	-	-	39.3	3.3
1991		5.5	10.1	18.4	-	-	43.8	2.9
1992		3.4	6.2	11.3	-	-	27.6	2.4
Subtotal		18.5	45.8	82.2	-	-	186.9	

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

Fiscal Year	Qty	FY77 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

(U)	(b)(1)	(U) Appropriation: Procurement (Missile)						
		(U)	(U)	(U)	(U)	(U)	(U)	(U)
1984		-	9.9	9.9	19.1	-	19.1	8.0
1985		0.8	7.7	35.6	9.0	-	70.8	3.4
1986		-	-	-	-	-	-	2.9
1987		-	-	-	-	-	-	3.1
1988		-	-	9.9	21.8	-	21.8	3.5
1989		78.7	36.4	161.2	33.0	21.8	364.5	3.5
1990		31.6	62.4	127.8	45.0	33.0	296.7	3.3
1991		29.5	98.1	145.4	55.0	45.0	345.7	2.9
1992		36.1	114.1	144.8	-	55.0	352.6	2.4
Subtotal		176.7	328.6	634.6	182.9	154.8	1471.2	

(U) Appropriation: Procurement (Other)								
1988	-	0.6	2.3	4.2	-	-	8.5	3.5
Subtotal	-	0.6	2.3	4.2	-	-	8.5	

(U)	(b)(1)	(U) Appropriation: MILCOM						
		(U)	(U)	(U)	(U)	(U)	(U)	(U)
1988		-	-	7.8	-	-	16.0	3.5
Subtotal		-	-	7.8	-	-	16.0	
Total		-	-	2177.5	-	-	4211.5	

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16. Program Funding Summary (Cont'd):

d. Obligations and Expenditures -

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated ¹	Expended ¹

Appropriation: RDT&E

1972	2.7	2.7	2.7
1973	0.2	0.2	0.2
1974	0.1	0.1	0.1
1975	2.7	2.7	2.7
1976	3.8	3.8	3.8
1977	2.2	2.2	2.2
1977	10.4	10.4	10.4
1978	39.7	39.7	39.7
1979	78.8	78.8	78.8
1980	81.9	81.9	81.9
1981	146.5	146.5	146.5
1982	182.3	182.3	182.3
1983	214.5	214.5	214.5
1984	202.2	202.2	195.5
1985	135.3	135.3	125.2
1986	150.2	148.5	77.9
1987	172.6	122.4	10.8
To Complete	1102.8	N/A	N/A
Total	2528.9	1374.2	1175.2

Appropriation: Procurement (Carrier Aircraft Equipment)

1985	8.6	2.3	2.2
1986	33.7	0.3	0.0
To Complete	144.6	N/A	N/A
Total	186.9	2.6	2.2

Appropriation: Procurement (Missile)

1984	19.1	19.1	15.3
1985	70.8	28.6	14.3
To Complete	1381.3	N/A	N/A
Total	1471.2	47.7	29.6

Appropriation: Procurement (Other)

To Complete	8.5	N/A	N/A
Total	8.5	N/A	N/A

Appropriation: MILCON

To Complete	16.0	N/A	N/A
Total	16.0	N/A	N/A

1/Reflects Program Office record as of 2 Jan 87.

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17. (U) Production Rate Date:

a. ~~(S)~~ Annual Production Rates -

(b)(1)



d. (U) Deliveries (Plan/Actual) -

RDT&E
Procurement

To Date
6/6
0/0

18. (U) Operating and Support Costs: N/A.

1/(U) Development Estimate was based on a 45 month delivery period.
2/(U) Current Estimate was based on a 44 month delivery period.

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SELECTED ACQUISITION REPORT (RCS: DD-COMP Q&A) 823)

PROGRAM: AIRBORNE SELF PROTECTION JAMMER (ASPJ)

AS OF DATE: 31 DECEMBER 1986

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FOR OPEN PUBLICATION
AS AMENDED
FEB 27 1987
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (MISD-PA)
DEPARTMENT OF DEFENSE

- (U) Designation/Nomenclature (Popular Name): AN/ALQ-165(V)/Defensive Electronic Countermeasure System, Airborne (Airborne Self Protection Jammer (ASPJ))
- (U) DOD Component: US Navy, US Air Force
- (U) Responsible Office and Telephone Number:
PMA-272 PMA: Capt A.E. Victor
Naval Air Systems Command Assigned: August 29, 1983
Washington, DC 20361 (202) 692-5225 A/V 222-5225
- (U) Program Elements:
RDT&E: 64226N, 64737F
Procurement: Included in host aircraft.
- (U) Related Programs: None

~~Classified by: Executive Order 12356~~
~~Declassify on: OADR~~

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~~CONFIDENTIAL~~

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6. (U) Mission and Description: The Airborne Self Protection Jammer (ASPJ) program is a joint Navy and Air Force effort to develop defensive electronic countermeasures systems to provide tactical aircraft self protection against terminal threat weapons from the mid 1980's through the remainder of the century.

7. (U) Program Highlights:

a. Significant Historical Developments: The program was started in 1969 as a traveling wave tube component development effort. In 1976, Director of Defense Research and Engineering (DDR&E) directed that this program (renamed ASPJ) and the Air Force lightweight, low cost countermeasures program be combined. Navy was designated the lead service. The joint effort is to develop a common, internal ASPJ system capable of integration with the Navy ALR-67 and the Air Force ALR-74 radar warning receivers (RWR). The system will be installed in the F/A-18, F-14, A-6, and a pod installation on the AV-8B. In January 1980, the Air Force confirmed the requirement for the ASPJ in the F-16. Major design changes were funded by the Air Force and inserted to meet Air Force requirements, thereby achieving the Office of the Secretary of Defense (OSD) guidance of a 100% common Navy and Air Force system. All twelve ASPJ Full Scale Development (FSD) prototype models have been delivered and fielded for testing. F-16 and F/A-18 integration was completed, and integration activities with the F-14D, A-6E/F and AV-8B (pod) were initiated.

b. Significant Developments Since Last Report: Laboratory development testing (DT) in the Air Force Electronic Warfare Evaluation Simulator (AFEWES) was successfully completed in June 1986. F/A-18 jam-to-signal flight tests were flown at the Naval Air Test Center (NATC) and completed in September 1986. "Pre-development" flight testing in the F-16 was conducted during October-November 1986, and DT flight testing in the F-16 and F/A-18 began in December. The ASPJ system is expected to fully satisfy its current mission requirements.

THIS SUBMISSION IS CHANGED TO INCLUDE FULL RDT&E AIR FORCE FUNDING OF \$265.1M.

c. Changes Since "As of" Date: None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated 19 Jan 81) threshold breaches.

9. ~~(S)~~ Schedule:
Development

a. <u>Milestones</u>	<u>Development Estimate</u>	<u>Approved Program Current Estimate</u>
(U) Complete Phase I	Aug 81	Feb 81
(U) Contract Award, Phase II	Dec 81	Aug 81
(U) Combined TECHEVAL/OPEVAL	Apr 86	Feb 88(Ch 1)
(U) JRMB III (A)	Aug 86	3Q 88(Ch 1)
(U) Limited Production Contract	Nov 86	Sep 88(Ch 1)

(b)(1)

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b. Previous Change Explanations:

Additional testing delays of four months are the result of the prototype model delivery slippages described in para 7b. Rescheduling was a result of delays in TECHEVAL/OPEVAL completion.

c. Current Change Explanations:

(Ch-1) Low reliability of Power Supplies caused delays in the development test program. Power supply fixes have been identified. Delays necessitated program changes which were approved by the Joint Resources Management Board (JRMB) November 1986.

d. References - Approved program per Deputy Secretary Defense Decision Memorandum (DSDDM), 24 February 1982 and Under Secretary of Defense (USD) (C I) Decision Memorandum (DM), 20 March 1984.

10. ~~(S)~~ Technical/Operational Characteristics:

a. Technical

<u>Development</u> <u>Estimate</u>	<u>Demonstrated</u> <u>Performance</u>	<u>Current</u> <u>Estimate</u>
---------------------------------------	---	-----------------------------------

(b)(1)

(U) Maintenance Demand Hours
(MPHBMA)
DMMH/MA (Basic/Augmented)

8.6	N/A	6.8
0.95/1.2	N/A	2.18/2.65

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c. Previous Change Explanations:

Original estimate was calculated. Revised current estimate is based on measured performance of critical components.

d. Current Change Explanations: No changes

e. References -- Same as section 9d.

11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a. Cost --	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
Development (RDT&E)	227.7	* +315.3	543.0
Procurement	N/A	N/A	N/A
Construction (MILCON)	N/A	N/A	N/A
Total FY 84 Base Year \$	227.7	+315.3	543.0
Escalation	8.7	+ 25.7	34.4
Development (RDT&E)	(8.7)	(+ 25.7)	(34.4)
Procurement	N/A	N/A	N/A
Construction (MILCON)	N/A	N/A	N/A
Total Then - Year \$	236.4	+ 341.0	577.4
b. Quantities --			
Development RDT&E	12	--	12
Procurement 1/	N/A	N/A	N/A
Total	12	--	12
c. Unit Cost -- N/A			
d. Approved Design to Cost Goal -- N/A			
e. Foreign Military Sales -- None			
f. Nuclear Costs -- None			

* Change from Navy only to joint Navy/Air Force SAR.

1/ Procurement costs are included in the host aircraft procurement budgets. Development estimate for procurement is 1180 systems with the current estimate at 2383 plus spares.

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12. (U) Program Acquisition/Current Procurement Unit Cost Summary: N/A

13. (U) Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	*RDT&E	PROC	MILCON	TOTAL
Baseline Estimate DE	236.4			236.4
Previous Changes:				
Economic	-1.4	--	--	-1.4
Quantity	--	--	--	--
Schedule	+20.2	--	--	+ 20.2
Engineering	+94.0	--	--	+ 94.0
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	112.8			112.8
Current Changes:				
Economic	- .2	--	--	- .2
Quantity	--	--	--	--
Schedule	+ 5.2	--	--	+ 5.2
Engineering	-41.9	--	--	- 41.9
Estimating	+265.1	--	--	+265.1
Other				
Support				
Subtotal	+228.2			+228.2
Total Changes	+341.0			+341.0
Current Estimate	577.4			577.4

* Change from Navy only to joint Navy/Air Force SAR.

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13. Cost Variance Analysis (Cont'd):
(FY 1984 Constant Dollars (Base Year) in Millions)

	* RDT&E	PROC	MILCON	TOTAL
BASLINE ESTIMATE DE	227.7			227.7
Previous Changes:				
Quantity	--	--	--	--
Schedule	+ 16.7	--	--	+ 16.7
Engineering	+ 76.2	--	--	+ 76.2
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	92.9			92.9
Current Changes				
Quantity	--	--	--	--
Schedule	+ 5.1	--	--	+ 5.1
Engineering	- 35.4	--	--	- 35.4
Estimating	+ 252.7	--	--	+252.7
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+ 222.4	--	--	+222.4
Total Changes	+ 315.3			+315.3
Current Estimates	543.0			543.0

b. Previous Change Explanations

(1) RDT&E

Revised Jan 87 Economic escalation rates and program NIF adjustments (Economic).

Delay of Aircraft integration (Schedule).

Required technical improvement initiatives FY-89-92 (Engineering).

Cancellation of Air Force CPMS Program (Other).

(2) Procurement - None

(3) MILCON - None

* Change from Navy only to joint Navy/Air Force SAR.

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c. Current Change Explanations:

		(Dollars in Millions)	
		<u>Base Year \$</u>	<u>Then Year \$</u>
(1)	<u>RD&E</u>		
	Revised Jan 87 escalation rates (Economic).		- .2
	Changes per JRMB directed test plan (Schedule)	+ 5.1	+ 5.2
	Re-assessment of the Pre-Planned Program Improvement requirements. (Engineering)	- 35.4	- 41.9
	Addition of Air Force RD&E funds in previous Navy only SAR. (Estimating)	+252.7	+265.1
(2)	<u>Procurement</u>		
(3)	<u>MILCON</u>		

d. References

Development Estimate: Approved program per DSDDM, 24 February 1982.
Approved Program: FY 1988 President's Budget.

14. (U) Program Acquisition Unit Cost (PAUC) History: N/A

15. (U) Contract Information: (Dollars in Millions)

a. ASPJ

RD&E
 Joint Venture, ITT/WEC
 Nutley NJ/Baltimore MD
 N00019-81-C-0369, CPAF
 27 Aug 1981

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>
80.8	N/A	12

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>
172.6	140.0 <u>1/</u>	12

Estimated Price at Completion	
<u>Contractor</u>	<u>Program Manager</u>
172.6	258.0

b. Procurement - None

c. MILCON - None

1/Navy and Air Force funded contract capped on 9 Nov 1984, maximum government liability is \$140M. Last CPR was submitted February 1985. Joint Venture stopped submitting CPR's when contract reached its capped value.

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Previous Cumulative Variances - Contract cap negotiated in Nov 1984 which established a maximum Government liability of \$140M.

Cumulative Variances to Date - Schedule delays due to late deliveries of Full Scale Development (FSD) Systems, caused by multiple hybrid redesigns and late vendor deliveries.

***16. (U) Program Funding Summary: (Current Estimate in Millions)**

a. Program Status -- (for R&D only)

- (1) Percent Program Completed: 66.7% (10 yrs/15 yrs)
- (2) Percent Program Cost Appropriated: 77.5% (447.4/577.4)
- (3) Principal RDT&E task remaining is the Pre-Planned Program Improvement requirements.

b. Appropriation Summary --

(Then Year Dollars in Millions)					
Appropriation	Current & Prior Yrs (FY78-87)	Budget Year (FY88)	Balance FYDP (FY89-92)	To Complete Beyond FYDP	Total
RDT&E	447.4	37.9	92.1	-0-	577.4

c. Annual Summary --

FISCAL YEAR	QTY ASPJ	ADV PROC (NONADD)	BASE-YEAR DOLLARS		TOTAL	THEN-YEAR DOLLARS		ESCALATION RATE
			FLYAWAY (NONADD)			ADV PROC (NONADD)		
			NONREC	REC			TOTAL	

APPROPRIATION: RDT&E 1/

FY	#		\$		\$		\$	#
78			2.6		2.6		2.6	
79			20.4		20.4		20.4	
80			22.3		22.3		22.3	
81			40.3		40.3		40.3	
82			78.4		78.4		78.4	
83	2		82.6		82.6		82.6	
84	3		82.0		82.0		83.7	3.80
85	5		57.2		57.2		60.3	3.40
86	2		26.0		26.0		28.3	2.90
87			25.4		25.4		28.5	3.10
88			32.6		32.6		37.9	3.50
89			11.9		11.9		14.3	3.50
90			20.8		20.8		25.8	3.30
91			25.4		25.4		32.3	2.90
92			15.1		15.1		19.7	2.40
TOTAL	12		543.0		543.0		577.4	

*Change from Navy only to joint Navy/Air Force SAR.

1/ Procurement costs are included in host aircraft lines as ancillary equipment.

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FISCAL YEAR	QTY ASPJ	ADV PROC (NONADD)	BASE-YEAR DOLLARS		TOTAL	THEN-YEAR DOLLARS		
			FLYAWAY (NONADD)			ADV PROC		ESCALATION RATE
			NONREC	REC		(NONADD)	TOTAL	

APPROPRIATION: RDT&E NAVY

FY	#		\$		\$		\$	#
78			2.6		2.6		2.6	
79			15.6		15.6		15.6	
80			13.2		13.2		13.2	
81			28.1		28.1		28.1	
82			24.0		24.0		24.0	
83			32.8		32.8		32.8	
84			41.2		41.2		42.0	3.80
85			34.1		34.1		36.0	3.40
86			18.2		18.2		19.8	2.90
87			14.8		14.8		16.6	3.10
88			14.1		14.1		16.4	3.50
89			5.2		5.2		6.3	3.50
90			15.7		15.7		19.4	3.30
91			20.4		20.4		25.9	2.90
92			10.4		10.4		13.6	2.40
TOTAL			290.4		290.4		312.3	

FISCAL YEAR	QTY ASPJ	ADV PROC (NONADD)	BASE-YEAR DOLLARS		TOTAL	THEN-YEAR DOLLARS		
			FLYAWAY (NONADD)			ADV PROC		ESCALATION RATE
			NONREC	REC		(NONADD)	TOTAL	

APPROPRIATION: RDT&E AIR FORCE

FY	#		\$		\$		\$	#
79			4.8		4.8		4.8	
80			9.1		9.1		9.1	
81			12.2		12.2		12.2	
82			54.4		54.4		54.4	
83			49.8		49.8		49.8	
84			40.9		40.9		41.7	3.80
85			23.0		23.0		24.3	3.40
86			7.8		7.8		8.5	2.90
87			10.6		10.6		11.9	3.10
88			18.5		18.5		21.5	3.50
89			6.7		6.7		8.0	3.50
90			5.2		5.2		6.4	3.30
91			5.0		5.0		6.4	2.90
92			4.7		4.7		6.1	2.40
TOTAL			252.7		252.7		265.1	

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ASPJ: 31 DECEMBER 1986

d. Obligation and Expenditures --A/

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1978	2.6	2.6	2.6
1979	20.4	20.4	20.4
1980	22.3	22.3	22.3
1981	40.3	40.3	40.3
1982	78.4	78.4	78.4
1983	82.6	82.6	81.0
1984	83.7	83.7	77.7
1985	60.3	57.9	43.2
1986	28.3	26.5	12.2
1987	28.5	5.7	0
To Complete	138.6	N/A	N/A
Total	577.4	420.4	378.1

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E NAVY			
1978	2.6	2.6	2.6
1979	15.6	15.6	15.6
1980	13.2	13.2	13.2
1981	28.1	28.1	28.1
1982	24.0	24.0	24.0
1983	32.8	32.8	31.2
1984	42.0	42.0	38.0
1985	36.0	33.8	28.2
1986	19.8	19.0	9.5
1987	16.6	4.1	0
To Complete	92.2	N/A	N/A
Total	312.3	215.2	190.4

A/As of December 31, 1986

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ASPJ: 31 DECEMBER 1986

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E AIR FORCE			
1979	4.8	4.8	4.8
1980	9.1	9.1	9.1
1981	12.2	12.2	12.2
1982	54.4	54.4	54.4
1983	49.8	49.8	49.8
1984	41.7	41.7	39.7
1985	24.3	24.1	15.0
1986	8.5	7.5	2.7
1987	11.9	1.6	0
To Complete	48.4	N/A	N/A
Total	265.1	205.2	187.7

17. (U) Production Rate Data

- a. Annual Production Rate - N/A
- b. Cost Variance - N/A
- c. Schedule Variance - N/A
- d. Deliveries (Plan/Actual) --

RDT&E
Procurement

To Date
12/12
0/0

18. Operating and Support Cost -- N/A

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~~CONFIDENTIAL~~N-31 SEA LANCE ~~CONFIDENTIAL~~SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)

PROGRAM: Sea Lance (ASW Standoff Weapon)

AS OF DATE: December 31, 1986

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1. (U) Designation and Nomenclature (Popular Name): UUM-125A/Sea Lance
2. (U) DoD Component: U.S. Navy
3. (U) Responsible Office and Telephone Number:

PMS414 Program Office
 Naval Sea Systems Command
 Washington, DC 20362

PM: CAPT John T. Regan
 Assigned: January 3, 1983
 AUTOVON: 222-7997 COMMERCIAL: (202) 692-7997

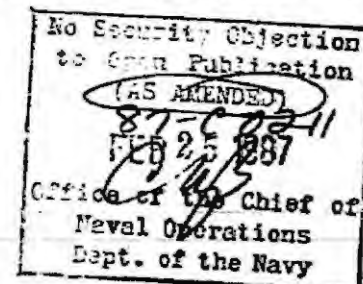
4. (U) Program Elements/Procurement-Line Items:

RDT&E: PE 63367N (FY86 & Prior)
 PE 64309N

PROCUREMENT: APPN 1507 ICN 4110

MILCON: PE 24896N

5. (U) Related Programs: MK 50 Advanced Lightweight Torpedo; CCS MK 1 Fire Control System.



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(b)(1)

7. (U) Program Highlights:

a. Significant Historical Developments -- The Sea Lance Mission Element Need Statement (MENS) was approved 4 January 1980. Four Concept Formulation Study (CFS) Phase contracts were awarded 1 February 1980 leading to the selection of a single contractor, Boeing Aerospace Company, to proceed into the Demonstration and Validation (D&V) Phase. A successful DSARC I was conducted on 1 December 1982. Studies of missile airframe, propulsion, guidance and control retardation system, capsule and subsystem technologies applicable to Sea Lance were conducted. Subsystem prime item and critical item development specifications were prepared and approved. Subsystem Preliminary Design Reviews were conducted, which ended with the System Preliminary Design Review and the commencement of detailed design. Validation of missile flyout from the capsule during a simulated broach condition and static rocket motor firings were conducted and developmental testing was initiated. Developmental testing progressed on schedule. Two body wind tunnel tests were performed to gather flight stability data on the missile system through separation. A full scale Structural Development Model of the complete missile was fabricated and assembled. The guidance and control systems in an Operational Mockup of the missile were installed and laboratory dynamic fly-downs of the missile were conducted. Torpedo MK 50 protective shell assembly and side parachute deceleration configurations were selected. Preliminary Stowage Rack Shock Test and missile system transition tests were conducted. These included submarine mechanical interface achievement in strikedown, stowage and torpedo tube loading, and launch at maximum expected depth and speed underway. Eight static rocket motor firings were successfully conducted. Sea Lance received DSARC II approval in April 1986. The SAR submitted for the quarter ending 30 September 1986 reflected program rebaselining from a planning to a development estimate. A Full Scale Development contract was awarded in July 1986. Commenced Critical Design Reviews of system components. On 26 August 1986, the Secretary of the Navy changed the Sea Lance Program to develop the conventional variant first, deferring the Milestone II decision on the Nuclear Depth Bomb (NDB) variant until Milestone III of the Sea Lance conventional variant. The program was rescheduled four times due to funding shortfalls.

b. Significant Developments Since Last Report -- Program funding has been reduced \$8.7M in FY 87, \$6.9M in FY 88 and \$6.8M in FY 89. Additional funding will be required in FYs 90 and 91 to complete development of the Sea Lance MK 50 variant. Operational testing is planned to commence with DT/OT flight testing in August 1990. Sea Lance will satisfy the mission requirements.

c. Changes Since "As Of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: None.

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Schedule:

a. Milestones --	Development Estimate/ Approved Program	Current Estimate	
Milestone I (DSARC I)	Dec 82 / Dec 82	Dec 82	
Milestone II (DSARC II)	Apr 86 / Apr 86	Apr 86	
FSD Contract Award	Jun 86 / Jul 86	Jul 86	(Ch-1)
Start Technical Evaluation (NDB)	Jul 89 / N/A	N/A	(Ch-2)
Milestone IIIA (JRMB IIIA)	Jul 89 / Dec 90	Dec 90	(Ch-2)
Production Contract Award	Oct 89 / Jan 91	Jan 91	(Ch-2)
Start Operational Evaluation (NDB)	Jan 90 / N/A	N/A	(Ch-2)
Milestone IIIB (JRMB IIIB) (Full Rate Prod)	Jul 90 / Oct 91	Oct 91	(Ch-2)
(b)(1)			
Start Technical Evaluation (MK 50)	Oct 91 / Oct 90	Oct 90	(Ch-2)
Start Operational Evaluation (MK 50)	Jan 92 / Jan 91	Jan 91	(Ch-2)
Milestone IIIC (JRMB IIIC) (MK 50)	Jul 92 / N/A	N/A	(Ch-2)

(b)(1)

b. Previous Change Explanations -- None

c. Current Change Explanations --

(Ch-1) FSD contract award was delayed one month from June 86 to July 86.

(Ch-2) The following changes reflect Secretary of the Navy direction to develop the Sea Lance MK 50 conventional variant first, with the Milestone II decision on the nuclear variant deferred until Milestone III approval of the Sea Lance conventional variant:

	From	To
Start Technical Evaluation (NDB)	Jul 89	N/A
Milestone IIIA (JRMB IIIA)	Jul 89	Dec 90
Production Contract Award	Oct 89	Jan 91
Start Operational Evaluation (NDB)	Jan 90	N/A
Milestone IIIB (JRMB IIIB) (Full Rate Prod)	Jul 90	Oct 91

(b)(1)

Start Technical Evaluation (MK 50)	Oct 91	Oct 90
Start Operational Evaluation (MK 50)	Jan 92	Jan 91
Milestone IIIC (JRMB IIIC) (MK 50)	Jul 92	N/A

(b)(1)

d. References --

Development Estimate: SDDM, dated 28 May 1986, subject "SEA LANCE Antisubmarine Warfare Standoff Weapon Milestone II Decision Memorandum."Approved Program: FY 1988 President's Budget.

* Initial Ship Loadout of 4 Units.

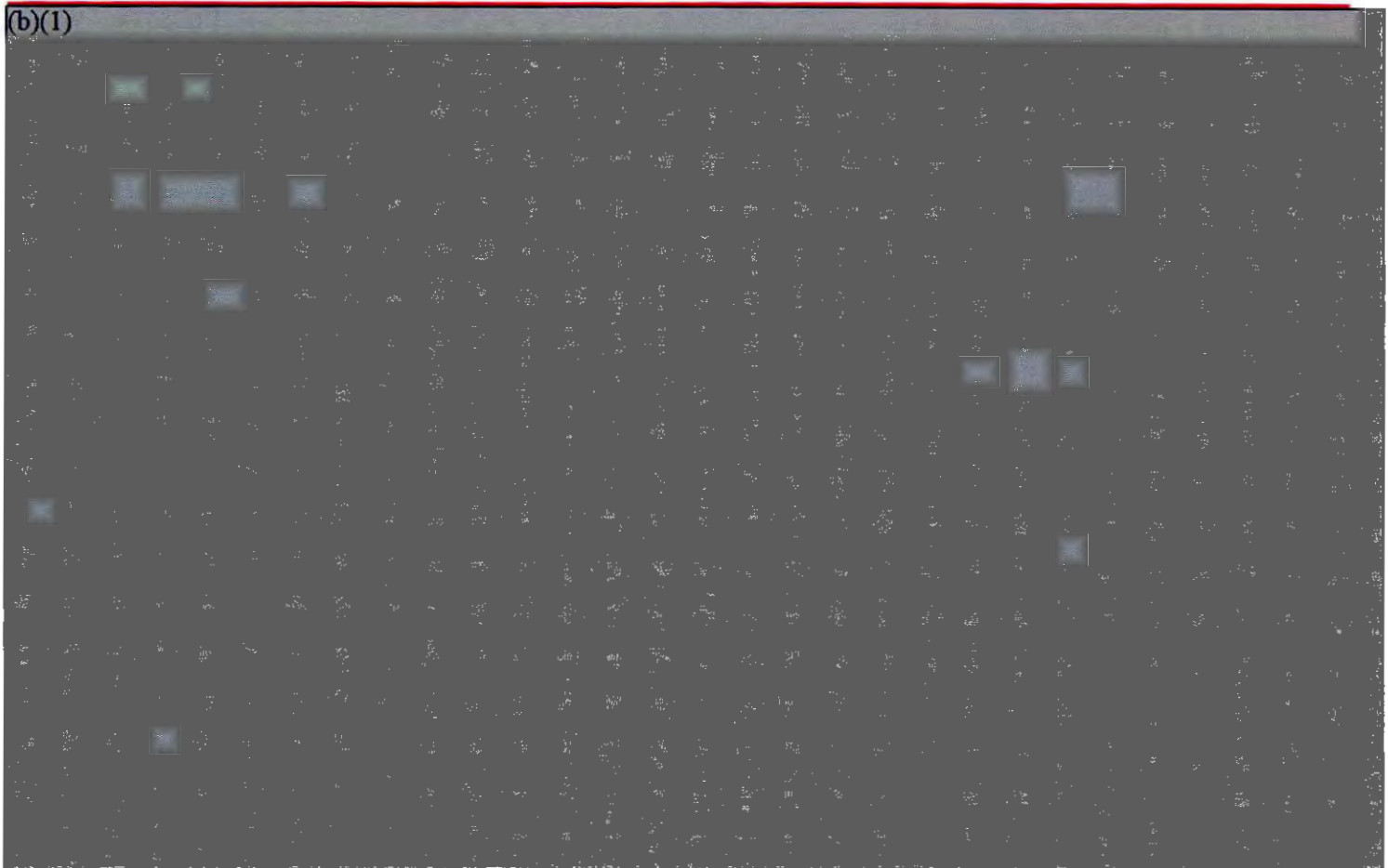
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Sea Lance (ASW Standoff Weapon), December 31, 1986

4. ~~(S)~~ Technical/Operational Characteristics:

a. Technical --	<u>Development Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Max Loading/ Handling Wt (lbs)	3100 / 3100	N/A	3100

(b)(1)



Maintenance Cycle (yrs)	5 / 5	N/A	5
-------------------------	-------	-----	---

c. Previous Change Explanations -- None

d. Current Change Explanations -- None

e. References --

Development Estimate: SDDM, dated 28 May 1986, subject "SEA LANCE Antisubmarine Warfare Standoff Weapon Milestone II Decision Memorandum."

Approved Program: FY 1988 President's Budget.

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Sea Lance (ASW Standoff Weapon), December 31, 1986

1. ~~1.1~~ **Program Acquisition Cost:** (Estimates in Millions of Dollars)
See Note 1 and Note 2

a. Cost --	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
Development (RDT&E)	\$ 733.7	+42.9	776.6
Procurement	1132.0	+30.8	1162.8
Total Flyaway	(964.6)	(+4.5)	(969.1)
Other Wpn Sys Cost	(129.7)	(+15.4)	(145.1)
Initial Spares	(37.7)	(+10.9)	(48.6)
Construction (MILCON)	17.5	+1.0	18.5
Total FY 85 Base-Year \$	\$ 1883.2	+74.7	1957.9
 Escalation	457.8	+35.2	493.0
Development (RDT&E)	(77.4)	(+4.4)	(81.8)
Procurement	(376.6)	(+30.1)	(406.7)
Construction (MILCON)	(3.8)	(+0.7)	(4.5)
Total Then-Year \$	\$ 2341.0	+109.9	2450.9

(b)(1)

- d. Approved Design-to-Cost Goal -- None
- e. Foreign Military Sales (FMS) -- None
- f. Nuclear Costs -- None

Note 1: Procurement totals do not include MK 50 torpedo costs for Sea Lance conventional payload.

Note 2: Quantity reduction reflects a MK 50 only program. Developmental flight test missiles are reduced from 53 to 42 units. Current cost estimate includes \$100 million over FY's 90, 91, and 92 for restart of Nuclear Depth Bomb (NDB) development effort. If NDB development is restarted, missile quantity will increase and additional funding will be required in FY's 93, 94, and 95.

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12. **Program Acquisition/Current Procurement Unit Cost Summary:** (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
a. Program Acquisition --	Current Estimate (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	UCR Baseline (Dec 86 SAR)
(1) Cost	2450.9	1839.6	2450.9
(b)(1)			
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	N/A	N/A	N/A
Less CY Adv Proc	N/A	N/A	N/A
Plus PY Adv Proc	N/A	N/A	N/A
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	Total
Development Estimate	811.1	1508.6	21.3	2341.0
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-7.5	-20.0	-0.2	-27.7 ✓
Quantity	-18.4	-	-	-18.4 ✓
Schedule	+73.2	+80.9	+1.9	+156.0
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+47.3	+60.9	+1.7	+109.9
Total Changes	+47.3	+60.9	+1.7	+109.9
Current Estimate	858.4 ✓	1569.5 ✓	23.0 ✓	2450.9 ✓

13. (U) Cost Variance Analysis (Cont'd)

(FY /85 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	Total
Development Estimate (FY 85\$)	733.7	1132.0	17.5	1883.2
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-16.5	-	-	-16.5
Schedule	+59.4	+30.8	+1.0	+91.2
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+42.9	+30.8	+1.0	+74.7
Total Changes	+42.9	+30.8	+1.0	+74.7
Current Estimate	776.6	1162.8	18.5	1957.9

b. Previous Change Explanations -- None

c. Current Change Explanations --

(1) RDT&E(Dollars in Millions)
FY85 Base-Year Then-YearRevised economic escalation indices
(Economic)

N/A -7.5

Quantity reduction reflects a MK 50 only flight
test program. Developmental flight test missiles
are reduced 11 units from 53 to 42 units.
(Quantity)

-16.5 -18.4

Reflects Secretary of the Navy decision to
accelerate the MK 50 development program and
defer further development of the NDB variant
until the Sea Lance MK 50 Milestone IIIA review.
Increased cost reflects revised estimates
based on schedule revision for a MK 50 only program
and an additional \$100.0M spread over FYs 90,
91 and 92 for restart of NDB variant development.
(Schedule)

+59.4 +73.2

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13. (U) Cost Variance Analysis (Cont'd)

	(Dollars in Millions)	
	<u>FY85 Base-Year</u>	<u>Then-Year</u>
(2) <u>Procurement</u>		
Revised economic escalation indices (Economic)	N/A	-20.0
Reflects Secretary of the Navy decision to accelerate the MK 50 development program and defer further development of the NDB variant until the Sea Lance MK 50 Milestone IIIA review. Increased cost reflects the associated one year delay in the procurement profile. (Schedule)	+30.8	+80.9
(3) <u>MILCON</u>		
Revised economic escalation indices (Economic)	N/A	-0.2
Reflects Secretary of the Navy decision to accelerate the MK 50 development program and defer further development of the NDB variant until the Sea Lance MK 50 Milestone IIIA review. (Schedule)	+1.0	+1.9

d. References --

Development Planning Estimate: SDDM, dated 28 May 1986, subject "SEA LANCE
Antisubmarine Warfare Standoff Weapon Milestone II Decision Memorandum."

Approved Program: FY 1988 President's Budget.

(U)(1)

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

			<u>Initial Contract Price</u>	
			<u>Target</u>	<u>Ceiling</u>
				<u>Qty</u>
<u>Missile:</u>				
Boeing Aerospace Co., Kent, WA				
N00024-86-C-6053, CPAF,			\$380.0	N/A
Work start date: 30 June 1986				
Definitized: 31 July 1986				N/A
			<u>Estimated Price at Completion</u>	
			<u>Contractor</u>	<u>Program Manager</u>
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
\$380.0	N/A	N/A	\$380.0	\$380.0

b. Procurement -- Not applicable

c. MILCON -- Not applicable

d. O&M -- Not applicable

e. Cost/Schedule Variances --

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	0.0	0.0
Cumulative Variances to Date (11/27/86)	-0.6	NA
Net Change	-0.6	NA

CPR data as of 27 November 1986

Explanation of Change: Subsequent to the award of the Sea Lance Full Scale Development contract on 31 July 1986, the Secretary of the Navy directed the Program to defer all further development of the Nuclear Depth Bomb (NDB) variant until the Sea Lance Mk 50 Milestone IIIA review. Accordingly, a Stop Work order was issued deferring NDB development effort. The program redirection substantially affected the implementation of a C/SCSC baseline. Cost reporting on a level of effort basis was authorized while new schedule and budget baselines were developed. Full C/SCSC reporting is planned to commence with the January 1987 Cost Performance Report.

16. ~~CONFIDENTIAL~~ **Program Funding Summary:** (Current/Development Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 42.1% (8 yrs/19 yrs)

(2) Percent Program Cost Appropriated: 13.8% (\$338.2/\$2450.9)

b. Appropriation Summary -- (Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY 80-87)	Budget Year (FY 88)	Balance To Complete FYDP (FY 89-92)	Balance To Complete Beyond FYDP (FY 93-98)	Total
RDT&E	338.2	114.3	405.9	0.0	858.4
Procurement	0.0	0.0	406.1	1163.4	1569.5
MILCON	0.0	0.0	23.0	0.0	23.0
Total	338.2	114.3	835.0	1163.4	2450.9

c. Annual Summary --

Fiscal Year	Qty	FY 85 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1980				8.8			7.0	10.50
1981				22.1			19.1	10.60
1982				39.0			35.5	7.59
1983				23.7			22.5	4.90
1984				27.8			27.4	3.80
1985				49.8			50.6	3.40
1986				63.4			66.4	2.90
1987	6		11.5	101.4			109.7	3.10
1988	20		38.5	102.1			114.3	3.50
1989	16		30.7	98.1			113.5	3.50
1990				109.6			130.8	3.30
1991				79.4			97.2	2.90
1992				51.4			64.4	2.40
Subtotal	42		80.7	776.6			858.4	

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Sea Lance (ASW Standoff Weapon), December 31, 1986

16. ~~(b)~~ **Program Funding Summary (Cont'd):** (Current/Development Estimate in Millions of Dollars)

Fiscal Year	Qty	FY 85 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

(b)(1)

Appropriation: MILCON

1990	-			8.3			10.1	3.3
1991	-			5.4			6.8	2.9
1992	-			4.8			6.1	2.4
Subtotal	-			18.5			23.0	

Total				1957.9			2450.9	
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16. (U) Program Funding Summary (Cont'd):

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Development Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1980	7.0	7.0	7.0
1981	19.1	19.1	19.1
1982	35.5	35.5	35.5
1983	22.5	22.5	22.5
1984	27.4	27.4	27.4
1985	50.6	50.6	50.6
1986	66.4	66.4	59.6
1987	109.7	58.3	1.3
To Complete	520.2	N/A	N/A
Total	858.4	286.8	223.0

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Sea Lance (ASW Standoff Weapon), December 31, 1986

17. ~~(U)~~ Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less Pde)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (85\$)	N/A	N/A	1957.9	N/A	N/A
(TY\$)	N/A	N/A	2450.9	N/A	N/A
PAUC (85\$)	N/A	N/A	1.414	N/A	N/A
(TY\$)	N/A	N/A	1.770	N/A	N/A

c. Schedule Variance --

	Production Estimate	Variance (CE VS Pde)	Current Estimate	Variance (CE VS Max)	Maximum Economic
Start Date (Mo/Yr)	N/A	N/A	1/91	N/A	N/A
Duration (in Months)	N/A	N/A	107	N/A	N/A
End Date (Mo/Yr)	N/A	N/A	11/99	N/A	N/A

d. Deliveries (Plan/Actual) --

	<u>To Date</u>
RD&E	0/0
Procurement	0/0

18. (U) Operating and Support (O&S) Costs:

Not applicable.

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⑤ AF-6 C-17A

SAR-86-073

(UNCLASSIFIED)

SELECTED ACQUISITION REPORT(RCS:DD-COMP(Q&A)823)

PROGRAM: C-17A

AS OF DATE: December 31, 1986

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1. <u>Designation and Nomenclature (Popular Name):</u>	
C-17A/Direct Delivery Airlift Aircraft	
2. <u>DoD Component:</u>	U.S. Air Force
3. <u>Responsible Office and Telephone Number</u>	
C-17A System Program Office	Program Dir: Col Thomas A. Stover
Aeronautical Systems Division	Assigned: September 1, 1986
Wright-Patterson AFB, OH 45433	AV: 785-6306 COMM: (513) 255-6306
4. <u>Program Elements/Procurement Line Items:</u>	
RDT&E: PE 64231F, PE 64227F (shared funding)	
PROCUREMENT: PE 41130F APPN 3010 ICN C017AD	
MILCON: PE 41130F	
5. <u>Related Programs:</u>	None

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AND SECURITY REVIEW (CASG-PA)
DEPARTMENT OF DEFENSE

(UNCLASSIFIED)

SAF/PASS

87-0063-T

87-T-0175

(UNCLASSIFIED)

C-17A, December 31, 1986

6. Mission and Description:

The purpose of the C-17 aircraft is to modernize the airlift fleet and improve the overall capability of the U.S. to rapidly project, reinforce, and sustain combat forces worldwide. The aircraft will augment the C-5 and C-141 in intertheater strategic deployment and the C-130 with intratheater theater operations. Because the C-17 will be capable of carrying outsize cargo over intertheater ranges into austere airfields, it introduces a direct deployment capability that will significantly improve airlift responsiveness. This improved responsiveness will, in turn, dramatically improve the mobility of our general purpose forces.

Significant features of the multi-engine C-17A include: supercritical wing design and winglets to reduce drag and increase fuel efficiency and range; receiver inflight refueling capability to increase range; externally blown flap configuration, direct lift control spoilers and high impact landing gear system, all of which contribute to the aircraft's capability to operate into and out of small austere airfields; forward and upward exhausted thrust reverser system that provides backup capability, reduces the aircraft ramp space requirements, and minimizes the interference of dust and debris on ground personnel activities; cargo door, ramp design and cargo restraint systems that are operable by a single loadmaster and permit immediate equipment offload without special handling equipment; two an cockpit with cathode ray tube (CRT) displays that reduce complexity and improve reliability; maximum use of built-in test (BIT) features to reduce maintenance and troubleshooting times; and walk-in avionics bay that improve accessibility. The end result is significantly reduced maintenance manhours per flight hour.

7. Program Highlights:

a. Significant Historical Developments --

A SECDEF decision during the FY81 budget review directed finding for a new aircraft which places increased emphasis on strategic airlift capability. The initial C-X Program Management Directive (PMD) was issued on 10 Dec 1979. The requirements for the C-17A aircraft were formalized in the C-X Mission Element Need Statement (MENS), dated 28 November 1980. In August 1981, SECAF announced Douglas Aircraft Company as the winner of the C-X source selection.

On 23 July 1982, the FSED contract that had been negotiated during the C-X source selection was awarded to Douglas with a restructure clause inserted to limit the scope of the contract to a 15 month modestly paced program.

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7. Program Highlights (Cont'd):

a. Significant Historical Developments (Cont'd) --

A revised PMD was issued in July 1983 which directed the continuation of C-17 design effort and the initiation of activities leading to an FSD start by FY85, a production start by FY88, and an initial operational capability of 12 aircraft in FY92.

In 1984, the C-17 program continued to operate as a moderately paced engineering effort. During this period, major wind tunnel testing was completed, structural design criteria were developed, and design analyses and vendor studies were completed.

On 15 February 1985, the Secretary of Defense approved FSED contingent on second source certification. The program office and Douglas Aircraft Company completed negotiations on the C-17 contract restructure on 31 October 1985. Secretary of the Air Force, the Honorable Mr Rourke, signed the C-17 second source certification to Congress on 30 December 1985, and the restructured contract was issued the following day.

The first Production Readiness Review was conducted at Douglas Aircraft Company from 21 April to 1 May 1986. The Air Force reviewed seven major functional areas (management, engineering, logistics, test/safety, material/subcontracts, manufacturing, and quality assurance) and determined that Douglas was proceeding on schedule in transitioning from full scale development to production.

b. Significant Developments Since Last Report --

During this reporting period Antenna Model Tests were completed in July 1986. The On-Board Inert Gas Generating System (OBIGGS) ECP was negotiated, and contract modification is being finalized. The Air Force Contract Management Division (AFCMD) conducted a Contractor Operations Review (COR) at Douglas Aircraft Company from 15 September - 25 September 1986. The COR team rated Douglas' product integrity "best yet" of any aircraft manufacturer reviewed. The SPO exercised the \$2.3B option for five years of follow-on FSED. Testing was completed at Pratt & Whitney's West Palm Beach facility to evaluate the engine nacelle/thrust reverser design compatibility with the C-17 engine.

The C-17 is expected to satisfy mission requirements.

c. Changes Since "As of Date:-- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: DCP 12 Oct 84. DCP being restructured to reflect changes in approved program parameters. Revised parameters shown in section 10b of this document were briefed to OSD at a Joint Requirements Management Board (JRMB) Program Review on 24 Nov 86. Payload reduction from 172,200 lbs to 166,965 lbs. resulted from government changes and design solutions to program requirements. Total RDT&E breach from \$4307.3M to \$4907.5M was caused by a Congressional directed change which transferred initial tooling from procurement to RDT&E.

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9. Schedule:

a. Milestones —	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>
(1) Source Selection Decision	Aug 81/Aug 81	Aug 81
(2) Contract Award	Jul 82/Jul 82	Jul 82
(3) Start FSED	Oct 84/Feb 85	Feb 85
(4) Milestone II (JRMB)	Nov 87/Feb 85	Feb 85
(5) First Full Funded Production Lot	Dec 87/Dec 87	Dec 87
(6) Milestone III (JRMB)	Feb 91/Feb 91	N/A
(7) Milestone III A (JRMB)	Nov 87/Oct 87	Oct 88 (Ch-1)
(8) Milestone III B (JRMB)	Feb 91/Aug 91	Jul 92 (Ch-2)
(9) IOC (Delivery of 12th acft)	Jan 92/Sep 92	Sep 92 *

* The FY 92 IOC is dependent on rephasing \$140M RDT&E funds from FY93 to earlier years and restoring procurement support funding in FY 88 and FY 89 to assure supportable aircraft.

b. Previous Change Explanations —

The authority to award the July 1982 contract directed a program review before beginning full scale development (FSD). In June 1984, the Air Force was informed DSARC II (JRMB) would be required to initiate PSD. This resulted in a schedule change for Milestone II (JRMB) from November 1987 to October 1984.

DSARC II (JRMB) was conducted in November 1984. Approval to enter FSED program was held in abeyence pending completion of a "bottoms up" program cost estimate. The estimate was completed and briefed to the OSD CAIG on January 31, 1985. SEC DEF signed FSED approval memo on February 15, 1985.

Milestone III (JRMB) was separated into a low-rate production decision (IIIA) (JRMB) and a full-rate production decision (IIIB) (JRMB). IOC delayed to April 1992 due to revised initial production rate buys.

Start of FSED was delayed by DSARC (JRMB) request for RDT&E independent cost estimate.

Milestone II (JRMB) was delayed by DSARC (JRMB) request for RDT&E independent cost estimate.

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9. Schedule (Cont'd):

b. Previous Change Explanations (Cont'd) —

HQ USAF has rescheduled Milestone IIIA (Joint Requirements Management Board)(JRMB) from September 1986 to October 1987 and substituted a program review in October 1986 to gain approval to release FY 1987 long lead funds.

IOC has been delayed from April 1992 to September 1992 due to funding levels in the FY 1987 President's Budget, Gramm-Rudman-Hollings Act, and other funding reductions.

c. Current Change Explanations —

(Ch-1) The Milestone IIIA (JRMB) was rescheduled to allow for completion of Critical Design Review (CDR) prior to the IIIA (JRMB) review.

(Ch-2) The Milestone IIIB (JRMB) was rescheduled to allow completion of IOT&E and preparation of test reports to support the IIIB (JRMB) review.

d. References —

Planning Estimate: PMD 0020(14) dated 25 Jul 83.

Approved Program: DCP dated 12 Oct 84; SDDM dated 15 Feb 85; PMD 0020(17)/64231F/41130F dated 2 Oct 85, amended by PMD 0020(18) dated 20 Dec 85 and PMD 0020(19) dated 5 March 1986.

10. Technical/Operational Characteristics:

a. Technical —	<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(1) Mission Completion Success Probability <u>1/</u>	.93/.93	N/A	.93
(2) Maintenance Manhours Per Flying Hour (Air Vehicle) <u>1/</u>	18.6/18.6	N/A	18.6

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10. Technical/Operational Characteristics (Cont'd):

b. Operational --	<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(1) Payload/Range 172,200/2400//166,965/2400 (Ch-1) (LBS/NM) <u>2/</u>		N/A	166,965/2400 (Ch-1)
(2) Landing Distance (Ft) <u>3/</u>	1550/2650 (Ch-2)	N/A	2650 (Ch-1)(Ch-2)
(3) Takeoff Distance (Ft) <u>4/</u>	6510/7600 (Ch-2)	N/A	7600 (Ch-1)(Ch-2)
(4) Cruise Speed <u>5/</u> (KTAS)	450/450	N/A	450
(5) Backup Capability 2/2 (Percent Grade) <u>6/</u>		N/A	2

1/ Reliability and maintainability based on 100,000 fleet flying hours.

2/ Unrefueled, 2.25G maneuver load factor, standard day, C-X reserves.

3/ Maximum Effort Landing Field Length, 123,977 lb payload, fuel to fly a 500 NM mission with zero payload, sea level, 90°F day, 3 engine idle reverse.

4/ Takeoff critical field length at gross weight to carry a payload of 166,965 lbs for a range of 2400 NM, sea level, 90°F day.

5/ Cruise Speed of 450 KTAS is equivalent to 0.77 MACH.

6/ Backup capability with a 166,965 lb payload and fuel to fly 1000 NM, sea level, 90°F day.

c. Previous Change Explanations — Program office current estimate of payload and takeoff/landing distance was adjusted as a result of the DSARC II (JRMB) added requirements for two additional pallets on the ramp and provided for full combat offload from the logistics rail system.

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10. Technical/Operational Characteristics (Cont'd):

d. Current Change Explanations —

(Ch-1) The approved program values and current estimate for payload carried 2400 NM has been reduced by 5,235 lbs to account for government changes to the design of the C-17 airlift aircraft. These changes include four pallet ramp/combat offload, wing load alleviation deletion, commercial pallet adapters, and incorporating the Onboard Inert Gas Generating System (OBIGGS). The aircraft is still designed to carry a maximum 2.25C payload of 172,200 lbs. The reduction corresponds to the C-17 contract specifications.

-- The payloads associated with the landing distance, takeoff distance, and backup capability characteristics have been adjusted as well.

(Ch-2) The approved program values and current estimate for landing and takeoff distance have been amended to reflect runway length requirements rather than landing and takeoff ground run distances. The C-17 contract specification which defines system requirements uses runway length and this change is to be consistent with program/testing requirements and criteria. The previously reported planning estimates for landing (1550 ft) and takeoff (6510 ft) distances remain correct for the conditions stated in paragraph b (3/ and 4/) above.

e. References —

Planning Estimate: PMD 0020(14) dated 25 Jul 83 as amended by PMD 0020(15), January 1984; MENS for C-X, November 28, 1980; PSOC for C-X, January 22, 1980.

Approved Program: DCP dated 12 Oct 84; SDDM dated 15 Feb 85; and PMD 0020(17)/64231F/41130F dated 2 Oct 85, amended by PMD 0020(18) dated 20 Dec 85 and PMD 0020(19) dated 5 March 1986.

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11. Program Acquisition Cost (Current Estimate in Millions of Dollars):

a. Cost —	Planning Estimate	Changes	Current Estimate
Development (RDT&E)	2704.1	+795.0	3499.1
Procurement	16793.2	+153.4	16946.6
Airframe	(11229.3)	-1081.4	(10147.9)
Engine	(2371.6)	+704.2	(3075.8)
Avionics	(687.1)	-239.5	(447.6)
Total Flyaway	(14288.0)	-616.7	(13671.3)
Peculiar Support	(314.2)	+1421.7	(1735.9)
Other Weapon System Cost	(1139.4)	-1090.7	(48.7)
Initial Spares	(1051.6)	+439.1	(1490.7)
Construction (MILCON)	47.3	+ 44.9	92.2
Total FY 81 Base-Year \$	19544.6	+993.3	20537.9

Escalation	20209.2	-5335.9	14873.3
Development (RDT&E)	(1242.9)	+ 165.5	(1408.4)
Procurement	(18939.6)	-5537.7	(13401.9)
Construction (MILCON)	(26.7)	+ 36.3	(63.0)

Total Then-Year \$	39753.8	-4342.6	35411.2
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b. Quantities —

Development (RDT&E)	1	—	1
Procurement	210	—	210
Total	211	—	211

c. Unit Cost —

Procurement:			
FY81 Base-Year \$	79.968	+ .730	80.698
Then-Year \$	170.156	- 25.639	144.517

Program:			
FY81 Base-Year \$	92.628	+ 4.708	97.336
Then-Year \$	188.407	- 20.581	167.826

d. Approved Design to Cost Goal — N/A

e. Foreign Military Sales — None

f. Nuclear Costs — None

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12. Program Acquisition/Current Procurement Unit Cost Summary:

a. Program Acquisition (Current (Then Year) Dollars in Millions) —

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current Estimate</u>	<u>UCR Baseline Estimate</u>	<u>UCR Baseline Estimate</u>
	(Dec 86 SAR)	(Dec 85 SAR)	(Dec 86 SAR)
(1) Cost	35411.2	34485.4	35411.2
(2) Quantity	211	211	211
(3) Unit Cost	167.826	163.438	167.826

b. Current Procurement —	(FY1987)	(FY1987)*	(FY 1988)
(1) Cost	49.1	49.1	723.7
Less CY Adv Proc	34.8	34.8	66.3
Plus PY Adv Proc	<u>0</u>	<u>0</u>	<u>34.8</u>
Net Total	14.3	14.3	692.2
(2) Quantity	0	0	2
(3) Unit Cost	N/A	N/A	346.100

* Adjusted to reflect FY 87 Appropriation Act in accordance with Congressional change to SAR law.

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13. Cost Variance Analysis:

a. Summary (Current (Then-Year) Dollars in Millions) --

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Planning Estimate	3947.0	35732.8	74.0	39753.8
Previous Changes:				
Economic	-145.3	-5195.9	- 3.2	-5344.4
Quantity	0.0	0.0	0.0	0.0
Schedule	+224.9	+ 189.3	0.0	+ 414.2
Engineering	+ 14.1	+ 214.5	0.0	+ 228.6
Estimating	-350.8	-1118.1	+121.5	-1347.4
Other	0.0	0.0	0.0	0.0
Support	+397.0	+ 417.1	0.0	+ 814.1
Subtotal	+139.9	-5493.1	+118.3	-5234.9
Current Changes:				
Economic	-38.9	-528.1	-8.5	-575.5
Quantity	0.0	0.0	0.0	0.0
Schedule	+ 82.0	0.0	0.0	+ 82.0
Engineering	0.0	0.0	0.0	0.0
Estimating	+773.5	-358.7	-28.6	+386.2
Other	0.0	0.0	0.0	0.0
Support	+ 4.0	+995.6	0.0	+999.6
Subtotal	+820.6	+108.8	-37.1	+892.3
Total Changes	+960.5	-5384.3	+ 81.2	-4342.6
Current Estimate	4907.5	30348.5	155.2	35411.2

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13. Cost Variance Analysis (Cont'd):

(FY81 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Planning Estimate	2704.1	16793.2	47.3	19544.6
Previous Changes:				
Quantity	0.0	0.0	0.0	0.0
Schedule	+ 127.9	0.0	0.0	+ 127.9
Engineering	+ 8.9	+ 115.0	0.0	+ 123.9
Estimating	- 222.4	- 481.1	+ 65.2	- 638.3
Other	0.0	0.0	0.0	0.0
Support	+ 279.6	+ 257.1	0.0	+ 536.7
Subtotal	+ 194.0	- 109.0	+ 65.2	+ 150.2
Current Changes:				
Quantity	0.0	0.0	0.0	0.0
Schedule	+ 44.4	0.0	0.0	+ 44.4
Engineering	0.0	0.0	0.0	0.0
Estimating	+553.7	-250.6	-20.3	+282.8
Other	0.0	0.0	0.0	0.0
Support	+ 2.9	+513.0	0.0	+515.9
Subtotal	+601.0	+262.4	-20.3	+843.1
Total Changes	+795.0	+ 153.4	+ 44.9	+ 993.3
Current Estimate	3499.1	16946.6	92.2	20537.9

b. Previous Change Explanations —

RD&E

Economic: Revised economic escalation indices.

Schedule: Revised schedule due to budget cuts and constraints.

Estimating: Refinement of FY1983/1984 requirements; reestimate based on impact of revised economic escalation indices in prior years; reestimate of flyaway costs based on an independent cost analysis (ICA); reestimate based on bottoms-up approach.

Support: Reestimate of support requirements based on ICA.

Engineering: Addition of DoD standard avionics racks.

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13. Cost Variance Analysis (Cont'd):

PROCUREMENT

Economic: Revised economic escalation indices.

Schedule: Schedule slip in early years of procurement (beginning in FY1990) and an increase in peak buy quantity from 25 to 29.

Engineering: Addition of 4-pallet ramp, combat offload rail system, and DoD standard avionics racks.

Estimating: Realignment of procurement funding to the program estimate; reestimate of flyaway cost based on an ICA; one-time change results from a correction to the methodology for computing inflation on programs with advance procurement funding. Reestimate based on bottoms-up; reestimate based on engineers higher cost weight.

Support: Deletion of initial spares for FY88 and FY89 based on decision to use interim contractor support for the first two years of operation; restructure of support requirements based on ICA; further definition of peculiar support and detailed spares buildup.

MILCON

Economic: Revised economic escalation indices

Estimating: Improved definition of support facility requirements during bottoms-up exercise.

c. Current Change Explanation —

	(Dollars In Millions)	
<u>RDT&E</u>	<u>Base Year \$</u>	<u>Then Year \$</u>
Revised economic escalation indices. (Economic)	N/A	- 38.9
Increased cost based on revised schedule due to budget cuts/constraints. Caused complete restructure of RDT&E contract thereby extending fixed overheads. Requires fabrication of partial development fixture, and resequencing of manufacturing flow. (Schedule)	+ 44.4	+ 82.0
Adjustments for current and prior year escalation change. (Estimating)	+ 7.7	+ 10.2

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13. Cost Variance Analysis (Cont'd):

<u>RDTE</u>	<u>Base Year \$</u>	<u>Then Year \$</u>
Congressional direction to move initial tooling from procurement to RDTE (+540M BY\$). Reestimate of Air Vehicle cost in bottoms-up annual estimate. (Estimating)	+ 546.0	+ 763.3
Additional common support equipment requirement for flight test program. (Support)	+ 2.9	+ 4.0

PROCUREMENT

Revised economic escalation indices. (Economic)	N/A	- 528.1
Adjustment for flyaway current and prior year escalation change. (Estimating)	+ 3.5	+ 5.2
Congressional direction to move initial tooling from procurement to RDTE (-540M BY\$). Reestimate of recurring flyaway cost in bottoms-up annual estimate. (Estimating)	- 254.1	- 363.9
USAF redefinition of acceptance spares; deletion of common support equipment; addition of enroute support equipment. (Support)	+ 512.3	+ 994.5
Adjustment for support current and prior year escalation change. (Support)	+ .7	+ 1.1

MILCON

Revised economic escalation indices (Economic)	N/A	- 8.5
Reestimate of facility requirements from annual estimate. (Estimating)	- 20.3	- 28.6

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13. Cost Variance Analysis (Cont'd):

d. References --

Planning Estimate: FY85 President's Budget, January 1984.

14. Program Acquisition Unit Cost (PAUC) History (Millions of Then-Year Dollars):

a. Initial SAR/Planning Estimate to Current Estimate --

PAUC (Plan. Estimate)	Changes								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
188.407	-28.057	0	+2.352	+1.083	-4.555	+8.596	0	-20.581	167.826

15. Contract Information (Then-Year Dollars in Millions):

a. RDT&E --	Initial Contract Price		
	Target	Ceiling	Qty
McDonnell-Douglas Corp. Douglas Aircraft Co. Long Beach, CA F33657-81-C-2108 FPIF Award: 23 July 1982 Definitized: 31 Dec 1985	31.6	31.6	0

Current Contract Price			Estimated Price at Completion	
Target	Ceiling	Qty	Contractor	Program Manager
4119.2	4754.3	1	4119.2	4119.2

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$ + 8.5	\$ -14.8
Cumulative Variances to Date (2 Nov 86)	<u>\$ + 5.7</u>	<u>\$ -58.4</u>
Net Change	\$ - 2.8	\$ -43.6

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15. Contract Information (Then-Year Dollars In Millions) Cont'd:

Explanation of Change:

Cost Variance: The net changes are not significant in relation to the current contract price.

Schedule Variance: The unfavorable schedule variance is due to design changes for weight savings and relocation of the auxiliary power unit (APU). Other contributors to the schedule variance include inefficiencies from adding new designers, previous staffing shortages, and a schedule phasing mismatch between engineering and manufacturing. This schedule variance is being addressed in current contract restructure negotiations. It is anticipated that the resulting contract will be realigned with the program milestones. No impact on contract or program at completion.

b. Procurement -- N/A

c. MILCON -- N/A

16. Program Funding Summary (Current Estimate in Millions of Dollars):

a. Program Status --

(1) Percent Program Completed (Years Funds Appropriated/Total Program Years):

$$7 \text{ yrs}/19 \text{ yrs} = 36.8\%$$

(2) Percent Program Cost Appropriated (Funds Appropriated To Date in Millions/Total Program Funding in Millions):

$$1263.4/35411.2 = 3.6\%$$

b. Appropriation Summary (Then-Year Dollars in Millions) --

<u>Appropriation</u>	<u>Current & Prior Yrs (FY81-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93-99)</u>	<u>Total</u>
RD&E	1214.3	1231.0	2179.0	283.2	4907.5
Procurement	49.1	723.7	9568.3	20007.4	30348.5
MILCON	N/A	---	22.0	133.2	155.2
Total	1263.4	1954.7	11769.3	20423.8	35411.2

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16. Program Funding Summary (Cont'd) (Current Estimate in Millions of Dollars):

c. Annual Summary:

APPROPRIATION - RDT&E								
Base Year 81 Dollars					Then Year Dollars		Escl	
Flyaway					Advance Proc		Rate	
Fiscal Year	Qty	Non Rec	Rec	Total	Debit	Credit	Total	%
1981				32.0			33.4	11.9
1982				0.0			0.0	9.2
1983				51.0			59.6	4.9
1984				21.2			25.7	3.8
1985				95.7			119.9	3.4
1986				268.8			347.5	2.9
1987				470.2			628.2	3.1
1988				890.7			1231.0	3.5
1989				714.8			1020.8	3.5
1990				445.5			655.3	3.3
1991				217.5			328.5	2.9
1992				112.8			174.4	2.4
1993				178.9			283.2	2.4
Subtotal	1	N/A	N/A	3499.1	N/A	N/A	4907.5	N/A

APPROPRIATION - PROCUREMENT								
FY 81 Base Year Dollars					Then Year Dollars		Escl*	
Flyaway					Advance Proc		Rate	
Fiscal Year	Qty	Non Rec	Rec	Total	Debit	Credit	Total	%
1987	0	9.5		32.6	34.8	0.0	49.1	3.1
1988	2	58.4	360.8	464.8	66.3	34.8	723.7	3.5
1989	4	73.1	526.0	682.2	99.4	66.3	1093.7	3.5
1990	6	42.7	706.8	1270.3	166.6	99.4	2089.7	3.3
1991	10	14.8	1017.2	1598.5	335.0	166.6	2693.5	2.9
1992	20		1595.4	2138.7	489.1	335.0	3691.4	2.4
1993	29		1863.9	2367.9	496.7	489.1	4184.1	2.4
1994	29		1679.7	2072.2	507.7	496.7	3750.8	2.4
1995	29		1577.9	1908.2	520.3	507.7	3536.0	2.4
1996	29		1515.7	1784.9	534.8	520.3	3385.9	2.4
1997	29		1472.2	1613.2	437.2	534.8	3134.5	2.4
1998	23		1157.3	1013.1	0.0	437.2	2016.1	2.4
Subtotal	210	198.5	13472.9	16946.6	3687.9	3687.9	30348.5	

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16. Program Funding Summary (Cont'd) (Current Estimate in Millions of Dollars):

APPROPRIATION - MILCON *								
Fiscal Year	Qty	FY81 Base Year Dollars			Then Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc		Total	
		Non Rec	Rec		Debit	Credit		
1989				3.5			5.1	3.5
1990				1.8			2.7	3.3
1991				4.5			7.0	2.9
1992				4.5			7.2	2.4
1993				26.0			42.1	2.4
1994				7.6			12.7	2.4
1995				13.5			22.9	2.4
1996				6.6			11.5	2.4
1997				13.2			23.6	2.4
1998				5.6			10.3	2.4
1999				5.4			10.1	2.4
Subtotal				92.2			155.2	
Total	211	198.4	13472.9	20537.9	3687.9	3687.9	35411.2	

* USAF constraints on FY89-92 preclude timely financing of requirements.

d. Obligations and Expenditures ** —

RDT&E Then Year Dollars (Current Estimate in Millions)

APPROPRIATION: RDT&E

Fiscal Year	Total	Obligated**	Expended**
1981	33.4	33.4	33.4
1982	0.0	0.0	0.0
1983	59.6	59.6	59.6
1984	25.7	25.7	25.7
1985	119.9	119.9	119.4
1986	347.5	346.6	188.8
1987	628.2	195.5	.2
To Complete	3693.2	N/A	N/A
Total	4907.5	780.7	427.1

** Reflects program office records as of December 31, 1986

(UNCLASSIFIED)

17.

(UNCLASSIFIED)

C-17A, December 31, 1986

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1988	2	N/A	8.0	N/A
1989	4	N/A	8.0	N/A
1990	10	N/A	8.0	N/A
1991	20	N/A	15.0	N/A
1992	25	N/A	26.7	N/A
1993	25	N/A	31.6	N/A
1994	25	N/A	29.0	N/A
1995	25	N/A	29.0	N/A
1996	25	N/A	29.0	N/A
1997	25	N/A	29.0	N/A
1998	24	N/A	30.7	N/A

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BY\$)	N/A	N/A	20537.9	N/A	N/A
(TY\$)	N/A	N/A	35411.2	N/A	N/A
PAUC (BY\$)	N/A	N/A	97.336	N/A	N/A
(TY\$)	N/A	N/A	167.826	N/A	N/A

c. Schedule Variance --

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	N/A	N/A	10/90	N/A	N/A
Duration (in Months)	N/A	N/A	110	N/A	N/A
End Date (Mo/Yr)	N/A	N/A	12/99	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
---RDT&E	0/0
Procurement	0/0

18. Operating and Support Costs: N/A

(UNCLASSIFIED)

SELECTED ACQUISITION REPORT(RCS:DD-COMP(QA)823)

PROGRAM: C-5B

AS OF: December 31, 1986

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1. Designation and Nomenclature (Popular Name): C-5B (GALAXY)2. DoD Component: U.S. Air Force3. Responsible Office and Telephone Number:

C-5B Program Office	PM: COL TYLER B. HUNEYCUTT
Aeronautical Systems Division	Assigned: MAY 4, 1986
Wright-Patterson AFB, OH 45433	AV 785-7300; COMM (513) 255-7300

4. Program Elements/Procurement Line Items:

PROCUREMENT: APPN 3010 PE 41119F ICN C005B0
MILCON: APPN 3300 PE 41896F (Shared funding)

5. Related Programs: C-5A Wing ModificationCLEARED
FOR OPEN PUBLICATION

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD)-PA
DEPARTMENT OF DEFENSE

87-0157

SAF/PAS

87-0036-

6. Mission and Description: Additional airlift is needed for rapid intertheater deployment of combat forces to support national strategy goals and to meet the mobility requirements of a modern army. The C-5B Program was initiated to fulfill the immediate need for additional intertheater airlift capability. The C-5B provides a near term reduction to the airlift shortfall. The aircraft is basically a C-5A with minor configuration changes intended to improve reliability. The aircraft will be a multi-engine turboprop aircraft designed to airlift substantial payloads, including outsize combat equipment, over intercontinental ranges without refueling and deliver this equipment/cargo for rapid intertheater deployment of combat forces. The C-5 augments existing C-5A squadrons.

7. Program Highlights:

a. Significant Historical Developments. The Lockheed-Georgia Company submitted an unsolicited Firm Fixed Price (FFP) Proposal for C-5B aircraft to the Secretary of the Air Force in October 1981. Based on the unsolicited proposal the Air Force was directed to procure 50 aircraft officially designated as the C-5B. A preliminary production contract was awarded to Lockheed in October 1982 for start-up and long lead efforts. A supplemental agreement was issued in December 1982 for FY83 start-up, long lead and procurement of one aircraft to be delivered in December 1985. The U.S. Air Force exercised Option One (four aircraft) in December 1983, Option Two (eight aircraft) in December 1984, and Option Three (sixteen aircraft) in November 1985. First flight of the C-5B occurred on September 10, 1985 (on schedule) and delivery of the first aircraft was accomplished on December 28, 1985 (also on schedule).

b. Significant Developments Since Last Report. Eight aircraft have been delivered since December 1985, all on schedule. Renegotiation of the FY 87 option (Option Four) for the final 21 aircraft was underway in December 1986, and exercise of the option is anticipated in early CY 87. Program Management Responsibility Transfer from Systems Co and to Logistics Command is tentatively set at March 1989, after delivery of the 50th C-5B.

The C-5B program is expected to meet mission requirements.

c. Changes Since "As Of" Date - On 15 January 1987 the FY 87 production option for 21 aircraft was renegotiated. This resulted in a decrease in contracted price from \$2,220 million to \$2,059 million (\$161 million decrease). The program was under funded in FY 87; hence, \$256.1 million was removed from program budget authority. These reduced FY 87 fundings are not reflected elsewhere in this SAR. The impact of the revised funding will be reflected in a future SAR.

8. Decision Coordinating Paper (DCP) Threshold Breaches: No DCP

9. Schedule:

a. Milestones --	Production Estimate/ Approved Program	Current Estimate
Award Initial Contract	Oct 82/Oct 82	Oct 82*
Award Production Contract	Dec 82/Dec 82	Dec 82*
First Flight	Sep 85/Sep 85	Sep 85*
First Delivery	Dec 85/Dec 85	Dec 85*
16th Aircraft Delivery	Jun 87/Jun 87	Jun 87
50th Aircraft Delivery	Mar 89/Mar 89	Feb 89
IOC <u>1/</u>	N/A/N/A	N/A
b. Previous Change Explanations --	50th Aircraft Delivery erroneously reported as Mar 89 in Dec 84 SAR (Current Estimate column).	
c. Current Change Explanations --	None.	
d. References --	<u>Production Estimate:</u> PMD 2072 (5), 5 April 1983. <u>Approved Program:</u> PMD 2072 (5), 5 April 1983.	
<u>1/</u>	Follow-on procurement of C-5 aircraft which adds an additional 50 C-5B aircraft to the current C-5A fleet.	
*	Reflects actual date of accomplishment.	

10. Technical/Operational Characteristics:

a. Technical --	Production Estimate/ Approved Program	Demonstrated Performance	Current Estimate
Maintainability MMH/FH <u>2/</u>	N/A/N/A	N/A	N/A
Cargo Compartment Size (Ft)			
Height	13.5/13.5	13.5*	13.5
Width	19.0/19.0	19.0*	19.0
Length	144.8/144.8	144.8*	144.8
Wing Span (Ft)	222.8/222.8	222.8*	222.8
b. Operational --			
Payload/Range (lbs/NM)	216,000/2,850/ 216,000/2,850	259,304/2,461 (Ch-1)	216,000/2,850
Landing Distance (Ft)	2,490/2,490	2,185 (Ch-1)	2,490
Takeoff Distance (Ft)	7,950/7,950	8,526 (Ch-1)	7,950
Cruise Speed (KTAS)	450/ 450	450 (Ch-1)	450

* Mean value

2/ The C-5B Program is structured with a goal of 40 MMH/FH. This will be based on operating sixteen aircraft at an average rate of 3.2 flight hours per day per aircraft over three consecutive months from one main operating base.

10. Technical/Operational Characteristics (Cont'd):

c. Previous Change Explanations — None

d. Current Change Explanations —

(Ch-1) Demonstrated values for payload/range and takeoff distance are based on increased takeoff gross weight of 797,000-lbs., whereas the production estimate/approved program performance values were based on a takeoff gross weight of 769,000-lbs. The demonstrated performance values for payload/range and takeoff distance reflect performance better than estimated as reported in the Air Force Approved C-5B Flight Test Report, October 1986.

e. References — Production Estimate: PMD 2072 (5), 5 April 1983.
Approved Program: PMD 2072 (5), 5 April 1983.

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a. Cost —	Production Estimate	Changes	Current Estimate
Development (RDT&E)	—	—	—
Procurement	5723.9	-1079.5	4644.4
Flyaway	(5105.2)	(-703.6)	(4401.6)
Other Wpn Sys Cost	(268.9)	(-119.1)	(149.8)
Initial Spares	(349.8)	(-256.8)	(93.0)
Construction	121.8	-113.2	8.6
Total: Constant FY80\$	5845.7	-1192.7	4653.0
Escalation	3821.6	-1046.9	2774.7
Development	—	—	—
Procurement	(3750.2)	(-980.2)	(2770.0)
Construction	(71.4)	(-66.7)	(4.7)
Total Program Cost (Then-Year)\$	9667.3	-2239.6	7427.7
b. Quantities —			
Development (RDT&E)	—	—	—
Procurement	50	—	50
Total	50	—	50
c. Unit Cost —			
Procurement:			
Constant FY80\$	114.478	-21.590	92.888
Current (Then-Year)\$	189.482	-41.194	148.288
Program:			
Constant FY80\$	116.914	-23.854	93.060
Current (then-Year)\$	193.346	-44.792	148.554
d. Approved Design to Cost Goal — N/A			
e. Foreign Military Sales — None.			
f. Nuclear Costs — None.			

C-5B, December 31, 1986

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	SAR Current	UCR Baseline	UCR Baseline
	Estimate 31 DEC 86	Estimate 31 DEC 85	Estimate 31 DEC 86
a. Program Acquisition			
(1) Cost	7427.7	7936.1	7427.7
(2) Quantity	50	50	50
(3) Unit Cost	148.554	158.722	148.554
b. Current Procurement (FY 1987)	*(FY 1987)		(FY 1988)
(1) Cost	1898.4	1898.4	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	349.0	349.0	0.0
Net Total	2247.4	2247.4	0.0
(2) Quantity	21	21	0
(3) Unit Cost	107.019	107.019	0.0

* Adjusted to reflect the FY87 Appropriation Act in accordance with Congressional change to SAR law.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	--	9474.1	193.2	9667.3
Previous Changes				
Economic	--	-61.2	-6.5	-67.7
Quantity	--	--	--	--
Schedule	--	+36.0	--	+36.0
Engineering	--	--	--	--
Estimating	--	-1032.3	-173.1	-1205.4
Other	--	--	--	--
Support	--	-494.1	--	-494.1
Subtotal	--	-1551.6	-179.6	-1731.2
Current Changes				
Economic	--	-163.3	-.2	-163.5
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	-240.4	-.1	-240.5
Other	--	--	--	--
Support	--	-104.4	--	-104.4
Subtotal	--	-508.1	-.3	-508.4
Total Changes	--	-2059.7	-179.9	-2239.6
Current Estimate	--	7414.4	13.3	7427.7

13. Cost Variance Analysis (Cont'd) :
 (FY 1980 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	--	5723.9	121.8	5845.7
Previous Changes				
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	-551.2	-113.1	-664.3
Other	--	--	--	--
Support	--	-311.8	--	-311.8
Subtotal	--	-863.0	-113.1	-976.1
Current Changes				
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	-152.4	-.1	-152.5
Other	--	--	--	--
Support	--	-64.1	--	-64.1
Subtotal	--	-216.5	-.1	-216.6
Total Changes	--	-1079.5	-113.2	-1192.7
Current Estimate	--	4644.4	8.6	4653.0

b. Previous Change Explanations --

RDT&E None.

Procurement

Economic: Revised escalation indices.

Schedule: Slip of two aircraft from FY85 to FY87.

Estimating: Reduction for ECO and EPA adjustments; re-estimate for prior year escalation; one-time change in advance procurement inflation methodology.

Support: Reduction of spares requirements and other peculiar equipment.

MILCON

Economic: Revised escalation indices.

Estimating: Decrease due to the shift of funding responsibility for reserve aircraft from the C-5B to C-5A program; additional facilities identified by MAC; USAF reduction of required funding for maintenance hangar and parking ramp extension at Altus AFB.

13. Cost Variance Analysis (Cont'd):
 c. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDTE</u>		
N/A		
(2) <u>Procurement</u>		
Revised economic escalation indices. (Economic)	N/A	-163.3
Adjustment for current and prior year escalation. (Estimating)	+95.3	+156.0
Adjustment for current and prior year escalation. (Support)	+4.6	+7.3
Reduction in ECO requirement (Estimating)	-97.5	-154.8
Reduction for advance EPA adjustments. (Estimating)	-150.2	-241.6
Reduction of provisioning spaces due to definitization of actual spare requirements. (Support)	-62.9	-101.9
Reduction of peculiar support equipment through the Support Equipment Recommendation Data (SERD) process. (Support)	-5.8	-9.8
(3) <u>MILCON</u>		
Revised economic escalation indices. (Economic)	N/A	-.2
Adjustment for prior year escalation. (Estimating)	+.1	+.2
Reduction in MILCON requirements. (Estimating)	-.2	-.3

d. References --Production Estimate: FY1984 President's Budget, January 1983

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

Initial SAR/Production Estimate (PdE) to Current Estimate (CE)

PAUC	Changes (Then-Year Dollars in Millions)								PAUC
(Initial SAR/PdE)	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	(Current Estimate)
193.346	-4.624	-	+ .720	-	-28.918	-11.970	-	-44.792	148.554

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E -- N/A

b. Procurement --

Initial Contract Price

AircraftTargetCeilingQty

Lockheed-Georgia Co.

\$50.0

N/A

0

Marietta GA

F33657-82-C-2117 FFP

Award: Oct 22, 1982

Definitized: Oct 22, 1982

Current Contract Price

Estimated Price at Completion

TargetCeilingQtyContractorProgram Manager

\$7223.3

N/A

50

\$7128.4

\$7128.4

Aircrew Training System

Initial Contract Price

United Airlines Aircrew

TargetCeilingQty

Training Inc.

\$120.7

N/A

1

Lakewood CO

F33657-84-C-0052 FFP

Award: Oct 30, 1984

Definitized: Oct 30, 1984

Current Contract Price

Estimated Price at Completion

TargetCeilingQtyContractorProgram Manager

\$120.7

N/A

1

\$128.7

\$128.7

*Troop Seats

Enginetics Corporation

4060 Lisa Drive

Tipp City OH 45371

F33657-83-C-0380 FFP

* Deleted - FY87 Authorization Act now requires reporting of six (6) largest contracts , \$40M or more.

c. MILCON -- N/A

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 83.3% (5/6)

(2) Percent Program Cost Appropriated: 99.9% (\$7421.2/\$7427.7)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current Prior Yrs (FY83-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-93)</u>	<u>Beyond FYDP (FY94)</u>	<u>Total</u>
RDT&E	--	--	--	--	--
Procurement	7414.4	--	--	--	7414.4
MILCON	<u>6.8</u>	<u>6.5</u>	<u>--</u>	<u>--</u>	<u>13.3</u>
Total	7421.2	6.5	--	--	7427.7

16. c. Annual Summary --

FY 80 Base Year Dollars					Then-Year Dollars			
Fiscal Year	Qty	Flyaway		Total	Advance Proc		Total	Escl Rate(%)
		Nonrec	Rec		Debit	Credit		
Appropriation: Procurement								
1983	1	189.3	208.1	531.5	80.7	0.0	776.5	9.0
1984	4	180.7	518.8	837.2	240.3	69.5	1277.5	8.0
1985	8	66.8	743.1	941.7	277.1	233.4	1486.9	3.4
1986	16	3.8	1160.3	1209.4	305.3	251.5	1975.1	2.9
1987	21	6.2	1324.5	1124.6	0.0	349.0	1898.4	3.1
Subtotal	50	446.8	3954.8	4644.4	903.4	903.4	7414.4	
Appropriation: MILCON								
1986				4.5			6.8	2.9
1987				--			--	3.1
1988				4.1			6.5	3.5
Subtotal				8.6			13.3	
Total	50	446.8	3954.8	4653.0	903.4	903.4	7427.7	

16. Program Funding Summary (Cont'd):

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated*	Expended*
Appropriation: Procurement			
1983	776.5	776.5	727.7
1984	1277.5	1277.5	1176.6
1985	1486.9	1367.4	1147.5
1986	1975.1	1942.4	203.0
1987	1898.4	254.6	--
Subtotal	7414.4	5618.4	3254.8
Appropriation: MILCON			
1986	6.8	0.0	0.0
1987	--	--	--
1988	6.5	--	--
Subtotal	13.3	--	--
Total	7427.7	5618.4	3254.8

*Reflects program office records as of 31 December 1986 (with the exception of spares expenditures 30 November 1986).

17. Production Rate Data:

a. Annual Production Rates -- (Note: The annual production rates shown differ from the annual funded quantities because the funded delivery period is 1.7 mos for FY83, 6.7 mos for FY84, 9.9 mos for FY85, 12.0 mos for FY86 and 12.6 mos for FY87.)

Production Rates (Quantity/Year)			
Fiscal Year	Production Estimate	Current Estimate	Maximum Economic
1983	7.2	7.2	7.2
1984	7.2	7.2	7.2
1985	10.7	9.7	9.7
1986	17.2	16.0	16.0
1987	20.0	20.0	20.0

17. Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Change (Pde - CE)	Current Estimate	Change (Max - CE)	Maximum Economic
Prog Acq Cost (BY)	5845.7	-1192.7	4653.0	—	4653.0
Prog Acq Cost (TY)	9667.3	-2239.3	7427.7	—	7427.7
PAUC (BY)	116.914	-23.854	93.060	—	93.060
PAUC (TY)	193.346	-44.792	148.554	—	148.554

c. Schedule Variance --

	Production Estimate	Variance (CE - Pde)	Current Estimate	Variance (CE - Max)	Maximum Economic
Start Date (Mo/Yr)	12/82	—	12/82	—	12/82
Duration (in months)	75	—	75	—	75
End Date (Mo/Yr)	2/89	—	2/89	—	2/89

d. Deliveries (Plan/Actual) --

Procurement To Date
9/9

18. Operating and Support Costs: N/A

(3)

SELECTED ACQUISITION REPORT (RCS: DD-COMP(O&A)823)
PROGRAM: DMSP BLOCK 5D-2 IMPROVED/5D-3

AS OF DATE: December 31, 1986

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1. Designation and Nomenclature (Popular Name): DMSP Block 5D-2 Improved/
 5D-3/Defense Meteorological Satellite Program (DMSP)

2. DoD Component: U.S. Air Force

3. Responsible Office and Telephone Number:

DMSP Program Office
 Space Division
 P.O. Box 92960
 Los Angeles AFS, CA 90009-2960

Col Justin A. Curtis
 Assigned: February 25, 1985
 AV: 833-0404; COMM (213) 643-0404

4. Program Elements/Procurement Line Items:

RDT&E: PE 35160F

PROCUREMENT: APPN 3020 PE 35160F ICN MS0554
 APPN 3080 PE 35160F ICN 833340

MILCON: PE 35160F

5. Related Programs: None.

SAF/PAS

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DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (OASD-PA)
 DEPARTMENT OF DEFENSE

87 0134

6. Mission and Description: The mission of DMSP is to provide an enduring and survivable capability, through all levels of conflict consistent with the survivability of the supported forces, to collect and disseminate global visible and infrared cloud data and other specialized meteorological, oceanographic, and solar-geophysical data required to support worldwide DoD operations and high-priority programs. Timely data are supplied to Air Force Global Weather Central, the Navy Fleet Numerical Oceanography Center, and to deployed tactical receiving terminals worldwide. The DMSP system is the only DoD meteorological satellite system. It consists of two three-axis stabilized satellites in 450 nautical mile sun-synchronous polar orbits (98.7 degrees inclination), command readout stations, command and control facilities, strategic data processing facilities, worldwide fixed and mobile tactical terminals, and communication satellite links. The DMSP Block 5D-2 Improved (S11-14)/5D-3 (S15-20) systems replace the Block 5D-2 system which has completed production and is operational.

7. Program Highlights:

a. Significant Historical Developments -- The Defense Meteorological Satellite Program is a Joint-Service program in accordance with the Memorandum of Agreement on Joint Service Management and Operations, dated 15 December 1976. The program supports all military services. This is a continuing program. RDT&E funding will allow evolutionary development of spacecraft and sensors as necessary to support new requirements of the special strategic missions, the Joint-Service mission, and the Joint Chiefs of Staff. Continuation of efforts begun in FY 82 included development and production of the microwave imager. The satellite reliability improvement program also continued. During 1984, DMSP definitized the multiyear procurement contract for four 5D-3 Operational Linescan Systems (OLS) for 5D-2 Improved spacecraft S11-14 (S11-12 procured in FY 83 and S13-14 procured in FY 85.) The preplanned product improvement (P³I) water vapor profiling capability for the temperature sounder was accelerated to a December 84 start. A successful Quality Audit and Manufacturing Readiness Review Follow-up were conducted at RCA in Jul 85 prior to entering full-scale box level production on 5D-2 Improved Spacecraft S11-14. Headquarters Air Force directed that an additional 5D-3 spacecraft (S-20) be procured in FY 91.

b. Significant Developments Since Last Report -- Contract was awarded for Block 5D-3 development spacecraft (S-15) to RCA Astro-Electronics in July 86. With Congressional approval of use of surplus Titan II ICBMs as space launch vehicles, DMSP plans to transition from Atlas to Titan II beginning in FY 90. The Fairchild Satellite Operations Center (FSOC) contract was awarded in Jan 86 to Harris Corp.; a successful Preliminary Design Review was completed in Sep 86. The FSOC building was accepted by the Corps of Engineers in Dec 86. The first two of six Air Force Mark IV tactical terminals, bought in 1984 from Harris Corp., were delivered; the remaining four are expected to be delivered by Jun 87. The Satellite Data Handling System (SDHS) was turned over to the Air Force Global Weather Central (AFGWC) in May 86. Implementation began at AFGWC in Jul 86 of a P³I improvement to SDHS, the Satellite Data Support System (SDSS) Group 1. The Automated Weather Distribution System (AWDS) Product Driver Subsystem (APDS) completed Final Qualification Testing (FQT) in Dec 86.

The DMSP expects to meet its directed operational force structure and all mission requirements.

7. Program Highlights (Cont'd):

c. Changes Since "As Of" Date -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: None. DMSP does not have SDDMs, DCPs or SCPs.

9. Schedule:

a. Milestones--	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
Spacecraft (S11-14) Production Contract Awd	Sep 83/Sep 83	Sep 83
Primary Sensor (S11-14) Prod Contract Awd	Jan 84/Jan 84	Jan 84
S11 Delivery	Jul 87/Jul 87	Nov 87 (Ch-1)
IOC - Block 5D-2 Improved (F-11) 1/	TBD/TBD	TBD
Spacecraft (S15) Design Contract Awd	Nov 85/Jul 86 (Ch-2)	Jul 86 (Ch-2)
IOC - Block 5D-3 (F-15) 1/	TBD/TBD	TBD
Primary Sensor (S15) Design Contract Awd	Sep 82/Sep 82	Sep 82
Fairchild Satellite Operations Center (FSOC) Operational	Sep 87/Sep 88	Jan 89
Thule Command Readout Station (CRS)		
(1) Operational	Sep 87/Sep 87	Sep 87
(2) Deactivate Loring CRS	Sep 88/Sep 88	Sep 88

1/ IOC will occur 30 days after launch (completion of on-orbit checkout).
As DMSP launches on demand, no firm estimate is currently available.

b. Previous Change Explanations --

Fairchild (Back-Up) Satellite Operations Center operational (IOC) slipped from Sep 88 to Jan 89 due to delay in contract award, and second proposal required to address all AFSPACECOM requirements. Spacecraft (S15) design contract award slipped to May 86 when additional technical evaluation of proposal was required.

c. Current Change Explanations --

- (Ch-1) Slipped from Jul 87 to Nov 87 due to late delivery of electronic piece-parts, qualification problems after spacecraft electronic redesign (due to new parts sources), and late delivery of Government furnished equipment.
- (Ch-2) Slipped from May 86 to Jul 86 due to delay in contract award. Additional technical evaluation of proposal was required.

d. References --

Production Estimate:

PMD R-S 3015 (20), dated 31 May 1983, subject "DMSP"

Approved Program:

PMD R-S 3015 (24), dated 20 Oct 1986, subject "DMSP"

10. Technical/Operational Characteristics:

a. Technical	<u>Prod Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Altitude (Nautical miles) <u>1/</u>	450/450	(Ch-1)	450 <u>3/</u>
Inclination (Degrees) <u>2/</u>	98.7/98.7	(Ch-1)	98.7 <u>3/</u>
b. Operational			
Mean Mission Duration (Months):			
5D-2 Improved	33/33		33 <u>3/</u>
5D-3	42/42		42 <u>3/</u>
Early Orbit Checkout (Days):			
5D-2 Improved	30/30		30
5D-3	30-120/30-120		30
Primary Sensor:			
Global Resolution (Km)	2.78/2.78	(Ch-1)	2.78 <u>3/</u>
Theater Resolution (Km)	0.56/0.56	(Ch-1)	0.56 <u>3/</u>
Mark IV Transportable			
Tactical Terminals:			
Set Up (Hours)	8/8	4 <u>4/</u>	6
MTBF (Hours)	2000/2000	2000 <u>5/</u>	2000
MTBF (Power Generation) (Hours)	3000/3000	3000 <u>5/</u>	3000
Availability	0.995/0.995	0.995 <u>5/</u>	0.995

1/ ± 20 nautical miles

2/ ± .15°

3/ Anticipated (based on current on-orbit satellite performance)

4/ Best case

5/ Mean of all deployed vans

c. Previous Change Explanations --

Previous entry for Early Orbit Checkout allowed up to 90 days in a transfer orbit for Space Shuttle launches. No longer required due to transition to Titan II ELV.

d. Current Change Explanations --

(Ch-1) Demonstrated performance was erroneously included in previous SARs. This performance was based on older DMSP satellites not included in this SAR.

e. References:

Production Estimate:

PMD R-S 3015 (20), dated 31 May 1983, subject "DMSP"

Approved Program: PMD R-S 3015 (24) dated 20 Oct 1986, subject "DMSP"

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	<u>Production Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	\$ 224.5	\$ +20.7	\$ 245.2
Procurement	491.6	+35.4	527.0
Launch Vehicle	(26.0)	(-16.6)	(9.4)
Spacecraft	(201.3)	(+12.3)	(213.6)
Primary Sensor	(79.6)	(+17.1)	(96.7)
Mission Sensors	(57.1)	(- 7.2)	(49.9)
Support	(48.9)	(+ 4.0)	(52.9)
Total Flyaway	(412.9)	(+ 9.6)	(422.5)
Ground System	(58.0)	(+12.1)	(70.1)
Field Level Support	(19.8)	(-19.8)	(0.0)*
Initial Spares	(0.9)	(+33.5)	(34.4)
Total Non-Flyaway	(78.7)	(+25.8)	(104.5)
Construction (MILCON)	2.6	+ 0.3	2.9
Total FY75 Base-Year \$	718.7	+56.4	775.1
Escalation	1160.3	- 4.3	1156.0
Development (RDT&E)	(318.1)	(+ 9.9)	(328.0)
Procurement	(839.1)	(-14.5)	(824.6)
Construction (MILCON)	(3.1)	(+ 0.3)	(3.4)
Total Then-Year \$	\$1879.0	\$+ 52.1	\$1931.1

* Current Estimate now included in Initial Spares Line.

b. Quantities --			
Development (RDT&E)	1	-	1
Procurement	8	+1	9
Total	9	+1	10
c. Unit Cost --			
Procurement:			
FY75 Base-Year \$	\$ 61.450	\$-2.894	\$ 58.556
Then-Year \$	166.338	-16.160	150.178
Program:			
FY75 Base-Year \$	79.856	-2.346	77.510
Then-Year \$	\$208.778	\$-15.668	\$193.110

11. Program Acquisition Cost (Cont'd):

- d. Approved Design to Cost Goal -- None.
- e. Foreign Military Sales -- None.
- f. Nuclear Costs -- None.

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u> <u>Dec 86 SAR</u>	<u>UCR Baseline</u> <u>Dec 85 SAR</u>	<u>UCR Baseline</u> <u>Dec 86 SAR</u>
a. Program Acquisition--			
(1) Cost	1931.1	2127.0	1931.1
(2) Quantity	10	10	10
(3) Unit Cost	193.110	212.700	193.110
b. Current Procurement--	(FY 1987)	(FY 1987)*	(FY 1988)
(1) Cost	21.8	21.8	107.8
Less CY Adv Proc	-	-	-91.7
Plus PY Adv Proc	-	-	-
Net Total	21.8	21.8	16.1
(2) Quantity	-	-	-
(3) Unit Cost	N/A	N/A	N/A

* Differs from the December 1985 SAR to reflect the FY 1987 Appropriations Act.

13. Cost Variance Analysis:

a. Summary--(Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	542.6	1330.7	5.7	1879.0
Previous Changes:				
Economic	-27.3	-93.6	-	-120.9
Quantity	-	+190.2	-	+190.2
Schedule	-	-	-	-
Engineering	+40.2	-23.5	-	+16.7
Estimating	+20.4	+56.8	-	+77.2
Other	-	-	-	-
Support	-12.4	+97.2	-	+84.8
Subtotal	+20.9	+227.1	-	+248.0
Current Changes:				
Economic	-3.7	-45.9	-0.1	-49.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-12.6	-	-	-12.6
Estimating	+2.8	-145.4	-	-142.6
Other	-	-	-	-
Support	+23.2	-14.9	+0.7	+9.0
Subtotal	+9.7	-206.2	+0.6	-195.9
Total Changes	+30.6	+20.9	+0.6	+52.1
Current Estimate	573.2	1351.6	6.3	1931.1

(FY 1975 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	224.5	491.6	2.6	718.7
Previous Changes:				
Quantity	-	+61.2	-	+61.2
Schedule	-	-	-	-
Engineering	+16.7	-8.2	-	+8.5
Estimating	+4.7	+13.2	-	+17.9
Other	-	-	-	-
Support	-5.6	+31.9	-	+26.3
Subtotal	+15.8	+98.1	-	+113.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-5.3	-	-	-5.3
Estimating	+0.4	-56.6	-	-56.2
Other	-	-	-	-
Support	+9.8	-6.1	+0.3	+4.0
Subtotal	+4.9	-62.7	+0.3	-57.5
Total Changes	+20.7	+35.4	+0.3	+56.4
Current Estimate	245.2	527.0	2.9	775.1

13. Cost Variance Analysis (Cont'd):

b. Previous Change Explanations --

RDT&E

Economic: revised escalation indices
 Engineering: developed satellite autonomy capability; added new wind sensor technology effort; de-scoped survivability of 5D-3 spacecraft (S-15); increased vacuum ultraviolet (SSUV) sensor development
 Estimating: adjustments to correct current & prior year escalation; adjustments to current & prior years to reflect actuals; funding reallocated to complete spacecrafts S8-10, which are not included in SAR; revised estimate due to late start of S-15 development; definitized Titan II ELV contract as 5D-3 booster;
 Support: OSD directed reductions for FCRC technical support and flying hours; decrease to design of tactical terminal modifications; increase in Automated Weather Product Driver System application; deleted Shuttle-Launch Base requirement

Procurement

Economic: revised escalation indices
 Quantity: add one 5D-3 satellite (S-20) due to extension of 5D-3 program
 Engineering: descope survivability and added classified sensor to S16-20 spacecraft
 Estimating: adjustments to correct current and prior year escalation; adjustments to current & prior years to reflect actuals; funding reallocated to complete spacecrafts S8-10, which are not included in SAR; extension of 5D-3 program; transition to Titan II ELV as 5D-3 booster; acceleration of water vapor profiling capability; descope merger of two mission sensors and reestimated mission sensor mix in June 85 for S16-20; revised estimate of OLS and spacecraft (for S16-20) using June 85 cost data; upgraded production/test equipment model for primary sensor (OLS13-21)
 Support: impact of revised economic escalation indices on current and prior years; revised estimate of spares and equipment allocation; decrease in Mark IV Production; replaced outdated and unsupportable Control Readout Station (CRS) antenna and Satellite Operations Center (SOC) computers; added Mark IV Mission Sensor Processing

MILCON: None. No previous changes.

c. Current Change Explanations--

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised economic escalation indices. (Economic)	N/A	-3.7

13. Cost Variance Analysis (Cont'd):

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E (Cont'd)</u>		
PMD authority for vacuum ultraviolet (SSUV) sensor withdrawn. (Engineering)	-5.3	-12.6
Adjustments to current and prior years escalation. (Estimating)	+0.4	+0.9
Definitization of 5D-3 development spacecraft (S-15) contract. (Estimating)	+1.7	+5.9
Additional development for wind measuring sensor. (Estimating)	+4.6	+11.6
Decrease in requirement for primary sensor, mission sensors, and ground systems contingency. (Estimating)	-15.4	-39.2
Increased program management and FCRC technical support. (Estimating)	+9.1	+23.6
Decrease to command, control, and communications (C ³) requirements. (Support)	-0.3	-1.3
Upgrade of deployed DMSP tactical terminals. (Support)	+5.9	+14.0
Development of new combat tactical terminal. (Support)	+4.2	+10.5
(2) <u>Procurement</u>		
Revised economic escalation indices. (Economic)	N/A	-45.9
Adjustments to correct current & prior year escalation. (Estimating)	+1.1	+2.7
Decrease in spacecraft and sensor procurement modifications. (Estimating)	-8.7	-20.5
Transfer of funding for Titan II launch vehicles refurbishment needed for DMSP S16-20 to Space Boosters Program (PE35119F). (Estimating)	-22.6	-61.1

DMSP Block 5D-2 Improved/5D-3, December 31, 1986

(Dollars in Millions)
Base-Year Then-Year

(2) Procurement (Cont'd)

Savings produced by the restructuring of the fully funded buy of Block 5D-3 spacecrafts S16-20 and their associated primary sensors as a multiyear procurement. (Estimating)	-34.3	-90.9
Integration for upgrade of production and test equipment model for primary sensor (OLS13-21). (Estimating)	+7.8	+21.7
Adjustments to spacecraft, primary sensor, and mission sensors contingency. (Estimating)	+0.1	+2.7
Adjustments to correct current & prior year escalation. (Support)	+0.3	+1.0
Adjustments to current and prior years for ground system, initial spares procurement, and secure voice network to reflect actuals. (Support)	-3.7	-8.5
Revised quantity of spares and equipment allocation due to better analysis of future requirements. (Support)	-2.7	-7.4

(3) MILCON

Revised economic escalation indices. (Economic)	N/A	-0.1
Adjustments to correct current & prior year escalation. (Support)	0	+0.1
Increase to backup satellite operations facility at Fairchild AFB. (Support)	+0.3	+0.6

d. References --

Production Estimate:

PMD R-S 3015 (20), dated 31 May 1983, subject "DMSP"

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

a. Initial SAR/Production Estimate to Current Estimate

PAUC (Initial SAR/Pd Estimate)	Changes								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
208.778	-17.060	-1.858	--	+0.410	-6.540	--	+9.380	-15.668	193.110

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E--

5D-3 Spacecraft

RCA Corp, Princeton, NJ,
FO4701-86-C-0038, FPIF, AF, PI
Award: July 7, 1986
Definitized: July 7, 1986

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$75.2	\$82.4	1

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$73.6	\$80.6	1

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$71.4	\$73.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$ 0.0	\$ 0.0
Cumulative Variances To Date (11/22/86)	\$ +0.2	\$ -0.7
Net Change	\$ +0.2	\$ -0.7

Explanation of Change: Schedule variance due to design tradeoff analysis taking longer than anticipated. Cost variance due to planned labor and computer related expenditures being lower than anticipated. Contractor has revised estimated price at completion to reflect underspending. Program Manager projects completion at target price.

First appearance in the SAR.

Spacecraft Design Improvements

RCA Corp., Princeton, NJ
FO4701-83-C-0030, CPFF
Award: September 2, 1983
Definitized: September 2, 1983

Deleted. FY87 DOD Authorization Act now requires reporting on the 6 largest contracts over \$40M (Refers to RDT&E (CPFF) portion of contract only.)

Hardcopy Image Processing System

General Electric Co., Lanham, MD
FO4701-83-C-0124, FPIF
Award: October 17, 1983
Definitized: October 17, 1983

Deleted. FY87 DOD Authorization Act now requires reporting on the 6 largest contracts over \$40M.

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

5D-3 Operational Linescan System

Westinghouse Corp., Baltimore, MD
F04701-82-C-0148, FPIF
Award: September 28, 1982
Definitized: September 28, 1982

Deleted. FY87 DOD Authorization Act now requires reporting on the 6 largest contracts over \$40M.

Automated Weather Distribution System Product Driver Subsystem

Harris Corp, Melbourne, FL
F04701-79-C-0055, FPIF
Award: January 19, 1985
Definitized: January 19, 1985

Deleted. FY87 DOD Authorization Act now requires reporting on the 6 largest contracts over \$40M.

b. Procurement

5D-2 Improved Spacecraft

RCA Corp., Princeton, NJ,
F04701-83-C-0030, FPIF,
Award: September 2, 1983
Definitized: September 2, 1983

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$161.7	\$171.9	4

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$163.2	\$173.5	4

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$157.8	\$157.8

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$ -0.8	\$ -4.0
Cumulative Variances To Date (11/22/86)	\$ +1.9	\$ -2.5
Net Change	\$ +2.7	\$ +1.5

Explanation of Change: Schedule variance due to late material deliveries and government furnished equipment. Work arounds in process but delivery of S-11 will slip approximately four months. Cost variance due to RCA's inability to hire systems engineers early in the program and a decrease in the required CDRLs currently in the baseline. Contractor's and Program Manager's estimates at completion reflect the underrun in systems engineer and data. No program impact is anticipated.

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

5D-3 Operational Linescan System

Westinghouse Corp., Baltimore, MD,
FO4701-83-C-0048, FPIF,
Award: January 19, 1984
Definitized: December 2, 1983

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$51.5	\$54.8	4

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$61.2	\$65.1	4

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$61.5	\$61.5

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$ -0.1	\$ +0.7
Cumulative Variances To Date (11/31/86)	\$ -0.2	\$ +0.1
Net Change	\$ -0.1	\$ -0.6

Explanation of Change: Schedule variance due to problems with subcontract parts impacting delivery of OLS 13. Cost variance due to design and processing problems with the Specialty Devices, Flight Hardware redesign and problems with OLS 13. Contractor's and Program Manager's estimates at completion reflect parts problem impacting delivery of OLS and design problems with Specialty Devices and Flight Hardware. No program impact is anticipated.

Microwave Temperature Sounder

Aerojet ElectroSystems Co., Azusa, CA,
FO4701-83-C-0038, FPIF,
Award: May 24, 1983
Definitized: May 24, 1983

Deleted. FY87 DOD Authorization Act now requires reporting on the 6 largest contracts over \$40M.

c. MILCON - No military construction contracts.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 35.3% (6 yrs/17 yrs)

(2) Percent Program Cost Appropriated: 33.6% (648.8/\$1931.1)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY82-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93-98)</u>	<u>Total</u>
RDT&E	201.2	51.8	200.2	120.0	573.2
Procurement - Missile	378.0	97.4	513.8	98.5	1087.7
Procurement - Other	63.3	10.4	86.8	103.4	263.9
MILCON	<u>6.3</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>6.3</u>
Total	648.8	159.6	800.8	321.9	1931.1

DMSP Block 5D-2 Improved/5D-3, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary -- 1/

Fiscal Year	Qty	FY 75 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1982				8.4			15.5	9.2
1983				8.7			16.8	4.9
1984				9.8			19.6	3.8
1985				18.3			37.7	3.4
1986				23.8			50.6	2.9
1987				27.8			61.0	3.1
1988				22.8			51.8	3.5
1989				23.7			55.6	3.5
1990				24.2			58.5	3.3
1991				19.0			47.3	2.9
1992				15.3			38.8	2.4
1993				7.3			19.1	2.4
1994				7.5			19.9	2.4
1995				7.0			19.2	2.4
1996				7.1			19.9	2.4
1997				7.2			20.6	2.4
1998				7.3			21.3	2.4
Subtotal	1		*	245.2			573.2	

* Not Available

Appropriation: Procurement - Missile

1982			0.0	6.9			14.2	9.6
1983	2	58.7	3.8	69.3	29.8		151.3	9.0
1984			3.8	12.8			29.2	8.0
1985	2	89.4	4.2	53.7		29.8	126.2	3.4
1986			4.1	15.9			38.7	2.9
1987			3.6	7.3			18.4	3.1
1988			1.3	37.6	91.7		97.4	3.5
1989	2	101.6	2.6	79.4	53.0	59.1	212.1	3.5
1990			2.6	35.7	90.0		97.9	3.3
1991	3	110.2	2.6	69.9		175.6	196.2	2.9
1992			2.6	2.6			7.6	2.4
1993			5.0	5.0			14.6	2.4
1994			5.0	5.0			15.2	2.4
1995			5.2	5.2			16.1	2.4
1996			5.3	5.3			16.8	2.4
1997			5.4	5.4			17.5	2.4
1998			5.5	5.5			18.3	2.4
Subtotal	9	359.9	62.6	422.5	264.5	264.5	1087.7	

DMSP Block 5D-2 Improved/5D-3, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary (Cont'd) -- 1/

Fiscal Year	Qty	FY 78 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement - Other

1983				3.7			7.5	4.9
1984				6.3			13.2	3.8
1985				13.5			29.0	3.4
1986				4.6			10.2	2.9
1987				1.5			3.4	3.1
1988				4.4			10.4	3.5
1989				9.4			23.0	3.5
1990				14.0			35.2	3.3
1991				8.2			21.0	2.9
1992				2.9			7.6	2.4
1993				5.4			14.5	2.4
1994				5.8			15.9	2.4
1995				5.9			16.8	2.4
1996				6.1			17.7	2.4
1997				6.3			18.6	2.4
1998				6.5			19.9	2.4
Subtotal				104.5			263.9	

Appropriation: MILCON

1985				2.9			6.3	3.4
Subtotal				2.9			6.3	
Total	10	45.2	377.3	775.1	264.5	264.5	1931.1	

1/ Funding does not match the budget documentation because the SAR is limited to DMSP Blocks 5D-2 Improved and 5D-3.

15. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated 2/	Expended 2/

Appropriation: RDT&E

1982	15.5	15.5	13.5
1983	16.8	16.8	15.8
1984	19.6	19.6	19.4
1985	37.7	37.7	34.1
1986	50.6	49.5	23.4
1987	61.0	30.0	1.8
To Complete	372.0	N/A	N/A
Total	573.2	169.1	108.0

Appropriation: Procurement - Missile

1982	14.2	14.2	13.1
1983	151.3	151.2	76.3
1984	29.2	27.8	15.6
1985	126.2	114.8	37.0
1986	38.7	19.6	10.7
1987	18.4	9.0	--
To Complete	709.7	N/A	N/A
Total	1087.7	336.6	152.7

Appropriation: Procurement - Other

1983	7.5	7.5	6.9
1984	13.2*	12.6**	10.7**
1985	29.0*	23.7**	8.1**
1986	10.2*	4.1**	5.7**
1987	3.4*	---**	---**
To Complete	200.6*	N/A	N/A
Total	263.9	47.9	31.4

* Total includes SM-ALC/AFLC Programed and Contractual funds in PE35160F.

** Only DMSP/AFSC obligations/expenditures are shown.

Appropriation: Construction

1985	6.3	Not Available	Not Available
Total	6.3	Not Available	Not Available

2/ Obligation and Expenditure information reflects program office records as of 24 December 1986.

DMSP Block 5D-2 Improved/5D-3, December 31, 1986

17. Production Rate Data: No report. Production less than 6 per year.
18. Operating and Support Costs: N/A.

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(0&A)823) (U)
 PROGRAM: Defense Support Program (DSP) (U)

AS OF DATE: December 31, 1986

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1. ~~(S)~~ Designation and Nomenclature (Popular Name): Defense Support Program/

(b)(1)

2. (U) DOD Component: U.S. Air Force

3. (U) Responsible Office and Telephone Number:

Deputy for Defense Support Program PM: Col Wayne J. Craft
 Space Division Assigned: April 1, 1985
 Los Angeles AFS, CA 90009 AUTOVON 833-1150
 Commercial: (213) 643-1150

4. (U) Program Element:

RDT&E: PE 12431F (Shared funding)
 PROCUREMENT: APPN 3020
 APPN 3080
 MILCON: PE 12431F

5. (U) Related Programs: Jam Resistant Secure Communications Terminals (JRSCT);
 AFSATCOM Modulation Compatibility (AMC) Terminal.

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87-0302

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7. ~~(S)~~ Program Highlights:

a. Significant Historical Developments --

(b)(1)



(U) Sensor Evolutionary Development (SED) satellite improvements are intended to prolong the useful life of each satellite, make the satellite more survivable in hostile environments, increase the viewing area of each satellite, and increase the accuracy of the data provided.

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7. ~~(S)~~ Program Highlights (Cont'd):

(b)(1)

b. Significant Developments Since Last Report --

(U) The significant accomplishment in the ground segment since last report was the turnover of the Mobile Ground Systems to AF Space Command for operational use.

(U) The fixed ground stations have completed the Large Processing Stations' Upgrade (LPSU) main computer replacement. They are undergoing the Peripheral Upgrade Program (PUP) and the Ground Stations' Upgrade for Satellite 14 (GS-14) to make them compatible with the second generation of satellites (Satellites 14-17).

(U) The significant developments in the spacecraft segment included the demating of Satellite 5R from the Titan 34D booster due to the ongoing booster investigations. Congress approved the multi-year procurement of Satellites 18-22.

The DSP is expected to satisfy mission requirements.

c. Changes Since "As Of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: -- There are currently no DCP (dated September 1, 1972, #58) threshold breaches.

9. ~~(S)~~ Schedule:

a. ~~(S)~~ Milestones --

Development Estimate/	Current
Approved Program	Estimate

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9. ~~(S)~~ Schedule (Cont'd):

(U) Delivery of Simplified Processing Station (SPS)	Dec 78/Dec 78	Dec 78
(U) Satellite 12 Delivery	Jun 81/Jun 81	Jun 81
(U) Satellite 5R Delivery	Sep 82/Sep 82	Aug 85
(U) Completion of Computer Replacement Large Processing Station (LPS) Upgrade	Jun 83/Jun 83	Jun 83
(U) Satellite 14-17 Design and Development (start)		
(U) Sensor	Jul 81/Jul 81	Jul 81
(U) Spacecraft	Nov 81/Nov 81	Nov 81
(U) Long Lead Material Support (Sat 14-17)	Nov 81/Nov 81	Nov 81
(U) Production Contract Award (Sat 14-17)		
(U) Sensor	Jan 83/Jan 83	Jan 83
(U) Spacecraft	Oct 83/Oct 83	Oct 83
(U) Production Contract Award Mobile Ground Terminal	Apr 81/Apr 81	Apr 81

(b)(1)

(U) Satellites 14-17 Delivery Start	Jan 87/Jan 87	Jul 88 (Ch-1)
(U) Satellite 18-22 MYP Contract Award	Dec 86/Dec 86	Jan 87 (Ch-2)

- b. (U) Previous Change Explanations -- The delay in delivery of Satellites 14-17 and Long Lead contract award of Satellites 18-22 was due to schedule impacts resulting from the delay in launching Satellite 5R and accelerating the launch of Satellites 12 and 6R. The delay in the Production contract award for Satellites 18-19 was due to a decision made by the program office and approved by Air Staff to offset cost growth in Laser Crosslink Production. The delay in Satellites 18-19 Delivery Start is due to the change in ready-to-ship date based on FY87 Long Lead Procurement authorization and FY88 production authorization as a result of the delay in Satellites 18-19 Production Contract award. The delay in Satellite 5R delivery from Jul 85 to Aug 85, was due to the deceleration of Satellite 5R. The delay in Satellites 14-17 delivery start from Apr 87 to Jul 87, was due to Satellite 5R impacts on planned launch delay resulting from problems with the booster. Multi-Year Procurement strategy approved by HQ Air Force for Satellites 18-22, replacing the Satellite 18-19 annual buy profile. The annual buy profile milestones are no longer applicable to SAR reporting.

c. (U) Current Change Explanations --

(Ch-1) This delay, from Jul 87 to Jul 88, is due to Satellite 5R launch delays.

(Ch-2) This change includes the incorporation of the Satellite 18-19 long lead and production contract awards and the Satellites 18-19 delivery start into the Satellite 18-22 MYP Contract Award; and the delay from Dec 86 to Jan 87 due to continuing negotiations.

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d. (U) References --

Development Estimate:

PMD No. R-S 4047 (24), October 18, 1983;
FY 85 RDT&E Descriptive Summaries, January 1984.

Approved Program: Same as Development Estimate.

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(b)(1)



- c. (U) Previous Change Explanations -- None. No previous changes.
- d. (U) Current Change Explanations -- None. No changes in current estimate or demonstrated performance.
- e. (U) References --

Development Estimate:

PMD NO. R-S 4047 (24), October 18, 1983;
FY 85 RDT&E Descriptive Summaries, January 1984.

Approved Program: Same as Development Estimate.

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11.(U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. Cost --			
Development (RDT&E)	\$1304.3	\$+205.7	\$1510.0
Procurement	3094.6	+807.5	3902.1
Total Flyaway	(2364.4)	(+662.9)	(3027.3)
Other System Costs	(730.2)	(+144.6)	(874.8)
Construction (MILCON)	25.7	-0.3	25.4
Total FY 78 Base Year \$	4424.6	+1012.9	5437.5
Escalation	1123.0	1055.3	2178.3
Development (RDT&E)	(-30.4)	(+176.7)	(+146.3)
Procurement	(+1151.6)	(+878.3)	(+2029.9)
Construction (MILCON)	(+1.8)	(+0.3)	(+2.1)
Total Then-Year \$	\$5547.6	\$+2068.2	\$7615.8
b. Quantities --			
Development (RDT&E)	4	-	4
Procurement	15	+6	21
Total	19	+6	25
c. Unit Cost --			
Procurement:			
FY 78 Base-Year \$	\$206.307	\$-20.493	\$185.814
Then-Year \$	283.080	- .604	282.476
Program:			
FY 78 Base-Year \$	232.874	-15.374	217.500
Then-Year \$	\$291.979	\$+12.653	304.632
d. Approved Design to Cost Goal --	None		
e. Foreign Military Sales --	None		
f. Nuclear Costs --	None		

12.(U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	UCR Baseline (Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	7615.8	6841.2	7615.8
(2) Quantity	25	22	25
(3) Unit Cost	304.632	310.964	304.632
b. Current Procurement --	(FY 1987)	*(FY 1987)	(FY 1988)
(1) Cost	375.9	375.9	419.8
Less CY Adv Proc	-216.3	-216.3	-63.1
Plus PY Adv Proc	-	-	+72.4
Net Total	159.6	159.6	429.1
(2) Quantity	-	-	1
(3) Unit Cost	N/A	N/A	429.100

* Differs from the December 85 SAR to reflect the FY 1987 Appropriations Act.

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13. (U) Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1273.9	4246.2	27.5	5547.6
Previous Changes:				
Economic	-9.2	-93.6	-	-102.8
Quantity	-	+1094.8	-	+1094.8
Schedule	-	+51.8	-	+51.8
Engineering	-	-	-	-
Estimating	+73.5	-413.8	-	-340.3
Other	-	-	-	-
Support	+277.6	+312.5	-	+590.1
Subtotal	+341.9	+951.7	-	+1293.6
Current Changes:				
Economic	-6.2	-88.2	-	-94.4
Quantity	-	+1215.0	-	+1215.0
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-5.8	-373.1	-	-378.9
Other	-	-	-	-
Support	+52.5	-19.6	-	+32.9
Subtotal	+40.5	+734.1	-	+774.6
Total Changes	+382.4	+1685.8	-	+2068.2
Current Estimate	1656.3	5932.0	27.5	7615.8

(FY 1978 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1304.3	3094.6	25.7	4424.6
Previous Changes:				
Quantity	-	+500.7	-	+500.7
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+40.6	-203.1	-0.3	-162.8
Other	-	-	-	-
Support	+144.8	+159.1	-	+303.9
Subtotal	+185.4	+456.7	-0.3	+641.8
Current Changes:				
Quantity	-	+533.1	-	+533.1
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-4.1	-167.8	-	-171.9
Other	-	-	-	-
Support	+24.4	-14.5	-	+9.9
Subtotal	+20.3	+350.8	0	+371.1
Total Changes	+205.7	+807.5	-0.3	+1012.9
Current Estimate	1510.0	3902.1	25.4	5437.5

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13. (U) Cost Variance Analysis (Cont'd):

b. Previous Change Explanations --

RDT&E

Economic: revised economic escalation indices.

Estimating: revised prior year escalation indices and appropriated costs, revised prior-year approved costs, estimating changes associated with the acquisition of software upgrades to support Satellites 14-17 and on, change in acquisition strategy for Laser Crosslink subsystem.

Support: integration and other program level efforts to support the acquisition of an added satellite in FY 90 and 91. Hardware and software upgrades of ground stations to support SAT 14.

Procurement

Economic: revised economic escalation indices.

Quantity: acquisition of three additional satellite in FY 89, FY 90, and FY 91.

Schedule: one year delay of start of procurement for Satellite 18 and two years for Satellite 19.

Estimating: new satellite procurement strategy (two in FY 88 versus one each in years FY 87 and FY 88); revised prior year approved cost, escalation indices, and appropriated costs. New Acquisition Strategy (Multi-year Procurement) for Satellites. Revised FY 90 and FY 91 cost based on ICA. Estimating category adjustment.

Support: inclusion of previously deleted logistics items to support ground systems, support of additional satellite in FY 90 and FY 91. Ground Station hardware acquisition. Add Satellite Readout Station Upgrade Project. Support category adjustment.

MILCON

Adjustment to prior year inflation rate.

c. Current Change Explanations --

(1) RDT&E

(Dollars in Millions)
Base-Year Then-Year

Revised economic escalation indices.
(Economic)

N/A -6.2

Adjustment for current and prior year
inflation indices (Estimating)

+2.9 +6.2

Gramm-Rudman-Hollings and general
inflation reductions resulting in
reduced software testing. (Estimating)

-4.7 -8.0

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13. (U) Cost Variance Analysis (Cont'd):

Reprogramming to Titan 34D unfunded requirement resulting in delayed software system upgrades. (Estimating)	-2.3	-4.0
Decrease in Shuttle integration effort for FY 87. (Support)	-13.3	-23.5
Increased integration efforts associated with FY 88 Shuttle Recovery (Support)	+5.3	+9.7
Increased integration efforts associated with FY 89 Shuttle Recovery (Support)	+1.6	+3.0
Program Level efforts to support the acquisition of two new satellites in FY 92. (Support)	+30.8	+63.3

c. Current Change Explanations

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(2) <u>Procurement</u>		
Revised economic escalation indices. (Economic)	N/A	-88.2
Adjustment for current and prior year inflation indices. (Estimating)	-18.2	-32.2
Acquisition of three satellites, one in FY 91 and two in FY 92.	+403.5	+910.6
-- Acquisition of three satellites. (Quantity)	(+533.1)	(+1215.0)
-- Estimating changes applicable to acquisition of three satellites. (Estimating)	(-129.6)	(-304.4)
Congressional reductions resulting in launch delay of Sat 14. (Estimating)	-20.5	-41.1
Congressional reductions resulting in delayed software system upgrades. (Estimating)	-5.7	-10.6
Reprogramming to higher priority effort.	-1.0	-1.8

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13. (U) Cost Variance Analysis (Cont'd):

Estimating changes associated with a new acquisition strategy (MYP). (Estimating)	-14.4	-28.8
Additional integration effort for Titan 34D launch recovery. (Estimating)	+13.0	+27.0
Addition of two Laser Crosslink Systems. (Estimating)	+8.6	+18.8
Congressional reduction resulting in deletion of Mobile Communication Terminal Phase IIA effort. (Support)	-17.6	-33.0
Congressional reduction resulting in deletion of logistics support spares. (Support)	-25.2	-46.2
Addition of support for satellites 14 and on. (Support)	+28.3	+59.6

(3) MILCON

None.

d. References:

PMD No. R-S 4047 (26), June 5, 1986, subject: Defense Support Program;
PMP, December 15, 1982, subject: Defense Support Program.

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

Initial SAR Estimate to Current Estimate --

PAUC (Initial SAR /Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
291.979	-7.888	+22.317	+2.072	-	-28.768	-	+24.920	+12.653	304.632

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15. (U) Contract Information: (Then-Year Dollars in Millions)

a. RDT&E - None

b. Procurement

Mobile Ground Terminal
IBM Federal Systems Division,
Westlake Villiage, CA
F04701-81-C-0022, FPIF,
Award: April 13, 1981
Definitized: October 6, 1981

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$62.0	\$66.9	1

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$243.1	\$262.9	6

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$359.8	\$246.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$+0.6	\$-3.2
Cumulative Variances To Date (11/14/86)	-2.6	-4.5
Net Change	\$-3.2	\$-1.3

Explanation of Change: The Mobile Ground Terminal contract cost variance is unfavorable due primarily to problems encountered in the communications terminal. Late delivery of some items of Government Furnished Equipment and problems encountered in the phased array subsystem have impacted the schedule, but due to work-arounds no delay in the completion date is expected. There is no impact to the overall program.

Sensor 14-17 Production
Aerojet ElectroSystems Co., Azusa, CA,
F04701-81-C-0105, FPIF/AF,
Award: October 1, 1981
Definitized: April 1, 1982

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$104.7	\$113.4	4

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$296.2	\$322.7	4

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$305.5	\$310.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$+3.3	\$-2.7
Cumulative Variances To Date (12/31/86)	-5.0	-2.5
Net Change	\$-8.3	\$+0.2

Explanation of Change: The Sensor 14-17 cost variance is unfavorable due to design modifications to the Thermal Control System and additional integration and test activities. The program manager's assessment is that the contract will complete on time with a minor cost overrun at completion. This contract is over 95% complete and will no longer appear in future Selected Acquisition Reports.

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15. (U) Contract Information (Cont'd):

Satellite 14-17 Production and Long-Lead
 TRW Electronics and Defense,
 Redondo Beach, CA,
 F04701-82-C-0035, FFP/FPIF/CPFF,
 Award: March 11, 1982
 Definitized: December 15, 1982

Initial Contract Price		
Target	Ceiling	Qty
\$47.9	N/A	4

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$666.3	\$739.6	4	\$668.7M	\$686.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$- 5.2	\$-13.3
Cumulative Variances To Date (11/28/86)	\$-21.8	\$-28.3
Net Change	\$-16.6	\$-15.0

Explanation of Change: The contract cost variance has worsened due to schedule recovery expenditures in the communications subsystems and assembly and test areas. The schedule variance is due to technical problems with the communications subsystems. The program manager's assessment is that the contract will complete on time with a slight cost overrun at completion, but no impact to the program is expected.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 80.8% (21 yrs/26 yrs)
- (2) Percent Program Cost Appropriated: 60.0% (4566.4/7615.8)

b. Appropriation Summary --

Appropriation	Current & Prior Yrs (FY67-87)	(Then-Year Dollars in Millions)			Total
		Budget Year (FY88)	Balance To Complete FYDP (FY89-92)	Beyond FYDP N/A	
RDT&E	1271.1	106.6	278.6	-	1656.3
Procurement - Missile	2422.0	391.8	2006.9	-	4820.7
Procurement - Other	845.8	28.0	237.5	-	1111.3
MILCON	27.5	-	-	-	27.5
TOTAL	4566.4	526.4	2523.0	-	7615.8

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 78 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1967	-	-	-	57.1	-	-	30.8	3.1
1968	-	-	-	93.4	-	-	52.3	3.6
1969	-	-	-	162.4	-	-	95.3	4.2
1970	-	-	-	118.9	-	-	73.5	5.4
1971	-	-	-	130.7	-	-	84.4	5.3
1972	-	-	-	47.5	-	-	31.9	3.6
1973	-	-	-	46.7	-	-	32.3	3.6
1974	-	-	-	77.6	-	-	60.1	8.3
1975	-	-	-	40.7	-	-	34.4	10.8
1976	-	-	-	18.2	-	-	16.4	7.0
1977	-	-	-	30.4	-	-	29.4	7.5
1978	-	-	-	28.0	-	-	28.7	6.0
1979	-	-	-	27.2	-	-	30.6	8.4
1980	-	-	-	24.8	-	-	31.0	9.4
1981	-	-	-	63.2	-	-	87.6	11.9
1982	-	-	-	97.4	-	-	144.2	9.2
1983	-	-	-	76.9	-	-	119.2	4.9
1984	-	-	-	29.6	-	-	47.7	3.8
1985	-	-	-	38.1	-	-	63.3	3.4
1986	-	-	-	37.9	-	-	65.0	2.9
1987	-	-	-	63.7	-	-	113.0	3.1
1988	-	-	-	58.1	-	-	106.6	3.5
1989	-	-	-	39.5	-	-	74.8	3.5
1990	-	-	-	40.1	-	-	78.3	3.3
1991	-	-	-	30.9	-	-	62.0	2.9
1992	-	-	-	31.0	-	-	63.5	2.4
Subtotal	4	-	-	1510.0	-	-	1656.3	-

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 78 Base-Year Dollars			Then-Year Dollars			Esc1 Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Missile Procurement

1969	-	-	31.4	31.4	-	-	17.8	3.5
1970	-	-	62.3	62.3	-	-	37.0	4.7
1971	3	-	165.3	165.3	-	-	102.8	5.7
1972	2	-	157.5	157.5	-	-	105.2	3.7
1973	3	-	231.4	231.4	-	-	167.1	4.7
1974	-	-	38.1	38.1	-	-	28.1	8.4
1975	1	-	91.7	91.7	-	-	80.8	16.3
1976	-	-	42.1	42.1	-	-	39.5	7.9
1977	-	-	27.9	27.9	-	-	28.0	7.5
1978	-	-	88.9	88.9	-	-	94.1	6.0
1979	-	-	100.0	100.0	-	-	123.4	8.7
1980	-	-	73.9	73.9	-	-	103.9	9.7
1981	-	-	33.5	33.5	-	-	51.8	11.9
1982	-	-	146.9	146.9	215.2	-	241.4	9.6
1983	2	-	234.4	234.4	-	107.6	408.5	9.0
1984	2	-	186.7	186.7	-	107.6	340.4	8.0
1985	-	-	30.3	30.3	-	-	56.9	3.4
1986	-	-	60.4	60.4	-	-	117.2	2.9
1987	-	-	138.6	138.6	216.3	-	278.1	3.1
1988	1	-	189.2	189.2	63.1	72.4	391.8	3.5
1989	2	-	229.2	229.2	36.4	111.0	488.8	3.5
1990	1	-	246.0	246.0	12.3	72.4	538.4	3.3
1991	2	-	221.8	221.8	-	72.3	497.5	2.9
1992	2	-	209.9	209.9	-	-	482.2	2.4
Subtotal	21	-	3037.4	3037.4	543.3	543.3	4820.7	-

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 78 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Other Procurement

1969	-	-	-	31.3	-	-	17.6	3.5
1970	-	-	-	144.5	-	-	85.4	4.7
1971	-	-	-	56.5	-	-	35.0	5.7
1972	-	-	-	65.2	-	-	42.0	3.7
1973	-	-	-	27.6	-	-	19.0	4.7
1974	-	-	-	2.2	-	-	1.7	8.4
1975	-	-	-	6.4	-	-	5.6	16.3
1976	-	-	-	13.7	-	-	12.8	7.9
1977	-	-	-	13.6	-	-	13.6	7.5
1978	-	-	-	0.3	-	-	0.3	6.0
1979	-	-	-	6.0	-	-	7.6	8.7
1980	-	-	-	19.0	-	-	26.6	9.7
1981	-	-	-	46.8	-	-	70.3	11.9
1982	-	-	-	64.4	-	-	100.1	9.2
1983	-	-	-	54.4	-	-	87.8	4.9
1984	-	-	-	21.7	-	-	36.1	3.8
1985	-	-	-	33.8	-	-	58.0	3.4
1986	-	-	-	72.4	-	-	128.5	2.9
1987	-	-	-	53.3	-	-	97.8	3.1
1988	-	-	-	14.8	-	-	28.0	3.5
1989	-	-	-	3.1	-	-	6.0	3.5
1990	-	-	-	74.3	-	-	149.1	3.3
1991	-	-	-	11.1	-	-	22.8	2.9
1992	-	-	-	28.3	-	-	59.6	2.4
Subtotal	-	-	-	864.7	-	-	1111.3	-

Appropriation: Construction

1975	-	-	-	19.6	-	-	17.3	8.5
1976	-	-	-	-	-	-	-	-
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	1.1	-	-	1.9	4.9
1984	-	-	-	-	-	-	-	-
1985	-	-	-	4.7	-	-	8.3	3.4
Subtotal	-	-	-	25.4	-	-	27.5	-
Total	25	-	-	5437.5	-	-	7615.8	-

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DSP, December 31, 1986

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated ¹	Expended ¹
Appropriation: RDT&E			
1967	30.8	30.8	30.8
1968	52.3	52.3	52.3
1969	95.3	95.3	95.3
1970	73.5	73.5	73.5
1971	84.4	84.4	84.4
1972	31.9	31.9	31.9
1973	32.3	32.3	32.3
1974	60.1	60.1	60.1
1975	34.4	34.4	34.4
1976	16.4	16.4	16.4
1977	29.4	29.4	29.4
1978	28.7	28.7	28.7
1979	30.6	30.6	30.6
1980	31.0	31.0	31.0
1981	87.6	87.6	87.6
1982	144.2	144.2	144.2
1983	119.2	119.2	116.5
1984	47.7	47.7	46.0
1985	63.3	63.3	50.7
1986	65.0	64.0	22.8
1987	113.0	15.6	1.4
To Complete	385.2	-	-
Total	1656.3	1172.7	1100.3

Appropriation: Missile Procurement			
1969	17.8	17.8	17.8
1970	37.0	37.0	37.0
1971	102.8	102.8	102.8
1972	105.2	105.2	105.2
1973	167.1	167.1	167.1
1974	28.1	28.1	28.1
1975	80.8	80.8	80.8
1976	39.5	39.5	39.5
1977	28.0	28.0	28.0
1978	94.1	94.1	94.1
1979	123.4	123.4	123.4
1980	103.9	103.9	103.9
1981	51.8	51.8	51.8
1982	241.4	241.0	234.5
1983	408.5	399.3	394.9
1984	340.4	340.4	202.3
1985	56.9	45.2	43.3
1986	117.2	108.8	39.3
1987	278.1	22.1	0.7
To Complete	2398.7	-	-
Total	4820.7	2136.3	1894.5

¹ Obligation and expenditure data reflects Program Office records as of 31 Dec 86.

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DSP, December 31, 1986

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated ¹	Expended ¹

Appropriation: Other Procurement

1969	17.6	17.6	17.6
1970	85.4	85.4	85.4
1971	35.0	35.0	35.0
1972	42.0	42.0	42.0
1973	19.0	19.0	19.0
1974	1.7	1.7	1.7
1975	5.6	5.6	5.6
1976	12.8	12.8	12.8
1977	13.6	13.6	13.6
1978	0.3	0.3	0.3
1979	7.6	7.6	7.6
1980	26.6	26.6	26.6
1981	70.3	70.3	70.3
1982	100.1	96.3	83.7
1983	87.8	86.5	77.1
1984	36.1	27.3	21.3
1985	58.0	37.7	19.0
1986	128.5	44.3	17.2
1987	97.8	11.2	0.7
To Complete	265.5	-	-
Total	1111.3	640.8	556.5

Appropriation: Construction

1975	17.3	17.3	17.3
1976	-	-	-
1977	-	-	-
1978	-	-	-
1979	-	-	-
1980	-	-	-
1981	-	-	-
1982	-	-	-
1983	1.9	1.9	1.9
1984	-	-	-
1985	8.3	8.3	-
To Complete	-	-	-
Total	27.5	27.5	19.2

¹ Obligation and expenditure data reflects Program Office records as of 31 Dec 86.

DSP, 31 December 1986

17. (U) Production Rate Data: No report. Production less than 6 per year.

18. (U) Operating and Support Costs: N/A

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)

PROGRAM: EA-6B

AS OF DATE: DECEMBER 31, 1986INDEX

<u>SUBJECT</u>	<u>PAGE</u>
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PROGRAM ACQUISITION UNIT COST HISTORY	8
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1. DESIGNATION/NOMENCLATURE (POPULAR NAME):
EA-6B/TACTICAL ELECTRONIC WARFARE (PROWLER)

CLEARED
FOR OPEN PUBLICATION

AS AMENDED
MAR 03 1987

AS AMENDED
22

2. DOD COMPONENT: U.S. NAVY

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

3. RESPONSIBLE OFFICE AND TELEPHONE NUMBER:
NAVAL AIR SYSTEMS COMMAND
WASHINGTON, D.C. 20361

PROGRAM MANAGER: CAPT. R. R. BUEHLER
ASSIGNED: 13 SEPTEMBER 1984
TELEPHONE: 692-8083

4. PROGRAM ELEMENTS:
RDT&E: 25674N
PROCUREMENT: 24154N
APPN: 1506 ICN 0115
0116

5. RELATED PROGRAMS: A-6B INTRUDER, E-2/C, F-14 TOMCAT AND F-111.

Classified by: OPNAVINST 5500.7-20
Declassify on: ~~OPNDIC~~

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1812

6. MISSION AND DESCRIPTION: (U) MISSION: The EA-6B's primary mission is the suppression and degradation of enemy defense systems by tactical jamming of enemy electronic activity. Secondary missions include passive early warning for fleet defense and battlefield electronic surveillance. The EA-6B is a four place derivation of the highly successful A-6 series attack aircraft. It is equipped with a computer controlled electronics surveillance and control system and up to eleven high power jamming transmitters in various frequency bands depending on the particular mission. The EA-6B is powered by two J-52-P-408 engines. The aircraft is 59 feet in length and has a wing span of 55 feet.

(b)(1)



c. Change Since "As of" Date -- None

8. DECISION COORDINATING PAPER (DCP) THRESHOLD BREACHES: NONE

9. (U) SCHEDULE:

a. <u>MILESTONES</u>	<u>PRODUCTION ESTIMATE/ APPROVED PROGRAM</u>	<u>CURRENT ESTIMATE</u>
EA-6B NAVY DECISION COORDINATION PAPER (NO. 20 REV A)	JUNE 1971/JUNE 1971	JUNE 1971
EA-6B Standard Version (Board of Inspection Survey)	1971/1971	1971
EA-6B Standard Version (Navy Preliminary Evaluation)	1972/1972	1972
EXCAP EA-6B Operation Evaluation	MAY 74/MAY 74	MAY 74
EA-6B ICAP/ALQ-99 TJS (Navy Preliminary Evaluation)	NOV 75/NOV 75	NOV 75
ICAP ALQ-99 TJS (Navy Preliminary Evaluation)	APR 76/APR 76	APR 76
EA-6B EXCAP (Operation Evaluation)	JUL 76/JUL 76	JUL 76
SERVICE ACCEPTANCE TRIALS & TECH EVAL OF ICAP EA-6B; FINAL REPORT	NOV 77/NOV 77	NOV 77
EA-6B ICAP BIS	NOV 77/NOV 77	NOV 77
EA-6B ICAP AIRCRAFT (Operational Evaluation)	MAR 79/MAR 79	MAR 79
NAVY PRELIMINATION EVALUATION OF AN/ALQ-99 SYS IN EA-6B ICAP II AIRPLANE	MAR 82/MAR 82	MAR 82
ICAP II INITIAL TRIALS PHASE & NAVY TECHNICAL EVALUATION OF SERVICE ACCEPTANCE TRIALS, PROJ BIS 21323		
FINAL REPORT	SEP 82/SEP 82	SEP 82
OPERATIONAL EVALUATION OF ICAP II AIRCRAFT	DEC 82/DEC 82	DEC 82
BOARD OF INSPECTION SURVEY REPORT		
ICAP II	AUG 83/AUG 83	AUG 83
Full Scale Development (EA-6B ADVCAP)	MAR 83/MAR 83	MAR 83
First Flight	MAY 87/MAY 88	FEB 89 CH-1
CTE (Contractor Tech. Eval.)	FEB 85/AUG 87	SEP 88 CH-1
NPE I (Navy Prelim. Eval.)	AUG 87/JUN 88	MAY 91 CH-1
TECHEVAL (Technical Evaluation)	JUL 88/APR 89	JUN 91 CH-1
OPEVAL (Operational Evaluation)	DEC 88/JAN 91	SEP 91 CH-1
III B Full Prod. Delivery	MAY 89/SEP 91	APR 92 CH-1
First Delivery	SEP 90/JUL 92	AUG 93 CH-1

b. PREVIOUS CHANGE EXPLANATIONS: None

c. CURRENT CHANGE EXPLANATIONS: CH-1 Production Estimate/Approved Program milestones were updated to reflect the approved NDCP for EW Counter Response dated 9 September 1985.

CH-1 Current estimates reflects milestone changes that were necessary due to dollar reductions in the program in FY90 and FY91. The changes reflect Advance Capability (ADVCAP) going into production in FY92 instead of FY90 as originally scheduled.

d. REFERENCES: PBD 369-1 OF 30 DEC 1966

Approved Program: FY 88/89 President's Budget.

NDCP for EW Counter Response dated 9 September 1985.

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10. TECHNICAL/OPERATIONAL CHARACTERISTICS:a. ~~TECHNICAL~~PRODUCTION EST
APPROVED PROGDEMONSTRATED
PERFORMANCECURRENT
ESTIMATE

(b)(1)

b. OPERATIONALSpeed (Kts)

(1) Max at Sea Level	530/530	530	530
(2) Stall Speed (Power Approach)	104/103	103	103
Specific Range at Optimum Altitude(NM/lb)	.0836	.0906	.0906

Take off Distance

(over 50' obstacle)	5,530/4,360	4,360	4,360
Radius/Range (Combat) (NM)	304/942;304/942	304/942	304/942
Combat Ceiling Altitude (ft)	34,600/34,600	34,600	34,600
Mission Reliability	90.2/90.2	90.2	90.2

Maintainability(1) Standard Depot Level Maintenance
(SDLM)

N/A;N/A	24	24
---------	----	----

(2) Maintenance Man-hours per Flight Hour N/A;N/A

36	36
----	----

Weight (Takeoff) (lb)	58,600/58,600	58,600	58,600
-----------------------	---------------	--------	--------

Dimensions (Length/Span) (ft)	59/53;59/53	59/53	59/53
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c. PREVIOUS CHANGE EXPLANATIONS: None.

d. CURRENT CHANGE EXPLANATION: None.

e. REFERENCES: Prod Est. PBD 369-1 of 30 Dec 1966.
Approved Program: FY 88/89 President's Budget.

11. PROGRAM ACQUISITION COST:

	<u>PRODUCTION ESTIMATE BASELINE</u>	<u>CHANGES</u>	<u>CURRENT ESTIMATE</u>
a. COST			
DEVELOPMENT (RDT&E)	210.6	+125.2	535.8
PROCUREMENT	2,029.0	+1,379.8	3,408.8
AIRFRAME	639.9	(+541.4)	1,181.3
ENGINE	98.9	(+108.4)	207.3
OTHER GFE	490.9	(+418.3)	909.2
TOTAL FLYAWAY	1,229.7	(+1,068.1)	2,297.8
OTHER WPN SYS COST	678.6	(+300.9)	979.5
INITIAL SPARES	120.7	(+ 10.8)	131.5
CONSTRUCTION (MILCON)	-0-	-0-	-0-
TOTAL FY-84 BASE-YEAR	2,239.6	+1,505.0	3,744.6
ESCALATION	508.2	+190.0	698.2
DEVELOPMENT (RDT&E)	30.9	+18.7	49.6
PROCUREMENT	477.3	+171.3	648.6
CONSTRUCTION (MILCON)	-0-	-0-	-0-
TOTAL THEN-YEAR	2,747.8	+1,695.0	4,442.8
b. QUANTITIES			
DEVELOPMENT (RDT&E)	---	---	---
PROCUREMENT	38	+42	80
TOTAL	38	+42	80
c. UNIT COST			
PROCUREMENT			
FY-84 BASE-YEAR	53.4	-10.8	42.6
THEN-YEAR	65.9	-15.2	50.7
PROGRAM			
FY-84 BASE-YEAR	58.9	-12.1	46.8
THEN-YEAR \$'s	72.3	-16.8	55.5
d. APPROVED DESIGN TO GOAL COST: N/A			
e. FOREIGN MILITARY SALES: None			
f. NUCLEAR COSTS: None			

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12. PROGRAM ACQUISITION/CURRENT PROCUREMENT COST SUMMARY: (Current (Then Year)
Dollars in Millions)

	<u>CURRENT YEAR</u>		<u>BUDGET YEAR</u>
	<u>SAR CURRENT</u>	<u>UCR BASELINE</u>	<u>UCR BASELINE</u>
	<u>ESTIMATE(Dec '86)</u>	<u>ESTIMATE(Dec '85)</u>	<u>ESTIMATE(Dec '86)</u>
a. Program Acquisition --			
(1) Cost	4,442.8	4,235.5	4,442.8
(2) Quantity	80	86	80
(3) Unit Cost	55.5	49.3	55.5
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	446.4	446.4	357.4
Less CY ADV. Proc.	21.6	21.6	17.8
Plus PY ADV. Proc.	21.8	21.8	21.6
Net Total	446.6	446.6	361.2
(2) Quantity	12	12	6
(3) Unit Cost	37.2	37.2	60.2

13. COST VARIANCE ANALYSIS:

a. Summary -- (Current (Then Year) Dollars in Millions)

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
PRODUCTION ESTIMATE	241.5	2,506.3		2,747.8
PREVIOUS CHANGES				
ECONOMIC	+47.9	+606.6		+654.5
QUANTITY		+ 2,294.0		+ 2,294.0
SCHEDULE	+ 148.9			+ 148.9
ENGINEERING				
ESTIMATING	- 45.7	-1,655.9		-1,701.6
OTHER				
SUPPORT		+ 91.9		+ 91.9
SUBTOTAL	+ 151.1	+ 1,336.6		+ 1,487.7
CURRENT CHANGES				
ECONOMIC	- 2.5	- 97.8		- 100.3
QUANTITY		- 180.3		- 180.3
SCHEDULE		+ 25.8		+ 25.8
ENGINEERING				
ESTIMATING	- 4.7	+ 155.3		+ 150.6
OTHER				
SUPPORT		+ 311.5		+ 311.5
SUBTOTAL	- 7.2	+ 214.5		+ 207.3
TOTAL CHANGES	+143.9	+1,551.1		+1,695.0
CURRENT ESTIMATES	385.4	4,057.4		4,442.8

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13. COST VARIANCE ANALYSIS (Cont'd):
 (FY 84 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
PRODUCTION ESTIMATE	210.6	2,029.0		2,239.6
PREVIOUS CHANGES				
ECONOMIC				
QUANTITY		+1,798.1		+1,798.1
SCHEDULE	+124.5			+ 124.5
ENGINEERING				
ESTIMATING	+ 8.2	-694.1		-685.9
OTHER				
SUPPORT		+ 54.2		+ 54.2
SUBTOTAL	+132.7	+ 1,158.2		+ 1,290.9
CURRENT CHANGES				
ECONOMIC				
QUANTITY		-136.8		- 136.8
SCHEDULE		- 1.8		- 1.8
ENGINEERING				
ESTIMATING	- 7.5	+ 118.8		+ 111.3
OTHER				
SUPPORT		+ 241.4		+ 241.4
SUBTOTAL	- 7.5	+ 221.6		+ 214.1
TOTAL CHANGES	+ 125.2	+ 1,379.8		+ 1,505.0
CURRENT ESTIMATES	335.8	3,408.8		3,744.6

b. Previous Change Explanations:

(1) RDT&E

Economic: Revised escalation indices

Schedule: Increase is attributable to the acceleration of ALQ-149 into ICAP II aircraft, integration of HARM into ICAP II and ADVCAP aircraft development of Jammer Modulation, ADVCAP repricing and expanded frequency jammer development.

Estimating: Offset of revised escalation indices

(2) Procurement

Economic: Revised escalation indices

Quantity: Increase in the number of budgeted aircraft

Support: Increase in support material/services and initial spares

Estimating: Offset of revised escalation indices

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c. Current Change Explanations - (Dollars in Millions)

		BASE YEAR DOLLARS	THEN YEAR DOLLARS
(1) <u>RDT&E</u>			
Economic:	Revised escalation indices	N/A	-2.5
Estimating:	Offset of revised escalation indices	-7.5	-4.7
(2) <u>Procurement</u>			
Economic:	Revised escalation indices	N/A	-97.8
Quantity:	Reduction in the total number of budgeted aircraft for FY88-91.	-136.8	-180.3
Schedule:	Increase is associated with the stretchout of aircraft quantity in FY88-91 from twelve to nine (9) per year.	- 1.8	+25.8
Estimating:	Increase is related to inventory requirements for PODS (universal exciters, transmitters), and non-recurring costs for Receiver Processor Group (RPG), ALQ-149 & other proposed improvements.	+118.8	+155.3
Support:	Attributable to support material/services for Peculiar Ground Support Equipment (PGSE), Peculiar Training, Pubs/Tech. Data & Integrated Logistics Support for the Receiver Processor Group and ALQ-149.	+241.4	+311.5

(3) MILCON. None

c. References - Production Estimate (FY 88/89 President's Budget).

14. PROGRAM ACQUISITION UNIT COST (PAUC) HISTORY: Millions of then-year \$s
a. Initial SAR Estimate to Current Baseline Estimate

PAUC Pde EST.	CHANGES (THEN YEAR DOLLARS IN MILLIONS)								PAUC (CURRENT ESTIMATE)
	ECON	QTY	SCH	ENG	EST	OTHER	SPT	TOTAL	
72.3	+ 6.9	-11.5	+2.2		-19.4		+5.0	-16.8	55.5

15. CONTRACT INFORMATION: (Then-Year Dollars in Millions)
a. RDT&E: None

(UNCLASSIFIED)

b. PROCUREMENT:

Initial Contract Price

	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
AIRFRAME	\$185.4	N/A	12
Grumman Aerospace			
Long Island, NY			
N00019-85-C-0380			
FFP			
Award Date: May 1986			
Definitization: March 1987			

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$185.4	N/A	12

Estimated Price at Completion

<u>Contractor</u>	<u>Program Manager</u>
\$185.4	\$185.4

Initial Contract Price

	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
ENGINES	\$31.3	N/A	24
Pratt & Whitney			
West Palm Beach, FL.			
N00019-85-C-0383			
FFP			
Award Date: April 1986			
Definitized: May 1987			

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$31.3	N/A	24

Estimated Price At Completion

<u>Contractor</u>	<u>Program Manager</u>
\$31.3	\$31.3

Previous Cumulative Variances To Date -- None
 Cumulative Variance To Date (12/31/86) -- None

Initial Contract Price16. PROGRAM FUNDING SUMMARY: (Current Estimate In Millions of Dollars)

a. Program Status

- (1) Percent Program Completed: 55.5% (5yrs/9yrs)
 (2) Percent Program Cost Appropriated: 43.4% (\$1,928.6/\$4,442.8)

b. Appropriation Summary

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY84-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93)</u>	<u>Total</u>
RDT&E	192.4	54.6	138.4	-0-	385.4
Procurement	1,736.2	357.4	1,963.8	--	4,057.4
MILCON	-0-	-0-	-0-	--	-0-
TOTAL	1,928.6	412.0	2,102.2	--	4,442.8

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FISCAL YEAR	QTY	FY84 Base-Year Dollars		Then-Year Dollars		TOTAL	ESCL RATE (%)
		FLYAWAY NONREC	TOTAL REC	ADVANCE DEBIT	PROCUREMENT CREDIT		

c. Annual Summary

APPROPRIATION: RDT&E

1984			24.7			25.3	3.80
1985			34.1			35.8	3.40
1986			74.9			81.2	2.90
1987			44.8			50.1	3.10
1988			47.2			54.6	3.50
1989			22.2			26.5	3.50
1990			24.9			30.8	3.30
1991			26.2			33.2	2.90
1992			36.8			47.9	2.40
SUB-TOTAL			335.8			385.4	

APPROPRIATION: PROCUREMENT

1983				16.8	17.0		17.0	
1984	8	2.5	218.4	459.1	22.3	17.0	484.9	3.40
1985	6	10.0	183.1	349.3	22.3	22.3	379.2	3.40
1986	12	17.1	281.4	364.7	21.8	22.3	408.8	2.90
1987	12	3.9	297.6	385.2	21.6	21.8	446.4	3.10
1988	6	3.6	207.7	298.3	17.8	21.6	357.4	3.50
1989	9	46.4	241.0	411.3	18.2	17.8	507.3	3.50
1990	9	45.1	203.9	373.4	19.3	18.2	473.0	3.30
1991	9	25.8	214.8	374.4	36.1	19.3	485.8	2.90
1992	9	12.5	283.0	376.3	37.0	36.1	497.6	2.40
SUB-TOTAL								
TOTAL 80		166.9	2,130.9	3,408.8	233.4	196.4	4,057.4	
TOTAL 80		166.9	2,130.9	3,744.6	233.4	196.4	4,442.8	

d. Obligations and Expenditures

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1984	25.3	25.3	23.1
1985	35.8	35.8	32.2
1986	81.2	81.2	72.2
1987	50.1	30.0	-0-
To Complete	193.0	N/A	N/A
Total	385.4	172.3	127.5

(UNCLASSIFIED)

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: Procurement			
1984	501.9	481.9	363.3
1985	378.7	329.6	178.0
1986	408.8	315.6	67.0
1987	446.4	47.6	4.8
To Complete	2,321.7	N/A	N/A
Total	4,057.4	1,174.7	613.1

17. PRODUCTION RATE DATA:

a. Annual Production Rates

Fiscal Year	Development Estimate	Production Rates (Quantity/Year)		
		Production Estimate Baseline	Current Estimate	Maximum *
1984	N/A	8	8	24
1985	N/A	6	6	24
1986	N/A	12	12	24
1987	N/A	12	12	24
1988	N/A	12	6	24
1989	N/A	12	9	24
1990	N/A	12	9	24
1991	N/A	12	9	24
1992	N/A		9	24

* This rate is attainable with the participation of A6E aircraft.

b. Cost Variance - Dollars in Millions

Item		Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	
					Max	Maximum
Prog. Acq. Cost	(BY \$)	2,239.6	+1,505.4	3,744.6	--	3,744.6
	(TY \$)	2,747.8	+1,695.0	4,442.8	--	4,442.8
Pauc	(BY \$)	58.9	- 12.1	46.8	--	46.8
	(TY \$)	72.3	- 16.8	55.5	--	55.5

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c. Schedule Variance

	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum
Start Date	12/82	--	5/86	--	5/86
Duration	43	-1	38	-14	24
End Date	7/86	--	7/93		7/89

d. Deliveries (Plan/Actual)

	To Date
RD&E	0/0
Procurement	10/10

18. Operating and Support Cost: N/A

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④

N-12 E-6A(TACAMO)

SAR-86-005

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: E-6A

AS OF DATE: DECEMBER 31, 1986

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (CASD-PA)
DEPARTMENT OF DEFENSE

1. Designation/Nomenclature: E-6A Airborne Strategic Communications
2. DOD Component: U. S. Navy
3. Responsible Office and Telephone Number:

E-6A Program Office (PMA271)
Naval Air Systems Command
Washington, DC 20361

PM: Capt Ernest L. Lewis, USN
Assigned: 30 December 1985
AUTOVON: 222-8086
COMM: 202-692-8086

4. Program Elements/Procurement Line Items:
RDT&E: 11402N

PROCUREMENT: 11315N APPN 1506 ICN 0435

5. Related Programs: EC-130Q/TACAMO; E-3; TRIDENT Fleet

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6. Mission and Description: The E-6A, previously ECX, is a manned strategic communications relay platform (replacement for the EC-130/TACAMO aircraft) and is a critical node in the Minimum Essential Emergency Communications Network (MEECN). The primary mission of the E-6A is to monitor multiple networks in the VLF, HF, and UHF frequency spectrum, process Single Integrated Operational Plan (SIOP) Emergency Action Messages (EAMs) originating under JCS Emergency Action Procedures (EAP), and provide survivable and enduring communications connectivity from the National Command Authority (NCA) to the Fleet Ballistic Missile Submarine Forces (SSBNs) during pre-, trans-, and post-attack phases of general nuclear exchange. A secondary mission is to provide a survivable relay for tactical Command, Control and Communications (C³) capability between the NCA and other elements of the SIOP Plan/Secure Reserve Force including the Launch Control Centers (LCC), the Strategic Air Command (SAC) missile complex, and airborne command posts for Commander in Chief, Pacific (CINCPAC) and Commander in Chief, U.S. Naval Forces, Europe (CINCUSNAVEUR).

7. Program Highlights:

a. Significant Historical Developments -- In December 1981 a NADEC Decision Memorandum approved the ECX program. In January 1982, the Operational Requirement for TACAMO/ECX (OR W1438) was approved. On 11 February 1982, a Request for Quotation was released. A letter contract with Boeing Aerospace Company was signed on 29 April 1983 for the Full Scale Development effort and included options for fourteen (14) production aircraft. On 30 June 1983 ECX was formally designated as E-6A. FY 1986 President's Budget approved continuation of the development and procurement of the first two aircraft in FY-86. In July 1985 the contractor successfully completed its Critical Design Review. A Pre-CRB was completed in November 1985. The first EC-130 to be stripped of Mission Avionics was started in December 1985. The Class III mockup was completed in December 1985.

b. Significant Developments Since Last Report -- Production approval was received in February 1986, and the Full Scale Development/Pre-Production contract was definitized in June 1986. Production deliveries will commence in January 1989. Tinker AFB has been designated as the single site MIDCONUS E-6A home base. Navy Decision Coordinating Paper (NDCP) was approved January 1986, and the Test and Evaluation Master Plan (TEMP) was approved in November 1986. Prototype aircraft rollout took place on 18 December 1986. A DoD program budget decision was made in December 1986 to increase the total number of aircraft to be procured from 15 to 16.

The E-6A is expected to satisfy the mission requirements. Prototype aircraft is scheduled for its first flight on 19 February 1987 with flight testing to begin in June 1987.

8. Decision Coordinating Paper (DCP) Threshold Breached: DCP in process of being updated to latest approved program activities.

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E-6A, December 31, 1986

9. Schedule:

a. Milestones --	Development/Approved	Current
	<u>Estimate/ Program</u>	<u>Estimate</u>
Justification for Major Systems New		
Starts (JMSNS)(Substantiation with POM)	Jul 81/Jul 81	Jul 81
Program Initiation		
(NADEC Decision Memo)	Dec 81/Dec 81	Dec 81
Operational Requirement	Jan 82/Jan 82	Jan 82
Request for Quotations (RFQ)	Mar 82/Mar 82	Mar 82
Award of Full Scale Development Contract	May 83/Apr 83	Apr 83
Preliminary Design Review (PDR)	Oct 83/Nov 83	Nov 83
DNSARC III	Dec 83/TBD	Jun 87(CH-1)
Release Long Lead Production Funds	Dec 83/TBD	Jun 84
Critical Design Review (CDR)	Aug 84/Dec 84	Jul 85
First Test Flight	Aug 86/Nov 86	Jun 87
Navy Technical Evaluation (NTE)	Aug 87/Aug 87	Aug 87
Deliver Prototype Aircraft	Feb 87/Jan 88	Jan 89
Deliver First Production Aircraft	Aug 87/Jan 88	Jan 89

(b)(1)

b. Previous Change Explanations --

DNSARC III scheduled for Apr 85 was cancelled. SECNAV memo of 3 Feb 86 approved E-6A production.

c. Current Change Explanations --

- (CH-1) DNSARC will be rescheduled during third quarter FY-87.
- (CH-2) IOC date reflects current 2-3-3-7 production aircraft buy schedule.
- (CH-3) FOC date accelerated due to accelerated aircraft delivery schedule.

d. References:

Development Estimate: Operational Requirement W1438 ~~(Secret)~~ 11 Jan 1982 Annex C to JSPD FY 84-91 ~~(Secret)~~ PE 11402N.

Approved Program: FY 1988 President's Budget

¹ IOC reflects one (1) squadron fully operational.

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E-6A, December 31, 1986

10. Technical/Operational Characteristics:

	<u>Development/Approved Estimate/ Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. Technical --			
Weight Empty (lbs)	165,125/167,800	N/A	167,800
Maximum Gross Weight (lbs)	342,000/342,000	N/A	342,000
Maintainability (manhours/flt hr)	16.5/ 16.5	N/A	16.5

(b)(1)

b. Operational

Cruise Speed (Mach No.)	.75/ .75	N/A	.75
Endurance (hours)	14/ 14	N/A	14
Critical Field Length (feet)	7,500/ 7,500	N/A	7,500
Range (unrefueled: NM)	6,000/ 6,000	N/A	6,000
Extended Airborne Operations (hr)	72/ 72	N/A	72
EMP Hardened (Upset Margin - db)	30/ 30	N/A	30

(b)(1)

Emergency Operations

Critical Engine
Inoperative

Critical Engine
N/A Inoperative

c. Previous Change Explanations -- None

d. Current Change Explanations --

CH-1 First time values defined in SAR Baseline.

CH-2 First time values defined in SAR Baseline.

e. References --

Development Estimate: Operational Requirement W1438 ~~(Secret)~~ 11 Jan
1982 Annex C to JSPD FY 84-91 ~~(Secret)~~ PE #11402N.

Approved Program: FY 1988 President's Budget.

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11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	292.6	+33.7	326.3
Procurement	1,292.1	-211.3	1,080.8
Airframe	(653.7)	(+220.9)	(874.6)
Engines	(168.7)	(-168.7)	(-0-)
Avionics	(121.6)	(-120.5)	(1.1)
Total Flyaway	(944.0)	(-68.2)	(875.8)
Other Wpn Sys Cost	(213.2)	(-86.1)	(127.1)
Initial Spares	(134.9)	(-57.0)	(77.9)
Construction (MILCON)	-0-	+37.5	37.5
Total FY 82 Base-Year \$	1,584.7	(-140.1)	1,444.6
Escalation	667.0	-183.7	483.3
Development (RDT&E)	(61.6)	(-8.6)	(53.0)
Procurement	(605.4)	(-187.5)	(417.9)
Construction (MILCON)	(-0-)	(+12.4)	(12.4)
Total Then-Year \$	2,251.7	-323.8	1,927.9
b. Quantities --			
Development (RDT&E)	1	-	1
Procurement	14	+1	15
Total	15	+1	16
c. Unit Cost --			
Procurement:			
FY 82 Base-Year \$	92.3	-20.2	72.1
Then-Year	135.5	-35.6	99.9
Program:			
FY 82 Base-Year \$	105.6	-15.4	90.3
Then-Year \$	150.1	-29.6	120.5
d. Approved Design to Cost Goal -- None			
e. Foreign Military Sales -- None			
f. Nuclear Costs -- None			

12. Program Acquisition/Current Procurement Unit Cost Summary: (Current
(Then Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>
	<u>Dec 86 SAR</u>	<u>Dec 86 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition:			
(1) Cost	1,927.9	2,248.6	1,927.9
(2) Quantity	16	15	16
(3) Unit Cost	120.5	149.9	120.5

FY 1987 Appropriation Act

b. Current Procurement:	(FY 1987)	(FY 1987)	(FY 1988)
1) Cost	351.5	351.5	346.8
Less CY Adv Proc	71.4	71.4	137.7
Plus PY Adv Proc	53.2	53.2	71.4
Net Total	333.3	333.3	280.5
(2) Quantity	3	3	3
(3) Unit Cost	111.1	111.1	93.5

13. Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Development Estimate	354.2	1,897.5	-	2,251.7
Previous Changes:				
Economic	-5.7	-152.0	-1.5	-159.2
Quantity	-	-	-	-
Schedule	-	+57.9	-	+57.9
Engineering	-2.9	+199.6	-	+196.7
Estimating	+33.2	-65.8	+55.9	+23.3
Other	-	-	-	-
Support	+2.9	-124.7	-	-121.8
Subtotal	+27.5	-85.0	+54.4	-3.1
Current Changes:				
Economic	-3.6	-64.4	-0.7	-68.7
Quantity	-	+61.2	-	+61.2
Schedule	-	-63.4	-	-63.4
Engineering	-	-149.1	-	-149.1
Estimating	+1.2	+68.9	-3.8	+66.3
Other	-	-	-	-
Support	-	-167.0	-	-167.0
Subtotal	-2.4	-313.8	-4.5	-320.7
Total Changes	+25.1	-398.8	+49.9	-323.8
Current Estimate	379.3	1,498.7	49.9	1,927.9

13. Cost Variance Analysis (Cont'd):

(FY 82 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	292.6	1,292.1	-	1,584.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	+32.9	-	+32.9
Engineering	-2.4	+96.4	-	+94.0
Estimating	+26.8	-76.4	+41.3	-8.3
Other	-	-	-	-
Support	+8.2	-89.0	-	-80.8
Subtotal	+32.6	-36.1	+41.3	+37.8
Current Changes:				
Quantity	-	+41.1	-	+41.1
Schedule	-	-38.2	-	-38.2
Engineering	-	-103.5	-	-103.5
Estimating	+1.1	+21.4	-3.8	+18.7
Other	-	-	-	-
Support	-	-96.0	-	-96.0
Subtotal	+1.1	-175.2	-3.8	-177.9
Total Changes	+33.7	-211.3	+37.5	-140.1
Current Estimate	326.3	1,080.8	37.5	1,444.6

b. Previous Change Explanations --

RDT&E

Economic: revised escalation indices
 Engineering: revised test program scope
 Estimating: communications suites integration and testing
 Support: increased field requirements

Procurement

Economic: revised escalation rates
 Schedule: delivery schedule stretched out one year
 Engineering: revised mission avionics requirements
 Estimating: reduction caused by restructured; revised change order;
 availability of independent cost estimate
 Support: refinement of Support Equipment Requirement Document

MILCON

Economic: revised escalation rates
 Estimating: reduced hangar facility requirements

13. Cost Variance Analysis (Cont'd):

c. Current Change Explanations

	(Dollars in Millions)	
	<u>Base Year</u>	<u>Then Year</u>
(1) <u>RDT&E</u>		
Revised escalation rates (Economic)	N/A	-3.6
Availability of definitized contract price (estimating)	+1.1	+1.2
(2) <u>Procurement</u>		
Revised escalation rates (economic)	N/A	-64.4
Aircraft quantity increased by 1- (quantity)	+41.1	+61.2
Delivery schedule compressed (schedule)	-38.2	-63.4
Current E-6A procurement and EC-130 drawdown schedules require fewer new mission avionics suites to support prod. pipeline (engineering)	-103.5	-149.1
Availability of independent cost estimate (estimating)	+21.4	+68.9
Refinement of requirements for support equipment, peculiar training equipment, technical pubs, and production support based on current basing plan and support concept (support)	-96.0	-167.0
(3) <u>MILCON</u>		
Revised escalation rates (economic)	N/A	-0.7
Reduced hangar facility requirements (estimating)	-3.8	-3.8

d. References --

Development Estimate: Operational Requirement W1438 ~~(Secret)~~ 11 Jan
1982 Annex C to JSPD FY 84-91 ~~(Secret)~~ PE #11402N.

14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate

(1) Same as Current Baseline Estimate.

b. Current Baseline Estimate to Current Estimate

PAUC (Development Estimate)	Changes (Then Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
150.113	-14.244	-5.557	-.343	+2.975	+5.600	-18.050	-	-29.619	120.494

15. Contract Information: (Dollars in Millions)

a. RDT&E

FSD Aircraft:

Boeing Aerospace Co.,

Seattle, Washington

N00019-83-C-0176, Letter Contract

Award date: 29 April 1983

Definitization date: June 1986

Initial Contract Price

Target	Ceiling	Qty
308.8	308.1	1

Current Contract Price

Target	Ceiling	Qty
316.5	N/A	1

Estimated Price At Completion

Contractor	Program Manager
316.5	316.5

Previous Cumulative Variances

Cumulative Variances to Date

Net Change

Cost Variance

N/A

N/A

N/A

Schedule Variance

N/A

N/A

N/A

Explanation of Change: FSD contract definitized FFP.

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

b. Procurement --

			Initial Contract Price		
			Target	Ceiling	Qty
Production Aircraft					
Boeing Aerospace Co.,			1,634.7	1,634.7	14
Seattle, Washington					
N00019-83-C-0176, Advance Acquisition Contract					
Award date: 30 June 1984					
Definitization: FY 86/87-Sep 87; FY 88-Sep 88; FY 89-Sep 89					

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
1,283.2	1,283.2	14	1,181.8	1,181.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances to Date	N/A	N/A
Net Change	N/A	N/A

Explanation of Change: N/A

c. MILCON: N/A

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 77% (7 yrs/9 yrs)

(2) Percent Program Cost Appropriated: 1,132.2/1,930.9 58%

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs FY81-87)	Budget Year (FY88)	Balance FYDP (FY89-91)	To Complete Beyond FYDP (FY92)	Total
RDT&E	343.1	36.2	-	-	379.3
Procurement	788.9	346.8	363.0	-	1,498.7
MILCON	-	11.8	38.1	-	49.9
Total	1,132.0	394.8	401.1	-	1,927.9

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E-6A, December 31, 1986

16. Program Funding Summary (Cont'd)

c. Annual Summary --

Fiscal Year	Qty	FY 82 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Nonrec	Flyaway Rec	Total	Advance Debit	Proc Credit	Total	

Appropriation: RDT&E

1981				.9			.9	10.6
1982				1.0			1.0	7.6
1983	1			34.7			37.2	4.9
1984				63.0			70.0	3.8
1985				58.9			67.4	3.4
1986				76.4			90.2	2.9
1987				62.7			76.4	3.1
1988				28.7			36.2	3.5
Subtotal	1			326.3			379.3	

Appropriation: Procurement

1984				74.3	97.9		97.9	8.0
1985				0.0	0.0		0.0	3.4
1986	2	115.7	140.6	256.3	53.2	97.9	339.4	2.9
1987	3	2.6	253.8	256.4	71.4	53.2	351.5	3.1
1988	3	1.4	242.1	243.5	137.7	71.4	346.8	3.5
1989	7		250.3	250.3	0.0	137.7	363.0	3.5
1990					-	-	-	-
1991					-	-	-	-
Subtotal	15	119.7	886.8	1,080.8	360.2	360.2	1,498.7	

Appropriation: MILCON

1988				9.1			11.8	3.5
1989				28.4			38.1	3.5
Subtotal				37.5			49.9	

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16. Program Funding Summary (Cont'd)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1981	.9	.9	.9
1982	1.0	1.0	1.0
1983	37.2	37.2	33.3
1984	70.0	70.0	60.4
1985	67.4	67.3	65.3
1986	90.2	89.7	18.0
1987	76.4	20.0	.1
To Complete	36.2	N/A	N/A
Total	379.3	286.1	179.0
Appropriation: Procurement			
1984	97.9	97.9	97.4
1985	-	-	-
1986	339.5	334.7	68.9
1987	351.6	-0-	-0-
To Complete	709.8	N/A	N/A
Total	1,498.8	432.6	166.3

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1985	2	N/A	0	N/A
1986	3	N/A	2	N/A
1987	3	N/A	3	N/A
1988	3	N/A	3	N/A
1989	3	N/A	7	N/A
1990		N/A		N/A
1991				
1992				

17. Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost BY\$	N/A	N/A	1,444.6	N/A	N/A
TY\$	N/A	N/A	1,927.9	N/A	N/A
PAUC BY\$	N/A	N/A	90.3	N/A	N/A
TY\$	N/A	N/A	120.5	N/A	N/A

c. Schedule Variance --

	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	N/A	N/A	FEB/86	N/A	N/A
Duration (in Months)	N/A	N/A	35	N/A	N/A
End Date (Mo/Yr)	N/A	N/A	JAN/91	N/A	N/A

d. Deliveries (Plan/Actual --

	To Date
RD&E	0/0
Procurement	0/0

18. Operating and Support Costs: N/A

A-4 ATACMS

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: Army Tactical Missile System (Army TACMS)

AS OF DATE: December 31, 1986

86-024

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1 CONCUR IN CLASSIFICATION

AS MARKED RMT 5

FEB 25 1987

3. DIRECTORATE FOR FREEDOM OF INFORMATION

4 AND SECURITY REVIEW (OASD-PA)

5 DEPARTMENT OF DEFENSE

1. Concur in Classification
 2. As marked

3 FEB 1987

SECURITY REVIEW, OACSI, HQDA

1. (U) Designation and Nomenclature (Popular Name): Not Assigned/Army
 Tactical Missile System (Army TACMS)

2. (U) DoD Component: Department of the Army

3. (U) Responsible Office and Telephone Number:
 Army Tactical Missile System Project
 Office (AMCPM-AT)
 US Army Missile Command
 Redstone Arsenal, AL 35898-5650

COL Thomas J. Kunhart
 Assigned: March 15, 1985
 AV 746-1141
 COMM (205) 876-1141

4. (U) Program Elements/Procurement Line Items:

RDT&E: PE 64324 Project D302

PROCUREMENT: SSN C98500 (System) APPN 2032

SSN CA0261 (Initial Spares) APPN 2032

MILCON: N/A

5. (U) Related Programs: Multiple Launch Rocket System (MLRS); Infrared
 Terminally Guided Submunition (IRTGSM)

6. (U) Mission and Description:

(U) The Army has an urgent need for a long-range weapon that operates in near all weather, day or night, is air transportable and capable of effectively engaging high priority land targets at ranges beyond the capability of cannons, rockets and the LANCE Missile System. The system will be used to attack tactical surface-to-surface missile sites, air defense systems, logistic elements, command/control/communication complexes, and second echelon maneuver units arrayed in depth throughout the corps area of influence.

OASD(PA) DFOISR

87-T-0387

CLASSIFIED BY: Army TACMS SCG

DECLASSIFY ON: OADR

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Army TACMS, December 31, 1986

(U) The Army TACMS will be developed and fielded to meet the Army's need. The system will be a ground-launched missile system consisting of a surface-to-surface guided ballistic missile with an Anti-Personnel/Anti-Materiel (APAM) warhead configuration. A later phase of the program will be development of an advanced technology warhead. Army TACMS will be fired from the modified M270 MLRS launcher. The system shall utilize targeting systems, engagement systems, and command and control systems that are the same as MLRS.

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- In 1981, the Army established a Special Task Force (STF) to initiate development of requirements for a Corps Support Weapon System (CSWS) to engage high priority targets at ranges beyond those of existing weapons. At approximately the same time, the Air Force initiated development of a Conventional Stand-Off Weapon (CSW) to attack high value, heavily defended, land and sea targets for global force employment. In June 1982, DoD directed the merger of these two programs into a joint development designated as the Joint Tactical Missile System (JTACMS). The objective of the program was to develop and field a missile with maximum commonality to meet the requirements of both services. In 1983, a TRADOC study resulted in an Army decision to utilize the MLRS launcher to fire the JTACMS. In 1984, a joint service decision was made to abandon efforts to develop a common missile and DoD approved the Army's request to develop an Army peculiar weapon to counter Warsaw Pact second echelon forces. During FY 85, the name was changed to Army TACMS and the Required Operational Capability (ROC) was approved in May 1985. In June 1985, the Assistant Secretary of the Army for Research, Development and Acquisition (SARDA) approved release of the Request for Proposals (RFPs) for the Full Scale Development program. A competitive RFP was issued for the Missile/Launch Pod Assembly (M/LPA) and a sole source RFP was issued to the MLRS prime contractor for the integration of the Army TACMS with the MLRS launcher. The Army System Acquisition Review Council (ASARC) approved the program in December 1985. The Defense System Acquisition Review Council (DSARC) approved the program in February 1986. The Secretary of Defense Decision Memorandum (SDDM) was issued on March 18, 1986. After a formal source selection evaluation, a competitive contract was awarded March 26, 1986 for the M/LPA. The sole source integration contract was awarded March 27, 1986. A Decision Coordinating Paper (DCP) was submitted on May 20, 1986 and received OSD approval on September 11, 1986.

b. (U) The September 30, 1986 Quarterly SAR was approved to rebase-line from a Planning Estimate (PE) to a Development Estimate (DE) that reflects the program approved at Milestone II (DSARC). The system Test and Evaluation Master Plan (TEMP) was approved by OSD on 31 Dec 86. All preliminary reviews were successfully completed. Army TACMS testing is to start in FY88 and these tests are expected to demonstrate that the mission requirements will be satisfied.

c. (U) Changes Since "As Of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (approved September 11, 1986) or SDDM (dated March 18, 1986) breaches.

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Army TACMS, December 31, 1986

9. (U) Schedule:

a. (U) Milestones --	Development Estimate/	
	<u>Approved Program</u>	<u>Current Estimate</u>
(U) Began Assault Breaker Technology Demonstration	Apr 78/Apr 78	Apr 78
(U) Began Special Task Force	Mar 81/Mar 81	Mar 81
(U) Mission Element Need Statement (MENS) Approval	Apr 81/Apr 81	Apr 81
(U) Joint Program Directed	Jun 82/Jun 82	Jun 82
(U) Completed Assault Breaker Technology Demonstration	Dec 82/Dec 82	Dec 82
(U) ROC Approved	May 85/May 85	May 85
(U) RFP Released	Jun 85/Jun 85	Jun 85
(U) Milestone II (ASARC)	Dec 85/Dec 85	Dec 85
(U) Milestone II (DSARC)	Feb 86/Feb 86	Feb 86
(U) FSD Contract Award	Mar 86/Mar 86	Mar 86
(U) Milestone III (ASARC)	/Sep 89	Sep 89 (Ch-1)

(b)(1)

b. (U) Previous Change Explanations -- None

c. (U) Current Change Explanations --

(U) (Ch-1) Milestone III was added to the schedule.

d. (U) References --

(U) Development Estimate: SDDM, dated March 18, 1986, subject: "Army Tactical Missile System (Army TACMS) Block I" based on Milestone II (DSARC) decision.

(U) Approved Program: FY88-FY89 President's Budget, dated January 5, 1987.

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Army TACMS, December 31, 1986

10. (U) Technical/Operational Characteristics:

a. (U) Technical --	Development Estimate/ Approved <u>Program</u>	Demonstrated <u>Performance</u>	Current <u>Estimate</u>
---------------------	--	------------------------------------	----------------------------

(b)(1)



c. (U) Previous Change Explanations -- None

d. (U) Current Change Explanations -- None

e. (U) References --

(U) Development Estimate: SDDM, dated March 18, 1986, subject "Army Tactical Missile System (Army TACMS) Block I" based on Milestone II (DSARC) decision.

(U) Approved Program: FY88-FY89 President's Budget, dated January 5, 1987.

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Army TACMS, December 31, 1986

11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

		Development		Current
		Estimate	Changes	Estimate
a. (U) Cost —				
Development (RDT&E)	\$	651.5	\$ - 44.5	\$ 607.0
Procurement		484.4	- 12.2	472.2
Missiles	(	460.8)	(- 12.2)	(448.6)
Ground Support Equipment	(	.8)		(.8)
Total Flyaway	(	461.6)	(- 12.2)	(449.4)
Other Weapon System Cost	(	22.2)		(22.2)
Initial Spares	(	.6)		(.6)
Total FY87 Base-Year \$	\$	1135.9	\$ - 56.7	\$ 1079.2
Escalation		86.4	- 2.3	84.1
Development (RDT&E)	(	5.2)	(- 2.5)	(2.7)
Procurement	(	81.2)	(+ .2)	(81.4)
Total Then-Year \$	\$	1222.3	\$(- 59.0)	\$ 1163.3
b. (U) Quantities —				
Development (RDT&E)		50	-0-	50
Procurement		1000	-0-	1000
Total		1050		1050
c. (U) Unit Cost —				
Procurement:				
FY 87 Base-Year \$	\$	.48	-.01	\$.47
Then-Year \$	\$	.57	-.02	\$.55
Program:				
FY 87 Base-Year \$	\$	1.08	\$ -.05	\$ 1.03
Then-Year \$	\$	1.16	\$ -.05	\$ 1.11
d. (U) Approved Design to Cost Goal — (Average Unit Flyaway Cost)				
		Development		Latest
		Estimate/		Approved
		Approved	Current	Threshold
		Program	Estimate	
Missiles				
@ Qty:		1000/1000	1000	1000
@ Peak Rate:		38-Mo/38-Mo	38-Mo	38-Mo
FY 87 Base Year \$		\$.462/\$.449	\$.449	\$.494
1/ Then-Year \$		\$.539/\$.513	\$.513	\$.593
1/ The following entries were incorrectly reported in the September 30, 1986 SAR and have been corrected accordingly:				
Then-Year \$.539 replaces \$.462				
Then-Year \$.593 replaces \$.508				
e. (U) Foreign Military Sales — None				
f. (U) Nuclear Costs — None				

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Army TACMS, December 31, 1986

12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

		Current Year		Budget Year
		Current Est Dec 86 SAR	UCR Baseline Dec 85 SAR	UCR Baseline Dec 86 SAR
a. (U)	Program Acquisition --			
	(1) (U) Cost	1163.3	1604.8	1163.3
	(2) (U) Quantity	1050	1055	1050
	(3) (U) Unit Cost	1.1	1.5	1.1
b. (U)	Current Procurement --	N/A -- First year of Procurement quantity is in FY 89		

13. (U) Cost Variance Analysis:

a. (U) Summary --

(Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	656.7	565.6	-0-	1222.3
Previous Changes:				
Economic				
Quantity				
Schedule				
Engineering				
Estimating				
Other				
Support				
Subtotal	-0-	-0-	-0-	-0-
Current Changes:				
Economic	- .9	- 2.0		- 2.9
Quantity				
Schedule				
Engineering				
Estimating	- 46.1	- 10.0		- 56.1
Other				
Support				
Subtotal	- 47.0	- 12.0	-0-	- 59.0
Total Changes	- 47.0	- 12.0	-0-	- 59.0
Current Estimate	609.7	553.6	-0-	1163.3

13. (U) Cost Variance Analysis (Cont'd):
 (FY 1987 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	651.5	484.4	-0-	1135.9
Previous Changes:				
Quantity				
Schedule				
Engineering				
Estimating				
Other				
Support				
Subtotal	-0-	-0-	-0-	-0-
Current Changes:				
Quantity				
Schedule				
Engineering				
Estimating	- 44.5	- 12.2		- 56.7
Other				
Support				
Subtotal	- 44.5	- 12.2	-0-	- 56.7
Total Changes	- 44.5	- 12.2	-0-	- 56.7
Current Estimate	607.0	472.2	-0-	1079.2

b. (U) Previous Change Explanations -- None

c. (U) Current Change Explanations — (Dollars in Millions)
Base-Year Then-Year

(1) (U) RDTE

Revised economic escalation indices. (Economic) \$ - .9

Program cost estimate revision is mandated by a funding reduction contained in Program Budget Decision (PBD) 231. TRACE will be adjusted in order to comply with approved funding. (Estimating) \$ - 44.5 \$ - 46.1

(2) (U) Procurement

Revised economic escalation indices. (Economic) \$ - 2.0

Program cost estimate revision \$ - 12.2 \$ - 10.0

The following areas will be reduced in order to comply with approved funding: (Estimating)

(Engineering Services \$ - 3.1 \$ - 2.5)
 (TRACE-P \$ - 9.1 \$ - 7.5)

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Army TACMS, December 31, 1986

d. (U) References --

(U) Development Estimate: SDDM, dated March 18, 1986, subject: "Army Tactical Missile System (Army TACMS) Block I" based on Milestone II (DSARC) decision.

(U) Approved Program: FY88-FY89 President's Budget, dated January 5, 1987.

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year dollars)

a. (U) Initial SAR Estimate to Current Baseline Estimate --

PAUC (Dec 84 SAR Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
2.087	-.083	-.002		+.138	-.991		+.015	-.923	1.164

Since quantities were not available in the Initial SAR (September 1984), this entry assumes the current estimate of the first SAR in which quantities appeared (i.e., December 1984).

b. (U) Current Baseline Estimate to Current Estimate --

PAUC (Dev Est)	Changes								PAUC (Cur Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1.164	-.003				-.053				1.108

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E --

M/LPA:

LTV Aerospace & Defense Co.
Dallas, TX

/1 DAAH01-86-C-A036, FPI

Award: March 26, 1986

Definitized: Not Applicable

Initial Contract Price

Target	Ceiling	Qty
\$180.4	\$203.4	50

Current Contract Price

Target	Ceiling	Qty
\$180.4	\$203.4	50

Estimated Price at Completion

Contractor	Program Manager
\$ 180.4	\$ 180.4

Previous Cumulative Variances
Cumulative Variances to Date
(10/31/86)

Net Change

Cost Variance	Schedule Variance
\$.163	\$ - .690
\$.277	-3.520
\$.114	\$ -2.830

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Army TACMS, December 31, 1986

15. (U) Contract Information (Cont'd):

a. (U) RDT&E --

M/LPA (Cont'd)

Explanation of Change: Personnel strength was below that projected creating a negative schedule variance - no program impact is expected.

/1 This contract also includes \$2.7 in Firm-Fixed Price RDTE Test Support Flight Options which are not reflected in the above prices. There are also Production Options with Not-To-Exceed amounts that may total up to \$408.4.

<u>Integration:</u>	<u>Initial Contract Price</u>		
LTV Aerospace & Defense Co.	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Dallas, TX	\$ 83.0	\$ 94.4	0
/2 DAAH01-86-C-A037, FPI			
Award: March 27, 1986			
Definitized: Not Applicable			

<u>Current Contract Price</u>			<u>Estimated Price at Completion:</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 87.7	\$ 99.8	0	\$ 87.0	\$ 87.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$.624	\$ - .435
Cumulative Variances to Date	\$.733	\$ - 1.797
(10/31/86)		
Net Change	\$.109	\$ - 1.362

Explanation of Change: Personnel strength was below that projected creating a negative schedule variance - no program impact is expected.

/2 This contract also includes a maintenance effort under a CPFF portion in the amount of \$3.4 M which is not reflected in the above prices.

b. (U) Procurement -- N/A

c. (U) MILCON -- N/A

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status

(U) (1) Percent Program Completed: 62% (8 yrs/13 yrs)

(U) (2) Percent Program Cost Appropriated: 31% (361.9/1163.3)

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Army TACMS, December 31, 1986

16. (U) Program Funding Summary Cont'd:

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY80-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance To Complete</u>		<u>Total</u>
			<u>FYDP (FY 89-92)</u>	<u>Beyond FYDP (FY93)</u>	
RDTE	\$ 361.9	\$ 112.2	\$ 135.6	-0-	\$ 609.7
Procurement	-0-	16.9	536.7	-0-	553.6
MILCON	-0-	-0-	-0-	-0-	-0-
Total	\$ 361.9	\$ 129.1	\$ 672.3	-0-	\$ 1163.3

c. (U) Annual Summary --

Fiscal Year	Qty	FY 87 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1980				13.4			9.4	10.6
1981				18.0			14.0	10.6
1982				14.1			11.8	7.6
1983				6.8			6.0	4.9
1984				53.9			50.2	3.8
1985				79.5			76.4	3.4
1986				110.1			109.3	2.9
1987				82.8			84.8	3.1
1988				105.9			112.2	3.5
1989				79.1			86.6	3.5
1990				43.4			49.0	3.3
Subtotal	50			607.0			609.7	

Appropriation: Procurement

1988		N/A	N/A	15.4	1.8		16.9	3.5
1989	66	N/A	65.4	72.0	4.3	1.8	81.3	3.5
1990	276	N/A	129.1	136.4	7.6	4.3	158.2	3.3
1991	452	N/A	173.7	175.9	4.9	7.6	209.0	2.9
1992	206	N/A	81.2	72.5		4.9	88.2	2.4
Subtotal	1000		449.4	472.2	18.6	18.6	553.6	
TOTAL	1050			1079.2			1163.3	

1/ \$186M in the TOC of the FYDP is in error and is not part of the program.

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Army TACMS, December 31, 1986

16. (U) Program Funding Summary (Cont'd):

d. (U) Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1980	9.4	9.4	9.4
1981	14.0	14.0	14.0
1982	11.8	11.8	11.7
1983	6.0	5.7	5.6
1984	50.2	34.0	26.4
1985	76.4	51.2	23.8
1986	109.3	106.7	20.5
1987	84.8	58.4	.1
1988	112.2	N/A	N/A
1989	86.6	N/A	N/A
1990	49.0	N/A	N/A
Total	609.7	291.2	111.4

17. (U) Production Rate Data:

(U) a. Annual Production Rates --

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1990	66	N/A	66	N/A
1991	276	N/A	276	N/A
1992	452	N/A	452	N/A
1993	206	N/A	206	N/A

(U) b. Cost Variance -- N/A

(U) c. Schedule Variance -- N/A

(U) d. Deliveries (Plan/Actual) --

RDTE
Procurement

To Date
0/0
0/0

18. (U) Operating and Support Costs:

N/A

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: V-22 (JVX)

AS OF DATE: December 31, 1986

<u>SUBJECT</u>	<u>INDEX</u>	<u>PAGE</u>
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- Designation/Nomenclature (Popular Name): V-22 Joint Services Advanced Vertical Lift Aircraft (Osprey)
- DoD Component: U.S. Marine Corps, U.S. Navy, U.S. Air Force, U.S. Army
- Responsible Office and Telephone Number:

Naval Air Systems Command
PMA-275
Washington, D.C.

PM: COL H.W. Blot, USMC
Assigned: January 21, 1986
(202) 692-7413
AUTOVON 222-7413
- Program Elements:

RDT&E: PE 63203N
PE 64262N
PE 63256N
PE 64222A
PE 63256F
PE 64219F

PROCUREMENT: APPN 1506 ICN 0163
PE 26497M
PE 26121M
PE 44011F

MILCON: N/A
- Related Programs: None

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6. Mission and Description: The V-22 Osprey is a Department of the Navy program for the purpose of developing, testing, evaluating, procuring and fielding a tilt rotor, vertical take off and landing aircraft for Joint Service application. The V-22 program is designed to provide an aircraft to meet the amphibious/vertical assault needs of the Marine Corps, the combat search and rescue (CSAR) needs of the Navy, and the special operations needs of the Air Force. The Army has stated the USMC medium lift version will be procured by that service. The V-22 will replace the CH-46 in the Marine Corps, the HH-3A in the Navy, and supplement H-53, H-60 and C-130 in the Air Force. The V-22 will be capable of flying over 2000 nautical miles without refueling, giving the Services the advantage of a VSTOL aircraft that can rapidly self-deploy to any location in the world.

7. Program Highlights:

a. Significant Historical Developments -- Preliminary Design was initiated in April 1983 with contract award to the joint Bell Boeing team. Trade studies, wind tunnel tests, and mockups provided the information required to enter full scale development. Also effort was initiated for long leadtime tasks to protect the schedule required by the Marine Corps. An initial effort to provide an interim engine for schedule protection was initiated and later terminated when the competitive proposals for the development of the engine indicated all offerors could meet the required schedule dates. Allison Gas Turbine Division of General Motors Corp. was announced as the winning competitor.

b. Significant Developments Since Last Report -- On 17 April 1986 the V-22 program was reviewed by the DSARC for the Milestone II decision. The SDDM was signed 1 May 1986 approving entry into Full Scale Development. Contracts for the development of the airframe and engine were executed on 2 May 1986 for \$1.8B (FPI, ceiling) and \$76.4M (FFP) respectively. Not to exceed (NTE) options for the first three lots of aircraft production were submitted in November 1986 to the Navy and are being incorporated into the FSD airframe contract. A Joint Requirements and Management Board (JRMBS) conducted a review of the V-22 program on 18 December 1986 and authorized continuance of the development program. Although no signed SDDM has been promulgated, informal authority has been given to Navy by OSD to continue exploring the potential of an antisubmarine warfare (ASW) variant of the V-22 with a Milestone II review in the November 1987 timeframe. As a result of the Milestone II decision, this SAR has been rebaselined to a Development Estimate incorporating for the first time the combined program requirements for the Navy, Air Force and Army requirements. The Development/Current Estimate of cost reflects the FY88/89 President's Budget for the Navy and the Air Force. The Army portion of the Development baseline reflects the estimate contained in the Decision Coordinating Paper dated May 1986.

c. The V-22 system is expected to satisfy all the mission requirements.

d. Changes Since "As Of" Date: None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: Not applicable.

9. Schedule:

a. Milestones	Planning Estimate/	Development Estimate/
	Approved Program	Current Estimate
✓ Milestone 0 (DEPSECDEF Memo)	Dec 81/Dec 81	Dec 81
✓ Milestone I (DEPSECDEF Memo)	Dec 82/Dec 82	Dec 82
✓ Preliminary Design Contract Award	Apr 83/Apr 83	Apr 83
✓ Milestone II (DSARC II)	May 85/Apr 86	Apr 86 (CH-4)
✓ FSD Contract Award	- /May 86	May 86 (CH-4)
First Flight	Aug 87-N/A	N/A (CH-2)
Development Testing IIC	Feb 89-N/A	N/A (CH-2)
✓ Production Contract Award (Adv Acq)	- /Jan 89	Jan 89 (CH-4)
✓ Operational Testing IIA	Jun 89/Aug 89	Aug 89 (CH-3)
✓ Milestone IIIA (USMC Pilot Prod)	Jul 89/Dec 89	Dec 89 (CH-3)
✓ Operational Testing IIB	- /Aug 90	Aug 90 (CH-4)
✓ Milestone IIIB (All Serv Ltd Prod)	- /Dec 90	Dec 90 (CH-4)
✓ Operational Testing IIC (OPEVAL)	- /Aug 91	Aug 91 (CH-4)
✓ Operational Testing IID (AF OPEVAL)	- /Aug 91	Aug 91 (CH-4)
✓ First Fleet Deliveries	Jul 91/Dec 91	Dec 91 (CH-5)
✓ Milestone IIIC (USN/MC/A Full Prod)	/Dec 91	Dec 91 (CH-4)
✓ Milestone IIID (USAF Full Prod)	- /Dec 91	Dec 91 (CH-4)
USMC IOC (5 Acft Training Det)	1991/1992	1992 (CH-5)
✓ USAF IOC (6 Acft Mission Capable)	- /1994	1994 (CH-4)
✓ USA FUE (First Unit Equipped)	- /FY1994	FY1994 (CH-4)
✓ USA IOC (First Operational Company Equipped)	- /FY1995	FY1995 (CH-4)

b. Previous Change Explanations --

Milestone II rescheduled to incorporate SECNAV guidance. First flight, Development Test IIC, Operational Test IIA, Milestone IIA, fleet deliveries, and Initial Operational Capability rescheduled due to ten month delay in Milestone II.

c. Current Change Explanations --

(CH-1) Milestone II reflects actual date.

(CH-2) This milestone is no longer considered significant for SAR tracking

(CH-3) OTIIA and MSIIIA realigned to accommodate revised test schedule (+1 month and +6 months)

(CH-4) Shown for the first time

(CH-5) Fleet deliveries and IOC moved to accommodate change in MSIIIA decision (+6 months)

d. References --

Planning Estimate: R&D Descriptive Summary

Development Estimate/Approved Program: DCP dtd 1 May 1986; FY 1988/89 President's Budget.

10. Technical/Operational Characteristics:

a. Technical	Planning Est/ Appr Program	Demonstrated Performance	Development Estimate
Shipboard Operational Spotting Factor (Maximum) (x H-46)	- / N/A		N/A
Length, ft Folded/Unfolded	- / 62.24/57.33		62.24/57.33
Width, ft Folded/Unfolded	- / 18.42/83.83		18.42/83.83
Height, ft Folded/Unfolded	- / 17.98/21.73		17.98/21.73
Empty Weight, lbs	- / 31,786		31,768
b. Operational			
Sustainability, days (operations under austere basing/support conditions)	- / N/A		N/A
Readiness, msn capability rate (% MC)	- / 70		70
Msn Complete Probability, rate (4 hrs)	- / N/A		N/A
Mission Complete Probability, Rate (MFHBMA - Design Controllable)	- / 98		98
Maintenance Man-Hours per Flight Hour, hrs (corrective and preventive, O&I level)	- / N/A		N/A
Direct Maintenance Man-Hours per Flight Hour, Design Controllable:			
O Level, Unscheduled (Corrective)	- / 7.0		7.0
O Level, Scheduled (Preventive)	- / 2.5		2.5
Survivability, (Flight critical resistant at 90% muzzle velocity)	- / N/A		N/A
World-wide Self-Deployment, nm (minimum distance)	- / 2100		2100
Continuous Cruise Speed, kts	- / 250		250
Dash Speed, kts	- / 275		275
Instantaneous G-Loading (+/-)	- / +4.0/-1.0		+4.0/-1.0
Troop Capacity	- / 24		24
External Cargo, lbs	- / 10,000		10,000

c. Previous Change Explanations -- None

d. Current Change Explanations -- All values shown for the first time. No planning estimate values were established. Those characteristics noted by "N/A" are no longer considered significant for SAR tracking.

e. References --

Planning Estimate: R&D Descriptive Summary

Approved Program/Development Estimate: DCP dtd 1 May 1986; FY 1988/89 President's Budget.

11. Program Acquisition Cost (Cost Estimate in Millions of Dollars)

	Planning		Development/ Current
a. Cost --	<u>Estimate</u>	<u>Changes</u>	<u>Estimate</u>
Development (RDT&E)	2044.9	+251.6	2296.5
Procurement	12941.7	+6320.9	19261.7
Airframe	(7757.7)	(+2593.0)	(10350.7)
Engine	(1170.9)	(+257.7)	(1428.6)
Avionics	(951.3)	(+264.6)	(1215.9)
Other Hardware	(-)	(+464.1)	(464.1)
Non-Recurring	(273.5)	(+851.7)	(1125.2)
Total Flyaway	(10153.4)	(+4431.1)	(14584.5)
Other Wpn Sys Cost	(1220.9)	(+1881.9)	(3101.8)
Initial Spares	(1567.4)	(+8.0)	(1575.4)
Construction (MILCON)	-	+128.0	128.0
Total FY 84 Base-Year \$	14986.6	+6699.6	21686.2
*Adjustment FY 84 to FY 86 \$			(1386.8)
Total FY 86 Base-Year \$			(23073.0)
Escalation	9480.4	-1504.3	7976.1
Development (RDT&E)	(364.2)	(-35.7)	(+328.5)
Procurement	(9116.2)	(-1513.5)	(+7602.7)
Construction (MILCON)	(-)	(+44.9)	(44.9)
Total Then-Year \$	244567.0	+5195.3	29662.3
b. Quantities --			
Development (RDT&E)	7	-1	6
Procurement	602	+311	913
Total	609	+310	919
c. Unit Cost --			
Procurement:			
FY 86 Base-Year \$	22.873	-0.426	22.447
Then-Year \$	36.641	-7.215	29.426
Program:			
FY 86 Base-Year \$	26.183	+1.076	25.107
Then-Year \$	40.176	-7.898	32.278
d. Approved Design to Cost Goal --	None		
e. Foreign Military Sales --	None		
f. Nuclear Costs --	None		

*Adjustment factor used to rebaseline from FY 84\$ to FY 86\$:

RDT&E $1.034 \times 1.034 = 1.0640$

Procurement $1.034 \times 1.034 = 1.0640$

12. Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then Year)
Dollars in Millions)

	Current Year		Budget Year
	SAR Current	UCR Baseline	UCR Baseline
	Estimate	Estimate	Estimate
	(Dec 86)	(Dec 85)	(Dec 86)
a. Program Acquisition --			
(1) Cost	29662.3	19804.8	29662.3
(2) Quantity	919	608	919
(3) Unit Cost	32.3	32.6	32.3
b. Current Procurement -- (FY 1987)		(FY 1987)	(FY 1988)
(1) Cost	N/A	N/A	N/A
Less CY Adv Proc	N/A	N/A	N/A
Plus PY Adv Proc	N/A	N/A	N/A
Net Total	N/A	N/A	N/A
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

13. Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2409.1	22057.9	-	24467.0
Previous Changes:				
Economic	-68.8	-4092.3	-	-4161.1
Quantity	-	-	-	-
Schedule	+162.0	-	-	+162.0
Engineering	-	-	-	-
Estimating	-31.8	-93.9	-	-125.7
Support	-	-537.4	-	-537.4
Other	-	-	-	-
Subtotal	+61.4	-4723.6	-	-4662.2
Current Changes:				
Economic	-34.0	-343.3	-	-377.3
Quantity	-	+6303.0	-	+6303.0
Schedule	-	+595.9	-	+595.9
Engineering	-	-	-	-
Estimating	+188.7	-206.5	+172.9	+155.1
Support	-	+3180.8	-	+3180.8
Other	-	-	-	-
Subtotal	+154.7	+9529.9	+172.9	+9857.5
Total Changes	+216.1	+4806.3	+172.9	+5195.3
Development/ Current Estimate	2625.2	26864.2	172.9	29662.3

13. Cost Variance Analysis (Cont'd):
(FY 1984/1986 Constant Dollars (Base Year) in Millions)

	RD&E	PROC	MILCON	TOTAL
Planning Estimate	2044.9	12941.7	-	14986.6
Previous Changes:				
Quantity	-	-	-	-
Schedule	+128.7	-	-	+128.7
Engineering	-	-	-	-
Estimating	-38.4	-95.6	-	-134.0
Support	-	-414.7	-	-414.7
Other	-	-	-	-
Subtotal (84)	+90.3	-510.3	-	-420.0
Current Changes:				
Quantity	-	+4360.6	-	+4360.6
Schedule	-	+275.8	-	+275.8
Engineering	-	-	-	-
Estimating	+161.3	-109.8	+128.0	+179.5
Support	-	+2303.7	-	+2303.7
Other	-	-	-	-
Subtotal	+161.3	+6830.3	+128.0	+7119.6
DE/CE (FY84\$)	2296.5	19261.7	128.0	21686.2
Adjustment FY84 to FY86	+147.2	+1231.4	+8.2	+1386.8
Dev/CE (FY86\$)	2443.7	20494.5	136.2	23073.0

b. Previous Change Explanations --

RD&E

Economic: revised escalation indices
 Schedule: program extended one year; program restructure due to DSARC II delay.
 Estimating: reprogramming to other Navy programs; Congressional reduction; and budget adjustments; rephase of dollars in outyears, refinement in estimating

Procurement

Economic: revised escalation indices
 Estimating: Adjustment and refined cost estimate for flyaway and engines to reflect acquisition strategy for competition and SECNAV tooling policy and to match FY 87 President's budget.
 Support: Adjustments to accommodate budget controls and refined pricing for Support and Spares

*Adjustment factor used to rebase from FY 84\$ to FY86\$:

RD&E - $1.034 \times 1.029 = 1.0640$
 Procurement - $1.034 \times 1.029 = 1.0640$
 MILCON - $1.034 \times 1.029 = 1.0640$

13. Cost Variance Analysis (Cont'd):c. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year \$</u>	<u>Then-Year \$</u>
(1) <u>RDT&E</u>		
Revised Jan 87 economic escalation rates (Economic)	-	-34.0
Addition of FY 83 Army and Air Force program funding (Estimating)	+136.8	+158.4
Addition of funds for ASW studies (Estimating)	+0.3	+0.3
Congressional actions (Estimating)	+0.7	+2.0
Program budget adjustments (PBD 240 and reprogramming to A-6)(Estimating)	-3.4	-4.0
Refinements in estimating (Estimating)	+26.9	+32.0
(2) <u>Procurement</u>		
Revised Jan 87 economic escalation rates (Economic)		-343.3
Addition of Army and Air Force procurement quantities (Quantity)	+4360.6	+6303.0
Procurement moved one year to right due to delay in DSARC II (Schedule)	+275.8	+595.9
Refinements in estimating (Estimating)	-109.8	-206.5
Addition of Army and Air Force support requirements (Support)	+1778.2	+2529.1
Refinements in estimating (Support)	+525.5	+651.8
(3) <u>MILCON</u>		
Shown for first time (Estimating)	+128.0	+172.9

d. References --

Planning Estimate - FY 1985 Descriptive Summary
Development/Current Estimate - Navy and Air Force FY 1988/1989 President's
 budget; Army DCP dtd 1 May 1986

14. Program Acquisition Unit (PAUC) History:

a. Initial SAR Estimate to Current Baseline Estimate

PAUC Planning Estimate 40.2	CHANGES (Then Year Dollars in Millions)								PAUC Development Estimate 32.3
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
	-4.9	-6.7	+0.8	-	-	+2.9	-	-7.9	

b. Current Baseline Estimate to Current Estimate

PAUC Development Estimate 32.3	CHANGES (Then Year Dollars in Millions)								PAUC Current Estimate 32.3
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
	-	-	-	-	-	-	-	-	

15. Contract Information: (Dollars in Millions)

a. RDT&E

Preliminary Design:

Bell-Boeing, Fort Worth, TX

N00019-83-C-0166, CPIF

25 April 1983

Target	Initial Contract Price Ceiling	Qty
\$153.3	\$176.3	-

Current Contract Price		
Target	Ceiling	Qty
\$191.3	\$220.0	-

Estimated Price At Completion	
Contractor	Program Manager
\$209.3	\$206.5

	Cost Variance	Schedule Variance
Previous Cumulative Variance	\$-31.1	\$-11.7
Cumulative Variances to Date (08/31/86)	\$-31.7	\$- 4.3
Net Change	\$- 0.6	\$+ 7.4

Explanation of Change: Preliminary Design efforts are over 97% complete. The remaining tasks to be completed are well understood and the cost risk associated with them is considered minimal. The estimated price at completion variance is caused by removal of unallowable costs from the contractor's estimate. This is the final report for Preliminary Design.

15. Contract Information (Cont'd): (Dollars in Millions)

<u>Full Scale Development (Airframe):</u>	<u>Target</u>	<u>Initial Contract Price</u>	
Bell-Boeing, Fort Worth, TX	\$1714.0	<u>Ceiling</u>	<u>Qty</u>
NOO019-85-C-0145, FPI		\$1810.0	6
2 May 1986			

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1714.0	\$1810.0	6	\$1714.0	\$1714.0
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance			\$-0-	\$-0-
Cumulative Variances to Date (09/30/86)			\$-24.5	\$-43.7
Net Change			\$-24.5	\$-43.7

Explanation of Change: Shown for the first time. Only one report has been received. It is too early for the Program Manager to project a price at completion other than target.

<u>Full Scale Development (Engine):</u>	<u>Target</u>	<u>Initial Contract Price</u>	
Allison Gas Turbine, Indpls, In	\$76.4	<u>Ceiling</u>	<u>Qty</u>
NOO019-85-C-0034, FFP		\$76.4	21
2 May 1986			

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$76.4	\$76.4	21	\$76.4	\$76.4

Explanation of Change: Shown for the first time. No reports will be received due to type of contract.

b. APN -- N/A

c. MILCON -- N/A

16. Program Funding Summary: (Current Estimate in Millions of Dollars)a. Program Status --

(1) Percent Program Completed: 33.3% (6 yrs/18 yrs)

(2) Percent Program Cost Appropriated: 4.2% (\$1252.5/\$29745.8)

b. Appropriation Summary --

	(Then-Year Dollars in Millions)				
<u>Appropriation</u>	<u>Current & Prior Yrs (FY82-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93-99)</u>	<u>Total</u>
RDT&E	1256.2	497.7	871.3	-	2625.2
Procurement	-	-	8070.6	18793.6	26864.2
MILCON	-	-	38.8	134.1	172.9
Total	1256.2	497.7	8980.7	18927.7	29662.3

16. Program Funding Summary (Con't): (Current Estimate in Millions of Dollars)

Fiscal Year	Qty	FY 86 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E TOTAL (Navy, Air Force and Army)								
1982	-			1.7			1.5	7.60
1983	-			37.5			34.7	4.90
1984	-			90.5			86.7	3.80
1985	-			176.6			174.5	3.40
1986	6			518.2			527.5	2.90
1987	-			410.2			431.3	3.10
1988	-			457.4			497.7	3.50
1989	-			295.5			332.3	3.50
1990	-			210.3			243.8	3.30
1991	-			150.7			179.3	2.90
1992	-			95.1			115.9	2.40
Subtotal	6			2443.7			2625.2	

Fiscal Year	Qty	FY 86 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: Procurement Total (Navy, Air Force, and Army)								
1989	-		-	284.3	338.2	0.0	338.2	3.50
1990	12	618.5	657.3	1608.5	181.6	338.2	1917.5	3.30
1991	45	69.3	1441.2	2195.6	209.9	181.6	2680.4	2.90
1992	75	69.8	1635.7	2507.2	248.4	209.9	3134.5	2.40
1993	108	66.9	1879.0	2731.7	297.0	248.4	3497.6	2.40
1994	132	63.6	1938.9	2707.2	281.1	297.0	3548.6	2.40
1995	132	64.3	1803.3	2466.3	271.2	281.1	3310.9	2.40
1996	132	65.4	1707.3	2216.6	259.0	271.2	3047.1	2.40
1997	132	65.1	1584.3	1904.7	223.1	259.0	2681.3	2.40
1998	116	64.6	1330.1	1430.1	55.6	223.0	2058.5	2.40
1999	29	49.6	342.9	440.9	0.0	55.6	649.6	2.40
Subtotal	913	1197.1	14320.0	20493.1	2365.1	2365.0	26864.2	

Appropriation: MILCON Total

1990				4.0			4.8	3.30
1991				4.1			5.0	2.90
1992				23.3			29.0	2.40
1993				99.9			127.6	2.40
1994				1.9			2.5	2.40
1995				3.0			4.0	2.40
Subtotal				136.2			172.9	

16. Program Funding Summary (Con't): (Current Estimate in Millions of Dollars)

Fiscal Year	Qty	FY 86 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E Navy								
1982	6			1.7			1.5	7.60
1983*				37.5			34.7	4.90
1984				90.5			86.7	3.80
1985				175.8			173.7	3.40
1986				515.9			525.2	2.90
1987				402.0			422.7	3.10
1988				428.0			465.7	3.50
1989				272.7			306.7	3.50
1990				191.8			222.3	3.30
1991				135.2			160.9	2.90
1992			79.3			96.6	2.40	
Subtotal	6			2330.4			2496.7	

*NOTE: FY 1983 RDT&E \$'s reflect \$29.9M of Army funds (P.E. 64222A)

Appropriation: RDT&E Air Force

1985				0.8			0.8	3.40
1986				2.3			2.3	2.90
1987				8.2			8.6	3.10
1988				29.4			32.0	3.50
1989				22.8			25.6	3.50
1990				18.5			21.5	3.30
1991				15.5			18.4	2.90
1992				15.8			19.3	2.40
Total AF				113.3			128.5	

Appropriation: Procurement Navy

1989				284.3	338.2	0.0	338.2	3.50
1990	12	618.5	657.3	1608.5	181.6	338.2	1917.5	3.30
1991	45	69.3	1441.2	2160.5	166.1	181.6	2636.6	2.90
1992	61	54.8	1317.9	1961.1	181.2	166.1	2451.4	2.40
1993	82	48.6	1398.2	1904.6	200.4	181.2	2438.3	2.40
1994	90	41.0	1276.2	1686.5	169.0	200.4	2210.8	2.40
1995	80	36.3	1051.1	1328.5	159.0	169.0	1783.7	2.40
1996	78	35.8	965.4	1111.5	154.7	159.0	1528.5	2.40
1997	78	35.7	917.8	1017.1	150.8	154.7	1432.5	2.40
1998	76	39.6	873.4	865.2	0.0	150.8	1244.6	2.40
1999	-			33.9	-	-	50.0	2.40
Total Navy	602	979.6	9898.5	13961.7	1701.0	1701.0	18032.1	

16. Program Funding Summary (Con't): (Current Estimate in Millions of Dollars)

Fiscal Year	Qty	FY 86 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Nonrec	Flyaway		Advance Proc			
			Rec	Total	Debit	Credit	Total	

Appropriation: Procurement Air Force

1991				18.1	22.6	0.0	22.6	2.90
1992	6	6.3	163.7	223.7	36.8	22.6	280.0	2.40
1993	12	8.3	264.6	366.9	49.7	36.8	470.0	2.40
1994	18	9.6	337.1	408.9	48.2	49.7	536.0	2.40
1995	18	9.6	318.7	397.5	46.2	48.2	533.5	2.40
1996	18	9.8	304.2	352.7	21.3	46.2	484.4	2.40
1997	8	4.2	129.6	140.4	0.0	21.3	197.4	2.40
Total AF	80	47.8	1517.9	1908.2	224.8	224.8	2523.9	

Appropriation: Procurement Army

1991				17.0	21.2	0.0	21.2	2.90
1992	8	8.7	154.1	322.4	30.4	21.2	403.1	2.40
1993	14	10.0	216.2	460.2	46.9	30.4	589.3	2.40
1994	24	13.0	325.6	611.8	63.9	46.9	801.8	2.40
1995	34	18.4	433.5	740.3	66.0	63.9	993.7	2.40
1996	36	19.8	437.7	752.4	83.0	66.0	1034.2	2.40
1997	46	25.2	536.9	747.2	72.2	83.0	1051.4	2.40
1998	40	25.0	456.7	564.9	55.6	72.2	813.9	2.40
1999	29	49.6	342.9	407.0	0.0	55.6	599.6	2.40
Total Army	231	169.7	2903.6	4623.2	439.2	439.2	6308.2	

Appropriation: MILCON Navy

1990	0			4.0			4.8	3.30
1991	0			4.1			5.0	2.90
1992	0			4.1			5.1	2.40
1993	0			0.0			0.0	2.40
1994	0			1.9			2.5	2.40
1995	0			3.0			4.0	2.40
Subtotal	0			17.1			21.4	

Appropriation: MILCON Air Force

1992	0			19.2			23.9	2.40
1993	0			99.9			127.6	2.40
Subtotal	0			119.1			151.5	

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1982	1.5	1.3	1.1
1983	34.7	34.5	34.1
1984	86.7	86.5	80.3
1985	174.5	174.5	167.6
1986	527.5	521.6	287.4
1987	431.3	318.3	0.9
To Complete	1369.0	N/A	N/A
Total	2625.2	1136.7	571.4

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year	Development Estimate	Production Rates (Quantity/Year)		
		Production Estimate	Current Estimate	Maximum Economic
1990	12	N/A	12	N/A
1991	45	N/A	45	N/A
1992	75	N/A	75	N/A
1993	108	N/A	108	N/A
1994	132	N/A	132	N/A
1995	132	N/A	132	N/A
1996	132	N/A	132	N/A
1997	132	N/A	132	N/A
1998	116	N/A	116	N/A
1999	29	N/A	29	N/A

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	N/A	N/A	23073.0	N/A	N/A
(TY \$)	N/A	N/A	29662.3	N/A	N/A
PAUC (BY \$)	N/A	N/A	25.1	N/A	N/A
(TY \$)	N/A	N/A	32.3	N/A	N/A

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V-22, December 31, 1986

c. Schedule Variance --

	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum Economic
Start Date (Mo/Yr)	N/A	N/A	1/89	N/A	N/A
Duration (in Months)	N/A	N/A	153	N/A	N/A
End Date (Mo/Yr)	N/A	N/A	9/01	N/A	N/A

d. Deliveries (Plan/Actual) --

To Date	
RDT&E	0/0
Procurement	0/0

18. Operating and Support Costs: N/A

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AF-21 KC-10A

SAR-86-114

(UNCLASSIFIED)

SELECTED ACQUISITION REPORT(RCS:DD-COMP(Q&A)823)

PROGRAM: KC-10A

AS OF DATE: December 31, 1986

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1. Designation and Nomenclature (Popular Name): KC-10A EXTENDER

2. DOD Component: U.S. Air Force

3. Responsible Office and Telephone Number

KC-10A Program Office
Aeronautical Systems Division
Wright-Patterson AFB, OH 45433

PM: Col Frank H. Tubbesing
Assigned: 5 May 1986
AV: 785-5722 COMM: (513)255-5722

4. Program Elements/Procurement Line Items

RDT&E: N/A
PROCUREMENT: APPN 3010 PE 27222F ICN C010AK
MILCON: APPN 3300 PE 27222F

5. Related Programs: None.

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DEPARTMENT OF DEFENSE

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(UNCLASSIFIED)

KC-10A, December 31, 1986

6. Mission and Description: The KC-10 is a version of the intercontinental range DC-10-30 convertible freighter modified to provide increased mobility for U.S. forces in contingency operations by: refueling fighters and simultaneously carrying the fighters' support equipment and personnel on overseas deployments and resupply missions, refueling strategic offensive and reconnaissance aircraft during long-range conventional operations and augmenting the U.S. cargo-carrying capability. This FAA certified system, supported by contractor support, will augment the present KC-135 Tanker System.

7. Program Highlights

a. Significant Historical Developments - The need for additional aerial refueling capability was first documented by the Air Force in 1967 (SAC ROC 9-67). In 1969-1970 a wide ranging study of advanced tanker options with emphasis on new design aircraft capabilities and costs was done. Because the new designs were all found to be cost prohibitive, the Air Force, in 1972, conducted flight tests to demonstrate the feasibility of converting existing wide-body design aircraft to a tanker design. The Arab-Israeli war of late 1973 highlighted the need for improvement in both tanker and cargo capabilities and in 1974 the tanker and cargo requirements were combined. In 1975-1976, the Air Force cancelled a full scale development acquisition approach because of funding and initiated a program for competitive procurement of wide-bodied commercial derivative aircraft and logistics support. In December 1977, USAF awarded a contract to McDonnell-Douglas Corporation for long lead and preproduction planning with options to acquire up to 60 aircraft plus a contract for five years of logistics support. In 1978, production go ahead was authorized (DCP #148) and USAF ordered two aircraft. In 1979-1981, options were exercised for 14 more aircraft and their logistics support. In December 1982, USAF received Congressional approval to modify the remaining option of the current acquisition contract for a multiyear procurement of 44 aircraft through 1987.

b. Significant Developments Since Last Report - During this period, planning began for the incorporation of the KC-10 Integral On-Board Loader and for Wing Mounted Hose Reel Aerial Refueling Pods. The KC-10 Program is 91% expended as of 31 December 1986. This satisfies the SAR requirement and this will be the last SAR prepared for the KC-10 Program.

The KC-10 meets current mission requirements.

c. Changes Since "As Of" Date (31 December 1986) - None.

8. Decision Coordinating Paper (DCP) Threshold Breaches - DCP #148, dated 13 November 1978. No thresholds have been breached.

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KC-10A, December 31, 1986

9. Schedule

	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
a. Milestones		
DSARC III (Production)	Nov 78/Nov 78	Nov 78
Exercise Production Options		
(1) FY78 Option	Dec 78/Dec 78	Dec 78
(2) FY79 Option	Dec 78/Dec 78	Dec 78
(3) FY80 Option	Dec 78/Dec 79	Oct 79
(4) FY81 Option	Dec 80/Dec 80	Feb 81
(5) FY82 Option	Dec 81/Dec 81	Jan 82
(6) FY83-87 Option	Dec 82/Dec 82	Dec 82
Roll Out #1 Aircraft	Feb 80/Feb 80	Apr 80
Predelivery Test-Start	Apr 80/Apr 80	Jul 80
Complete	Oct 80/Oct 80	May 80
Aircraft Delivery-#1	Oct 80/Oct 80	Sep 81
#2	Dec 80/Dec 80	Mar 81
*IOC	Oct 80/Oct 80	Oct 80

b. Previous Change Explanations -

Program Office exercised FY80 option in October 79 within the window ending in December 79 to take advantage of available funding.

FY81 option delayed until contractor made satisfactory progress towards accomplishing predelivery milestones requirements.

FY82 option delayed due to lack of funding.

Rollout delayed because of the late delivery of parts by vendors and in-line changes.

Predelivery testing delayed because of slippage of first flight.

Initial aircraft deliveries delayed due to resolution of technical problems discovered during predelivery testing. Aircraft #1 continued in delivery program while #2 began USAF OTE program.

c. Current Change Explanations- None

d. References -Production Estimate: DCP #148, Dated 13 November 78.
Approved Program: DCP #148, Dated 13 November 78.

*Denotes Initial Operating Capability (Activation of 1st Main Operating Base)

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10. Technical/Operational Characteristics

	<u>Prod Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. Technical			
Support Features (%)			
Probability of Mission Success	96/96	98.8	98
Full Mission Capable Rate	70/70	90.6	90
Not Mission Capable Supply	3/1	0.88	1
Partial Mission Capable Supply	7/1	0.46	1

b. Operational

Critical Field Length (ft)	11000/11000	10300	10300
Fuel Transfer Rate (Gals/Min)			
(1) Boom	1500/1500	1435	1435
(2) Hose	600/600	600	600
Maximum Fuel Offload (lbs)			
(1) 3000 nm radius	127000/127000	127000	127000
(2) 5000 nm radius	109000/109000	109000	109000
Maximum Cargo Capacity (lbs)			
4000 nm range	163000/163000	163000	163000

c. Previous Change Explanations - During flight testing of the KC-10, it was established that the KC-10 can take off in less than 11,000 ft, a development goal for the program. The fuel transfer rate achieved with the KC-10A, 1435 GPM, is less than the design goal of 1500 GPM due to limitations of receiver aircraft to take on fuel. This demonstrated transfer rate does meet technical specification and program requirements. In the first one and one half years of operational experience, the KC-10 has consistently exceeded production estimates and contractual requirements for reliability and maintainability. Changes to Full Mission Capable Rate, Not Mission Capable Supply, and Partial Mission Capable Supply were based on FY84 operational performance.

d. Current Change Explanations - None.

e. References - Production Estimate: DCP #148, Dated 13 November 78.
Approved Program: DCP #148, Dated 13 November 78.

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11. <u>Program Acquisition Cost</u> (Current Estimate in Millions of Dollars)			
	<u>Production</u> <u>Estimate</u>	<u>Changes</u>	<u>Current</u> <u>Estimate</u>
a. Cost			
Development	-0-	-0-	-0-
Procurement	2394.7	- 358.7	2036.0
Airframe	(1656.8)	(- 257.3)	(1399.5)
Engine	(460.3)	(- 96.0)	(364.3)
Other Flyaway	(85.9)	(- 16.6)	(69.3)
Total Flyaway	(2203.0)	(- 369.9)	(1833.1)
Other Wpn Sys Costs	(56.3)	(+ 18.0)	(74.3)
Initial Spares	(135.4)	(- 6.8)	(128.6)
Milcon	31.1	- 7.5	23.6
Total Cost in Constant FY76 \$	2425.8	- 366.2	2059.6
Escalation	2796.2	-1033.0	1763.2
Development	(-0-)	(-0-)	(-0-)
Procurement	(2768.7)	(-1029.1)	(1739.6)
Milcon	(27.5)	(- 3.9)	(23.6)
Total Program Cost in Then Year	5222.0	-1399.2	3822.8
b. Quantities			
Development	-0-	-0-	-0-
Procurement	72	-12	60
Total	72	-12	60
c. Unit Cost			
Procurement:			
Constant FY76\$	33.260	+ 0.673	33.933
Current TY\$	71.714	- 8.787	62.927
Program:			
Constant FY76\$	33.692	+ 0.634	34.326
Current TY\$	72.528	- 8.815	63.713
d. Approved Design to Cost Goal -- None.			
e. Foreign Military Sales -- None.			
f. Nuclear Costs -- None.			

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12. Program Acquisition/Current Procurement Unit Cost Summary
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition			
(1) Cost	3822.8	3876.1	3822.8
(2) Quantity	60	60	60
(3) Unit Cost	63.713	64.602	63.713
b. Current Procurement	(FY87)	(FY87)*	(FY88)
(1) Cost	87.6	87.6	N/A
(2) Less CY Adv Proc	0.0	0.0	N/A
(3) Plus PY Adv Proc	376.4	376.4	N/A
Net Total	464.0	464.0	N/A
(4) Quantity	8	8	N/A
(5) Unit Cost	58.000	58.000	N/A

* Adjusted to reflect FY87 Appropriations Act in accordance with Congressional changes to SAR.

13. Cost Variance Analysis

a. Summary — (Current (Then-Year) Dollars in Millions)

	<u>RDTE</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
<u>Production Estimate</u>	—	5163.4	58.6	5222.0
<u>Previous Changes</u>				
Economic	—	- 308.0	+ 4.0	- 304.0
Quantity	—	- 983.2	—	- 983.2
Schedule	—	—	—	—
Engineering	—	—	+ 5.2	+ 5.2
Estimating	—	- 96.6	- 20.6	- 117.2
Other	—	—	—	—
Support	—	+ 53.3	—	+ 53.3
Subtotal	—	-1334.5	- 11.4	-1345.9
<u>Current Changes</u>				
Economic	—	- 24.3	- 0.6	- 24.9
Quantity	—	—	—	—
Schedule	—	—	—	—
Engineering	—	+ 2.2	—	+ 2.2
Estimating	—	- 27.5	+ 0.6	- 26.9
Other	—	—	—	—
Support	—	- 3.7	—	- 3.7
Subtotal	—	- 53.3	+ 0.0	- 53.3
<u>Total Changes</u>	—	-1387.8	-11.4	-1399.2
<u>Current Estimate</u>	—	3775.6	47.2	3822.8

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13. Cost Variance Analysis (Cont'd) (FY 1976 Constant (Base-Year) Dollars in Millions)

	RDTE	PROC	MILCON	TOTAL
Production Estimate	—	2394.7	31.1	2425.8
Previous Changes				
Quantity	—	- 380.0	—	- 380.0
Schedule	—	—	—	—
Engineering	—	—	+ 2.3	+ 2.3
Estimating	—	+ 21.6	- 10.1	+ 11.5
Other	—	—	—	—
Support	—	+ 14.1	—	+ 14.1
Subtotal	—	- 344.3	- 7.8	- 352.1
Current Changes				
Quantity	—	—	—	—
Schedule	—	—	—	—
Engineering	—	+ 1.1	—	+ 1.1
Estimating	—	- 13.4	+ 0.3	- 13.1
Other	—	—	—	—
Support	—	- 2.1	—	- 2.1
Subtotal	—	- 14.4	+ 0.3	- 14.1
Total Changes	—	- 358.7	- 7.5	- 366.2
Current Estimate	—	2036.0	23.6	2059.6

b. Previous Change Explanations

RDTE: None.

Procurement:

(ECONOMIC): Revised economic escalation indices.

(QUANTITY): Twelve aircraft deleted (from 72 to 60) to fund higher priority requirements.

(ESTIMATING): Additional ECO; change in advance buy methodology.

(SUPPORT): Spares and other support costs reduced due to aircraft reduction; revised estimate of support requirements.

MILCON:

(ECONOMIC): Revised economic escalation indices.

(ESTIMATING): Revised estimates of HQ SAC construction requirements; funding for Centralized Aircraft Support System deferred to FY87 for phasing with program requirements; impact of escalation change on prior years.

(ENGINEERING): Modification of facilities (ramp improvements).

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13. Cost Variance Analysis (Cont'd)

c. Current Change Explanations

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDTE:</u> None.		
(2) <u>PROCUREMENT:</u>		
Revised program peculiar inflation indices.(ECONOMIC)	-0-	- 24.3
Enhancements to the aircraft. (ENGINEERING)	+ 1.1	+ 2.2
Reestimate of flyaway costs (ESTIMATING)	- 14.8	- 30.1
Increase to flyaway due to EPA retention. (ESTIMATING)	+ 1.4	+ 2.6
Reestimate of initial spares requirements. (SUPPORT)	- 2.3	- 4.1
Reestimate of support requirements. (SUPPORT)	+ 0.2	+ 0.4
(3) <u>MILCON:</u>		
Revised Dec 86 economic escalation indices. (ECONOMIC)	-0-	- 0.6
Adjustment for current and prior year inflation adjustment. (ESTIMATING)	+ 0.3	+ 0.6

d. References - Production Estimate: DCP #148, Dated 13 November 78.

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14. Program Acquisition Unit Cost (PAUC) History (TY \$ in Millions)

a. Initial SAR Estimate to Current Estimate

PAUC (Initial SAR-PdE)	Changes (Then-Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
72.528	-5.482	-1.880	—	+0.123	-2.402	+0.826	—	-8.815	63.713

15. Contract Information : (Then-Year Dollars in Millions)

a. RDTE: None.

b. PROCUREMENT:

(1) Contractor: Douglas Aircraft Company, Long Beach, California
Contract Title: KC-10 Acquisition Type: FFP W/EPA
Contract Number: F33700-78-C-0001
Award Date: 3 January 78 Definitization Date: 3 January 78

Initial Contract Price			Current Contract Price		
Target	Ceiling	Quantity	Target	Ceiling	Quantity
877.9	N/A	16	3327.4	N/A	60

Estimated Price At Completion	
Contractor	Program Manager
3327.4	3327.4

(2) Contractor: Douglas Aircraft Company, Long Beach, California
Contract Title: Contractor Logistics Support Type: FFP W/EPA
Contract Number: F33700-78-C-0003
Award Date: 3 January 78 Definitization Date: 3 January 78

Initial Contract Price			Current Contract Price		
Target	Ceiling	Quantity	Target	Ceiling	Quantity
61.2	N/A	—	245.1	N/A	—

Estimated Price At Completion	
Contractor	Program Manager
245.1	245.1

(3) Contractor: McDonnell Douglas Training Systems Inc., Dallas, Texas
Contract Title: Follow-On-Aircrew-Training Type: FFP
Contract Number: F33700-80-C-0040
Award Date: 15 July 80 Definitization Date: 15 July 80

Initial Contract Price			Current Contract Price		
Target	Ceiling	Quantity	Target	Ceiling	Quantity
19.2	N/A	1.0	69.1	N/A	3

Estimated Price At Completion	
Contractor	Program Manager
69.1	69.1

c. MILCON: None.

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16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status

- (1) Percent Program Completed: (9/9)=100.0%
 (Years Funds Appropriated/Total Program Years)
- (2) Percent Program Cost Appropriated: 100.00%
 (Funds Appropriated To Date in Millions/Total Program
 Funding in Millions)

b. Appropriation Summary

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current Prior Yrs</u> (FY79-87)	<u>Budget Year</u> (FY88)	<u>Balance to Complete FYDP</u> (FY89-91)	<u>Beyond FYDP</u>	<u>Total</u>
RDTE	—	—	—	—	—
PROCUREMENT	3775.6	—	—	—	3775.6
MILCON	<u>47.2</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>47.2</u>
Total	3822.8	—	—	—	3822.8

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions
of Dollars)

c. Annual Summary —

		Base-Year Dollars		Then-Year Dollars			
Fiscal Year	Qty	Flyaway		Advance Proc		Escl	
		Nonrec	Rec	Total	Debit	Credit	Total Rate(%) ★
Appropriation - RDTE (NOT APPLICABLE)							
Appropriation - PROCUREMENT							
1979	2	50.5	72.1	139.0	—	—	191.8
1980	4	-0-	115.9	123.1	—	—	195.0
1981	6	-0-	164.6	183.5	—	—	316.9
1982	4	-0-	114.8	128.4	—	—	233.2
1983	8	-0-	227.0	491.9	441.0	—	923.2
1984	8	-0-	250.0	401.6	425.3	209.3	782.2
1985	8	-0-	251.2	302.6	375.3	332.0	604.7
1986	12	-0-	357.1	222.5	200.3	524.2	441.0
1987	8	-0-	229.9	43.4	—	376.4	87.6
Subtotal	60	50.5	1782.6	2036.0	1441.9	1441.9	3775.6
Appropriation - MILCON							
1982				1.7		3.0	9.2
1983				—		—	4.9
1984				7.7		15.0	3.8
1985				7.3		14.5	3.4
1986				0.5		1.1	2.9
1987				6.4		13.6	3.1
Subtotal				23.6		47.2	
Total	60	50.5	1782.6	2059.6	1441.9	1441.9	3822.8

* Procurement escalation rates are peculiar for the KC-10 acquisition. Construction escalation rates reflect OSD escalation rates. KC-10 procurement inflation indices are computed according to the contract EPA clause and the methodology does not provide raw inflation rates.

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16. Program Funding Summary (Cont'd) (Current Estimate in Millions
of Dollars)

d. Obligations and Expenditures

Then-Year Dollars (Current Estimate in Millions)			
Fiscal Year	Total	Obligated	Expended

Appropriation - RDTE : Not Applicable

Appropriation - PROCUREMENT

1979	191.8	191.8	191.8
1980	195.0	195.0	195.0
1981	316.9	316.9	316.9
1982	233.2	233.2	233.2
1983	923.2	923.2	923.2
1984	782.2	782.2	772.2
1985	604.7	595.7	568.7
1986	441.0	437.9	233.7
1987	87.6	86.4	-0-
Subtotal	3775.6	3762.3	3434.7

Appropriation - MILCON

1982	3.0	3.0	3.0
1983	-0-	-0-	-0-
1984	15.0	10.1	10.0
1985	14.5	9.8	7.8
1986	1.1	0.9	0.4
1987	13.6	-0-	-0-
Subtotal	47.2	23.8	21.2

Reflects program office records as of 31 December 86.

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17. Production Rate Data:

a. Annual Production Rates

Fiscal Year	Production Rates (Quantity/Year)		
	Production Estimate	Current Estimate	Maximum Economic
1979	—	5.0	9.6
1980	16.0	5.2	8.3
1981	3.0	6.2	7.1
1982	2.1	7.0	7.2
1983	9.1	7.0	7.2
1984	10.1	10.3	10.3
1985	15.0	11.4	11.4
1986	12.5	11.7	12.0
1987	12.0	5.1	12.0
1988	12.0	—	—

b. Cost Variance — Dollars in Millions

Item	Production Estimate	Change (Cur Est Less Prod Est)		Change (Cur Est Less Max Econ)		Maximum Economic
		Current Estimate		Max Econ		
Prog Acq Cost (BY\$)	2425.8	- 366.2	2059.6	—		2059.6
(TY\$)	5222.0	-1399.2	3822.8	—		3822.8
PAUC (BY\$)	33.692 +	0.634	34.326	—		34.326
(TY\$)	72.528 -	8.815	63.713	—		63.713

c. Schedule Changes: None.

d. Deliveries (Plan/Actual)

RDTE: To Date
0/0

Procurement: 51/51

18. OPERATING AND SUPPORT COSTS: None.

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SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A)823)

PROGRAM: LCAC

AS OF DATE: December 31, 1986

28515

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SUBJECT

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DIRECTORATE FOR FREEDOM OF INFORMATION
SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. (U) Designation/Nomenclature (Popular Name): LCAC/Landing Craft, Air Cushion

2. (U) DOD Component: U. S. Navy

3. (U) Responsible Office and Telephone Number:

Amphibious Warfare and Strategic
Sealift Program Office (PMS377)
Naval Sea Systems Command
Washington, DC 20362

PM: E. E. Shoults
Assigned: April 29, 1985
AUTOVON: 222-8511
COMM: (202) 692-8511

4. (U) Program Elements:

RDT&E: PE64567N (shared funding)
PROCUREMENT: 24411N, APPN 1611, ICN 5105
MILCON: 24796N, 24786N, 65896N

5. (U) Related Programs: AALC; LHD; LSD 41;

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6. (U) Mission and Description: The LCAC program has been established to transport weapon systems, equipment, cargo, and personnel of the assault elements of the marine air/ground task force from ship to shore and across the beach. The LCAC is a fully Amphibious Air Cushion vehicle capable of operating from existing and future amphibious well deck ships. Having an on-cushion length of 88ft and beam of 47ft, the LCAC can carry a 60 ton payload (75 ton overload capacity) and provides drive through capability by means of ramps forward and aft.

7. (U) Program Highlights:

a. (U) Significant Historical Developments-- In 1970 the first contracts for the design and construction of prototype Amphibious Assault Landing Craft (AALC), nicknamed JEFF Craft, designated JEFF (A) (Aerojet) and JEFF (B) (Bell) were delivered in 1978 and 1979. These crafts have undergone an extensive testing program since delivery. Results from the test program were extremely successful, with the craft satisfying all established performance requirements.

Bell Aerospace, Textron was competitively selected and subsequently awarded contracts for production of six craft (three authorized in FY82 and three in FY83). Additional contracts were awarded to Bell in November 1983 for Long Lead Material and on 9 March 1984 a Fixed Price Incentive (FPI) contract for the construction of six additional LCAC.

The first LCAC successfully completed acceptance trials on 7 December 1984 at the Naval Coastal Systems Center (NCSC) in Panama City, Florida. During the initial phase of operational testing (OT-IIIA) early in 1985 the LCAC met all mission specifications; however, discrepancies affecting craft reliability were identified. Correction of these discrepancies has required analysis, system redesign, corrective action and evaluation. LCAC 002 was delivered 22 February 1985.

In 1984, Bell Aerospace reported a potential cost growth of \$11.1 million on the FY 1982/1983 LCAC contract. This growth was associated with production facility start-up and material cost. On April 3, 1985, the Navy converted the FY 82/83 contract from a Cost Plus Award Fee (CPAF) to a Fixed Price Incentive (FPI) contract with a 50/50 share line to limit the Navy's liability for the projected cost overrun.

A second source builder, Lockheed Shipbuilding Company, has been selected and a contract to produce two FY85 craft was awarded on September 30, 1985. These craft are to be produced in Gulfport, Mississippi.

7. (U) Program Highlights (Cont'd):

b. (U) Significant Developments Since Last Report-- During 1986, the Navy accepted delivery of LCAC 003 on 9 June, LCAC 004 on 13 August, LCAC 005 on 26 November, and LCAC 006 on 1 December. Final Contract Trials (FCT) on LCAC 002 and 003 were completed in June 1986 and November 1986 respectively, with the craft being identified as operationally suitable. LCAC 002 and 003 completed Operational Testing (OT IIIB) on 5 July 1986.

The first fleet operating unit, Assault Craft Unit 5 (ACU 5), established in October 1983 at NCSC was relocated to permanent base facilities at Camp Pendleton, California on 28 August 1986. An initial delivery of three craft (LCAC 002, 003 and 004) arrived aboard the Dock Landing Ship (LSD) 42 on 28 August 1986. The remaining three (3) craft, LCAC 001, 005, and 006, arrived at ACU 5 on 18 December 1986 via the LSD 39, resulting in the achievement of a six craft Initial Operating Capability (IOC) for the program.

Textron Marine Systems, formerly Bell Aerospace, was awarded a Fixed Price Incentive (FPI) contract for two FY85 craft plus an option for an additional two craft on 25 November 1986. The remaining FY85 (3) craft and FY86 (12) craft are expected to be competitively awarded during the summer of 1987. These craft will be split between the two manufacturing sources, Textron Marine Systems and Lockheed, Gulfport. The LCAC program is expected to meet its mission requirements.

c. (U) Changes Since "as of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no NDCP (SECNAV memo dated December 21, 1981) threshold breaches.

9. (U) Schedule:

a. (U) Milestone --	Production Estimate/Approved Program	Current Estimate
(U) SAIP	Feb 80/Feb 80	Feb 80
(U) MENS APPROVED	Oct 80/Oct 80	Oct 80

9. (U) Schedule (Cont'd):

a. (U) Milestone --	<u>Production Estimate/Approved Program</u>	<u>Current Estimate</u>
(U) DETAIL DESIGN/LONG LEAD MATERIAL CONTRACT	Jun 81/Jun 81	Jun 81
(U) APPROVAL OF LEAD PRODUCTION	Dec 81/Dec 81	Dec 81
(U) CONTRACT AWARD	Feb 82/Dec 81	Feb 82
(U) FIRST CRAFT DELIVERY	Dec 84/Dec 84	Dec 84
*(U) INITIAL OPERATIONAL CAPABILITY	Jul 86/Jul 86	Dec 86 (CH-1)

*IOC - reflects date the lead craft are ready for operational deployment

b. (U) Previous Change Explanations --

Correction of operating problems surfaced during operational testing on LCAC 1 and trials on LCAC 2 causing delay in delivery of LCAC 2-6. This has resulted in the slippage of Initial Operating Capability by 1 additional month (total slip of 5 months).

c. (U) Current Change Explanation --

(CH-1) Cause of additional 1 month slip in IOC is the same as previously reported. IOC has been accomplished.

d. (U) References --

Production Estimate: SECNAV Memo dated December 21, 1981, subject "LCAC Milestone IIIA DNSARC Decision Memorandum"; Approved LCAC NDCP dated May 25, 1983.

Approved Program: SECNAV Memo dated December 21, 1981, subject "LCAC Milestone IIIA DNSARC Decision Memorandum"; Approved LCAC NDCP dated May 25, 1983; FY 88/89 President's Budget.

10. (U) Technical/Operational Characteristics:

		Production		
		Estimate/Approved	Demonstrated	Current
a. (U) Technical --		Program	Performance	Estimate
(U) Operating Crew	5/5		5	5
(U) Troop Capacity (Internal)	24/24			24
(U) Cargo Deck Area (ft2)	1,800/1,800		1,809	1,809
(U) Length-On Cushion (ft)	88/88		87'11"	87'11"
(U) Beam-On Cushion (ft)	47/47		47'	47'
b. (U) Operational --				
(U) Speed (kts)	35+/35+		40+	40+
(U) Design Payload (lbs)	120,000/120,000		120,000	120,000
(U) System Reliability	0.90/0.90		0.96	0.96 (CH-1)
(U) Maintainability MMH/OH Total (CM+PM)	34/34		29.6	34
c. (U) Previous Change Explanations --				
	Demonstrated performance for the cargo deck area exceeds the production estimate.			
	Trials have shown that the craft exceeds minimum speed requirements.			
	Demonstrated performance.			
d. (U) Current Change Explanations --				
	(CH-1) Improved reliability based on demonstrated performance.			
e. (U) References --				

Production Estimate: Approved LCAC NDCP dated May 25, 1983.

Approved Program: LCAC NDCP dated May 25, 1983.

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LCAC, DECEMBER 31, 1980

1140) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	Production Estimate	Changes	Current Estimate
a. Cost			
Development (RDT&E)	21.2	12.3	33.5
Procurement (SCN)	1023.6	585.8	1609.4
(Sailaway)	(982.3)	(545.4)	(1527.7)
(Ship System)	(3.3)	(0.4)	(3.7)
(Initial Spares)	(13.4)	(-13.4)	(0.0)
(Outfitting/Post Delivery)	(24.6)	(53.4)	(78.0)
Construction (MILCON)	58.5	27.2	85.7
Total FY82 Base-Year \$	1103.3	625.3	1728.6
Escalation			
Development (RDT&E)	(0.2)	(2.7)	(2.9)
Procurement	(489.3)	(-87.8)	(401.5)
Construction (MILCON)	(17.9)	(6.5)	(24.4)
Total Then-Year \$	1610.7	546.7	2157.4*
*Excludes FY 92 Advanced Procurement for the FY 93 ships.			
b. Quantities			
Development (RDT&E)	0	0	0
Procurement	60	18	78
Total	60	18	78
c. Unit Cost			
Procurement:			
FY82 Base-Year \$	17.1	3.5	20.6
Then-year \$	25.2	0.6	25.8
Program:			
FY82 Base-Year \$	18.4	3.8	22.2
Then-year \$	26.8	0.9	27.7
d. Approved Design to Cost Goal -- None.			
e. Foreign Military Sales -- None.			
f. Nuclear Costs -- None.			

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LCAC, DECEMBER 31, 1986

12(U) Program Acquisition/Current Procurement Unit Cost Summary:

(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition --			
(1) Cost	2157.4	2028.9	2157.4
(2) Quantity	78	69	78
(3) Unit Cost	27.7	29.4	27.7
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	4.4	4.4	45.4
Less CY Adv Proc	0.0	0.0	-43.7
Plus PY Adv Proc	0.0	0.0	0.0
Less OF/PD	-4.4	-4.4	-1.7
Less PY Escal	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	0.0	0.0	0.0

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LUAL, DECEMBER 31, 1976

3(U) Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Baseline Est. (Pde)	21.4	1512.9	76.4	1610.7
Previous Changes:				
Economic	0.0	-369.1	-5.3	-374.4
Quantity	0.0	342.7	0.0	342.7
Schedule	0.0	-9.7	0.0	-9.7
Engineering	0.0	0.0	0.0	0.0
Estimating	5.5	397.6	24.3	427.4
Other	0.0	0.0	0.0	0.0
Support	0.0	32.2	0.0	32.2
Subtotal	5.5	393.7	19.0	418.2
Current Changes:				
Economic	-0.1	-76.6	-0.8	-77.5
Quantity	0.0	202.8	0.0	202.8
Schedule	0.0	43.0	0.0	43.0
Engineering	0.0	0.0	0.0	0.0
Estimating	9.6	-72.3	15.5	-47.2
Other	0.0	0.0	0.0	0.0
Support	0.0	7.4	0.0	7.4
Subtotal	9.5	104.3	14.7	128.5
Total Changes	15.0	498.0	33.7	546.7
Current Estimate	36.4	2010.9	110.1	2157.4

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LOAD, DECEMBER 31, 1982

13 (U) Cost Variance Analysis (Continued):

a. Summary -- (FY 1982 (Base-Year) Dollars, in Millions)

	RDT&E	PROC	MILCON	TOTAL
Baseline Est. (Pde)	21.2	1023.6	58.5	1103.3
Previous Changes:				
Quantity	0.0	165.8	0.0	165.8
Schedule	0.0	-21.6	0.0	-21.6
Engineering	0.0	0.0	0.0	0.0
Estimating	4.8	291.7	17.4	313.9
Other	0.0	0.0	0.0	0.0
Support	0.0	28.5	0.0	28.5
Subtotal	4.8	464.4	17.4	486.6
Current Changes:				
Quantity	0.0	144.4	0.0	144.4
Schedule	0.0	18.0	0.0	18.0
Engineering	0.0	0.0	0.0	0.0
Estimating	7.5	-46.8	9.8	-29.5
Other	0.0	0.0	0.0	0.0
Support	0.0	5.8	0.0	5.8
Subtotal	7.5	121.4	9.8	138.7
Total Changes	12.3	585.8	27.2	625.3
Current Estimate	33.5	1609.4	85.7	1728.6

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13. (U) Cost Variance Analysis (Cont'd):

b. Previous Change Explanations--

RDTE

Estimating: Refinement of estimates; qualification of second source for LCAC construction; repricing of contract design requirements.

Procurement - SCN

Economic: Revised ASD(C) escalation indices; correction to prior economic assumptions.

Quantity: Addition of 9 craft in FY89; addition of 12 craft in FY90 and associated advance procurement; deletion of 12 craft in FY87.

Schedule: Delay of 3 LCAC from FY85 to FY89; planned construction contract awarded 2 months early; rescheduling 9 craft from FY88-90 to FY91 and associated advance procurement.

Estimating: Offset to ASD(C) escalation indices to maintain controls; adjustment for inflation; correction to prior constant \$ assumptions; congressional reduction to PM growth; reduction to engineering services; additional funding for conversion of contract from CPAF to FPI; revised program estimates; major commodity escalation adjustments; re-estimation of contractor provisioning material; second source planning.

Support: Reduction to Outfitting and Post Delivery associated with rescheduling of craft; repricing of Outfitting and Post Delivery requirements.

MILCON

Economic: Revised ASD(C) escalation indices; correction of prior economic assumptions.

Estimating: Offset to ASD(C) indices to maintain controls; refinement of estimates; correction to prior constant dollar assumptions; addition of MILCON projects; deferral of LCAC projects.

3. Cost Variance Analysis (Continued):

c. Current Change Explanations

(Dollars in Millions)
Base-Year \$ Then-Year \$

1) RDT&E

ECONOMIC

REVISED JAN 87 ECONOMIC ESCALATION RATES	0.0	-0.1
ESTIMATING		
REVISED PROGRAM ESTIMATES (ESTIMATING)	0.0	0.1
INCREASE FOR ADDITIONAL PROGRAM REQUIREMENTS	7.5	9.5

2) Procurement

ECONOMIC

REVISED JAN 87 ECONOMIC ESCALATION RATES	0.0	-76.6
QUANTITY		
ADDITION OF 9 CRAFT IN FY 92	103.4	146.2
ADV PROC ASSOCIATED WITH ADDITIONAL 9 CRAFT	41.0	56.6

SCHEDULE

ADV PROC ASSOCIATED WITH RESCHEDULING FY88 CRAFT	20.5	29.9
TRANSFER 9 CRAFT FROM FY88 TO FY90-92, 3 EACH YEA	-2.5	13.1

SUPPORT

ADDITIONAL PD ASSOC WITH NEW CRAFT & RESCHED CRAFT	2.9	4.1
INCREASE OUTFITTING REQMTS FOR ADDITIONAL 9 CRAFT	2.6	3.0
INCREASE OUTFITTING REQMTS FOR 9 RESCHEDULED CRAFT	3.4	3.7
REDUCTION TO OUTFITTING FOR GRAMM RUDMAN	-2.9	-3.2
REDUCTION TO POST DELIVERY FOR GRAMM RUDMAN	-0.2	-0.2

ESTIMATING

REVISED PROGRAM ESTIMATES (ESTIMATING)	39.0	50.1
ADJUSTMENT FOR INFLATION	-8.5	-10.1
DECREASE DUE TO PROGRAM REPRICING	-103.0	-140.5
INCREASE FOR CONTRACT COST GROWTH	24.5	26.8
REDUCTIONS FOR GRAMM RUDMAN	3.4	4.6
TRANSFER OF CONTRACT DESIGN FUNDS TO RDTE	-2.2	-2.7

3) MILCON

ECONOMIC

REVISED JAN 87 ECONOMIC ESCALATION RATES	0.0	-0.8
--	-----	------

ESTIMATING

REVISED PROGRAM ESTIMATES (ESTIMATING)	0.5	0.8
ADDITION OF LCAC MILCON PROJECTS	10.3	14.8
RESCHEDULING OF LCAC MILCON PROJECTS	-1.0	-0.1

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LEAC, DECEMBER 31, 1980

14(U) Program Acquisition Unit Cost (PAUC) History:

(Millions of Then-Year dollars)

- a. Initial SAR Estimate to Current Baseline Estimate
(Same as Current Baseline Estimate)
- b. Current Baseline Estimate to Current Estimate

+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+										
! PAUC !	Changes (Then Year Dollars in Millions)									! PAUC !
! (Product. !	-----									! (Current !
! Estimate) !	Econ !	Qty !	Sch !	Eng !	Est !	Spt !	Other !	Total !	Estimate) !	
! 26.8 !	-5.8 !	0.9 !	0.4 !	0.0 !	4.9 !	0.5 !	0.0 !	0.9 !	27.7 !	
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+										

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15. (U) Contract Information: (Then-Year Dollars in Millions)

- a. (U) RDT&E -- N/A
- b. (U) Procurement --

LCAC (1-6) 1/
 Textron Marine Systems,
 New Orleans, LA,
 N00024-84-C-2055, FPI,
 Award: June 6, 1981
 Definitized: April 3, 1985

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$184.1	\$217.6	6

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$187.9	\$222.2	6

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$201.6	\$201.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-10.5	\$-4.7
Cumulative Variances to Date (11/22/85)	\$-28.2	\$-1.1
Net Change	\$-17.7	\$+3.6

Explanation of Change: The unfavorable cost variance is primarily identified with TMS labor, effort expended to implement trial card changes, MOA/Guaranty items, craft test support and subcontractor effort to support modification, rework and refurbishment of equipment. The favorable schedule variance is due to adjustments in material earnings. The Program Manager's assessment takes into consideration the above variance.

LCAC (7-12) 1/
 Textron Marine Systems,
 New Orleans, LA,
 N0024-84-C-2055, FPI,
 Award: March 9, 1984
 Definitized: March 9, 1984

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$102.4	\$117.7	6

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$106.2	\$122.1	6

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager*</u>
\$112.3	\$124.5

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$+1.6	\$-8.5
Cumulative Variances to Date (11/22/85)	\$-4.7	\$-6.1
Net Change	\$-6.3	\$+2.4

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

b. (U) Procurement --

Explanation of Change: The unfavorable cost variance is due to BHI and major subcontract growth due to additional cost for economic price adjustments. The favorable schedule variance is primarily due to adjustments in material earnings. The Program Manager's assessment takes into consideration the above variances.

<u>LLTM (85) 1/ 2/</u> Textron Marine Systems, New Orleans, LA, N00024-84-C-2055, FPI, Award: March 14, 1985 Definitized: March 14, 1985	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$78.9	\$97.7	2

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager*</u>
\$78.9	\$97.7	2	\$78.9	\$95.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$+.03	\$+ .8
Cumulative Variances to Date (11/22/85)	\$+.8	\$-7.5
Net Change	\$+.83	\$-8.3

Explanation of Change: The favorable cost variance is due to an understated material earnings for AVCO engines. The unfavorable schedule variance is the result of adjustments in material earnings. The Program Manager's assessment takes into consideration the above variances.

Explanation of Change: The unfavorable cost variance is identified with Engineer and Production Support (i.e., planning, schedule and administration) whereas contract requirements were underestimated by contractor, labor overhead and G&A rate problems. The favorable schedule variance is identified with production efforts relating to Hull construction. The Program Manager's assessment takes into consideration the above variances.

<u>LCAC (13-14) 3/</u> Textron Marine Systems, New Orleans, LA, N00024-87-C-2075, FPI, Award: November 25, 1986 Definitized: November 25, 1986	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$38.6	\$44.6	2

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

b. (U) Procurement --

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager*</u>
\$38.6	\$44.6	2	\$38.6	\$40.2

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$ 0	\$ 0
Cumulative Variances to Date (12/31/86)	\$ 0	\$ 0
Net Change	\$ 0	\$ 0

1/ Shipyard name changed from Bell Aerospace to Textron Marine Systems.

2/ Contract includes LLTM for FY85 Craft plus LLTM for 2nd Source FY85 Craft.

3/ Added

* PM's estimated price at completion includes the Navy estimated escalation for the contract.

c. (U) MILCON -- N/A

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LCAC, DECEMBER 31, 1986

6(U) Program Funding Summary: (Current Estimate in Millions)

a. Program Status --

- (1) Percent Program Completed: $11/16 = 68.8\%$
(Years Funds Appropriated/Total Program Years)
- (2) Percent Program Cost Appropriated: $1029.8 / 2157.4 = 47.7\%$
(Funds Appropriated To Date/Total Program Funding in Millions)

b. Appropriation Summary

(Then-Year Dollars in Millions)

Appropriation	Current & Prior yrs (FY77-87)	Budget Year (FY88)	Balance FYDP (FY89-92)	to Complete Beyond FYDP (FY93-	Total
RDT&E	31.4	1.0	4.0	0.0	36.4
Procurement	942.2	45.4	1015.6	7.7	2010.9
MILCON	56.2	0.0	42.3	11.6	110.1
Total	1029.8	46.4	1061.9	19.3	2157.4

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LCAC, DECEMBER 31, 1986

6(U) Program Funding Summary (Continued): (Current Estimate in Millions)

c. Annual Summary --

Fiscal Year	Qty	FY82 Base-Year Dollars			Then-Year Dollars			Escl Rate %	
		Sailaway		Total	Advance Proc		Total		
		Nonrec.	Rec.		Debit	Credit			
APPROPRIATION: RDT&E									
1977	0	0.0	0.0	0.2	0.0	0.0	0.2	2.58	
1978	0	0.0	0.0	1.5	0.0	0.0	1.5	6.80	
1979	0	0.0	0.0	1.5	0.0	0.0	1.5	8.39	
1980	0	0.0	0.0	8.2	0.0	0.0	8.2	10.50	
1981	0	0.0	0.0	4.7	0.0	0.0	4.7	10.60	
1982	0	0.0	0.0	5.2	0.0	0.0	5.3	7.59	
1983	0	0.0	0.0	1.0	0.0	0.0	1.1	4.90	
1984	0	0.0	0.0	0.8	0.0	0.0	0.9	3.80	
1985	0	0.0	0.0	1.7	0.0	0.0	2.0	3.40	
1986	0	0.0	0.0	3.1	0.0	0.0	3.7	2.90	
1987	0	0.0	0.0	1.9	0.0	0.0	2.3	3.10	
1988	0	0.0	0.0	0.8	0.0	0.0	1.0	3.50	
1989	0	0.0	0.0	0.8	0.0	0.0	1.0	3.50	
1990	0	0.0	0.0	0.7	0.0	0.0	1.0	3.30	
1991	0	0.0	0.0	0.7	0.0	0.0	1.0	2.90	
1992	0	0.0	0.0	0.7	0.0	0.0	1.0	2.40	
Subtotal	0	0.0	0.0	33.5	0.0	0.0	36.4	--	

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LCAD, DECEMBER 31, 1986

5 (U) Program Funding Summary (Continued): (Current Estimate in Millions)

c. Annual Summary --

Fiscal Year	Qty	FY82 Base-Year Dollars			Then-Year Dollars			Escal Rate %	
		Sailaway		Total	Advance Proc		Total		
		Nonrec.	Rec.		Debit	Credit			
APPROPRIATION: Procurement									
1981	0	0.0	0.0	50.7	53.6	0.0	53.6	9.60	
1982	3	55.0	95.4	104.7	0.0	52.2	113.9	7.50	
1983	3	0.0	64.6	64.8	0.0	1.4	71.8	3.80	
1984	6	0.0	118.2	149.3	34.8	0.0	170.2	3.00	
1985	9	0.0	182.4	219.1	63.9	22.9	253.4	2.10	
1986	12	0.0	238.6	229.9	18.7	29.8	274.9	1.20	
1987	0	0.0	0.0	3.8	4.4	0.0	4.4	3.10	
1988	0	0.0	0.0	35.6	45.4	0.0	45.4	3.50	
1989	9	0.0	160.1	177.1	67.0	43.7	232.4	3.50	
1990	12	0.0	202.9	204.9	68.1	63.8	276.1	3.30	
1991	12	0.0	204.3	206.6	71.0	66.4	285.0	2.90	
1992	12	0.0	204.8	157.2	2.5	68.3	222.1	2.40	
1993	0	0.0	0.0	5.7	7.7	0.0	7.7	2.40	
Subtotal	78	55.0	1471.3	1609.4	437.1	348.5	2010.9	--	

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LOAD, DECEMBER 31, 1993

6(U) Program Funding Summary (Continued): (Current Estimate in Millions)

c. Annual Summary --

Fiscal Year	Qty	FY82 Base-Year Dollars			Then-Year Dollars			Escl Rate %	
		Sailaway		Total	Advance Proc		Total		
		Nonrec.	Rec.		Debit	Credit			
APPROPRIATION: MILCON									
1984	0	0.0	0.0	19.2	0.0	0.0	21.9	3.80	
1985	0	0.0	0.0	16.4	0.0	0.0	19.4	3.40	
1986	0	0.0	0.0	12.2	0.0	0.0	14.9	2.90	
1987	0	0.0	0.0	0.0	0.0	0.0	0.0	3.10	
1988	0	0.0	0.0	0.0	0.0	0.0	0.0	3.50	
1989	0	0.0	0.0	1.0	0.0	0.0	1.4	3.50	
1990	0	0.0	0.0	14.2	0.0	0.0	19.6	3.30	
1991	0	0.0	0.0	5.6	0.0	0.0	7.9	2.90	
1992	0	0.0	0.0	9.3	0.0	0.0	13.4	2.40	
1993	0	0.0	0.0	7.8	0.0	0.0	11.6	2.40	
Subtotal	0	0.0	0.0	85.7	0.0	0.0	110.1	--	
Total	78	55.0	1471.3	1728.6	437.1	348.5	2157.4	--	

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LCAC, DECEMBER 31, 1986

6(U) Program Funding Summary (Continued): (Current Estimate in Millions)

d. Obligations and Expenditures --

APPROPRIATION: RDT&E

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	Total	Oblig.	Expended
1977	0.2	0.2	0.2
1978	1.5	1.5	1.5
1979	1.5	1.5	1.5
1980	8.2	8.2	8.2
1981	4.7	4.7	4.7
1982	5.3	5.3	5.3
1983	1.1	1.1	1.1
1984	0.9	0.9	0.9
1985	2.0	2.0	2.0
1986	3.7	3.6	1.0
1987	2.3	0.0	0.0
To Compl.	5.0	0.0	0.0
Total	36.4	29.0	26.4

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(UNCLASSIFIED)

LCAC, DECEMBER 31, 1986

6(U) Program Funding Summary (Continued): (Current Estimate in Millions)

d. Obligations and Expenditures --

APPROPRIATION: Procurement

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	Total	Oblig.	Expended
1981	53.6	53.5	43.1
1982	113.9	113.4	111.1
1983	71.8	64.6	64.1
1984	170.2	149.0	105.2
1985	253.4	140.4	61.6
1986	274.9	1.7	0.0
1987	4.4	0.0	0.0
To Compl.	1068.7	0.0	0.0
Total	2010.9	522.6	385.1

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LCAC, DECEMBER 31, 1986

6(U) Program Funding Summary (Continued): (Current Estimate in Millions)

d. Obligations and Expenditures --

APPROPRIATION: MILCON

Then Year Dollars (Current Estimate in Millions)					
Fiscal Year	Total	Oblig.	Expended		
1984	21.9	21.9	21.0		
1985	19.4	19.4	15.5		
1986	14.9	14.9	0.0		
1987	0.0	0.0	0.0		
To Compl.	53.9	0.0	0.0		
Total	110.1	56.2	36.5		

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LEAC, DECEMBER 31, 1988

7(U) Production Rate Data:

a. Annual Production Rates

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimates	Production Estimates	Current Estimates	Maximum
1982	N/A	3	3	3
1983	N/A	3	3	3
1984	N/A	6	6	6
1985	N/A	12	9	9
1986	N/A	12	12	12
1987	N/A	12	0	0
1988	N/A	12	0	0
1989	N/A	0	9	9
1990	N/A	0	12	12
1991	N/A	0	12	12
1992	N/A	0	12	12
1993	N/A	0	0	0

b. Cost Variance (Dollars in Millions)

Item	Production Estimates	Variance (CE less Pde)	Current Estimates	Variance (CE less Max)	Maximum
Prod Acq. Cost					
(BY \$)	1103.3	625.3	1728.6	0.0	1728.6
(TY \$)	1610.7	546.7	2157.4	0.0	2157.4
PAUC					
(BY \$)	18.4	3.8	22.2	0.0	22.2
(TY \$)	26.8	0.9	27.7	0.0	27.7

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LCAC 1 Class, December 31, 1986

17. (U) Production Rate Data (Cond't):

c. Schedule Variance --

	Production	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum
Start Date (Mo/Yr)	2/82	-	2/82	-	2/82
Duration (in Months)	110	+38	148	-	148
End Date (Mo/Yr)	4/91	+38	6/94	-	6/94

d. Deliveries (Plan/Actual) --

	<u>TO DATE</u>
RDT&E	0/0
Procurement	6/6

18. (U) Operating and Support Costs: N/A

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~~CONFIDENTIAL~~SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A)823)

PROGRAM: LHD 1 CLASS

AS OF DATE: December 31, 1986

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SUBJECT

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1. (U) Designation/Nomenclature (Popular Name): LHD 1/Amphibious Assault Ship

2. (U) DOD Component: U.S. Navy

3. (U) Responsible Office and Telephone Number:

Amphibious Warfare and Strategic
Sealift Program Office (PMS377)
Naval Sea Systems Command
Washington, DC 20362

PM: E. E. Shoults
Assigned: April 29, 1985
AUTOVON: 222-8511
COMM: (202) 692-8511

4. (U) Program Elements:

RDT&E: PE63564N, PE64526N, PE64567N (shared funding)
PROCUREMENT: 24411N, APPN 1611, ICN 5105

5. (U) Related Programs: Landing Craft, Air Cushion (LCAC)

~~Classified by Form DD-254 dated 15 Apr 82
Contract #N000-86-0-2180 and SEA 00
Review for DECLASSIFICATION and OADR~~

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6. (U) Mission and Description:

The ships primary amphibious mission is to embark, deploy and land elements of a marine landing force in an assault by helicopters, landing craft, amphibious vehicles, and by combinations of these methods. LHD 1 Class has a secondary/convertible mission for sea control and power projection.

7. (U) Program Highlights:

a. (U) Significant Historical Developments-- The LHD program began in FY 1981 as part of an overall program to address impending block obsolescence of the Navy's amphibious lift capability. Initially, the LHD was intended to be a traditional, new design ship development program with lead ship authorization in 1987. In the spring of 1981, in response to SECNAV direction to rapidly increase amphibious lift capability, the Navy accelerated the LHD program by moving lead ship authorization forward from 1987 to 1985. Subsequently, in June 1981, SECNAV proposed that the LHD have a convertible sea control mission; and, in November, directed that the Program be accelerated in a 1984 Authorization as a modified LHA design.

Baseline design of the LHD was completed in June 1982. Contract design was completed in November 1983. On 12 June 1982, the SAIP approved the LHD characteristics, which were certified by CNO on 2 December 1982. On 2 June 1983, SECNAV reviewed the LHD Program.

A detail design and construction contract was awarded to Ingalls Shipbuilding Division on 28 February 1984 for the Lead Ship in the LHD Program. Actual construction was started on the LHD 1 on 9 July 1984, two months earlier than originally planned. The LHD 1 keel laying occurred 30 May 1985, two months earlier than originally planned.

b. (U) Significant Developments Since Last Report-- On 10 September 1986, the Navy awarded a Fixed Price Incentive (FPI) contract to Ingalls Shipbuilding Division for the LHD 2. The contract also includes options for the LHD 3 and 4. The option for LHD 3 Long Lead Time Material (LLTM) was executed on 25 November 1986.

A detailed testing program is scheduled during construction to verify compliance with detail criteria. INSURV will conduct standard at-sea trials (Acceptance and Final Contract) at completion. Experience from the LHA Class has been utilized in the development of the LHD 1 Class design. A ship shock test will be performed on the lead ship to validate shock hardening criteria applied to the LHD 1 design and to identify deficiencies and develop corrective measures for follow ships of the class. No further OT&E is planned for the LHD 1 Class Hull System. The LHD 1 Program is expected to meet its mission requirements.

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LHD 1 Class, December 31, 1986

c. (U) Changes Since "as of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches:

There are currently no NDCP (dated August 15, 1985) threshold breaches.

9. ~~(U)~~ Schedule:

a. (U) Milestones --	Development Estimate/Approved Program	Current Estimate
(U) SAIP	Jul 82/Jul 82	Jul 82
(U) Start Contract Design	Aug 82/Aug 82	Aug 82
(U) Award Lead Ship Contract	Dec 83/Dec 83	Feb 84
(U) Launch First Ship	Aug 87/Aug 87	Aug 87
(U) Acceptance Trials (Lead Ship)	Feb 89/Feb 89	Feb 89
(U) Lead Ship Delivery	Mar 89/Mar 89	Mar 89

(b)(1)

b. (U) Previous Change Explanations --

The contract award date for the LHD 1 Class Lead Ship was updated to reflect actual date of February 28, 1984.

Original date for the Initial Operating Capability for the LHD was improperly calculated. The SAR has been updated to reflect correct data.

c. (U) Current Change Explanation -- None

d. (U) References --

Development Estimates: Top Level Requirements (TLR) dated 8 December 1983, CNO Ser 03/C387632 dated 2 December 1982.

Approved Program: Top Level Requirements (TLR) dated 8 December 1983, CNO Ser 03/C387632 dated 2 December 1982; FY 88/89 President's Budget.

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LHD 1 Class, December 31, 1986

10. ~~CONFIDENTIAL~~ Technical/Operational Characteristics:

a. (U) Technical --	Development Estimate/Approved Program	Demonstrated Performance	Current Estimate
(U) Troops	1,873/1,873	N/A	1,873
(U) Vehicle Square (ft ²)	22,900/22,900	N/A	22,900
(U) Cargo Cube (ft ³)	109,000/109,000	N/A	109,000
(U) LCAC	3/3	N/A	3
(U) Length (ft)	840/840	N/A	844
(U) Beam (ft)	106/106	N/A	106
(U) Draft (Full Load) (ft) 1/	26/26	N/A	26'8"
(U) Displacement (Full Load) 1/	39,400/39,400	N/A	40,533
(U) Offload Capability (Tons/Hr)	300/300	N/A	300
(U) Propulsion	Steam/Steam	N/A	Steam
(U) Shaft HP/No. Screws	70,000/2/70,000/2	N/A	70,000/2
(U) Medical Facilities	6 ORs/6 ORs*		6 ORs

b. ~~CONFIDENTIAL~~ Operational --

(U) Speed (Kts)	22/22	N/A	22
-----------------	-------	-----	----

(b)(1)

(U) Armament			
- Close in Weapon System	3/3	N/A	3
- Self Defense Missile System	2/2	N/A	2

c. (U) Previous Change Explanations --

The 26/39,400 estimates were figures provided during the design development phase. The 26'8" and 40,533 reflects the full load weight estimate at the completion of the Contract Design.

d. (U) Current Change Explanations -- None

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LHD 1 Class, December 31, 1986

e. (U) References --

Development Estimate: SECNAV Memo dated 2 December 1982, subject "LHD 1 Class Amphibious Assault Ship SAIP; LHD 1 Class NDCP dated 15 August 1985.

Approved Program: SECNAV Memo dated 2 December 1982, subject "LHD 1 Class Amphibious Assault Ship SAIP; LHD 1 Class NDCP dated 15 August 1985.

* Operating Room (ORs)

1/ Changes in Current Estimate will not be noted unless they exceed: Draft \pm 3 inches; Displacement \pm 1,000 tons.

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LHD 1 Class, DECEMBER 31, 1995

1(U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. Cost			
Development (RDT&E)	39.9	1.5	41.4
Procurement (SCN)	2891.9	1204.3	4096.2
(Sailaway)	(2794.9)	(1081.4)	(3865.0)
(Ship System)	(10.1)	(-10.1)	(11.3)
(Initial Spares)	(9.3)	(1.2)	(10.5)
(Outfitting/Post Delivery)	(77.6)	(131.8)	(209.4)
Total FY82 Base-Year \$	2931.8	1205.8	4137.6
Escalation	1519.2	-495.1	1024.1
Development (RDT&E)	(3.7)	(-0.5)	(3.2)
Procurement	(1515.5)	(-494.6)	(1020.9)
Total Then-Year \$	4451.0	710.7	5161.7*
*Excludes FY'92 Advance Procurement for the FY 93 ships.			
b. Quantities			
Development (RDT&E)	0	0	0
Procurement	3	2	5
Total	3	2	5
c. Unit Cost			
Procurement:			
FY82 Base-Year \$	964.0	-144.7	819.3
Then-year \$	1464.1	-440.7	1023.4
Program:			
FY82 Base-Year \$	977.3	-149.8	827.5
Then-year \$	1483.7	-451.4	1032.3

d. Approved Design to Cost Goal -- None.

e. Foreign Military Sales -- None.

f. Nuclear Costs -- None.

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LHD 1 Class, DECEMBER 31, 1986

12(U) Program Acquisition/Current Procurement Unit Cost Summary:

(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition --			
(1) Cost	5161.7	6363.1	5161.7
(2) Quantity	5	5	5
(3) Unit Cost	1032.3	1272.6	1032.3
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	40.4	40.4	783.2
Less CY Adv Proc	-35.0	-35.0	-32.2
Plus PY Adv Proc	0.0	0.0	0.0
Less OF/PD	-5.4	-5.4	-10.3
Less PY Escal	0.0	0.0	0.0
Net Total	0.0	0.0	740.7
(2) Quantity	0	0	1
(3) Unit Cost	0.0	0.0	740.7

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LHD 1 Class, DECEMBER 31, 1985

13(U) Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	43.6	4407.4	0.0	4451.0
Previous Changes:				
Economic	-0.8	-1200.5	0.0	-1201.5
Quantity	0.0	3075.0	0.0	3075.0
Schedule	0.0	-233.9	0.0	-233.9
Engineering	0.0	0.0	0.0	0.0
Estimating	-2.9	150.7	0.0	148.0
Other	0.0	0.0	0.0	0.0
Support	0.0	124.5	0.0	124.5
Subtotal	-3.7	1915.8	0.0	1912.1
Current Changes:				
Economic	0.1	-267.8	0.0	-267.7
Quantity	0.0	0.0	0.0	0.0
Schedule	0.0	0.0	0.0	0.0
Engineering	0.0	0.0	0.0	0.0
Estimating	4.6	-962.4	0.0	-957.8
Other	0.0	0.0	0.0	0.0
Support	0.0	24.1	0.0	24.1
Subtotal	4.7	-1206.1	0.0	-1201.4
Total Changes	1.0	709.7	0.0	710.7
Current Estimate	44.6	5117.1	0.0	5161.7

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LHD 1 Class, DECEMBER 31, 1986

3(U) Cost Variance Analysis (Continued):

a. Summary -- (FY 1982 (Base-Year) Dollars in Millions)

	RDT&E	PRDC	MILCON	TOTAL
Development Estimate	39.9	2891.9	0.0	2931.8
Previous Changes:				
Quantity	0.0	1872.9	0.0	1872.9
Schedule	0.0	-187.4	0.0	-187.4
Engineering	0.0	0.0	0.0	0.0
Estimating	-2.2	183.3	0.0	181.1
Other	0.0	0.0	0.0	0.0
Support	0.0	80.7	0.0	80.7
Subtotal	-2.2	1949.5	0.0	1947.3
Current Changes:				
Quantity	0.0	0.0	0.0	0.0
Schedule	0.0	0.0	0.0	0.0
Engineering	0.0	0.0	0.0	0.0
Estimating	3.7	-759.0	0.0	-755.3
Other	0.0	0.0	0.0	0.0
Support	0.0	13.8	0.0	13.8
Subtotal	3.7	-745.2	0.0	-741.5
Total Changes	1.5	1204.3	0.0	1205.8
Current Estimate	41.4	4096.2	0.0	4137.6

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13. (U) Cost Variance Analysis (Cont'd):

b. Previous Change Explanations--

RDTE

Economic: Revised ASD(C) escalation indices.

Estimating: Repricing of LHD design requirements; Offset to ASD(C) escalation indices to maintain controls.

Procurement

Economic: Revised ASD(C) escalation indices; correction to prior escalation assumptions.

Quantity: Addition of 1 ship in FY90.

Schedule: Rescheduling FY90 ship to FY91; changing the acquisition strategy from an annual to multiyear procurement.

Estimating: Adjustment for inflation; offset to ASD(C) indices to maintain controls; correction to prior SAR constant dollar assumptions; revised estimates for multiyear procurement; revised program estimates; major commodity escalation adjustment; contract design requirements; program repricing.

Support: Addition of Outfitting and Post Delivery for new ship; revised outfitting and post delivery estimates; revised OF/PD associated with rescheduling of ship.

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LHO 1 Class, DECEMBER 31, 1995

3. Cost Variance Analysis (Continued):

c. Current Change Explanations

(Dollars in Millions)
Base-Year \$ Then-Year \$

1) RDT&E

ECONOMIC

REVISED JAN 87 ECONOMIC ESCALATION RATES ESTIMATING	0.0	0.1
REVISED PROGRAM ESTIMATES (ESTIMATING)	0.1	-0.1
ADDITION OF CONTRACT DESIGN FUNDS	1.1	1.4
REPRICING OF PROGRAM REQUIREMENTS	2.5	3.3

2) Procurement

ECONOMIC

REVISED JAN 87 ECONOMIC ESCALATION RATES SUPPORT	0.0	-267.8
REPRICING OF OUTFITTING PROGRAM REQUIREMENTS	10.4	15.1
REPRICING OF POST DELIVERY PROGRAM REQUIREMENTS	3.4	9.0
ESTIMATING		
REVISED PROGRAM ESTIMATES (ESTIMATING)	213.0	267.8
ADJUSTMENT FOR INFLATION	-32.8	-39.5
CSS/CAAS REDUCTIONS	-2.5	-3.2
FAVORABLE CONTRACT NEGOTIATION, ADV. PROC.	-411.0	-509.2
FAVORABLE CONTRACT NEGOTIATIONS (FF)	-275.6	-336.7
PROFIT REDUCTION	-3.6	-4.7
REDUCTION FOR GRAMM RUDMAN	-14.4	-16.5
REPRICING OF THE FY91 PROGRAM	-230.1	-317.7
TRANSFER CONTRACT DESIGN FUNDS FROM SON TO R&D	-2.0	-2.7

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LHD 1 Class, DECEMBER 31, 1976

4(U) Program Acquisition Unit Cost (PAUC) History:

(Millions of Then-Year dollars)

- a. Initial SAR Estimate to Current Baseline Estimate
(Same as Current Baseline Estimate)
- b. Current Baseline Estimate to Current Estimate

+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+										
! PAUC !	Changes (Then Year Dollars in Millions)									! PAUC !
! (Develop. !										! (Current !
! Estimate) !	Econ !	Qty !	Sch !	Eng !	Est !	Spt !	Other !	Total !	Estimate) !	
! 1483.7 !	! -293.7 !	! 21.5 !	! -46.8 !	! 0.0 !	! 0.0 !	! 29.7 !	! 0.0 !	! -451.4 !	! 1032.3 !	
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+										

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15. (U) Contract Information: (Then-Year Dollars in Millions)

- a. (U) RDT&E -- N/A
- b. (U) Procurement --

<u>LHD 1</u>			<u>Initial Contract Price</u>		
Ingalls Shipbuilding Division,			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Pascagoula, MS			\$962.1	\$1150.8	1
N00024-82-C-2260, FPI,					
Award: February 28, 1984					
Definitized: February 28, 1984					

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager*</u>
\$957.0	\$1144.6	1	\$958.6	\$1032.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$+ 2.7	\$+22.6
Cumulative Variances to Date (11/30/86)	\$-18.1	\$-15.0
Net Change	\$-20.8	\$-37.6

Explanation of Change: The unfavorable cost and schedule variances are a result of poor craft cost performance accruing in the Hull Fab, IPD, Ship Management and Electrical areas and major procurement resulting from erroneous timephasing of payment. The Program Manager's assessment takes into consideration the above variances.

<u>LHD 2</u> <u>1/</u>			<u>Initial Contract Price</u>		
Ingalls Shipbuilding Division,			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Pascagoula, MS			\$401.3	\$453.3	1
N0024-86-C-2005, FPI,					
Award: September 10, 1986					
Definitized: September 10, 1986					

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager**</u>
\$401.3	\$453.3	1	\$401.3	\$521.5

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$ 0	\$ 0
Cumulative Variances to Date (12/30/86)	\$ 0	\$ 0
Net Change	\$ 0	\$ 0

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LHD 1 Class, December 31, 1986

Explanation of Change: None

1/ Added

c. (U) Milcon -- N/A

* PM'S estimated price of completion includes the Navy estimated escalation for the contract.

** PM'S estimated price of completion for LHD 2 includes the Navy's estimate that the contract will go to ceiling and estimated escalation for the contract.

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LHD 1 Class, DECEMBER 31, 1986

6(U) Program Funding Summary: (Current Estimate in Millions)

a. Program Status --

(1) Percent Program Completed: $7/15 = 46.7\%$
(Years Funds Appropriated/Total Program Years)

(2) Percent Program Cost Appropriated: $2360.6/5161.7 = 45.7\%$
(Funds Appropriated To Date/Total Program Funding in Millions)

b. Appropriation Summary

(Then-Year Dollars in Millions)

Appropriation	Current & Prior yrs (FY81-87)	Budget Year (FY88)	Balance FYDP (FY89-92)	to Complete Beyond FYDP (FY93-	Total
RDT&E	40.7	0.9	3.0	0.0	44.6
Procurement	2319.9	783.2	1875.5	138.5	5117.1
Total	2360.6	784.1	1878.5	138.5	5161.7

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LHD 1 Class, DECEMBER 31, 1986

16(U) Program Funding Summary (Continued): (Current Estimate in Millions)

c. Annual Summary --

Fiscal Year	Qty	FY82 Base-Year Dollars			Then-Year Dollars			Escl Rate %	
		Sailaway		Total	Advance Proc		Total		
		Nonrec.	Rec.		Debit	Credit			
APPROPRIATION: RDT&E									
1981	0	0.0	0.0	0.9	0.0	0.0	0.9	10.60	
1982	0	0.0	0.0	14.2	0.0	0.0	14.5	7.59	
1983	0	0.6	0.0	19.2	0.0	0.0	20.6	4.90	
1984	0	0.0	0.0	1.0	0.0	0.0	1.1	3.80	
1985	0	0.0	0.0	2.4	0.0	0.0	2.7	3.40	
1986	0	0.0	0.0	0.3	0.0	0.0	0.4	2.90	
1987	0	0.0	0.0	0.4	0.0	0.0	0.5	3.10	
1988	0	0.0	0.0	0.7	0.0	0.0	0.9	3.50	
1989	0	0.0	0.0	0.8	0.0	0.0	1.0	3.50	
1990	0	0.0	0.0	0.7	0.0	0.0	1.0	3.50	
1991	0	0.0	0.0	0.4	0.0	0.0	0.5	3.50	
1992	0	0.0	0.0	0.4	0.0	0.0	0.5	3.50	
Subtotal	0	0.0	0.0	41.4	0.0	0.0	44.6	--	

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LHD 1 Class, DECEMBER 31, 1986

6(U) Program Funding Summary (Continued): (Current Estimate in Millions)

c. Annual Summary --

Fiscal Year	Qty	FY82 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		Sailaway		Total	Advance Proc		Total	
		Nonrec.	Rec.		Debit	Credit		
		APPROPRIATION: Procurement						
1982	0	0.0	0.0	41.3	45.0	0.0	45.0	7.50
1983	0	0.0	0.0	49.6	54.9	0.0	54.9	3.80
1984	1	150.0	1063.9	1144.8	0.0	99.9	1311.4	3.00
1985	0	0.0	0.0	33.6	39.2	0.0	39.2	2.10
1986	1	0.0	722.8	689.4	0.2	39.2	829.0	1.20
1987	0	0.0	0.0	32.9	40.4	0.0	40.4	3.10
1988	1	0.0	607.7	613.4	42.5	35.0	783.2	3.50
1989	1	0.0	589.3	591.3	33.1	32.2	774.2	3.50
1990	0	0.0	0.0	38.2	50.9	0.0	50.9	3.30
1991	1	0.0	731.4	722.7	29.0	41.8	996.1	2.90
1992	0	0.0	0.0	40.9	54.3	0.0	54.3	2.40
1993	0	0.0	0.0	19.7	26.8	0.0	26.8	2.40
1994	0	0.0	0.0	34.8	48.5	0.0	48.5	2.40
1995	0	0.0	0.0	28.4	40.5	0.0	40.5	2.40
1996	0	0.0	0.0	0.0	0.0	0.0	0.0	2.40
1997	0	0.0	0.0	15.2	22.7	0.0	22.7	2.40
Subtotal	5	150.0	3715.1	4096.2	528.0	248.1	5117.1	--
Total	5	150.0	3715.1	4137.6	528.0	248.1	5161.7	--

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LHD 1 Class, DECEMBER 31, 1986

6(U) Program Funding Summary (Continued): (Current Estimate in Millions)

d. Obligations and Expenditures --

APPROPRIATION: RDT&E

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	Total	Oblig.	Expended
1981	0.9	0.9	0.9
1982	14.5	14.5	14.5
1983	20.6	18.5	18.1
1984	1.1	1.2	1.2
1985	2.7	2.0	1.9
1986	0.4	0.3	0.3
1987	0.5	0.1	0.0
To Compl.	3.9	0.0	0.0
Total	44.6	37.5	36.9

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LHD 1 Class, DECEMBER 31, 1985

6(U) Program Funding Summary (Continued): (Current Estimate in Millions)

d. Obligations and Expenditures --

APPROPRIATION: Procurement

Then Year Dollars (Current Estimate in Millions)					
Fiscal Year	Total	Oblig.	Expended		
1982	45.0	45.0	44.9		
1983	54.9	53.8	52.5		
1984	1311.4	1070.1	638.8		
1985	39.2	39.0	21.2		
1986	829.0	506.2	3.2		
1987	40.4	28.1	0.0		
To Compl.	2797.2	0.0	0.0		
Total	5117.1	1742.2	760.6		

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LHD 1 Class, DECEMBER 31, 1986

17(U) Production Rate Data:

- * Annual Production rate is less than 6 yearly
Per ASD Memo dated 12 Dec. 86, Production
rate information is not applicable to the
program.

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SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A)823)

PROGRAM: LSD 41 CLASS

AS OF DATE: * December 31, 1986

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1. (U) <u>Designation/Nomenclature (Popular Name):</u>	LSD 41 Class/ Dock Landing Ship
2. (U) <u>DOD Component:</u>	U.S. Navy
3. (U) <u>Responsible Office and Telephone Number:</u>	
Amphibious Warfare and Strategic Sealift Program Office (PMS377) Naval Sea Systems Command Washington, DC	PM: E. E. Shoults Assigned: April 29, 1985 AUTOVON: 222-8511 COMM: (202) 692-8511
4. (U) <u>Program Elements:</u>	
RDT&E: PE63564N, PE63567N, PE64567N (shared funding) PROCUREMENT: 24411N, APPN 1611, ICN 5105	
5. (U) <u>Related Programs:</u>	LCAC

~~Classified by SP4/ANT 15513.3A, Enc (41)
Review for DECLASSIFICATION ON: OADR~~

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AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

6. (U) Missions and Description: To conduct sustained combat operations, to gain/maintain sea control. To project naval power ashore by transporting landing force elements, landing craft, Landing Craft, Air Cushion (LCAC) and assault amphibians to the objective area, launching preloaded assault craft and amphibians to support amphibious assault and to operate in the amphibious warfare environment. The Dock Landing Ship (LSD 41) is a twin-screw, 22 knot, diesel propelled amphibious assault ship, with an overall length of 609 feet and a maximum beam of 84 feet. It also has accommodations for a total of 917 (413 crew and 504 troops, which includes 102 surge troops).

7. (U) Program Highlights:

a. (U) Significant Historical Developments-- An Operational Requirement (OR) (OR-0863-AW) for a Dock Landing Ship (LSD 41) was established by the Chief of Naval Operations (CNO) on 2 November 1976. At Milestone I on 18 July 1977, the Ship Acquisition and Improvement Panel (SAIP) recommended and the CNO approved the LSD 41 general configuration of a wet-well, medium-speed diesel propulsion system design. On 1 November 1978 at Milestone II, the Secretary of the Navy approved the contract design characteristics. On 16 January 1981, Milestone III, for production and fleet introduction, was approved. A Ship Systems Design Support contract was awarded to Lockheed Shipbuilding (Seattle, WA) on 15 February 1980. The Lead Ship Detail Design and Construction contract was awarded to Lockheed on 9 February 1981. The contract for the first follow-ship was awarded on 26 March 1982 and the second follow-ship 27 January 1983. On 21 November 1983, the Navy awarded a Fixed Price Incentive contract to Avondale Shipbuilding, Inc. for construction of the LSD 44. An option for the construction of two ships (LSD 45 & 46) was executed on 26 November 1984. Builder's Trials for the LSD 42 were conducted during October 1985. Acceptance Trials were held during December 1985. The LSD 42 delivered on 1 February 1986. The LSD 43 was successfully launched on 1 February 1986. The final option for construction of two ships (LSD 47 & 48) was executed on 11 December 1985.

The LSD 41 successfully completed Acceptance Trials on 7 December 1984 and was delivered to the Navy on 8 January 1985. Final Contract Trials (FCT) for the LSD 41 were successfully completed during September 1985. The LSD 42 was launched 29 June 1984 on schedule.

On 8 November 1984 the LSD 41 contract was renegotiated from Cost Plus Award Fee (CPAF) to Cost Plus Fixed Fee (CPFF) with ceiling limiting the government's liability for the overrun to \$38.0M. The LSD 42 contract was converted from a CPAF to Fixed Price Incentive (FPI) with a 50/50 share ratio. All remaining ships are being procured under FPI contracts.

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b. (U) Significant Development Since Last Report-- Final Contract Trials (FCT) for the LSD 42 were successfully completed on 24 June 1986. An eight week Post Shakedown Availability (PSA) for the LSD 42 was completed on 12 December 1986.

The LSD 43 is currently on schedule for delivery in June 1987, despite a lockout of union employees by Lockheed Shipbuilding. However continuation of the lockout past mid January 1987 could delay delivery of the LSD 43.

Keel laying ceremonies for the LSD 44 were held 26 May 1986. Actual construction of the LSD 45 and LSD 46 began 21 April 1986 and 22 September 1986, respectively. The LSD 45 also achieved its keel laying milestone on 27 October 1986. The LSD 41 Program is expected to meet its mission requirements.

c. (U) Changes Since "as of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no NDCP (dated March 1985) threshold breaches.

9. (U) Schedule:

a. (U) Milestone --	Production Estimate/Approved Program	Current Estimate
(U) SAIP Approval	Nov 78/Nov 78	Nov 78
(U) Approval For Production	Jan 81/Jan 81	Jan 81
(U) Lead Ship Award	Feb 81/Feb 81	Feb 81
(U) Launch Lead Ship	Jun 83/Jun 83	Jun 83
(U) Acceptance Trials (Lead Ship)	Oct 84/Oct 84	Dec 84
(U) Delivery Lead Ship	Nov 84/Nov 84	Jan 85
*(U) Initial Operational Capability	Nov 85/Nov 85	Feb 86

*IOC - reflects date the lead ready for operational deployment.

b. (U) Previous Change Explanations --

Delay in acceptance trials from 8 October 1984 to 7 December 1984 and delivery from 30 November 1984 to 8 January 1985 resulted from the shipbuilder overrunning his production man-hours to complete the ship.

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LSD 41 Class, December 31, 1986

Delay in IOC of two months is the result of 2 month late delivery of the Lead Ship, coupled with extension of SCN period to conduct Shock Test, and LCAC/LSD interface trials, which delayed PSA start date.

c. (U) Current Change Explanation -- None

d. (U) References --

Production Estimate: Revised NDCP, dated March 1985, subject LSD 41 Class.

Approved Program: Revised NDCP, dated March 1985, subject LSD 41 Class.

10. ☒ Technical/Operational Characteristics:

a. (U) Technical --	<u>Production Estimate/Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(U) Accommodations			
(1) Troops	338/338	338	338
(2) Crew	413/413	413	413
(3) Staff	166/166	166	166
(U) Vehicle Square ft	12,800/12,800	12,800	12,800
(U) Marine Cargo			
(Cubic ft)	5,000/5,000	5,000	5,000
(U) Helicopter Spots			
(CH-46)	1 + 1/1 + 1	1 + 1	1 + 1
(U) Landing Craft	4 LCAC/4 LCAC	4 LCAC	4 LCAC
(U) Length (ft)	609/609	609	609
(U) Beam (ft)	84	84	84
(U) Draft (ft)	19'5"/19'5"	19'5"	19'5"

b. ☒ Operational --

(U) Speed (kts)	22/22	22	22
-----------------	-------	----	----

(b)(1)

c. (U) Previous Change Explanations -- None.

d. (U) Current Change Explanations -- None.

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LSD 41 Class, December 31, 1986

e. (U) References --

Production Estimate: Revised NDCP, dated March 1985
subject LSD 41 Class.

Approved Program: Revised NDCP, dated March 1985 subject
LSD 41 Class; FY 88/89 President's Budget.

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LSD 41 Class, DECEMBER 31, 1984

11(U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	Production Estimate	Changes	Current Estimate
a. Cost			
Development (RDT&E)	46.9	-1.6	45.3
Procurement (SCN)	3177.0	-1129.9	2047.1
(Sailaway)	(3021.8)	(-1119.0)	(1902.8)
(Ship System)	(5.3)	(0)	(5.3)
(Initial Spares)	(3.5)	(-0.2)	(3.3)
(Outfitting/Post Delivery)	(146.4)	(-10.7)	(135.7)
Total FY82 Base-Year \$	3223.9	-1131.5	2092.4
Escalation	1626.0	-1193.9	432.1
Development (RDT&E)	(2.6)	(-0.9)	(1.7)
Procurement	(1623.4)	(-1193.0)	(430.4)
Total Then-Year \$	4849.9	-2325.4	2524.5*
*Excludes FY 92 Advance Procurement for the FY 93 ships.			
b. Quantities			
Development (RDT&E)	0	0	0
Procurement	12	-4	8
Total	12	-4	8
c. Unit Cost			
Procurement:			
FY82 Base-Year \$	264.8	-8.9	255.9
Then-year \$	400.0	-90.3	309.7
Program:			
FY82 Base-Year \$	268.7	-7.1	261.6
Then-year \$	404.2	-88.6	315.6
d. Approved Design to Cost Goal -- None.			
e. Foreign Military Sales -- None.			
f. Nuclear Costs -- None.			

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LSD 41 Class, DECEMBER 31, 1986

12(U) Program Acquisition/Current Procurement Unit Cost Summary:

(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition --			
(1) Cost	2524.5	2600.3	2524.5
(2) Quantity	8	8	8
(3) Unit Cost	315.6	325.0	315.6
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	20.8	20.6	25.1
Less CY Adv Proc	0.0	0.0	0.0
Plus FY Adv Proc	0.0	0.0	0.0
Less OF/PD	-20.8	-20.6	-25.1
Less PY Escal	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	0.0	0.0	0.0

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LSD 41 Class, DECEMBER 31, 1968

3(U) Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	! RDT&E !	! PROC !	! MILCON !	! TOTAL !
Baseline Est. (Pde)	49.5	4800.4	0.0	4849.9
Previous Changes:				
Economic	-0.2	-444.9	0.0	-445.1
Quantity	0.0	-1476.4	0.0	-1476.4
Schedule	0.0	0.0	0.0	0.0
Engineering	0.0	0.0	0.0	0.0
Estimating	-1.6	-275.3	0.0	-276.9
Other	0.0	0.0	0.0	0.0
Support	0.0	-51.2	0.0	-51.2
Subtotal	-1.8	-2247.8	0.0	-2249.6
Current Changes:				
Economic	0.0	-81.2	0.0	-81.2
Quantity	0.0	0.0	0.0	0.0
Schedule	0.0	0.0	0.0	0.0
Engineering	0.0	0.0	0.0	0.0
Estimating	-0.6	12.7	0.0	12.1
Other	0.0	0.0	0.0	0.0
Support	0.0	-6.7	0.0	-6.7
Subtotal	-0.6	-75.2	0.0	-75.8
Total Changes	-2.4	-2323.0	0.0	-2325.4
Current Estimate	47.1	2477.4	0.0	2524.5

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LSD 41 Class, DECEMBER 31, 1978

3(U) Cost Variance Analysis (Continued):

a. Summary -- (FY 1982 (Base-Year) Dollars in Millions)

	! RDT&E !	! PROC !	! MILCON !	! TOTAL !
! Baseline Est. (Pde) !	! 46.9 !	! 3177.0 !	! 0.0 !	! 3223.9 !
! Previous Changes:				
! Quantity	! 0.0 !	! -928.5 !	! 0.0 !	! -928.5 !
! Schedule	! 0.0 !	! 0.0 !	! 0.0 !	! 0.0 !
! Engineering	! 0.0 !	! 0.0 !	! 0.0 !	! 0.0 !
! Estimating	! -1.2 !	! -177.4 !	! 0.0 !	! -178.6 !
! Other	! 0.0 !	! 0.0 !	! 0.0 !	! 0.0 !
! Support	! 0.0 !	! -29.8 !	! 0.0 !	! -29.8 !
! Subtotal	! -1.2 !	! -1135.7 !	! 0.0 !	! -1136.9 !
! Current Changes:				
! Quantity	! 0.0 !	! 0.0 !	! 0.0 !	! 0.0 !
! Schedule	! 0.0 !	! 0.0 !	! 0.0 !	! 0.0 !
! Engineering	! 0.0 !	! 0.0 !	! 0.0 !	! 0.0 !
! Estimating	! -0.4 !	! 11.1 !	! 0.0 !	! 10.7 !
! Other	! 0.0 !	! 0.0 !	! 0.0 !	! 0.0 !
! Support	! 0.0 !	! -5.3 !	! 0.0 !	! -5.3 !
! Subtotal	! -0.4 !	! 5.8 !	! 0.0 !	! 5.4 !
! Total Changes	! -1.6 !	! -1129.9 !	! 0.0 !	! -1131.5 !
! Current Estimate	! 45.3 !	! 2047.1 !	! 0.0 !	! 2092.4 !

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13. (U) Cost Variance Analysis (Cont'd):

b. Previous Change Explanations--

RDT&E

Economic: Revised ASD(c) escalation indices.

Estimating: Reduction in RDT&E and contract design requirements; offset to ASD(c) escalation indices to maintain control.

Procurement

Economic: Revised ASD(c) escalation indices; correction of prior economic assumptions.

Quantity: Deletion of 4 ships and associated advance procurement.

Estimating: Adjustments for inflation; offset to ASD(c) indices to maintain controls; favorable negotiations of FY 84-86 contract; refinement of estimates; reduction of cost growth requirement; adjustment of FY81 ship for projected final cost; major commodity escalation change; revised program estimates.

Support: Repricing of Outfitting and Post Delivery requirements.

3. Cost Variance Analysis (Continued):

c. Current Change Explanations

(Dollars in Millions)
Base-Year \$ Then-Year \$

1) RDT&E

ESTIMATING

REVISED PROGRAM ESTIMATES (ESTIMATING)	0.1	0.0
REDUCTION DUE TO REPRICING OF SHIP DESIGN	-0.5	-0.6

2) Procurement

ECONOMIC

REVISED JAN 87 ECONOMIC ESCALATION RATES	0.0	-81.2
--	-----	-------

SUPPORT

DECREASE DUE TO REPRICING OF POST DELIVERY REQMTS	-6.5	-8.6
INCREASE DUE TO REPRICING OF OUTFITTING REQMTS	5.2	6.6
REDUCTIONS FOR GRAMM RUDMAN	-4.0	-4.7

ESTIMATING

REVISED PROGRAM ESTIMATES (ESTIMATING)	66.5	81.2
ADJUSTMENTS FOR INFLATION	-5.4	-6.9
DECREASE DUE TO PROGRAM REPRICING	-29.3	-35.6
REDUCTIONS TO PROGRAM FOR GRAMM RUDMAN	-20.7	-26.0

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LSD 41 Class, DECEMBER 31, 1964

4(U) Program Acquisition Unit Cost (PAUC) History:

(Millions of Then-Year dollars)

- a. Initial GAR Estimate to Current Baseline Estimate
(Same as Current Baseline Estimate)
- b. Current Baseline Estimate to Current Estimate

+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+									
! PAUC !	! Changes (Then Year Dollars in Millions) !								! PAUC !
! (Product. !	! -----! (Current !								! (Current !
! Estimate) !	Econ !	Qty !	Sch !	Eng !	Est !	Spt !	Other !	Total !	Estimate) !
! 404.2 !	! -65.8 !	! 17.5 !	! 0.0 !	! 0.0 !	! -33.1 !	! -7.2 !	! 0.0 !	! -88.6 !	! 315.6 !
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+									

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15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E -- N/A

b. (U) Procurement --

LSD 43 CONSTRUCTION

Lockheed Shipbuilding Co.,
Seattle, WA
N00024-83-C-2070, FPI,
Award: January 27, 1983
Definitized: January 27, 1983

Initial Contract Price
Target Ceiling Qty

\$271.5 \$318.0 1

Current Contract Price

Target Ceiling Qty
\$278.6 \$326.9 1

Estimated Price At Completion

Contractor Program Manager*
\$284.2 \$312.3

Previous Cumulative Variances

Cost VarianceSchedule Variance

Cumulative Variances to Date (11/02/86)

\$- 1.4

\$-16.0

Net Change

\$-18.6

\$-11.5

\$-17.2

\$+ 4.5

Explanation of Change: The unfavorable cost variance is primarily related to production and labor manhour requirements. The favorable schedule variance is identified with completion of work scheduled in engineering areas of hull foundations, compartment testing, communication and control. The Program Manager's assessment takes into consideration the above variances.

LSD 44 CONSTRUCTION

Avondale Industries, Inc.,
New Orleans, LA
N00024-84-C-2027, FPI,
Award: November 21, 1983
Definitized: November 21, 1983

Initial Contract Price

Target Ceiling Qty

\$166.6 \$202.3 1

Current Contract Price

Target Ceiling Qty
\$193.4 \$232.9 1

Estimated Price At Completion

Contractor Program Manager*
\$199.3 \$217.2

Previous Cumulative Variances

Cost VarianceSchedule Variance

Cumulative Variances to Date (10/31/86)

\$-10.6

\$-4.1

Net Change

\$-15.0

\$-7.9

\$- 4.4

\$-3.8

Explanation of Change: The unfavorable cost and schedule variances are primarily related to production craft labor and engineering costs being higher than expected. The Program Manager's assessment takes into consideration the above variance.

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

b. (U) Procurement --

		<u>Initial Contract Price</u>		
		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>LSD 45/46 CONSTRUCTION</u>				
Avondale Industries, Inc.,				
New Orleans, LA				
N00024-84-C-2070, FPI,				
Award: November 26, 1984				
Definitized: November 26, 1984				

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager*</u>
\$318.1	\$408.6	2	\$312.9	\$348.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-.1	\$-.7
Cumulative Variances to Date (10/31/86)	\$+.9	\$-14.2
Net Change	\$+.8	\$-13.5

Explanation of Change: The favorable cost variance is identified with the Integration Engineering areas. The unfavorable schedule variance is primarily related to production craft labor and commodity material shortages. The Program Manager's assessment takes into consideration the above variance.

		<u>Initial Contract Price</u>		
		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>LSD 47/48 CONSTRUCTION</u>				
Avondale Industries, Inc.,				
New Orleans, LA				
N00024-84-C-2027, FPI,				
Award: December 11, 1985				
Definitized: December 11, 1985				

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager*</u>
\$310.4	\$398.8	2	\$306.8	\$351.2

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-.03	\$-.2
Cumulative Variances to Date (11/30/85)	\$+.07	\$ 0
Net Change	\$+.04	\$+.2

Explanation of Change: The favorable cost and schedule variance are identified with the Integration and Engineering areas. The Program Manager's assessment takes into consideration the above variances.

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LSD 41 Class, December 31, 1986

1/ LSD 41 and LSD 42 contracts have been completed. Ships have delivered and completed PSA. Reporting on these contracts is no longer required.

* PM's estimated price at completion includes the Navy estimated escalation for the contract.

c. (U) MILCON -- N/A

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6(U) Program Funding Summary: (Current Estimate in Millions)

a. Program Status --

- (1) Percent Program Completed: $11/15 = 73.3\%$
 (Years Funds Appropriated/Total Program Years)
- (2) Percent Program Cost Appropriated: $2432.3 / 2524.5 = 96.3\%$
 (Funds Appropriated To Date/Total Program Funding in Millions)

b. Appropriation Summary

(Then-Year Dollars in Millions)

Appropriation	Current & Prior yrs (FY77-87)	Budget Year (FY88)	Balance to Complete FYDP (FY89-92)	to Complete Beyond FYDP (FY93-	Total
RDT&E	47.1	0.0	0.0	0.0	47.1
Procurement	2385.2	25.1	67.1	0.0	2477.4
Total	2432.3	25.1	67.1	0.0	2524.5

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LSD 41 Class, DECEMBER 31, 1984

6(U) Program Funding Summary (Continued): (Current Estimate in Millions)

c. Annual Summary --

Fiscal Year	Qty	FY82 Base-Year Dollars			Then-Year Dollars			Esc1 Rate %
		Sailaway		Total	Advance Proc		Total	
		Nonrec.	Rec.		Debit	Credit		
		APPROPRIATION: RDT&E						
1977	0	0.0	0.0	3.7	0.0	0.0	3.7	2.58
1978	0	0.0	0.0	10.3	0.0	0.0	10.3	6.80
1979	0	0.0	0.0	6.3	0.0	0.0	6.3	8.40
1980	0	0.0	0.0	9.7	0.0	0.0	9.7	10.50
1981	0	0.0	0.0	5.8	0.0	0.0	6.1	10.60
1982	0	0.0	0.0	3.2	0.0	0.0	3.6	7.59
1983	0	0.0	0.0	3.2	0.0	0.0	3.7	4.90
1984	0	0.0	0.0	1.8	0.0	0.0	2.1	3.80
1985	0	0.0	0.0	0.7	0.0	0.0	0.9	3.40
1986	0	0.0	0.0	0.6	0.0	0.0	0.7	2.90
1987	0	0.0	0.0	0.0	0.0	0.0	0.0	3.10
1988	0	0.0	0.0	0.0	0.0	0.0	0.0	3.50
Subtotal	0	0.0	0.0	45.3	0.0	0.0	47.1	--

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LSD 41 Class, DECEMBER 31, 1986

6(U) Program Funding Summary (Continued): (Current Estimate in Millions)

c. Annual Summary --

Fiscal Year	Qty	FY82 Base-Year Dollars			Then-Year Dollars			Escl Rate %	
		Sailaway		Total	Advance Proc		Total		
		Nonrec.	Rec.		Debit	Credit			
APPROPRIATION: Procurement									
1980	0	0.0	0.0	41.0	41.0	0.0	41.0	9.80	
1981	1	22.9	309.4	341.3	47.0	41.0	387.7	9.60	
1982	1	0.0	302.9	261.7	0.2	47.0	306.2	7.50	
1983	1	0.0	296.8	332.3	42.0	0.0	395.4	3.80	
1984	1	0.0	263.2	315.6	102.1	37.8	387.1	3.00	
1985	2	0.0	363.8	386.8	108.6	80.0	483.5	2.10	
1986	2	0.0	344.1	281.3	3.6	82.4	363.5	1.20	
1987	0	0.0	0.0	16.9	20.8	0.0	20.8	3.10	
1988	0	0.0	0.0	19.8	25.1	0.0	25.1	3.50	
1989	0	0.0	0.0	27.5	36.0	0.0	36.0	3.50	
1990	0	0.0	0.0	21.4	29.0	0.0	29.0	3.30	
1991	0	0.0	0.0	1.5	2.1	0.0	2.1	2.90	
1992	0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	
Subtotal	8	22.9	1880.2	2047.1	457.5	288.2	2477.4	--	
Total	8	22.9	1880.2	2092.4	457.5	288.2	2524.5	--	

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LSD 41 Class, DECEMBER 31, 1988

16(U) Program Funding Summary (Continued): (Current Estimate in Millions)

d. Obligations and Expenditures --

APPROPRIATION: RDT&E

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	Total	Oblig.	Expended
1977	3.7	3.7	3.7
1978	10.3	10.3	10.3
1979	6.3	6.3	6.3
1980	9.7	9.7	9.7
1981	6.1	6.1	6.1
1982	3.6	3.6	3.6
1983	3.7	3.7	3.7
1984	2.1	2.1	2.1
1985	0.9	0.9	0.9
1986	0.7	0.7	0.6
1987	0.0	0.0	0.0
To Compl.	0.0	0.0	0.0
Total	47.1	47.1	47.0

(UNCLASSIFIED)

(UNCLASSIFIED)

LSD 41 Class, DECEMBER 31, 1986

—(U) Program Funding Summary (Continued): (Current Estimate in Millions)

d. Obligations and Expenditures --

APPROPRIATION: Procurement

Then Year Dollars (Current Estimate in Millions)			
Fiscal Year	Total	Oblig.	Expended
1980	41.0	41.0	40.8
1981	387.7	387.3	383.1
1982	306.2	303.1	294.4
1983	395.4	373.6	301.1
1984	387.1	341.9	161.1
1985	483.5	378.8	139.1
1986	363.5	255.4	43.9
1987	20.8	0.0	0.0
To Compl.	92.2	0.0	0.0
Total	2477.4	2081.1	1363.5

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(UNCLASSIFIED)

LSD 41 Close, DECEMBER 31, 1985

7 (U) Production Rate Data:

- * Annual Production rate is less than 6 yearly
Per ASD Memo dated 12 Dec. 86, Production
rate information is not applicable to the
program.

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~~SECRET~~SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

Program: Peacekeeper

AS OF DATE: December 31, 1986

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1. Designation and Nomenclature (Popular Name): LGM-118A/Land Based ICBM (Peacekeeper)

2. DoD Component: U.S. Air Force

3. Responsible Office and Telephone Number:

Program Manager
Ballistic Missile Office
Norton AFB, CA 92409-6468

Col C. J. Schichtle, Jr
Assigned: Oct 86
AV 876-6014; COMM (714) 382-3356

4. Program Elements/Procurement Line Items:

RDT&E: PE 64312F (Shared Funding)

PROCUREMENT: APPN 3020 PE 11215F ICN MMXOLG,MMXYO

MILCON: PE 11215F

~~Classified by: [redacted] Sources~~
~~Declassify on: OADR~~

~~NOT RELEASABLE TO FOREIGN NATIONALS~~

~~RESTRICTED DATA~~

~~This material contains RESTRICTED DATA as defined in the Atomic Energy Act of 1954.~~

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SAF/PAS

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Peacekeeper, December 1, 1986

5. Related Programs: Small ICBM, Rail Garrison Basing Mode

6. Mission and Description: The mission of the Peacekeeper weapon system is to enhance the deterrent posture of US strategic forces. Should deterrence fail, Peacekeeper must be able to effectively attack the full spectrum of designated targets with nuclear weapons. The system must provide a prompt retaliatory capability. The Peacekeeper missile has four powered stages consisting of three solid propellant stages and a liquid fueled post-boost vehicle capable of delivering 10 multiple independently targetable reentry vehicles. This system replaces 50 Minuteman III missiles, but does not replace the Minuteman system. The second 50 Peacekeepers are planned for Rail Garrison deployment as directed by the President in December 1986.

7. Program Highlights:

a. Significant Historical Developments — DSARC I, held in 1976, selected Trench & Horizontal Multiple Protective Shelters for further validation. In 1978, at DSARC II, the Air Force recommended use of vertical multiple protective structures as the basing mode. The President, in 1979, approved M-X Full Scale Engineering Development of a SALT verifiable system based in horizontal multiple protective structures. The missile chosen for development was the 92-inch diameter missile. Additionally, a dash capability was to be provided. After initiation of Full-Scale Engineering Development, the engineering baseline was changed. Separate missile transporters and launchers replaced the transporter erector launcher and the size of the shelters was reduced. System Design Reviews for the system were completed in 1980 and the first Preliminary Design Review was held in 1981 prior to cancellation. In addition, construction of flight test facilities at Vandenberg AFB was begun, and assembling and check out planning for deployment was started.

In 1981, the horizontal multiple protective shelter basing mode was terminated and the President directed production of 100 M-X missiles and interim deployment of 40 missiles in existing Minuteman and Titan silos while long-term basing options including deep basing, defended fixed basing, defended deceptive basing and continuous patrol aircraft were studied. In early 1982, study on the continuous patrol aircraft option was discontinued. In late 1982, Minuteman silo basing was not approved and the President directed Closely Spaced Basing at F.E. Warren AFB, Wyoming, for which the M-X was named the "Peacekeeper." In April 1983, the President recommended deployment of 100 Peacekeeper missiles in 100 Minuteman silos at F.E. Warren AFB. Direction was received in July 1985 to deploy not more than 50 missiles in Minuteman silos at F.E. Warren AFB.

b. Significant Developments Since Last Report — Fifteen of the scheduled 20 missile flights have been successfully launched from Vandenberg AFB.

Initial Operational Capability was achieved in December 1986. Deployment activities are on schedule for a Full Operational Capability by December 1988.

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Rail Garrison basing was picked by the President for deployment of the second 50 Peacekeeper missiles in December 1986.

The Peacekeeper ICBM system is expected to fulfill all mission requirements.

c. Changes since as of date - None

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are no SDDM (dated 14 Feb 80) threshold breaches.

9. Schedule:

a. Milestones --

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
Milestone I (DSARC)	Mar 76/Mar 76	Mar 76*
Milestone II (DSARC)	Dec 78/Dec 78	Dec 78*
Systems Design Review	Feb 80/Feb 80	Feb 80*
Preliminary Design Review	Aug 80/Aug 80	Aug 80*
Stage Destruct Test Complete	Jul 82/Jul 82	Jul 82*
Ordnance Induced Shock Tests Complete	Dec 82/Dec 82	Dec 82*
First Flight	Jan 83/Jan 83	Jun 83*
Structure Load Tests Complete	Jun 83/Jun 83	Jun 83*
First Production Contract Award	Jan 84/Jan 84	Jan 84*
Propulsion Flight Proof Tests Complete	Apr 84/Apr 84	Jul 84*
Initial Operational Capability (IOC)	Dec 86/Dec 86	Dec 86*

*Reflects actual dates of accomplishment.

b. Previous Change Explanations --

First flight delayed due to development problems and congressional restrictions which ran concurrently from January to June 1983. Propulsion Flight Proof Tests were completed late due to a redesign of the Stage IV propellant tank which required an additional flight proof test in July 1984.

c. Current Change Explanations --

There have been no milestone schedule changes since the last report (December 1985).

d. References: Development Estimate: SecDef Memorandum, dated February 14, 1980.
Approved Program: PMD 0075(15), dated 14 Sep 83 as amended by DEPSECDEF Memo dated 5 May 87.

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10. Technical/Operational Characteristics (Cont'd):

- 3/ (U) Countdown & flight reliability is the probability that a missile system which is available for commitment to launch sequence will respond to a valid launch command, successfully complete the launch and flight, and detonate a given warhead within 3.5 times the circular error probable requirement. (Includes launch critical operational support equipment and aerospace vehicle equipment.)
- 4/ (U) Weapon system availability is the percentage of the missile force, under the jurisdiction of the using command and committed to the wartime mission, which is capable of commitment to the launch sequence at any random point in time.

(b)(1)



- 6/ (U) Accuracy is defined in terms of Circular Error Probable (CEP), the radius of a circle within which 50% of the reentry vehicles will impact at a range of 5775 nm with 27.5 degree reentry angle, and applies to a mature system three to five years after IOC.
- 7/ (U) Demonstrated performance is based on mean.

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Peacekeeper, December 31, 1986

11. ~~(S)~~ Program Acquisition Cost (Current Estimate in Millions of Dollars) 1/

a. (U) Cost —	Development Estimate	Changes	Current Estimate
Development (RDT&E)	\$6018.2	\$-241.4	\$5776.8
Procurement	10292.0	+513.4	10805.4
Total Flyaway	(6645.9)	(1596.8)	(8242.7)
Other Weapon System Costs	(2546.2)	(-1637.9)	(908.3)
Initial Spares	(304.2)	(222.3)	(526.5)
Support	(795.7)	(332.2)	(1127.9)
Construction (MILCON) <u>2/</u>	324.7	-116.9	207.8
Total FY 82 Base-Year \$	16634.9	+155.1	16790.0
Escalation	5045.3	+184.9	5230.2
Development (RDT&E)	(878.9)	(-174.9)	(704.0)
Procurement	(4086.2)	(+396.8)	(4483.0)
Construction (MILCON)	(80.2)	(-37.0)	(43.2)
Total Then-Year \$	\$21680.2	+340.0	22020.2
b. (U) Quantities — <u>3/</u>			
Development (RDT&E)	20	0	20
Procurement	223	12	235
Total	243	12	255
c. (U) Unit Cost —			
Procurement:			
FY 82 Base Year \$	46.152	-0.172	45.980
Then-Year \$	64.476	+0.581	65.057
Program:			
FY 82 Base Year \$	68.456	-2.613	65.843
Then-Year \$	89.219	-2.865	86.354
d. (U) Approved Design to Cost Goal —	N/A		
e. (U) Foreign Military Sales —	None		

(b)(1)

1/ (U) The total costs identify the \$16.8B estimate (FY 82 dollars), which equates to \$22.0B in then-year dollars, for the current Peacekeeper program which is based on the Report by the President's Commission on Strategic Forces, April 1983, and the President's letter, 19 April 1983, transmitting Strategic Forces Technical Assessment Review (31 March 1983), to the Congress. Does not include \$3199.5 in FY 82 and prior missile costs (development of flight test missiles and all equipment leading to first flight) or \$1399.2 in FY 83 and prior spent on earlier basing modes (Multiple Protective Shelters, horizontal shelter system, interim deployment in 40 Minuteman silos, and Closely Spaced Basing) (then-year dollars in millions). This program includes production missiles and missile initial spares for Rail Garrison Basing mode (see note 3). All other Rail Garrison Costs, including RDT&E missiles, are in the Rail Garrison Basing SAR.

2/ (U) Construction figure does not include \$86.1M in FY 82 and prior year funds (then-year dollars).

3/ (U) 235 production missiles equates to 100 deployment missiles, 120 operational test and evaluation missiles (12 Rail Garrison), and 15 aging and surveillance missiles.

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12. Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current</u>	<u>UCER Baseline</u>	<u>UCR Baseline</u>
	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>
	(Dec 86 SAR)	(5 Feb 86 UCER)	(Dec 86 SAR)
a. Program Acquisition —			
(1) Cost	22020.2	20935.7	22020.2
(2) Quantity	255	243	255
(3) Unit Cost	86.354	86.155	86.354
b. Current Procurement —	(FY 1987)	(FY 1987)*	(FY 1988)
(1) Cost	1136.6	1136.6	1276.9
Less CY Adv Proc	-	-	-
Plus PY Adv Proc			
Net Total	<u>1136.6</u>	<u>1136.6</u>	<u>1276.9</u>
(2) Quantity	12	12	21
(3) Unit Cost	94.717	94.717	60.805

* Differs from the Feb 86 UCER to reflect the FY 87 Appropriation Act.

13. Cost Variance Analysis:

a. Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	6897.1	14378.2	404.9	21680.2
Previous Changes:				
Economic	-125.4	-494.6	-1.0	-621.0
Quantity			-30.3	-30.3
Schedule		469.3		469.3
Engineering			-97.1	-97.1
Estimating	-158.9	569.8		410.9
Other				0.0
Support	-0.8	-970.5	-29.1	-1000.4
Subtotal	-285.1	-426.0	-157.5	-868.6
Current Changes:				
Economic	-17.1	-279.6	-3.7	-300.4
Quantity		377.6	30.3	407.9
Schedule		298.4		298.4
Engineering				0.0
Estimating	-114.1	1470.7	7.3	1363.9
Other				0.0
Support		-530.9	-30.3	-561.2
Subtotal	-131.2	1336.2	3.6	1208.6
Total Changes	-416.3	910.2	-153.9	340.0
Current Estimate	6480.8	15288.4	251.0	22020.2

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13. Cost Variance Analysis (Cont'd):

(FY 1982 Constant (Base-Year) Dollars in Millions)

:	:	RDT&E	:	PROC	:	MILCON	:	TOTAL	:
:	Development Estimate	:	6018.2	:	10292.0	:	324.7	:	16634.9
:	Previous Changes:	:		:		:		:	
:	Quantity	:		:		:	-23.5	:	-23.5
:	Schedule	:		:	17.6	:		:	17.6
:	Engineering	:		:		:	-72.5	:	-72.5
:	Estimating	:	-146.0	:	399.0	:		:	253.0
:	Other	:		:		:		:	0.0
:	Support	:	-1.3	:	-673.0	:	-25.7	:	-700.0
:	Subtotal	:	-147.3	:	-256.4	:	-121.7	:	-525.4
:	Current Changes:	:		:		:		:	
:	Quantity	:		:	236.4	:	23.5	:	259.9
:	Schedule	:		:		:		:	0.0
:	Engineering	:		:		:		:	0.0
:	Estimating	:	-94.1	:	943.8	:	4.8	:	854.5
:	Other	:		:		:		:	0.0
:	Support	:		:	-410.4	:	-23.5	:	-433.9
:	Subtotal	:	-94.1	:	769.8	:	4.8	:	680.5
:	Total Changes	:	-241.4	:	513.4	:	-116.9	:	155.1
:	Current Estimate	:	5776.8	:	10805.4	:	207.8	:	16790.0

b. Previous Change Explanations —

Development

Economic: Revised economic escalation indices.

Support: Reduce development test data analysis to live within fiscal constraints. Reinstate essential development test data analysis previously reduced by fiscal constraints.

Estimating: Adjustment for current and prior year escalation change. Estimate refined as a result of high test success.

Procurement

Economic: Revised economic escalation indices.

Schedule: The procurement schedule was restructured as a direct result of Congressional action (-6 in FY 84) and the revised schedule contained in the President's Budget (-2 in FY 85) and adding the missiles back in FY 89 (+8).

Rephase of 19 missiles from FY 85 to FY 89 due to FY 85 Congressional action.

Reduce FY 86 and FY 87 missile buys and stretch program into FY 91.

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13. Cost Variance Analysis (Cont'd):

Estimating: Impact of revised economic escalation indices on prior years.
Adjustment of prior years amounts to actuals.

Reestimate and realignment of funds to flyaway from support.

Reduced Assembly and Checkout estimate.

Increased missile cost due to FY 86 and FY 87 missile buy reduction.

Support: Reduces quantity of initial spares to less than projected requirements. Lower quantities of spares increases risk of reduced weapon system availability to live within fiscal constraints.
Impact of revised economic escalation indices on prior years.

Reduced Instrumentation and Flight Safety System estimate.

Reestimate and realignment of funds from support to flyaway.

Increased general support due to FY 86 and FY 87 missile buy reduction.

Congressional cut in spares.

Reduction of 50 basing sets.

Construction

Economic: Revised economic escalation indices.

Engineering: Descope defense access roads due to reduced funding in FY 85 President's Budget. Will not allow completion of road program as scheduled and will impact FOC.

Descope defense access roads due to reduced funding in FY 86 President's Budget. Will not allow completion of road program as scheduled and will affect FOC.

Support: Removal of planning and design funds included in 30 June SAR. This change was directed by higher headquarters since these funds were not considered program unique.

Quantity: Quantity reduction of 50 basing sets.

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13. Cost Variance Analysis (Cont'd):

c. Current Change Explanations —

		(Dollars in Millions)		
		<u>Base-Year</u>	<u>Then-Year</u>	
(1)	<u>RDT&E</u>			
	Revised economic escalation indices (economic)	-	-17.1	
	Adjustment for current and prior year escalation (estimating)	13.4	15.6	
	Congressional and OSD and other reductions increased risk to the program (estimating)	-107.5	-129.7	
(2)	<u>Procurement</u>			
	Revised economic escalation indices (economic)	-	-279.6	
	Increased missile buy quantity by 12 to support Rail Garrison basing (quantity)	236.4	377.6	
	Stretched missile buy due to FY 87 Congressional cut and a revised buy profile of 21 per year (schedule)	-	298.4	
	Adjustment for flyaway current and prior year escalation (estimating)	69.0	90.5	
	Increase fixed program costs.			
	Production rate inefficiencies raised unit costs (estimating)	874.8	1380.2	
	Increased missile initial spares to support Rail Garrison (support)	219.5	335.8	
	Adjustment for current and prior year escalation in support categories (support)	48.0	62.6	
	Revised buy schedule for Instrumentation and Flight Safety System, lower estimates for mechanical, support equipment, and engineering support (support)	-677.9	-929.3	
(3)	<u>MILCON</u>			
	Revised economic escalation indices (economic)	-	-3.7	
	Revised estimate for storage facilities (estimating)	2.0	4.0	
	Adjustment for current and prior year escalation (estimating)	2.8	3.3	
	Adjustment to change Dec 85 entry from quantity to support (quantity)	23.5	30.3	
		(support)	-23.5	-30.3

d. References —

Development Estimate: Report of the President's Commission on Strategic Forces, April 1983, and President's letter, 19 April 1983, transmitting Strategic Forces Technical Assessment.

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14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

a. Initial SAR Estimate to Current Baseline Estimate —

Changes										PAUC
PAUC										(Current
(Initial										Est)
SAR Est)	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	Est)	
89.219	-3.613	-2.718	3.011	-0.381	6.960	0.000	-6.124	-2.865	86.354	

15. Contract Information: (Then-Year Dollars in Millions)

<u>Basing Operational Support Equipment:</u>	Initial Contract Price		
	Target	Ceiling	Qty
Boeing, Seattle, WA			
F04704-83-C-0047, CPIF/AF	\$573.0	N/A	N/A
Award: October 1, 1983			
Definitized: April 24, 1984			

This contract was reported in the Dec 85 SAR and is now over 90 percent complete and no longer being reported.

<u>Guidance & Control:</u>	Initial Contract Price		
	Target	Ceiling	Qty
Rockwell International			
(Autonetics), Anaheim, CA	\$394.6	N/A	20
F04704-82-C-0020, CPIF/AF			
Award: March 3, 1983			
Definitized: January 18, 1983			

This contract was reported in the Dec 85 SAR and is now over 90 percent complete and no longer being reported.

<u>Inertial Measurement Unit:</u>	Initial Contract Price		
	Target	Ceiling	Qty
Northrop Electronics Division,			
Hawthorne, CA	\$392.1	N/A	18
F04704-83-C-0023, CPIF/AF			
Award: August 30, 1983			
Definitized: August 30, 1983			

This contract was reported in the Dec 85 SAR and is now over 90 percent complete and no longer being reported.

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Peacekeeper December 31, 1986

15. Contract Information: (Then-Year Dollars in Millions)

<u>Stage I:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Morton Thiokol, Brigham City, UT			
FO4704-83-C-0001, FPIF	\$310.5	\$346.9	10
Award: June 6, 1983			
Definitized: May 15, 1983			

This contract was reported in the Dec 85 SAR and is now over 90 percent complete and no longer being reported.

<u>Stage IV:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Rockwell International			
(Rocketdyne), Canoga Park, CA	\$222.3	N/A	10
FO4704-83-C-0004, FPIF/CPIF			
Award: June 1, 1983			
Definitized: June 29, 1983			

This contract was reported in the Dec 85 SAR and is now over 90 percent complete and no longer being reported.

a. RDT&E

<u>Assembly, Test & System Support:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Martin Marietta, Denver, CO			
FO4704-84-C-0048, CPIF/AF	\$671.6	N/A	N/A
Award: June 14, 1984			
Definitized: June 14, 1984			

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$723.0	N/A	N/A

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$717.3	\$715.3 <u>1/</u>

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$+0.7	\$-10.1
Cumulative Variances to Date (11/30/86)	\$-9.7	\$-4.8
Net Change	\$-10.4	\$+5.3

Explanation of Change: The cost variance deteriorated due to additional acceptance test requirements and in scope engineering changes. The schedule variance improved due to resolution of several subcontractor delivery problems in support of the emplacer. No program or contract impact.

1/ Includes authorized undefinitized work. To prevent disclosure of our negotiating position, the authorized undefinitized work is valued at the contractor's estimate for purposes of this report.

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15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

b. Production

<u>Guidance and Control, FY 84:</u> Rockwell International Autonetics, Anaheim, CA FO4704-84-C-0025, FPIF Award: March 5, 1984 Definitized: March 5, 1984	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$233.0	\$249.6	33

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$237.6	\$254.5	33	\$229.5	\$224.6 <u>1/</u>

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances to Date (11/30/86)	\$+3.5	\$-10.7
Net Change	N/A	N/A

Explanation of Change: This is the first time for this contract to be included in the SAR. The cost variance is due to favorable material costs for the missile electronic computer assembly. The schedule variance is due to delays in delivery of plated wire memories. No program or contract impact.

<u>Reentry Systems/Reentry Vehicle, FY 84:</u> AVCO, Wilmington, MA FO4704-84-C-0132, FPIF Award: August 31, 1984 Definitized: December 14, 1984	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$253.8	\$280.1	233

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$253.7	\$279.8	236	\$246.6	\$244.6 <u>1/</u>

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances to Date (11/30/86)	\$+5.5	\$-12.4
Net Change	N/A	N/A

Explanation of Change: This is the first time for this contract to be included in the SAR. The cost variance is due to deployment module material costs being less than planned. The schedule variance is due to delays in delivery of deployment module structure material. No program or contract impact.

1/ Includes authorized undefinitized work. To prevent disclosure of our negotiating position, the authorized undefinitized work is valued at the contractor's estimate for purposes of this report.

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15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

<u>Peculiar Support Equipment:</u>			<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Martin Marietta, Denver, CO					
F04704-85-C-0064, FPIF			\$206.0	\$233.0	N/A
Award: August 14, 1985					
Definitized: August 14, 1985					

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$356.2	\$405.9	N/A	\$356.2	\$349.2 1/

<u>Previous Cumulative Variances</u>	<u>Cost Variance</u>	<u>Schedule Variance</u>
	N/A	N/A
<u>Cumulative Variances to Date (11/30/86)</u>	\$+14.1	\$-9.7
<u>Net Change</u>	N/A	N/A

Explanation of Change: This is the first time for this contract to be included in the SAR. The cost variance is due to slow start-up activities in manufacturing support and economical material purchases and parts substitutions. The schedule variance is due to slower than planned start-up in the transportation and handling equipment area and late material and subcontractor deliveries. No program or contract impact.

<u>Basing Operational Support Equipment:</u>			<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Boeing, Seattle, WA					
F04704-85-C-0050, FPIF			\$221.6	\$240.7	33
Award: February 1, 1985					
Definitized: October 17, 1985					

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$255.6	\$278.3	33	\$255.6	\$252.0 1/

<u>Previous Cumulative Variances</u>	<u>Cost Variance</u>	<u>Schedule Variance</u>
	N/A	N/A
<u>Cumulative Variances to Date (11/30/86)</u>	\$-7.1	\$-5.1
<u>Net Change</u>	N/A	N/A

Explanation of Change: This is the first time for this contract to be included in the SAR. The cost variance is due to trainer equipment difficulties and correction of unit pricing errors. The schedule variance is due to nonavailability of hardened parts at the subcontractor level, incorporation of engineering changes in the electrical surge arrestor panels, and late material deliveries. No program or contract impact.

1/ Includes authorized undefinitized work. To prevent disclosure of our negotiating position, the authorized undefinitized work is valued at the contractor's estimate for purposes of this report.

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15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

<u>Inertial Measurement Unit:</u>			<u>Initial Contract Price</u>		
<u>Northrop Electronics Division</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Hawthorne, CA			\$262.4	\$282.0	52
FO4704-84-C-0041, FPIF					
Award: April 1, 1984					
Definitized: October 1, 1984					

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$333.8	\$358.6	52	\$336.2	\$339.6 <u>1/</u>

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances to Date (11/30/86)	\$-6.7	\$-35.6
Net Change	N/A	N/A

Explanation of Change: This is the first time for this contract to be included in the SAR. The cost variance is due to increased effort in attempting to recover schedule in the hybrid area and higher than planned hybrid material costs. The schedule variance is due to delay of sphere assembly hybrid kit releases to assembly due to part shortages and shop order backlog. Failure to meet contract delivery dates resulted in withholding of progress payments. No program impact.

c. MILCON: N/A

1/ Includes authorized undefinitized work. To prevent disclosure of our negotiating position, the authorized undefinitized work is valued at the contractor's estimate for purposes of this report.

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16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status —

(1) Percent Program Completed: 38.5% (5/13)

(2) Percent Program Cost Appropriated: 60.9% (13409.7/22020.2)

b. Appropriation Summary —

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY83-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93-95)</u>	<u>Total</u>
RD&E	6354.4	51.2	69.2	6.0	6480.8
Procurement	6832.7	1276.9	4605.3	2573.5	15288.4
MILCON	<u>222.6</u>	<u>9.4</u>	<u>19.0</u>	<u>0.0</u>	<u>251.0</u>
Total	13409.7	1337.5	4693.5	2579.5	22020.2

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars) 1/

c. Annual Summary --

:	:	FY 82 Base-Year Dollars			:	Then-Year Dollars			:	:
:	:	3/ Flyaway			:	Advance Proc			:	Escl
:	Fiscal	Qty	:	Total	:	:	Total	:	Rate	:
:	Year	:	Nonrec	Rec	:	Debit	Credit	:	%	:
:	:	:	:	:	:	:	:	:	:	:

Appropriation: RDT&E

1983	:	:	:	1787.5	:	:	1912.6	4.9	:
1984	:	:	:	1766.5	:	:	1962.6	3.8	:
1985	:	:	:	1324.4	:	:	1520.4	3.4	:
1986	:	:	:	564.9	:	:	668.8	2.9	:
1987	:	:	:	237.1	:	:	290.0	3.1	:
1988	:	:	:	40.4	:	:	51.2	3.5	:
1989	:	:	:	30.6	:	:	40.0	3.5	:
1990	:	:	:	11.0	:	:	14.8	3.3	:
1991	:	:	:	5.4	:	:	7.4	2.9	:
1992	:	:	:	4.9	:	:	7.0	2.4	:
1993	:	:	:	4.1	:	:	6.0	2.4	:
Subtotal	20	:	:	5776.8	:	:	6480.8	:	:

Appropriation: Procurement

1984	:	21	:	222.4	:	988.6	:	1718.6	:	2143.1	8.0	:
1985	:	21	:	7.8	:	787.6	:	1869.9	:	2400.9	3.4	:
1986	:	12	:	0.0	:	680.6	:	868.1	:	1152.1	2.9	:
1987	:	12	:	0.0	:	604.2	:	828.4	:	1136.6	3.1	:
1988	:	21	:	0.0	:	824.3	:	901.8	:	1276.9	3.5	:
1989	:	21	:	0.0	:	807.1	:	933.5	:	1361.1	3.5	:
1990	:	21	:	0.0	:	651.0	:	771.7	:	1155.2	3.3	:
1991	:	21	:	0.0	:	605.5	:	705.4	:	1082.0	2.9	:
1992	:	21	:	0.0	:	574.8	:	641.0	:	1007.0	2.4	:
1993	:	21	:	0.0	:	585.8	:	620.9	:	998.4	2.4	:
1994	:	21	:	0.0	:	490.1	:	511.7	:	842.7	2.4	:
1995	:	22	:	0.0	:	412.9	:	434.4	:	732.4	2.4	:
Subtotal	:	235	:	230.2	:	8012.5	:	10805.4	:	15288.4	:	:

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars) 1/

Appropriation: MILCON 2/

: 1983	:	:	:	:	14.9	:	:	:	16.7	:	4.9	:
: 1984	:	:	:	:	27.2	:	:	:	31.2	:	3.8	:
: 1985	:	:	:	:	80.8	:	:	:	95.7	:	3.4	:
: 1986	:	:	:	:	43.4	:	:	:	53.1	:	2.9	:
: 1987	:	:	:	:	20.5	:	:	:	25.9	:	3.1	:
: 1988	:	:	:	:	7.2	:	:	:	9.4	:	3.5	:
: 1989	:	:	:	:	4.8	:	:	:	6.5	:	3.5	:
: 1990	:	:	:	:	7.6	:	:	:	10.5	:	3.3	:
: 1991	:	:	:	:	1.4	:	:	:	2.0	:	2.9	:
: Subtotal	:	:	:	:	207.8	:	:	:	251.0	:	:	:
: Total	:	255	:	:	16790.0	:	:	:	22020.2	:	:	:

1/ The total costs identify the \$16.8B estimate (FY 82 dollars), which equates to \$22.0B in then-year dollars, for the current Peacekeeper program which is based on the Report by the President's Commission on Strategic Forces, April 1983, and the President's letter, 19 April 1983, transmitting Strategic Forces Technical Assessment Review (31 March 1983), to the Congress. Does not include \$3199.5 in FY 82 and prior missile costs (development of flight test missiles and all equipment leading to first flight) or \$1399.2 in FY 83 and prior spent on earlier basing modes (Multiple Protective Shelters, horizontal shelter system, interim deployment in 40 Minuteman silos, and Closely Spaced Basins) (then-year dollars in millions). This program includes production missiles and missile initial spares for Rail Garrison Basing mode (see note 3). All other Rail Garrison costs, including RDT&E missiles, are in the Rail Garrison Basing SAR.

2/ Construction figure does not include \$86.1M in FY 82 and prior year funds (then-year dollars).

3/ 235 production missiles equates to 100 deployment missiles, 120 operational test and evaluation missiles (12 Rail Garrison), and 15 aging and surveillance missiles.

4/ Of the 21 PEACEKEEPER missiles for FY 89, 17 are to be designated for Rail Garrison deployment, as per DepSecDef memo of Feb 20, 1987.

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16. Program Funding Summary (Cont'd): 1/

d. Obligations and Expenditures —

: Then-Year Dollars (Current Estimate in Millions) :			
: Fiscal Year :	: Total :	: Obligated :	: Expended :

Appropriation: RDT&E

: 1983 :	1912.6 :	1912.6 :	1877.3 :
: 1984 :	1962.6 :	1945.0 :	1877.6 :
: 1985 :	1520.4 :	1511.1 :	1387.2 :
: 1986 :	668.8 :	581.4 :	295.1 :
: 1987 :	290.0 :	64.5 :	10.0 :
: To Complete :	126.4 :	N/A :	N/A :
: Total :	6480.8 :	6014.6 :	5447.2 :

Appropriation: Procurement 2/

: 1984 :	2143.1 :	2047.7 :	1298.6 :
: 1985 :	2400.9 :	1747.2 :	504.1 :
: 1986 :	1152.1 :	254.3 :	57.1 :
: 1987 :	1136.6 :	46.4 :	0.0 :
: To Complete :	8455.7 :	N/A :	N/A :
: Total :	15288.4 :	4095.6 :	1859.8 :

Appropriation: MILCON

: 1983 :	16.7 :	12.1 :	12.0 :
: 1984 :	31.2 :	27.3 :	26.5 :
: 1985 :	95.7 :	54.6 :	53.3 :
: 1986 :	53.1 :	11.0 :	7.7 :
: To Complete :	54.3 :	N/A :	N/A :
: Total :	251.0 :	105.0 :	99.5 :

1/ Obligation and Expenditure figures reflect program office records as of 24 Dec 86.

2/ Obligation and Expenditure figures reflect only funds issued to BMO. They do not include initial spares, OSD/AF/AFSC withholds, or funds issued to other agencies.

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17. Production Rate Data:

a. Annual Production Rates -- Funded delivery period is 13 months for FY84. Peacekeeper missile is produced as a combined effort of at least 10 major associate contractors. These rates are the end product of all the associate contractors.

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1984	19.4	14.4	19.4	48.0
1985	28.2	24.0	21.0	48.0
1986	30.3	17.0	12.0	48.0
1987	48.0	14.0	12.0	48.0
1988	48.0	34.0	21.0	48.0
1989	48.0	48.0	21.0	48.0
1990		48.0	21.0	48.0
1991		48.0	21.0	48.0
1992			21.0	48.0
1993			21.0	48.0
1994			21.0	48.0
1995			22.0	48.0

b. Cost Variance -- Dollars in Millions (NOTE: Maximum rates were calculated by computing average cost of missiles at maximum production rate of 48 per year and multiplying the remaining units to be purchased by the average cost and adding that to the cost to date.)

Item	Production		Variance		Variance	
	Estimate	PdE	(CE less : Estimate	Current : Estimate	(CE less : Max)	Maximum
Prog Acq Cost (BY \$)	16160.2	-	16790.0	2468.4	14321.6	
(TY \$)	20907.9	-	22020.2	3503.6	18516.6	
PAUC (BY \$)	66.503	-	65.843	10.680	55.163	
(TY \$)	86.041	-	86.354	13.740	72.614	

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c. Schedule Variance —

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr) 1/	5/86		5/86	—	5/86
Duration (in Months)	85		139	73	66
End Date (Mo/Yr) 2/	5/93		12/97	59	11/91

1/ First missile delivery.

2/ Last missile delivery.

17. Production Rate Data (Cont'd):

d. Deliveries (Plan/Actual) —

	<u>To Date</u>
RDT&E	15/15
Procurement	11/11

18. Operating and Support Costs: N/A

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SELECTED ACQUISITION REPORT(RCS:DD-COMP(Q&A)823)

PROGRAM: T-46A

AS OF: December 31, 1986

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1. Designation and Nomenclature (Popular Name): T-46A (Next Generation Trainer)

2. DoD Component: U.S. Air Force

3. Responsible Office and Telephone Number:
T-46A Program Office Col David W. Milan
Aeronautical Systems Division Assigned: December 1, 1986
Wright-Patterson AFB, OH 45433 AV 785-5764; COMM (513)255-5764

4. Program Elements/Procurement Line Items
RDT&E: PE 64313F
PE 64227F (Shared funding)
PROCUREMENT: APPN 3010 PE 84741F ICN T046AD
MILCON: NONE

5. Related Programs--NONE

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6. Mission and Description: The mission of the T-46A is to meet the Air Force need of providing a primary flight trainer as expressed in the 26 June 79 MENS for Primary Undergraduate Pilot Training. Deficiencies in the existing system are expressed in ATC GOR 01-78 and dictate initiation of the program as soon as possible to accommodate a FY87 Initial Operating Capability. The T-46A System will correct T-37 deficiencies listed in the MENS; these include high fuel consumption, weather limitation, limited range and endurance, outdated avionics and instruments, noise levels that exceed limits, high maintenance costs, and low performance. The aircraft is designed to the mission requirements and performance parameters stated in the ATC System Operational Concept dated Nov 83. Twin turbofan engines and side-by-side seating configuration are fundamental requirements. The T-46A must be capable of operating efficiently and safely within the current and projected operational training environment with emphasis on operational supportability.

7. Program Highlights:

a. Significant Historical Developments -- The requirement for the T-46A (Next Generation Trainer (NGT) Program) began with Air Training Command (ATC) General Operational Requirement (GOR) 01-78, dated 6 March 1978. On 2 July 1982 FSD Contracts were awarded to the Fairchild Republic Company (FRC) for air vehicle development and to the Garrett Turbine Engine Company (GTEC) for engine development. GTEC and FRC successfully completed their Critical Design Reviews (CDR) in October 1983 and December 1983 respectively. On 3 December 1983, the first complete F-109-GA-100 engine was run and achieved 100% static thrust during initial tests.

1984 -- Milestone II review by the Air Force System Acquisition Review Council (AFSARC) was held on 14 Feb 84; long lead funding for production lot 1 was released to contractors. A technical review was presented to the AFSARC on 6 Nov 84; full production funding for production lot 1 and long lead funding for production lot 2 was released. DT&E aircraft #1 major assembly was started on 1 Mar 84 with completion planned for second quarter FY85. Contract for the T-46A Operational Flight Trainer was awarded in Oct 84.

1985 -- Rollout of the first flight test aircraft occurred on 11 Feb 85. A Secretarial Program Review was conducted on 21 Feb 85. An Air Force Executive Review of the airframe contractor's capability to conduct the T-46A program was held after it became apparent that DT&E aircraft #1 was incapable of first flight on or about the contract date of 15 Apr 85. Subsequently, the contractor has committed additional resources, instituted management changes and presented a new schedule to the Air Force. The Initial Flight Release qualification of the F109 engine was completed on 16 Apr 85. The first test aircraft was delivered to the Air Force and transported to Edwards AFB on 29 Aug 85. A Contractor Operations Review held by AFCMD at Fairchild Republic Company from 3-14 Jun 85 found the company unsatisfactory in all eight categories reviewed. Fifty percent of progress payments were being withheld pending satisfactory progress on corrective actions.

1986 -- First flight was successfully completed on 15 Oct 85. Congress appropriated funds for FY86 Lot II production aircraft and long lead funds for Lot III. The Air Force declined to exercise Lot II for FY86 and the OSD withheld FY86 production funding.

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7. Program Highlights (Cont'd):

b. Significant Developments Since Last Report -- Congress has now directed that the Lot II funds (Then Year \$169.9M) be used for a competitive evaluation and flyoff. These funds are not included in this SAR.

The T-46 is expected to be unavailable to satisfy mission requirements due the elimination of FY86 and subsequent years production funding.

c. Changes Since 31 Dec 86 -- None

8. Decision Coordinating Paper (DCP) Threshold Breaches:--

9. Schedule:

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
--	---	-----------------------------

a. Milestones--

Full Scale Development Contract Award	Jul 82/Jul 82	Jul 82
Critical Design Review	Aug 83/Aug 83	Dec 83
AFSARC II (Limited Prod Decision)	Nov 83/Nov 83	Feb 84
First Flight	Apr 85/Apr 85	Oct 85
First Prod Aircraft Deliv	Apr 86/Apr 86	Jan 87 (Ch-1)
AFSARC III Full Rate Prod Decision	Sep 86/N/A (Ch-2)	N/A
IOC	Sep 87/N/A (Ch-2)	N/A

b. Previous Change Explanations--

Engineering, test and manufacturing effort for first test aircraft was underestimated and airframe contractor failed to apply required resources. Production deliveries were delayed as result of structural mainframe fatigue on test aircraft and subsequent redesign/remanufacture. AFSARC III was delayed to accommodate slip in IOT&E and full-scale fatigue test as result of structural mainframe fatigue failure on test article. IOC slipped due to initial production delivery slip. The FY87 PB cancelled the program production funding after FY85. Therefore, the AFSARC III Decision is no longer required and IOC will not occur due to insufficient aircraft.

c. Current Change Explanations--

(Ch-1) The First Production Aircraft Delivery was delayed (from Nov 86 to Jan 87) due to delays in fabrication and test.

(Ch-2) (AFSARC III-From FY86 to N/A; IOC-From Sep 87 to N/A) FY86 and subsequent years production funding was eliminated by PMD 13, therefore, removing requirement for AFSARC III decision and production aircraft for IOC.

d. References--

Development Estimate: PMD 8067(9)/64313F, 19 Nov 82.

Approved Program: PMD 8067(13)/64313F, 21 Oct 85.

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10. Technical/Operational Characteristics

	<u>Development Estimate/ Approved Program</u>	<u>Demonstrated Performance 1/</u>	<u>Current Estimate 2/</u>
a. Technical--			
Maintainability (Man-hours/Flt Hr)	4.75/4.75	5.85 (Ch-1)	4.25 (Ch-1)
Full Mission Capable Rate (%)	83/83	85 (Ch-1)	85 (Ch-1)
Sustained Load Factor at 25,000 Ft (G)	2.5/2.5	2.2 (Ch-1)	2.3 (Ch-1)
b. Operational--			
Takeoff Climb Gradient (Single Engine, (Ft/NM)/(%))	3.5/(212/3.5) (Ch-3)	215/3.5 (Ch-1)	220/5.6 (Ch-1)
Go-Around Climb Gradient (Single Engine, (Ft/NM)/(%))	N/A/(100/1.7) (Ch-3)	60/3.7 (Ch-2)	100/1.7 (Ch-2)
Rate of Climb at 25,000 FT (FPM)	2000/2000	1865 (Ch-1)	2010 (Ch-1)
Critical Field Length (Ft)	5000/5000	4365 (Ch-1)	4410 (Ch-1)

1/ Estimate for first production aircraft (P-1) is provided in lieu of demonstrated performance of flight test aircraft which do not represent production aircraft in configuration and weight.

2/ Estimated value at system maturity (250,000 fleet flying hours)

c. Previous Change Explanations--

The takeoff climb gradient was based on estimated weight increase since Feb 85.

d. Current Change Explanations--

(Ch-1) Based upon flying test hrs.

(Ch-2) Added characteristic to be consistent with other reporting.

(Ch-3) Ft/NM has been added.

e. References--

Development Estimate: PMD 8067/(9)/64313F, 19 Nov 82.

Approved Program: PMD 8067/(13)/64313F, 21 Oct 85.

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11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost--	Development Estimate	Changes	Current 1/ Estimate
Development (RDT&E)	294.7	-18.4	276.3
Procurement	1825.9	-1731.0	94.9
Airframe	(1165.7)	(-1112.6)	(53.1)
Engine	(342.1)	(-326.3)	(15.8)
Avionics	(67.9)	(-66.9)	(1.0)
Total Flyaway	(1575.7)	(-1505.8)	(69.9)
Other Weapon System Cost	(190.0)	(-170.8)	(19.2)
Initial Spares	(60.2)	(-54.4)	(5.8)
Construction (MILCON)	---	---	---
Total FY81 Base Year \$	2120.6	-1749.4	371.2
Escalation	1371.8	-1271.5	100.3
Development (RDT&E)	(77.8)	(-16.3)	(61.5)
Procurement	(1294.0)	(-1255.2)	(38.8)
Construction (MILCON)	---	---	---
Total Then-Year \$	3492.4	-3020.9	471.5
b. Quantities --			
Development (RDT&E)	2	--	2
Procurement	650	-640	10
Total	652	-640	12
c. Unit Cost--			
Procurement:			
FY81 Base-Year \$	2.809	+6.681	9.490
Then-Year \$	4.800	+8.570	13.370
Program:			
FY81 Base-Year \$	3.252	+27.681	30.933
Then-Year \$	5.356	+33.936	39.292

1/ Since Congressional language stipulates T-46A FY86 procurement funds (Base Year \$116.4; Then Year \$169.9) be used to conduct a competitive evaluation with flyoff, these funds are not included in this SAR.

d. Approved Design to Cost Goal -- None

e. Foreign Military Sales -- None

f. Nuclear Costs -- None

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12. Program Acquisition/Current Procurement Unit Cost Summary
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition			
(1) Cost	471.5	498.1	471.5
(2) Quantity	12	12	12
(3) Unit Cost	39.292	41.508	39.292
b. Current Procurement --(FY 1987)	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	0	0	0
Less CY Adv Proc	0	0	0
Plus PY Adv Proc	0	0	0
Net Total	0	0	0
(2) Quantity	0	0	0
(3) Unit Cost	0	0	0

13. Cost Variance Analysis

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROG	MILCON	TOTAL
Development Estimate	372.5	3119.9	--	3492.4
Previous Changes				
Economic	-8.6	-1.4	--	-10.0
Quantity	--	-2589.4	--	-2589.4
Schedule	--	+1.0	--	+1.0
Engineering	--	--	--	--
Estimating	+17.2	-4.3	--	+12.9
Other	--	--	--	--
Support	-19.9	-388.9	--	-408.8
Subtotal	-11.3	-2983.0	--	-2994.3
Current Changes				
Economic	-1.0	-2.0	--	-3.0
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-20.8	+3.3	--	-17.5
Other	--	--	--	--
Support	-1.6	-4.5	--	-6.1
Subtotal	-23.4	-3.2	--	-26.6
Total Changes	-34.7	-2986.2	--	-3020.9
Current Estimate	337.8	133.7	--	471.5

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13. Cost Variance Analysis (Cont'd)
(FY 1981 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	294.7	1825.9	--	2120.6
Previous Changes				
Quantity	--	-1516.8	--	-1516.8
Schedule	--	+2.7	--	+2.7
Engineering	--	--	--	--
Estimating	+12.6	+6.0	--	+18.6
Other	--	--	--	--
Support	-14.9	-222.1	--	-237.0
Subtotal	-2.3	-1730.2	--	-1732.5
Current Changes				
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-14.9	+2.3	--	-12.6
Other	--	--	--	--
Support	-1.2	-3.1	--	-4.3
Subtotal	-16.1	-.8	--	-16.9
Total Changes	-18.4	-1731.0	--	-1749.4
Current Estimate	276.3	94.9	--	371.2

b. Previous Change Explanations

RDT&E

ECONOMIC: revised escalation indices

ESTIMATING: restored reduction in FY84 President's Budget;
adjustment for prior year escalation; delayed engine
spin tests and reduced management reserve to
accommodate reprogramming for small business
contracts; reprogramming by USAF to simulator;
addition of 4th step engine durability test

SUPPORT: revised simulator estimate reflecting negotiated contract;
reduction in simulator test and evaluation

Procurement

ECONOMIC: revised escalation indices

QUANTITY: reduction in aircraft quantity from 650 to 10.

SCHEDULE: revised schedule reduced initial aircraft procurement
rates because of funding constraints; reduction in
aircraft quantity from 650 to 10

ESTIMATING: one time change for correcting of methodology for
computing inflation of advanced procurement funding;
adjustment for prior years escalation; reduction in
aircraft quantity from 650 to 10

SUPPORT: reduced spares requirement due to reduced initial aircraft
procurement rates; adjustment to allow for simulator
concurrency and refinement of previous estimate;
re-estimate of peculiar support equipment; reduction in
aircraft quantity from 650 to 10

MILCON--NONE

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13. Cost Variance Analysis (Cont'd):

c. Current Change Explanations--	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised economic escalation indices (Economic)	N/A	-1.0
Adjustment for current and prior year escalation change. (Estimating)	+0.6	+0.8
Reduction of system test and evaluation and ECP's. (Estimating)	-15.5	-21.6
Reduction of flight simulator test and evaluation. (Support)	-1.2	-1.6
(2) <u>Procurement</u>		
Revised economic escalation indices (Economic)	N/A	-2.0
Adjustment for current and prior escalation change. (Estimating)	+0.9	+1.3
Increase in estimate for airframe, engine, and GFE costs. (Estimating)	+1.4	+2.0
Reduction in initial spares and support requirement. (Support)	-3.6	-5.2
Adjustment for current and prior escalation change. (Support)	+0.5	+0.7

d. References--

Development Estimate: FY84 President's Budget, January 1983.

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14. Program Acquisition Unit Cost (PAUC) History (TY \$ in Millions)
a. Initial SAR/Development Estimate to Current Estimate

PAUC (Initial SAR-DE)	Changes (Then-Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
5.356	-1.083	+69.894	+0.083	—	- 0.383	-34.575	—	+33.936	39.292

15. Contract Information- (Then-Year Dollars in Millions)

a. RDT&E —

Initial Contract Price

	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>Airframe</u>	104.0	125.3	2
Fairchild Republic Co.			
Farmingdale, LI, NY			
F33657-82-C-2128 FPIF			
Award/Definitized: July 2, 1982			

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
111.8	134.4	2	221.7	221.7

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance	\$-41.8	\$-6.2
Cumulative Variances to Date(8/24/86)	\$-61.7	\$-3.2
Net Change	\$-19.9	\$+3.0

Explanation of Change— The change in cost variance since the previous report is primarily in the Airframe and Development Test and Evaluation (DT&E) WBS elements. The airframe cost variance (52.8% of the total cumulative cost variance) results primarily from design engineering changes and rework, manufacturing efforts such as parts growth, and overtime expenses exceeding plan. The DT&E cost variance (30.8% of the total cumulative cost variance) results primarily from greater than planned design and test efforts, efforts required to investigate the failure of the PVD #4 mainframe, support of flight test, and engineering changes and rework.

The change in schedule variance since the previous report, although favorable, is not a true measure of schedule performance since FRC was authorized to implement Contract Supplemental Agreement P00050, which revised the FSD build plan to delay deliveries of T-1 and T-2 aircraft by four and nine months respectively. This was accomplished in the Dec 85 CPR and resulted in a decrease in the schedule variance; however, an unfavorable trend has continued since, and is attributable to the same reasons as those given for the cost variance.

Although the program manager's Estimate at Completion (EAC) is \$87.3M higher than the ceiling price of \$134.4M, the Air Force exposure will not exceed ceiling.

The T-46A FSD CPR was discontinued with the August 86 submittal since performance as measured against the Total Allocated Budget was 95% complete and all major items of equipment have been delivered.

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15. Contract Information (Cont'd) (Then-Year Dollars in Millions)Engine

Garrett Turbine Engine Company

Phoenix, AZ

F33657-82-C-2129 FPIF

Award: July 2, 1982

Definitized: July 2, 1982

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>
121.2	135.4	6

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	<u>Contractor</u>	<u>Program Manager</u>
125.1	140.0	19	147.5	147.5

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-17.2	\$-5.6
Cumulative Variance to Date (12/04/86)	\$-1.6	\$-3.7
Net Change	\$+15.6	\$+1.9

Explanation of Change: The positive change in the cost variance since the previous report is due largely to the fact that the FSD contract went to an Over-Target Baseline (OTB) on 21 November 85. In the event of an OTB, Budgeted Cost of Work Scheduled (BCWS) cum-to-date and Budgeted Cost of Work Performed (BCWP) cum-to-date are set equal to Actual Cost of Work Performed (ACWP) cum-to-date; therefore, the cost variance becomes zero.

The change in schedule variance since the previous report is due largely to the negotiation of stretch-out of FSD milestones. This stretch-out caused Garrett's schedule variances to improve considerably. Although the Program Manager's Estimate at Completion (EAC) is \$7.5M higher than the ceiling of \$140M, Air Force exposure will not exceed ceiling.

b. ProcurementAirframe (Lot I)

Fairchild Republic Co.

Farmingdale, L.I. NY,

F33657-82-C-2128 FPIF,

Award: Dec 1, 1984

Definitized: Dec 1, 1984

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>
58.9	64.3	10

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	<u>Contractor</u>	<u>Program Manager</u>
58.9	65.2	10	\$ 96.3	\$ 120.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance	\$ -6.5	\$ -8.7
Cumulative Variance to Date (11-23-86)	\$-29.0	\$-10.1
Net Change	\$-22.5	\$-1.4

Explanation of Changes: The change in cost variance since the previous report is predominantly in the Airframe WBS element (91.3% of the total cost variance). This variance results mainly from increased tooling requirements, incorporation of design changes in P-1, and weight reduction design efforts.

The change in schedule variance since the previous report is also predominantly in the Airframe WBS element (92.3% of the total schedule variance). The variance is attributed to late tool completions and engineering changes and diversions of manpower to FSD. Although the Program Manager's Estimate at Completion (EAC) is \$54.8M higher than the ceiling price of \$65.2M, Air Force exposure will not exceed ceiling.

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15. Contract Information (Cont'd) (Then Year Dollars in Millions)

Engine (Lot I)

Garrett Turbine Engine Company
Phoenix, AZ
F33657-82-C-2129 FPIF
Award: January 10, 1985
Definitized: January 10, 1985

FY87 Authorizations Act requires reporting of the six largest contracts,
\$40M or more.

Airframe (Lot II Long Lead)

Fairchild Republic Co.
Farmingdale, L.I. NY
F33657-82-C-2128, FPIF
Definitized: Dec 1, 1984

FY87 Authorizations Act requires reporting of the six largest contracts,
\$40M or more.

Engine (Lot II Long Lead)

Garrett Turbine Engine Co.
Phoenix AZ
F33657-82-C-2129, FPIF
Definitized: Jan 10, 1985

FY87 Authorizations Act requires reporting of the six largest contracts,
\$40M or more.

c. MILCON--None

16. Program Funding Summary (Current Estimate in Millions of Dollars)

a. Program Status--

- (1) Percent Program Completed: 100 % (7 yrs/7 yrs)
- (2) Percent Program Cost Appropriated: 100 % (471.5/471.5)

b. Appropriation Summary--(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current</u>	<u>Budget</u>	<u>Balance to Complete</u>		<u>Total</u>
	<u>Prior Yrs</u>	<u>Year</u>	<u>FYDP</u>	<u>Beyond FYDP</u>	
	<u>(FY80-87)</u>	<u>(FY88)</u>	<u>(FY89-92)</u>	<u>N/A</u>	
RDT&E	337.8	0.0	0.0	—	337.8
Procurement	133.7	0.0	0.0	—	133.7
MILCON	—	—	—	—	—
Total	471.5	0.0	0.0	—	471.5

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

FY81 Base-Year Dollars					Then-Year Dollars		
Fiscal Year	Qty	Flyaway		Total	Advance Proc		Escl Rate(%)
		Nonrec	Rec		Debit	Credit	

Appropriation - RDT&E

1980				2.0			1.9	9.4
1981				--			--	N/A
1982				13.1			14.6	9.2
1983				44.5			52.0	4.9
1984				101.8			123.4	3.8
1985				67.6			84.8	3.4
1986				39.5			50.9	2.9
1987				7.8			10.2	3.1
Subtotal	2			276.3			337.8	

Appropriation - Procurement

1984				7.1	6.		9.7	8.0
1985	10	3.0	66.9	87.8	31.0	6.1	124.0	3.4
Subtotal	10	3.0	66.9	94.9	37.1	6.1	133.7	

Appropriation - MILCON--None

Total	12	3.0	66.9	371.2	37.1	6.1	471.5	
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16. Program Funding Summary (Cont'd) (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures —

Then-Year Dollars (Current Estimate in Millions)

Fiscal Year	Total	Obligated	Expended
-------------	-------	-----------	----------

Appropriation - RDT&E

1980	1.9	1.9	1.9
1981	—	—	—
1982	14.6	14.6	14.6
1983	52.0	52.0	50.4
1984	123.4	122.9	104.2
1985	84.8	84.5	70.9
1986	50.9	36.2	19.8
1987	10.2	0.0	0.0
To Complete	0.0	N/A	N/A
Subtotal	337.8	312.1	261.8

Appropriation - Procurement

1984	9.7	9.7	5.3
1985	124.0	100.4	56.9
To Complete	0.0	N/A	N/A
Subtotal	133.7	110.1	62.2

Appropriation - MILCON — None

Total	471.5	422.2	324.0
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Reflects program office records as of 31 Dec 86 for RDT&E and procurement. Initial spares expenditures were as of 30 Nov 86.

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17. Production Rate Data —

a. Annual Production Rates — (Note: The annual production rates shown differ from the annual funded quantities because the funded delivery period is 9 months for the FY85.)

Production Rates (Quantity/Year)

Fiscal Year	Development Estimate	Production Estimate	Current Estimate	Maximum
1985	21	N/A	13	N/A
1986	79	N/A	—	N/A
1987	125	N/A	—	N/A
1988	130	N/A	—	N/A
1989	144	N/A	—	N/A
1990	144	N/A	—	N/A
1991	7	N/A	—	N/A

b. Cost Variance — Dollars in Millions

Item	Production Estimate	Variance	Current Estimate	Variance	Maximum
Prog Acq Cost (BYS)	N/A	N/A	371.2	N/A	N/A
(TYS)	N/A	N/A	471.5	N/A	N/A
PAUC (BYS)	N/A	N/A	30.933	N/A	N/A
(TYS)	N/A	N/A	39.292	N/A	N/A

c. Schedule Changes —

	Production Estimate	Variance	Current Estimate	Variance	Maximum
Start Date (Mo/Yr)	N/A	N/A	12/84	N/A	N/A
Duration (in Months)	N/A	N/A	32	N/A	N/A
End Date (Mo/Yr)	N/A	N/A	7/87	N/A	N/A

d. Deliveries (Plan/Actual) —

	To Date
RDT&E	2/2
Procurement	2/0

18. Operating and Support Costs — None

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
 PROGRAM: OVER-THE-HORIZON BACKSCATTER RADAR (OTH-B)

AS OF DATE: December 31, 1986

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1. Designation/Nomenclature (Popular Name): AN/FPS-118/OTH-B Radar2. DOD Component: U.S. Air Force3. Responsible Office and Telephone Number:

OTH-B Program Office	PM: Col James A. Lee
Electronic Systems Division	Assigned June 19, 1985
Hanscom AFB, MA 01731-5000	Autovon 478-5980, MITRE Ext 5387

4. Program Elements:

RDT&E: PE 12417F
 PROCUREMENT: PE 12417F APPN 3080 ICN 83312D
 MILCON: PE 12417F

5. Related Program: NONE6. Mission and Description:

The OTH-B radar system satisfies requirements for tactical early warning of an attack on North America by bombers and air-to-surface missiles. It will detect and track airborne vehicles at ranges between approximately 500-1800 nautical miles from the radar. OTH-B increases warning time for survival of retaliatory forces and provides decision time for the National Command Authority consistent with ballistic missile warning requirements. The OTH-B will provide surveillance coverage of the East, West, Northwest and Southern approaches to North America. The OTH-B does not replace any existing radar systems.

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7. Program Highlights:

- a. Significant Historical Developments -- Following the successful demonstration of the Experimental Radar System, a fixed price incentive firm contract was awarded to General Electric Company for the Initial Operating Sector (IOS) of the East Coast Radar System (ECRS) in June 1982. Procurement contracts for Sectors 2 and 3 of the East Coast Radar System were awarded on 29 June 84 and 28 October 84, respectively. The West Coast Radar System (WCRS), three 60 degree sectors; Central Radar System (CRS), four 60 degree sectors; and Alaskan Radar System (ARS), two 60 degree sectors were programmed in 1984. Planning and site surveys for CRS and ARS were initiated in 1985.
- b. Significant Developments Since Last Report -- The Initial Capability Verification (ICV) testing for the Initial Operating Sector was completed in November 1986.

A fixed price incentive firm contract was awarded to General Electric Company for the first sector of the WCRS in December 1986.

The draft Environmental Impact Statement (EIS) for the CRS and the ARS were filed in August 1986, followed by public hearings in the communities for the proposed sites of the two systems.

The OTH-B Radar Program is expected to satisfy mission requirements.

- c. Changes Since "As Of" Date -- None

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated 18 January 1982) threshold breaches.

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OTH-B Radar, 31 December 1986

9. (U) Schedule:

(U) Milestone --	Development Estimate/ Approved Program	Current Estimate
(U) System Definition Complete	Nov 73/Nov 73	Nov 73
(U) Prototype Contract Award	Mar 75/Mar 75	Mar 75
(U) Initiate Program Restructure	Dec 76/Dec 76	Dec 76
(U) Conclude Technical Feasibility Test	Feb 81/Feb 81	Feb 81
(U) Conclude IOT&E	Jun 81/Jun 81	Jun 81
(U) AFSARC Review	Nov 81/Nov 81	Nov 81
(U) Development Decision	Jan 82/Jan 82	Jan 82
(U) Development Contract Award	Jun 82/Jun 82	Jun 82
(U) SAF/AL Program Review	Dec 83/Dec 83	Dec 83
(U) Award First Production Contract (FCRS)	May 84/May 84	May 84

(b)(1)

(U) Award WCRS Production Contract Jul 86/Jun 86 Dec 86 (Ch-1)
(U) Initial Operating
Capability (IOC)

(b)(1)

- b. (U) Previous Change Explanations--
(U) Congressional action to defer initial procurement of WCRS from FY85 to FY86 caused a slip in WCRS and CRS IOC dates. The ARS was added to the OTH-B program in 1984.

(b)(1)

(U) Milestones added since 31 December 1984 - SAF/AL Program Review and Award WCRS Production Contract.

(b)(1)

- (U) Current Change Explanations --
(U) (Ch-1) West Coast contract award was changed from Jul 6 to Dec 86 due to receipt of only one proposal and the resulting additional time required to complete pricing analysis and negotiations on a single source basis.

(b)(1)

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OTH-B Radar, 31 December 1986

d. (U) References --

(U) Development Estimate: DCP #49, Revision 2, dated 18 January 1982,
Subject: "CONUS OTH-B Radar Program".

(U) Approved Program: Same as Development Estimate.

10. (U) Technical/Operational Characteristics:

a. (U) Technical --	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance 2/</u>	<u>Current Estimate</u>
(U) Detection/Tracking Range (nm)	500-1800/ 500-1800	500-1800	500-1800

(b)(1)

1/ (U) rms = root mean square.

2/ (U) The better than expected performance of operational and technical characteristics is derived from Experimental Radar System (ERS) test program results.

b. (U) Operational --

(b)(1)

(U) Mean Time Between Failures (hrs)	40/40	--	41
--------------------------------------	-------	----	----

3/ (U) Probability/confidence level.

c. (U) Previous change explanations -- None

d. (U) Current Change Explanations -- None

e. Reference --

Development Estimate: DCP #49, Revision 2, dated 18 January 1982,
Subject: "CONUS OTH-B Radar Program".

Approved Program: Same as Development Estimate.

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11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a. Cost—	Development Estimate	Changes	Current Estimate
Development (RDT&E)	\$327.3	\$+78.5	\$405.8
Procurement	710.9	+631.6	1342.5
East Coast	(199.0)	(-14.6)	(184.4)
West Coast	(263.0)	(+17.0)	(280.0)
Central	(184.8)	(+172.7)	(357.5)
Alaskan	(—)	(+207.6)	(207.6)
P3I	(7.2)	(+190.9)	(198.1)
Spares	(56.9)	(+58.0)	(114.9)
Construction (MILCON)	107.1	+72.2	179.3
Total FY82 Base Year \$	1145.3	+782.3	1927.6
Escalation	274.1	+293.1	567.2
Development (RDT&E)	(51.1)	(+22.5)	(73.6)
Procurement	(191.3)	(+241.0)	(432.3)
Construction (MILCON)	(31.7)	(+29.6)	(61.3)
Total Then-Year \$	\$1419.4	\$+1075.4	\$2494.8
b. Quantities—			
Development (RDT&E)	1		1
Procurement	7	+4	11
Total	8	+4	12
c. Unit Cost * —			
Procurement:			
FY 82 Base-Year \$	\$101.557	\$+20.488	\$122.045
Then-Year \$	128.886	+32.459	161.345
Program:			
FY 82 Base-Year \$	143.163	+17.470	160.633
Then-Year \$	\$177.425	\$+30.475	\$207.900

* Portion of the cost of a sector is determined by the specific site conditions

d. Approved Design to Cost Goal — None

e. Foreign Military Sales — None

f. Nuclear Costs — None

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
a. Program Acquisition—	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
(1) Cost	2494.8	2520.0	2494.8
(2) Quantity	12	12	12
(3) Unit Cost *	207.900	210.000	207.900
b. Current Procurement—	(FY 1987)	(FY 1987) **	(FY 1988)
(1) Cost	112.9	112.9	133.5
Less CY Adv Proc	0	0	0
Plus PY Adv Proc	20.0	20.0	20.0
Net Total	132.9	132.9	153.5
(2) Quantity	1	1	1
(3) Unit Cost *	132.900	132.900	153.500

* Portion of the cost of a sector is determined by the specific site conditions

** Adjusted to reflect FY87 Appropriations Act in accordance with Congressional change to SAR law.

13. Cost Variance Analysis:

a. Summary -- (Current(Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	378.4	902.2	138.8	1419.4
Previous Changes:				
Economic	-7.8	-52.5	-7.6	-67.9
Quantity	-	+540.4	+147.4	+687.8
Schedule	-	+35.1	-2.6	+32.5
Engineering	+54.5	+124.9	-	+179.4
Estimating	+67.6	+120.9	-58.6	+129.9
Other	-	-	-	-
Support	-	+138.9	-	+138.9
Subtotal	+114.3	+907.7	+78.6	+1100.6
Current Changes:				
Economic	-2.3	-20.9	-3.3	-26.5
Quantity	-	-	-	-
Schedule	-	+1.0	+4.1	+5.1
Engineering	-	+97.8	-	+97.8
Estimating	-11.0	-64.2	+22.4	-52.8
Other	-	-	-	-
Support	-	-48.8	-	-48.8
Subtotal	-13.3	-35.1	+23.2	-25.2
Total Changes	+101.0	+872.6	+101.8	+1075.4
Current Estimate	479.4	1774.8	240.6	2494.8

13. Cost Variance Analysis (Cont'd):

(FY 1982 Constant Dollars (Base-Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	327.3	710.9	107.1	1145.3
Previous Changes:				
Quantity	-	+380.5	+107.0	+487.5
Schedule	-	+6.1	-	+6.1
Engineering	+37.5	+82.3	-	+119.8
Estimating	+50.2	+85.6	-50.6	+85.2
Other	-	-	-	-
Support	-	+92.6	-	+92.6
Subtotal	+87.7	+647.1	+56.4	+791.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+66.1	-	+66.1
Estimating	-9.2	-47.0	+15.8	-40.4
Other	-	-	-	-
Support	-	-34.6	-	-34.6
Subtotal	-9.2	-15.5	+15.8	-8.9
Total Changes	+78.5	+631.6	+72.2	+782.3
Current Estimate	405.8	1342.5	179.3	1927.6

b. Previous Change Explanations—

(1) RDT&E

Economic: revised escalation indices
 Estimating: increased costs associated with 4 additional radar sectors, operating the Program Office for 2 additional years and escalation change on prior years
 Engineering: Change in P3I efforts towards improved small target detection capabilities and a one time correction to the previous SAR, 31 Dec 1984

(2) Procurement

Economic: revised escalation indices
 Quantity: increased program by 4 radar sectors
 Schedule: rescheduled Sector 4 from FY85 to FY86
 increased costs due to re-scheduling procurement over 7 years instead of 5 years and a two year delay in P3I implementation
 Estimating: increased costs due to cost area factors for the ARS, escalation changes on prior years, and a one time correction to previous SAR, 31 Dec 1984
 Engineering: change in P3I efforts towards improved small target detection capabilities and a one time correction to previous SAR, 31 Dec 1984
 Support: increase for spares and Other Weapons System cost to support 4 additional sectors and two added years in the program schedule, increase to cost due to re-phasing spares to the current schedule profile, and a one time correction to previous SAR, 31 Dec 1984

13. Cost Variance Analysis (Cont'd):(3) MILCON

Economic: revised escalation indices
 Quantity: increase in facilities costs to support 4 additional sectors
 Schedule: reduction in costs due to re-phasing the procurement of the ARS
 Estimating: reduction in West Coast Radar System facilities cost and the CRS from two to one operation centers

c. Current Change Explanations —

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised economic escalation indices (Economic)	N/A	-2.3
Reductions due to Congressional actions. (Estimating)	-10.3	-12.2
Adjustment for impact of escalation change on current and prior years (Estimating)	+1.1	+1.2
(2) <u>Procurement</u>		
Revised economic escalation indices (Economic)	N/A	-20.9
Increased costs due to Congressional stretchout of WCRS acquisition (Schedule)	N/A	+10.3
Decreased costs associated with beginning P3I implementation in FY88 instead of FY90 (Schedule)	N/A	-9.3
P3I efforts directed towards improved small target detection capabilities and reduced life cycle costs (Engineering)	+66.1	+97.8
Decreased cost estimates due to completion of negotiation of the WCRS (Estimating)	-54.0	-72.7
Adjustment for impact of escalation change on current and prior years (Estimating)	+7.0	+8.5

13. Cost Variance Analysis (Cont'd):

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Decreased cost due to reduced initial spare requirements (Support)	-35.2	-49.5
Adjustment for impact of escalation change on current and prior years (Support)	+6	+7

(3) MILCON

Revised economic escalation indices (Economic)	N/A	-3.3
Increased costs associated with rephasing the procurement of the ARS from FY88 to FY89 and CRS from FY89 to FY90. (Schedule)	N/A	+4.1
Increased cost due to revised estimates for a technical support facilities (Estimating)	+15.2	+21.6
Adjustment for impact of escalation change on current and prior years (Estimating)	+0.6	+0.8

d. Reference: Development Estimate FY85 President's Budget, January 1984.14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

a. Initial SAR Estimate/Development Estimate to Current Baseline Estimate --

PAUC (Initial SAR/ Development Estimate)	Changes (Then-Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
177.425	-7.867	-1.825	+3.134	+23.100	+6.425	+7.508		+30.475	207.900

15. Contractor Information: (Then-Year Dollars in Millions)

a. RDT&E --

<u>Sector 1 (IOS):</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
General Electric Co., Syracuse, NY F19628-82-C-0114, FPIF, Award: June 14, 1982 Definitized: June 6, 1983	\$232.1	\$239.0	1.0

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$236.7	\$253.6	1	\$253.6	\$253.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances (As of 1 Dec 85)	\$-11.6	\$-8.1
Cumulative Variances to Date (As of 30 Nov 86)	\$-51.3	\$-12.8
Net Change	\$-39.7	\$-4.7

Explanation of Change: The unfavorable cost variance is a result of unplanned computer software effort and related system engineering growth due to extended effort by software design and integration personnel. The unfavorable schedule variance is a result of delays in completing computer software integration and testing. No impact on contract cost--the program managers' estimate at completion remains at ceiling price and is within approved funding.

b. Procurement --

<u>Sector 2:</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
General Electric Co., Syracuse, NY F19628-82-C-0114, FPIF, Award: June 29, 1984 Definitized: December 28, 1984	\$91.0	\$96.6	1

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$99.2	\$105.5	1	\$99.2	\$99.2

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances (As of 1 Dec 85)	\$+3.7	\$-2.8
Cumulative Variances to Date (As of 30 Nov 86)	\$+4.5	\$-6.3
Net Change	+8	\$-3.5

Explanation of Change: The cost variance change from last year is insignificant. The overall favorable variance is due to efficiencies in transmitter and receiver installation and assembly, program management, and system engineering. The unfavorable schedule variance is due to delays in receiver assembly and test and transmitter and receiver equipment installation and assembly. There is no impact to contract cost or to program at completion.

15. Contractor Information (Cont'd): (Then-Year Dollars in Millions)

c. Procurement			Initial Contract Price		
<u>Sector 3:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
General Electric Co., Syracuse, NY			\$83.0	\$88.1	1
F19628-82-C-0114, FPIF,					
Award: October 28, 1984					
Definitized: February 15, 1985					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$86.3	\$91.6	1	\$82.3	\$86.3	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances					
(As of 1 Dec 85)			\$+2.6	\$-1.4	
Cumulative Variances to Date					
(As of 30 Nov 86)			\$+5.9	\$-4.0	
Net Change			\$+3.3	\$-2.6	

Explanation of Change: The favorable cost variance is due to efficiencies in receiver equipment fabrication, integration and test, system engineering and program management. The unfavorable schedule variance is due to delays in receipt of transmitter and receiver equipment.

There is no impact to contract cost or to program at completion.

d. Procurement			Initial Contract Price		
<u>Sector 4:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
General Electric Co., Syracuse, NY			\$145.2	\$155.8	1
F19628-86-C-0174, FPIF,					
Award: December 19, 1986					
Definitized: December 19, 1986					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$145.2	\$155.8	1	\$145.2	\$145.2	

Variances: The contract was signed 19 December 1986.
There is no Contract Performance Report to date.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status —

(1) Percent Program Completed: 46.2% (6yrs/13yrs)

(2) Percent Program Cost Appropriated: 35.8% 892.3/2494.8

b. Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY82-87)	Budget Year (FY88)	Balance to Complete FYDP (FY89-92)	Beyond FYDP (FY93-94)	Total
RDT&E	342.2	38.4	68.4	30.4	479.4
Procurement	515.9	133.5	1024.1	101.3	1774.8
MILCON	34.2	23.3	183.1	-	240.6
Total	892.3	195.2	1275.6	131.7	2494.8

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary —

Fiscal Year	Qty	FY 82 Base-Year Dollars		Then-Year Dollars			
		Flyaway		Advance Proc		Total	Escl Rate (%)
		Nonrec	Rec	Total	Debit	Credit	

Appropriation: RDT&E

1982				16.3			16.7	9.2
1983				72.1			77.2	4.9
1984				86.9			96.5	3.8
1985				52.9			60.7	3.4
1986				50.2			59.4	2.9
1987				25.9			31.7	3.1
1988				30.3			38.4	3.5
1989				14.7			19.2	3.5
1990				15.2			20.5	3.3
1991				10.3			14.2	2.9
1992				10.2			14.5	2.4
1993				10.4			15.0	2.4
1994				10.4			15.4	2.4
Subtotal	1			405.8			479.4	

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary (Continued) —

Fiscal Year	Qty	FY 82 Base-Year Dollars		Then-Year Dollars				
		Flyaway		Total	Advance Proc		Total	Escl Rate (%)
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement

1984	1		81.5	86.4			98.7	3.8
1985	1		102.9	109.1			128.6	3.4
1986	1		130.4	144.2	40.0		175.7	2.9
1987	1		84.8	89.7		20.0	112.9	3.1
1988	1		95.3	102.6		20.0	133.5	3.5
1989	2		228.1	237.1			317.7	3.5
1990	2		220.3	238.4			328.3	3.3
1991	2		192.4	215.0			303.4	2.9
1992			34.4	51.7			74.7	2.4
1993			50.9	61.7			91.3	2.4
1994			6.6	6.6			10.0	2.4
Subtotal	11		1227.6	1342.5	40.0	40.0	1774.8	

Appropriation: MILCON

1983				1.1			1.2	4.9
1984				8.7			10.1	3.8
1985								3.4
1986				7.0			8.6	2.9
1987				11.3			14.3	3.1
1988				17.8			23.3	3.5
1989				51.1			68.7	3.5
1990				59.3			81.9	3.3
1991				23.0			32.5	2.9
1992								2.4
1993								2.4
1994								2.4
Subtotal				179.3			240.6	

Total	12		1227.6	1927.6	40.0	40.0	2494.8	
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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)d. Obligations and Expenditures * --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1982	16.7	16.7	16.7
1983	77.2	77.2	77.2
1984	96.5	95.8	86.8
1985	60.7	60.7	56.8
1986	59.4	37.2	28.5
1987	31.7	8.9	1.3
To Complete	137.2	0.0	0.0
Total	479.4	296.5	267.3

Appropriation: Procurement

1984	98.7	96.7	67.1
1985	128.6	100.4	58.8
1986	175.7	149.3	2.9
1987	112.9	0.0	0.0
To Complete	1258.9	0.0	0.0
Total	1774.8	346.4	128.8

Appropriation: MILOON

1983	1.2	1.2	1.2
1984	10.1	6.5	6.4
1985	-	-	-
1986	8.6	6.0	2.7
1987	14.3	0.0	0.0
To Complete	206.4	0.0	0.0
Total	240.6	13.7	10.3

*Reflects Program's Office Records as of 19 Dec 1986

17. Production Rate Data: N/A -- OTH-B is not a typical unit production program. Sectors are site unique and vary in costs; therefore production rate data is not applicable.
18. Operating and Support Costs: N/A

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SAR.86-102

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823) (U)
PROGRAM: Remotely Piloted Vehicle (RPV)

AS OF DATE: December 31, 1986

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CHANGE IN CLASSIFICATION
AS MARKED *Now*

FEB 26 1987 5

INFORMATION FOR THE RECORD OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name): YMQM-105 Tactical Airborne Remotely Piloted Vehicle/Drone Systems (AQUILA).

2. (U) DoD Component: U.S. Army.

3. (U) Responsible Office and Telephone Number:

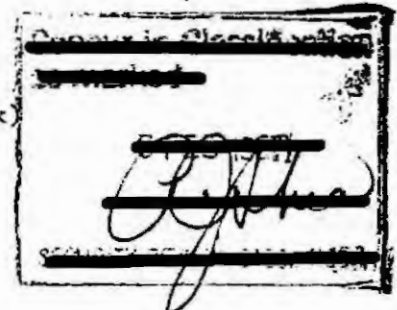
Office of the Project Manager Tactical	COL David W. Keating
Airborne Remotely Piloted Vehicle/	Assigned: 26 Aug 85
Drone Systems (RPV)	AV 746-3945; COMM (205)876-3945
U.S. Army Missile Command	
Redstone Arsenal, Alabama 35898-5791	

4. (U) Program Elements/Procurement Line Items:

RDTE: PE 63725A Project DK61 (Shared Funding-sunk)
PE 64730A Project D040
PE 64730A Project D041
PE 64730A Project D207

PROCUREMENT: APPN 2035 SSN A02900 (Shared Funding-sunk)

MILCON: PN 504
PN 506
PN 507
PN T008700
PN T111700



5. (U) Related Programs: None.

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~~CLASSIFIED BY: RPV SCG
DATE: 86
DECLASSIFY ON: OADR~~

OASD(PA) DECISR 87-T-0394

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6. (U) Mission and Description:

This program will develop a Remotely Piloted Vehicle (RPV) System with both daylight (TV) and Forward Looking Infrared (FLIR) sensors to perform target acquisition, designation, aerial reconnaissance, artillery adjustment, and battlefield post-strike assessment. Laser designation will be provided for all Army and Air Force laser-guided munitions. The RPV System designation will extend the attack capability of commanders beyond the forward line of troops to the full range of artillery and close air support weapons. It focuses on the area beyond 5km where forward observers, ground systems, and helicopters are ineffective and the risk to manned systems is high because of the enemy's sophisticated air defense systems.

7. (U) Program Highlights:

a. (U) Significant Historical Developments:

Funding for RPV was initiated in FY74 and AD was completed in FY78. An AD antijam data link was flight tested in FY78 and an FSD contract for the Modular Integrated Communication and Navigation System (MICNS) data link was awarded in May 79. A DA IPR gave Milestone II approval in Sep 78 and an FSD contract was awarded in Aug 79. An RPV section was tested in 1982 at Fort Huachuca, AZ using a commercial data link and development daylight payload to provide confirmation of the adequacy of hardware and software design. The FLIR payload, the first of RPV preplanned product improvements, complete AD in FY82. A complete FSD RPV system including MICNS and the daylight payload began flight test in Dec 83. Excessive flight failures led to a review of the program by a Blue Ribbon Panel in Apr 84. A series of ASARC reviews culminated in approval of a restructured program in Dec 84. The restructured program provided for extension of FSD from 70 to 79 months. The FSD flight test program ended with a successful technical feasibility demonstration of the RPV engaging targets in conjunction with Copperhead in Dec 84. While the program was being reviewed in 1984, development of the FLIR payload continued and an FSD contract was awarded to Ford Aerospace in May 84. An early operational capability (EOC) section was placed at Fort Hood in Sep 84.

The system entered prototype qualification testing in Jan 85 and DT II began in May 85. After critical performance problems surfaced in testing, a Red Team was convened in May 85. Red Team findings in Aug 85 concluded that required performance was not demonstrated, inadequate quantities of available hardware precluded completion of necessary testing and substantial effort would be required to improve logistics and training. On 26 Aug 85, the RPV program was transitioned from the U.S. Army Aviation System Command (AVSCOM) to the U.S. Army Missile Command (MICOM). DT II was halted in Sep 85. MICOM and Lockheed worked to address the recommendations of the Red Team. In order to prove that AQUILA was ready for DT II, Lockheed proposed a flight demonstration program at no cost to the Government. The FSD program was restructured to address Red Team technical performance issues and to incorporate the Lockheed Austin Division Demonstration (LAD Demo). The restructured program was approved by the Under Secretary of the Army and the Vice Chief of Staff, Army, extending FSD from 79 to 92 months. The Lockheed

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7. (U) Program Highlights (Cont'd):

demonstration was successfully completed in Jan 86 to include a joint RPV/Copperhead live fire exercise. The Army concluded that Red Team issues had been sufficiently resolved to continue FSD.

On 3 Jan 86, the Under Secretary of the Army and the Vice Chief of Staff, Army issued a joint memo formally establishing a nine battery AQUILA program. Funding ceilings in the FY87 President's Budget limited procurement to four batteries. The budget did not meet the Army's requirements and action was initiated to develop a restructured program to meet the Army requirement.

b. (U) Significant Developments Since Last Report -- DT II was restarted in Feb 86. The 92 month FSD contract restructure was initiated in Feb 86 by issuance of a pre-contract costs letter which was followed by a letter contract in Apr which was definitized in Jul 86. DT II flight testing was completed 10 May 86. Collective training was initiated 28 May 86 at Fort Sill, OK. Flight incidents and training and technical issues interrupted collective training in Aug. Training was complete Oct 86. OT II began in Nov 86 with completion scheduled for Mar 87. The FLIR program has been a major concern throughout 1986. Technical changes to the day payload resulted in impacts to the FLIR payload and restructure of the RPV program necessitated a FLIR program restructure. Efforts were underway to evaluate several options for FSD completion when Congress significantly reduced FY87 funds for FLIR below the level required to restructure the program. DA directed a Red Team be formed to consider options for achieving a 24-hour AQUILA capability. The Red Team presented twelve options to DA on 24 Nov 86. These options were reduced to three for further analysis. A decision briefing to DA is scheduled for second quarter FY87. RPV is expected to satisfy the mission requirement.

c. (U) Changes since "As of Date" -- None.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches:

There are currently no DCP (draft dated May 81) threshold breaches.

9. (U) Schedule:

a. (U) Milestones--

RPV System with Day Mission Payload Subsystem (MPS) Only

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
Milestone II (DA IPR)	Sep 78/Sep 78	Sep 78
FSD Contract Award	Aug 79/Aug 79	Aug 79
First Flight	Nov 83/Nov 83	Nov 83
DT/OT-II Complete	Mar 85/Mar 87	Mar 87 (Ch-1)
ASARC III	Jun 85/Jun 87	Jun 87 (Ch-1)
Type Class Std	Jun 85/Jun 87	Jun 87 (Ch-1)
Milestone III (JRMB)	Jun 85/Jul 87	Jul 87 (Ch-1)
Prod Cont Awd	Jul 85/Aug 87	Aug 87 (Ch-1)
Initial Operational Capability	Sep 87/Mar 91	Mar 91 (Ch-1)

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9. (U) Schedule (Cont'd)

RPV FLIR System with Day and FLIR MPS Capability

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
Milestone II (IPR)	Feb 84/Feb 84	Feb 84
FSD Contract Awd (FMPS Only)	Apr 84/Apr 84	Apr 84
Milestone IIIA (ASARC)	Dec 86/TBD	TBD (Ch-2)
DT/OT-II Completed	Apr 87/TBD	TBD (Ch-2)
ASARC	Jul 87/TBD	TBD (Ch-2)
Type Class Std	Jul 87/TBD	TBD (Ch-2)
Prod Cont Awd	Aug 87/TBD	TBD (Ch-2)
Initial Operational Capability	Mar 89/TBD	TBD (Ch-2)

b. (U) Previous Change Explanations --

RPV System with MPS: All changes represented a revised FSD schedule from 70 to 79 months as approved by the VCSA in Dec 84 and a subsequent revision from 79 months to 92 months.

RPV FLIR System: All changes were implemented due to a number of replanning and reprogramming exercises. These actions were the result of either a direct reduction in FSD funds by higher headquarters, or PMO management decisions related to the overall program.

c. (U) Current Change Explanations --

(Ch-1) Difficulties were encountered in collective training. ASARC principals on 5 Aug 86 directed that collective training be extended and OT II not be started until training was complete and software upgrades validated with troop flights. New schedule 2-3 month slip in subsequent milestones.

(Ch-2) DA Red Team report on FLIR is pending. No current milestones are available.

d. (U) Reference --

Development Estimate: HQ DA (DAMO-FDI) Action Memorandum, 16 Aug 83, subject: Remotely Piloted Vehicle (RPV), Organizational and Operational (O&O) Concept.

Approved Program: FY88/89 President's Budget

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10. (U) Technical/Operational Characteristics:

<u>Dev Est/ Appr Pgm</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
------------------------------	-------------------------------------	-----------------------------

a. (U) Technical

(b)(1)

<u>Dev Est/ Appr Pgm</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
------------------------------	-------------------------------------	-----------------------------

b. (U) Operational

(b)(1)

(2) (U) Reliability System			
Flight (Catastrophic) 1/	0.91/0.91	0.89	0.91
TADARS Mission (3 hr) 1/	0.82/0.82	0.76	0.82
(3) (U) Maintainability			
Org. (90% of failure):	0.50hr/0.50hr	1.00hr	0.50hr
Dir Support (10% of failure):	2.00hr/2.00hr	TBD	2.00hr
(4) (U) Availability:	0.89/0.89	TBD	0.89
(5) (U) Manning (Direct)	975MY/TBD	TBD	TBD

c. (U) Previous Change Explanation --

Revision of the ROC in 1985 changed the requirement for Laser designation slant range. Direct manning requirement was established for a 13-battery program. Requirement has not been established for reduced program.

d. (U) Current Change Explanation --

(Ch-1) The ROC specifies the target detection slant range in terms of wide field of view (FOV). This requirement is not consistent with the operational scenario which uses the medium FOV for target detection. Demonstrated performance/current estimate are for the medium FOV detection.

(Ch-2) Current estimate reflects performance demonstrated in DT II.

1/ . Reliability descriptors changed to reflect ROC.

e. (U) References--

Development Estimate: ROC, dated Sep 78.

Approved Program: FY88/89 President's Budget

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11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development	Change	Current
Development (RDT&E)	Estimate		Estimate
	\$ 1012.0	\$-114.3	\$ 897.7
RPV Day Program	(470.9)	(+151.9)	(622.8)
MICNS Datalink	(86.0)	(- 14.3)	(71.7)
RPV-Payload-FLIR	(90.9)	(27.3)	(118.2)
RPV-Drones Adv Dev	(142.7)	(- 57.7)	(85.0)
Preplanned Product Improvement	(221.5)	(-221.5)	(0)
Procurement	1119.9	-142.2	977.7
Air Vehicle	(158.4)	(+ 8.8)	(167.3)
Mission Payload (Day TV)	(71.0)	(+ 30.0)	(101.0)
Ground Control Station	(90.7)	(+ 8.7)	(99.4)
Launch Subsystem	(22.4)	(0)	(22.4)
Recovery Subsystem	(21.7)	(+ 6.3)	(28.0)
Air Data Terminal	(111.4)	(+ 1.9)	(113.3)
Ground Data Terminal	(62.1)	(+ 21.1)	(83.1)
Mission Payload (FLIR)	(136.0)	(+ 19.1)	(155.1)
Maintenance Shelter	(11.8)	(+ 13.0)	(24.8)
Training Interface Unit	(10.2)	(+ 0.5)	(10.7)
Inert Air Vehicle	(0.9)	(+ 0.9)	(1.8)
Common GFE	(42.0)	(- 42.0)	(0)
Total Flyaway	738.6	+ 68.3	806.9
Other Wpn Sys Cost	(255.4)	(-151.6)	(103.8)
Initial Spares	(125.9)	(- 58.9)	(67.0)
Construction (MILCON)	16.2	- 4.4	11.8
Total FY84 Base-Year \$	2148.1	-259.5	1887.2
Escalation	261.9	- 29.6	232.3
Development (RDT&E)	(7.4)	(- 40.8)	(-33.4)
Procurement	(252.0)	(+ 11.5)	(263.5)
Construction (MILCON)	(2.5)	(- 0.3)	(2.2)
Total Then-Year \$	\$2410.0	\$-290.5	\$2119.5
b. (U) Quantities --1/			
Development (RDT&E)	1.4	-	1.4
Procurement	16.0	- 5.4	10.6
Total	17.4	- 5.4	12.0

1/ Equivalent Battery Sets (Number of Ground Control Stations Divided by five).

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11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)
(Cont'd)

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
c. (U) Unit Cost --			
Procurement:			
FY 84 Base-Year \$	\$ 70.0	\$ 22.2	\$ 92.2
Then-Year \$	\$ 85.7	\$ 31.4	\$ 117.1
Program:			
FY 84 Base-Year \$	\$ 123.4	\$ 33.8	\$ 157.2
Then-Year \$	\$ 138.5	\$ 38.1	\$ 176.6

d. (U) Approved Design to Cost Goal --

(Average Unit Flyaway Cost)

	<u>Dev Estimate/ Appr Program 1/</u>	<u>Current Estimate 2/</u>	<u>Latest Approved Threshold</u>
@ Qty: 16.0			
@ Peak Rate: 15 AV/2 GS			
FY 84 Base-Year \$	46.2/46.2	46.2	N/A
Then-Year \$	56.5/56.5	56.5	

1/ This cost represents a weighted unit flyaway including war reserves, training attrition, and training base. A typical RPV battery costed for only equipment that is indigenous to that battery \$26.4M (84 \$ DE) - 5 Ground Control Stations, 5 Ground Data Terminals, 13 Air Vehicles, 13 Air Vehicle Containers, 9 Forward-Looking Infrared (FLIR) Mission Payload Subsystems, 5 Daylight (Television) Mission Payload Subsystems; 13 Air Data Terminals, 2 Launcher Subsystems, 2 Recovery Subsystems, 1 Maintenance Shelter and one set of Common Support Equipment.

2/ Design to Cost Goal has not been redefined to reflect reduced quantities.

e. (U) Foreign Military Sales -- None.

f. (U) Nuclear Costs -- None.

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12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

		<u>Current Year</u>	<u>Budget Year</u>
	<u>Current</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>
	<u>(DEC 86 SAR)</u>	<u>(DEC 85 SAR)</u>	<u>(DEC 86 SAR)</u>
a. (U) Program Acquisition			
(1) (U) Cost	2119.5	1529.8	2119.5
(2) (U) Quantity	12.0	6.2	12.0
(3) (U) Unit Cost	176.6	246.7	176.6
b. (U) Current Procurement --(FY 1987) (FY 1987 Appr) (FY 1988)			
(1) (U) Cost	53.5	53.5	195.3
Less CY Adv Proc	0	0	0
Plus PY Adv Proc	<u>0</u>	<u>0</u>	<u>0</u>
Net Total	53.5	53.5	195.3
(2) (U) Quantity	0	0.4	2.0
(3) (U) Unit Cost	-	133.8	97.7

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13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1019.4	1371.9	18.7	2410.0
Previous Changes:				
Economic	- 16.4	- 55.0	- 0.9	- 72.3
Quantity		-646.5		-646.5
Schedule	- 11.1	+ 18.5	+ 1.4	+ 8.8
Engineering	-110.6			-110.6
Estimating	- 25.5	- 35.0	+ 0.9	- 59.6
Other				
Support				
Subtotal	-163.6	-718.0	+ 1.4	-880.2
Current Changes:				
Economic	- 3.6	- 7.1	- 0.2	- 10.9
Quantity		+458.3		+458.3
Schedule	+ 29.4	+ 24.4		+ 53.8
Engineering				
Estimating	- 17.3	+ 82.6		+ 65.3
Other				
Support		+ 29.1	- 5.9	+ 23.2
Subtotal	+ 8.5	+587.3	- 6.1	589.7
Total Changes	-155.1	-130.7	- 4.7	-290.5
Current Estimate	864.3	1241.2	14.0	2119.5

(FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1012.0	1119.9	16.2	2148.1
Previous Changes:				
Quantity		-572.5		-572.5
Schedule	-9.9	- 7.5		-17.4
Engineering	- 16.7			- 16.7
Estimating	- 92.7	- 8.1	+ .6	-100.2
Other				
Support				
Subtotal	-119.3	-588.1	+ .6	-706.8
Current Changes:				
Quantity		+345.6		+345.6
Schedule	+ 21.5	+ 14.9		+ 36.4
Engineering				
Estimating	- 16.5	+ 65.3		+ 48.8
Other				
Support		+ 20.1	- 5.0	+ 15.1
Subtotal	+ 5.0	+445.9	- 5.0	+445.9
Total Changes	-114.3	-142.2	- 4.4	-260.9
Current Estimate	897.7	977.7	11.8	1887.2

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13. (U) Cost Variance Analysis (Cont'd):

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation rates.
 Schedule: FLIR slipped due to DA funding reductions.
 Engineering: Producibility Enhancement Initiative dropped; future enhancements added and later dropped
 Estimating: Revised estimate for data link (MIONS) and restructure of FSD program.

Procurement

Economic: Revised escalation rates.
 Quantity: Programmatic perturbation caused deployed quantity fluctuation from 13 batteries to 4 batteries. Corresponding changes in end item quantities of air vehicles - 548 to 84 and ground control stations - 80 to 24.
 Schedule: Program slipped to FY87 start due to restructure of FSD program.
 Estimating: Re-evaluation of program requirements when RPV was reassigned to MICOM and addition of UAV funding.

MILCON

Economic: Revised escalation rates.
 Schedule: Shifting of MCA projects to out years.
 Estimating: Added company admin and supply bldg at Fort Hood.

c. (U) Current Change Explanations --

	(Dollars in Millions)	
	Base-Year	Then-Year
(1) (U) <u>RDT&E</u>		
Revised Dec 86 economic escalation rates. (Economic)	N/A	- 3.6
Restructure of FSD program driven by Congressional funding cuts in FY87 and reprofile of RDTE. (Schedule)	+ 21.5	+ 29.4
Removal of shared funding (SKYEYE) from SAR. (Estimating)	- 16.5	- 17.3

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13. (U) Cost Variance Analysis (Cont'd):

c. (U) Current Change Explanations --

		(Dollars in Millions)	
		Base-Year	Then-Year
(2)	(U) Procurement		
	Revised Dec 86 economic escalation rates. (Economic)	N/A	- 7.1
	Increase from 4 batteries to 9		
	o Increase in battery end items. (Quantity)	+345.6	+458.3
	o Production span increase to 6 years. (Schedule)	+ 14.9	+ 24.4
	o Initial spares. (Support)	+ 19.5	+ 26.7
	Revised 1986 Baseline Cost Estimate		
	o Hardware (+76.1), Warranty (+11.8) GFE (-12.5). (Estimating)	+75.4	+ 94.1
	o Training (-13.8), System Test (+14.4). (Support)	+ 0.6	+ 2.4
	Deletion of shared funding (UAV) (Estimating)	- 10.1	- 11.5
(3)	(U) MILCON		
	Revised Dec 86 economic escalation rates. (Economic)	N/A	- 0.2
	Revised estimate of MCA requirements. (Estimating)	- 5.0	- 5.9

d. (U) References --

Development Estimate: FY 85 President's Budget, Dec 83.

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. (U) Initial SAR Estimate to Current Estimate --

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
138.5	- 6.9	+46.6	+ 5.2	- 9.2	+ 0.5	0	+ 1.9	+38.1	176.6

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15. (U) Contract Information: (Then-Year Dollars in Millions)

(b)(4)



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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

(b)(4)



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15. (U) Contract Information (Cont'd): (Then-Year Dollars in Millions)

b. (U) Procurement -- Not Applicable.

c. (U) MILCON -- Not Applicable.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) (U) Percent Program Completed: 60.9% (14 yrs/23 yrs)

(2) (U) Percent Program Cost Appropriated: 39.3% (\$834.0/\$2119.5)

b. (U) Appropriation Summary --

<u>Appropriation</u>	<u>Current & Prior Yrs (FY74-87)</u>	<u>Budget Year (FY88)</u>	(Then-Year Dollars in Millions)		<u>Total</u>
			<u>Balance to Complete FYDP (FY82-92)</u>	<u>Beyond FYDP (FY93-FY96)</u>	
RD&E	761.3	32.6	69.6	0.8	864.3
Procurement	69.1	195.3	909.5	67.3	1241.2
MILCON	3.6	0	10.4	0	14.0
Total	834.0	227.9	989.5	68.1	2119.5

c. (U) Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RD&E

1974				1.9			.9	
1975				10.3			5.5	

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. (U) Annual Summary --

Fiscal Year	Qty	FY84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E (Cont'd)

1976				21.0			12.0	
1977				3.7			2.2	
1978				9.2			5.5	
1979				12.5			8.1	
1980				29.9			20.9	
1981				70.4			54.3	
1982				72.0			61.4	
1983				104.4			95.8	
1984				111.4			107.3	
1985				141.9			145.0	3.8
1986				98.9			104.2	3.4
1987				70.2			76.4	2.9
1988				55.0			61.8	3.1
1989				28.0			32.6	3.5
1990				24.6			29.6	3.5
1991				17.7			21.9	3.3
1992				8.8			11.2	2.9
1993				5.3			6.9	2.4
1994				0.6			0.8	2.4
Subtotal	1.4			897.7			864.3	

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. (U) Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement

1986				6.0			6.8	2.9
1987		3.4	31.7	41.9			49.0	3.1
1988	2.0	22.4	117.4	148.8			179.4	3.5
1989	2.4	1.9	137.8	158.1			196.3	3.5
1990	2.2	14.7	176.4	216.3			275.7	3.3
1991	2.0		150.8	168.4			219.8	2.9
1992	2.0		105.4	122.2			163.3	2.4
1993			38.1	44.0			60.2	2.4
1994			.3	2.7			3.8	2.4
1995			.3	1.5			2.1	2.4
1996			.3	0.8			1.2	2.4
Subtotal	10.6	42.4	758.5	910.7			1157.6	

Appropriation: Procurement (Spares)

1986				7.8			8.8	2.9
1987				3.9			4.5	3.1
1988				13.2			15.9	3.5
1989				9.6			11.9	3.5
1990				11.8			15.0	3.3
1991				3.0			3.9	2.9
1992				17.7			23.6	2.4
Subtotal				67.0			83.6	

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. (U) Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: MILCON

1982				2.7			2.5	
1983								
1984								
1985				1.0			1.1	
1986								
1987								
1988								
1989								
1990				6.6			8.4	3.3
1991				1.5			2.0	2.9
Subtotal				11.8			14.0	
Total	12.0	42.4	758.5	1887.2			2119.5	

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16. (U) Program Funding Summary (Cont'd):

d. (U) Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

83	105.5	105.5	102.9
84	143.7	143.7	138.2
85	105.7	105.7	79.3
86	76.4	56.1	28.9
To Complete	164.2		
Total	595.5	411.0	349.3

17. (U) Production Rate Data: No longer required IAW provisions of FY 87 Authorization Act (i.e. production at less than 6 per year).
18. (U) Operating and Support Costs: N/A

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SAR-86-010

(5) N-32 SH-60F

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)

PROGRAM: Aircraft Carrier Inner Zone Anti-Submarine Warfare Helo (SH-60F)

AS OF DATE: December 31, 1986

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RECTORATE FOR EFFICIENCY INFORMATION
AND SECURITY REVIEW (CASP-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): Aircraft Carrier Inner Zone
Anti-Submarine Warfare Helo (SH-60F)

2. DoD Component: U.S. Navy

3. Responsible Office and Telephone Number:

Aircraft Carrier Inner Zone Anti-
Submarine Warfare Helo
Naval Air Systems Command
Washington, D.C. 20361

PM: Capt R.G. Harrison
Assigned: May 23, 1984
AV 286-1534; COMM (202)746-1534

4. Program Elements/Procurement Line Items:

RDT&E,N: PE 64228N PE 64229N
PROCUREMENT: APPN 1506 ICN 0183 PE 24233N, PE 24262N
MILCON: PE 24696N (Shared funding)

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5. (U) Related Programs: Army UH-60A BLACK HAWK; Army EH-60A Quickfix; Air Force HH-60A NIGHT HAWK; Navy SH-60B SEAHAWK; SH-60F Trainer; NAVY HH-60H Helicopter Combat Support Aircraft; Coast Guard HH-60J Medium Range Recovery Helicopter.

6. (U) Mission and Description: The CV Inner Zone Anti-Submarine Warfare (ASW) Helicopter provides Aircraft Carrier Battle Groups (CVBG) with quick reaction Inner Zone ASW protection (up to 50 NM). This vehicle will replace the aging SH-3H. Primary mission is Inner Zone ASW. Secondary missions include: Anti Air Warfare (CHAFF); Command, Control and Communication; Fleet Support Operations (including plane guard, MEDIVAC and Search and Rescue); logistics support and surveillance.

7. (U) Program Highlights:

(U) Significant Historical Developments -- From the full and open competition held in FY 1984, Sikorsky Aircraft Division of United Technology was selected as the prime contractor for the CV Helo. A letter contract for the acquisition was signed on February 28, 1985. That contract consists of not-to-exceed (NTE) prices for development and options for five lots of production aircraft. Delivery of the SH-60F Aircraft to the U.S. Navy is scheduled for July 1987.

(U) Significant Developments Since Last Report -- In March 1986 Sikorsky Aircraft completed its automatic flight control systems development (DT-IIB) and transferred a SH-60B prototype aircraft to the Naval Air Test Center (NATC). NATC conducted extensive testing at Patuxent River and Atlantic Underwater Test and Evaluation Center (AUTEC) (DT-IIC). In August 1986 the prototype aircraft was transferred to VX-1 which conducted operational testing. Prototype testing was completed in September 1986 (DT-IIA). Critical design reviews were conducted on the software in April 1986 and the airframe in June 1986. The development portion of the contract was definitized in August 1986. In November 1986 the Hardware/Software Integration Facility successfully completed Phase I of its demonstration. Based on current projections, the CV Helo is expected to fulfill all known mission requirements.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (unsigned) or SDDM (dated February 22, 1985) threshold breaches.

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9. (U) Schedule:

a. (U) Milestones --	Development Estimate/ <u>Approved Program</u>	<u>Current Estimate</u>
(U) Justification for Major System New Start (JMSNS) Submitted	Aug 82/Aug 82	Aug 82
(U) SECDEF Approved FY 1984 New Start	Aug 82/Aug 82	Aug 82
(U) Milestone I (DSARC)	Jun 83/Jun 83	Jun 83
(U) SECDEF Decision Memorandum (SDDM) MS I Approval	May 84/May 84	May 84
(U) Request for Proposal Release	Jun 84/Jun 84	Jun 84
(U) Proposals Received	Aug 84/Aug 84	Aug 84
(U) Milestone II (DSARC)	Jan 85/Aug 84	Jan 85
(U) SDDM Milestone II Approval	Feb 85/Feb 85	Feb 85
(U) Contract Award for the SH-60F	Feb 85/Feb 85	Feb 85
(U) Award Production Lots I & II Long Lead Contracts	Jan 86/Jan 86	Jan 86
(U) Award Lot I/II and Lot III Long Lead Contracts	Jan 87/Jan 87	Mar 87 (Ch-1)
(U) Operational Evaluation	Nov 87-Dec 87/ Nov 87-Dec 87	Nov 87-Dec 87
(U) Milestone III JRMB	Mar 88/Mar 88	Mar 88

(b)(1)

b. (U) Previous Change Explanations -- Not Applicable.

c. (U) Current Change Explanations --

Ch-1 Definitization of Lots I/II contract delayed from January 1987 to March 1987 due to prolonged negotiations.

d. (U) References --

Development Estimate: SDDM, dated May 2, 1984, subject, "Carrier (CV) Inner Zone Helicopter Program." SDDM, dated February 22, 1985, subject "Inner Zone Helo Program."

Approved Program: FY 88/89 President's Budget.

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10. (U) Technical/Operational Characteristics:

a. (U) Technical --	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(U) Weight (Lbs)(Maximum Gross)	21,884/21,884		21,884
(U) Dimensions			
(U) Length (Ft)			
Overall	64.8/64.8		64.8
Folded	41.1/41.1		41.1
(U) Width (Ft)			
Normal (W/O Main Rotor)	14.3/14.3		14.3
Folded	10.8/10.8		10.8
(U) Height (Ft)			
Normal	17.2/17.2		17.2
Folded	13.3/13.3		13.3

(b)(1)

b. (U) Operational --

(b)(1)

(U) Prob of Completing 4 Hr Mission		
W/O Critical Failure	.8/.8	.8
(U) MFHBCF	18/18	18
(U) MTTR Airframe (Hrs)	2.0/2.0	2.0
(U) MTTR Engine (Hrs)	4.8/4.8	4.8
(U) MTTR Avionics (Hrs)	1.0/1.0	1.0
(U) MTTR Sonar (Hrs)	3.0/3.0	3.0
(U) DMMH/FH (Hrs)	16.0/16.0	16.0
(U) Availability A ₀	.8/.8	.8

c. (U) Previous Change Explanations -- Not Applicable.

d. (U) Current Change Explanations -- No Change.

e. (U) References --

Development Estimate: SDDM, dated May 2, 1984, subject "Carrier (CV) Inner Zone Helicopter Program." SDDM, dated February 22, 1985, subject "Inner Zone Helo Program."

Approved Program: FY 88/89 President's Budget.

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11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Changes	Current Estimate
Development (RDT&E,N)	\$ 56.4	\$-3.7	\$ 52.7
Procurement	2277.1	+90.7	2367.8
Airframe	(1569.3)	-(20.3)	(1549.0)
Engine	(142.0)	(+1.4)	(143.4)
Avionics	(56.7)	(-7.6)	(49.1)
Total Flyaway	(1768.0)	(-26.5)	(1741.5)
Other Wpn Sys Cost	(440.4)	(+75.8)	(516.2)
Initial Spares	(68.7)	(+41.4)	(110.1)
Construction (MILCON)	19.8	+1.4	21.2
Total FY 85 Base-Year \$	2353.3	+88.4	2441.7
Escalation	722.9	-11.2	711.7
Development (RDT&E,N)	(1.6)	(-0.6)	(1.0)
Procurement	(715.7)	(-8.5)	(707.2)
Construction (MILCON)	(5.6)	(-2.1)	(3.5)
Total Then-Year \$	\$3076.2	+77.2	\$3153.4
b. Quantities --			
Development (RDT&E,N)	-	-	-
Procurement	175	-	175
Total	175	-	175
c. Unit Cost --			
Procurement:			
FY 85 Base-Year \$	\$13.0	+0.5	\$13.5
Then-Year \$	17.1	+0.5	17.6
Program:			
FY 85 Base-Year \$	13.4	+0.6	14.0
Then-Year \$	\$17.6	+0.4	\$18.0
d. Approved Design to Cost Goal --	This program has a built-in design-to-cost (DTC) feature in that competitive not-to-exceed prices have been obtained for five lots of production.		
e. Foreign Military Sales --	None		
f. Nuclear Costs --	None		

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12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	SAR Current	UCR Baseline	UCR Baseline
	Estimate	Estimate	Estimate
	Dec 86	Dec 85	Dec 86
a. Program Acquisition --			
(1) Cost	3153.4	3076.2	3153.4
(2) Quantity	175	175	175
(3) Unit Cost	18.0	17.6	18.0
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
	APPN ACT	APPN ACT	
(1) Cost	155.4	155.4	330.0
Less CY Adv Proc	-26.3	-26.3	-29.6
Plus PY Adv Proc	+28.4	+28.4	+26.3
Net Total	157.5	157.5	326.7
(2) Quantity	7	7	18
(3) Unit Cost	22.5	22.5	18.2

13. (U) Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E,N	PROC	MILCON	TOTAL
Development Estimate	58.0	2992.8	25.4	3076.2
Previous Changes:	-	-	-	-
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:	-	-	-	-
Economic	-0.4	-34.4	-	-34.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-3.9	-21.6	-0.7	-26.2
Other	-	-	-	-
Support	-	+138.2	-	+138.2
Subtotal	-4.3	+82.2	-0.7	+77.2
Total Changes	-4.3	+82.2	-0.7	+77.2
Current Estimate	53.7	3075.0	24.7	3153.4

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13. (U) Cost Variance Analysis (Cont'd):
 (FY 1985 Constant (Base-Year) Dollars in Millions)

	RDT&E,N	PROC	MILCON	TOTAL
Development Estimate	56.4	2277.1	19.8	2353.3
Previous Changes:	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-3.7	-26.6	+1.4	-28.9
Other	-	-	-	-
Support	-	+117.3	-	+117.3
Subtotal-	-3.7	+90.7	+1.4	+88.4
Total Changes	-3.7	+90.7	+1.4	+88.4
Current Estimate	52.7	2367.8	21.2	2441.7

b. Previous Change Explanations -- Not Applicable.

c. Current Change Explanations --

		(Dollars in Millions)	
		Base-Year	Then-Year
(1)	RDT&E,N		
	Revised escalation indices. (Economic)	N/A	-0.4
	Revised cost estimates. (Estimating)	-3.7	-3.9
(2)	Procurement		
	(a) APN		
	Revised escalation indices. (Economic)	N/A	-34.4
	Breakouts from prime contractor will reduce costs (Estimating)	-26.6	-21.6
	Refinement of support equipment and spares; refinement of estimates for pubs/technical data. (Support)	+117.3	+138.2
(3)	MILCON		
	Revised Cost Estimates. (Estimating)	+1.4	-0.7

d. References --

Development Estimate: SDDM, dated May 2, 1984, subject "Carrier (CV) Inner Zone Helicopter Program." SDDM, dated February 22, 1985, subject "Inner Zone Helo Program."

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14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

a. Initial SAR Estimate to Current Baseline Estimate --

PAUC (Initial SAR Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
17.6	--	--	--	--	--	--	--	--	17.6

b. Current Baseline Estimate to Current Estimate --

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
17.6	-0.2	--	--	--	-0.1	--	+0.7	+0.4	18.0

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. RDT&E, N --

Airframe:

Sikorsky Aircraft Division, Stratford, CT,
N00019-85-C-0148, Firm Fixed Price Contract
Award: February 28, 1985
Definitized: August 22, 1986

Initial Contract Price		Qty
Target	Ceiling	
\$50.9	N/A	N/A

Current Contract Price		
Target	Ceiling	Qty
\$50.9	N/A	N/A

Estimated Price At Completion	
Contractor	Program Manager
\$50.9	\$50.9

Previous Cumulative Variances
Cumulative Variances To Date
Net Change
Explanation of Change: Not Applicable.

Cost Variance	Schedule Variance
N/A	N/A
N/A	N/A
N/A	N/A

b. APN --

Airframe:

Sikorsky Aircraft Division, Stratford, CT,
N00019-85-C-0148, Lots I/II
To be definitized as Firm Fixed Price Contract
Award: February 28, 1985

Initial Contract Price		Qty
Target	Ceiling	
\$27.5	N/A	7

Current Contract Price		
Target	Ceiling	Qty
\$27.5	N/A	7

Estimated Price At Completion	
Contractor	Program Manager
\$226.0	\$226.0

Previous Cumulative Variances
Cumulative Variances To Date
Net Change
Explanation of Change: Not Applicable.

Cost Variance	Schedule Variance
N/A	N/A
N/A	N/A
N/A	N/A

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c. MILCON -- Not Applicable.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 23.5% (4 yrs/17 yrs)
 (2) Percent Program Cost Appropriated: 7.5% (\$236.9/\$3153.4)

b. Appropriation Summary --

Appropriation	Current & Prior Yrs (FY82-87)	(Then-Year Dollars in Millions)			Total
		Budget Year (FY88)	FYDP (FY89-92)	Balance to Complete Beyond FYDP (FY93-00)	
RDT&E,N	53.1	0.6	-	-	53.7
Procurement	183.8	330.0	1106.9	1454.3	3075.0
MILCON	-	17.2	7.5	-	24.7
Total	236.9	347.8	1114.4	1454.3	3153.4

c. Annual Summary --

Fiscal Year	Qty	FY 85 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E,N

1984		18.6		18.6			18.4	3.8
1985		18.8		18.8			19.1	3.4
1986		11.1		11.1			11.6	2.9
1987		3.7		3.7			4.0	3.1
1988		.5		.5			.6	3.5
Subtotal		52.7		52.7			53.7	

Appropriation: Procurement

1986				25.2	28.4		28.4	2.9
1987	7	12.1	102.2	137.3	26.3	28.4	155.4	3.1
1988	18		181.4	282.8	29.6	26.3	330.0	3.5
1989	18		175.6	305.3	30.6	29.6	366.9	3.5
1990	18		171.6	243.4	23.1	30.6	300.4	3.3
1991	12		117.7	173.2	23.9	23.1	219.1	2.9
1992	12		117.6	170.2	25.4	23.9	220.5	2.4
1993	12		117.6	153.1	26.3	25.4	203.2	2.4
1994	12		117.5	145.8	24.8	26.3	198.0	2.4
1995	11		108.1	155.3	53.6	24.8	216.8	2.4
1996	24		225.1	254.9	55.0	53.6	363.5	2.4
1997	24		225.0	219.3	17.6	55.0	319.4	2.4
1998	7		69.9	74.0		17.6	110.3	2.4
1999				14.2			21.6	2.4
2000				13.8			21.5	2.4
Subtotal	175	12.1	1729.3	2367.8	364.6	364.6	3075.0	

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16. (U) Program Funding Summary (Cont'd):

Appropriation: MILCON

1988	14.9	14.9	17.2	3.5
1989	4.9	4.9	5.8	3.5
1990	1.4	1.4	1.7	3.3
Subtotal	21.2	21.2	24.7	
Total		2441.7	3153.4	

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E,N

1984	18.4	18.4	14.2
1985	19.1	19.1	17.0
1986	11.6	11.3	9.7
1987	4.0	3.9	.0
To Complete	0.6	N/A	N/A
Total	53.7	52.7	40.9

Appropriation: APN

1986	28.4	28.2	26.6
1987	155.4	1.0	.0
To Complete	2891.2	N/A	N/A
Total	3075.0	29.2	26.6

MILCON -- Not Applicable.

17. (U) Production Rate Data:

a. Annual Production Rates -- The maximum economic production rate is the combination of SH-60F/SH-60B.

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1987	7	N/A	7	N/A
1988	18	N/A	18	N/A
1989	18	N/A	18	N/A
1990	18	N/A	18	N/A
1991	12	N/A	12	N/A
1992	12	N/A	12	N/A
1993	12	N/A	12	N/A
1994	12	N/A	12	N/A
1995	11	N/A	11	N/A
1996	24	N/A	24	N/A
1997	24	N/A	24	N/A
1998	7	N/A	7	N/A

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17. (U) Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE Less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BY \$)	N/A	N/A	2441.7	N/A	N/A
(TY \$)	N/A	N/A	3153.4	N/A	N/A
PAUC (BY \$)	N/A	N/A	14.0	N/A	N/A
(TY \$)	N/A	N/A	18.0	N/A	N/A

c. Schedule Variance --

	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum
Start Date (mo/yr)	N/A	N/A	7/87	N/A	N/A
Duration (in months)	N/A	N/A	149	N/A	N/A
End Date (mo/yr)	N/A	N/A	12/99	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RD&E, N	N/A
Procurement	0/0

18. (U) Operating and Support Costs:

a. Assumptions and Ground Rules --

This O&S estimate is based on each aircraft flying 660 hours, or an operational squadron, of 6 aircraft, flying 3960 hours a year. The maintenance concept for both the SH-60F and the antecedent system is for organic support at all three levels of maintenance. Estimates for the SH-60F avionics assumed a 50% increase in the reliability of the AQS-13F over the AQS-13E onboard the SH-3H.

Personnel costs are for all people assigned to the squadron required to operate and maintain the aircraft. This cost also includes the cost of administrative and staff personnel required for the operational control of the squadron. The O&S consumable cost is for fuel, training expendables and other consumables used in the direct support of the weapons system. Direct depot maintenance contains the cost of scheduled depot level maintenance (SDLM), engine repair/rework and components repair. The sustaining investment cost is for replenishment spares, support equipment maintenance, simulator maintenance and software support. No other direct costs could be estimated. Indirect costs are for base operating and health care support personnel and the materials required by these two groups.

Assumptions and ground rules for the SH-60F and the SH-3H are the same, unless otherwise stated.

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18. (U) Operating and Support Costs (Cont'd):

b. Costs --

(FY 1985 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per SH-60F Squadron	Avg Annual Cost Per SH-3H Squadron (Antecedent)
Personnel	7.276	7.462
O&S Consumables	1.764	2.017
Direct Depot Maintenance	1.362	2.098
Sustaining Investment	.929	.718
Other Direct Costs		
Indirect Costs	.310	.321
Total	11.641	12.616

Source: NADC report "Carrier Inner Zone ASW Helicopter System (CV-Helo) Operating and Support Cost Estimates" of May 7, 1985 and as updated by Naval Air Systems Command.

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A-22 SINGARS

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)B23)
PROGRAM: SINGLE CHANNEL GROUND AND AIRBORNE RADIO SYSTEM
(SINGARS)

DATE 3 FEB 1987
DA'S SUBMISSION TO OSD

AS OF DATE: December 31, 1986

86-016

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FOR OPEN PUBLICATION

FEB 26 1987

5

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation/Nomenclature (Popular Name):

AN/PRC-119()(V); AN/VRC-87()(V) thru AN/VRC-92()(V) and AN/ARC-201() / Single
Channel Ground and Airborne Radio System (SINGARS)

2. DoD Component: U.S. Army

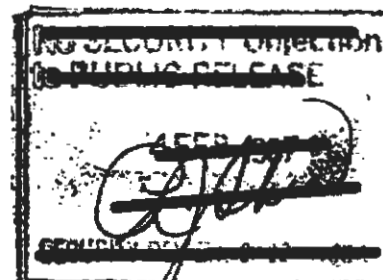
3. Responsible Office and Telephone Number:

Project Manager, SINGARS
USA CECOM
Fort Monmouth, NJ 07703

PM: COL Domenic F. Basile
Assigned: 1 August 1986
AUTOVON: 995-3063
Commercial: 201-544-3063

4. Program Elements/Procurement Line Items:

RDTE:	PE 63746A	Project D555	(Shared funding)
	PE 64805A	Project D282	(Shared funding)
PROCUREMENT:	APPN 2031	SSN AZ3500	
	APPN 2031	SSN AA0974	(Shared funding)
	APPN 2035	SSN B00500	
	APPN 2035	SSN BA950A	(Shared funding)
	APPN 2035	SSN B45500	(Shared funding)
	APPN 2035	SSN B00508	
	APPN 2035	SSN T99500	(Shared funding)
	APPN 2035	SSN Z16800	(Shared funding)



OASD(PA) DE01SR 87-1-
6391

Related Programs: None.

6. Mission and Description:

The SINGGARS system will replace the current AN/VRC-12 family, AN/PRC-77, and AN/ARC-114 radios. The new family of radios will provide the primary means of command and control for Infantry, Armor and Artillery Units, and will be capable of transmission of voice, tactical data, and record traffic. Manpack, vehicular and airborne configurations will be securable with VINSON or other COMSEC devices and will be capable of operating in an electronic warfare environment.

7. Program Highlights:

a. Significant Historical Developments -- The ROC for SINGGARS was approved at DA in Dec 74. In Jun 77, the VCSA directed the project manager to reduce the program schedule by two to three years, resulting in a decision to proceed from AD directly into production (decision reaffirmed at Dec 77 DAPR). At a Dec 81 briefing to the VCSA, the decision was made to further accelerate development through early delivery of Advanced Development Models for limited DT/OT.

The SINGGARS ground radio production hardware was type classified standard at ASARC III in Sep 83. A single year production contract with follow-on options (total buy of 44,100 RT units) was awarded in Dec 83 to ITT Aerospace/Optical Div., Ft Wayne, IN. Options 1 and 2 of the contract were awarded in Nov 84 and May 85, respectively. The initial SINGGARS airborne radio production contract (single year plus three options) was awarded to ITT in May 85.

First Article Test on the SINGGARS ground radio, which began in Aug 85, surfaced a number of problems that caused a stretch-out of the test schedule and delays in production deliveries. The inability of the production radio to achieve the contractually required MTBF of 1250 hrs at 80% confidence caused additional delay and prompted the PM to pursue a rebaselining of the contract.

b. Significant Developments Since Last Report -- A Test-Analyze and Fix (TAAF) effort has been implemented by ITT to correct failures in the ground radio hardware and to improve MTBF. Reliability has continued to increase as each fix is applied. Current projection is that deliveries of 1250 MTBF radios will begin in Jan 88. The new delivery schedule will be included as part of the contract rebaselining effort which is expected to be completed in 2Q FY 87.

A SINGGARS Familiarization Exercise (FAMEX) using ground radio production hardware was held at Ft Gordon, GA from Oct-Dec 86. Feedback from the soldiers was very favorable.

In Jul 86, the PMO began an evaluation of potential NDI candidates for an interim/replacement VHF-FM combat net radio. Based on the results, a major development effort would have to have been part of the acquisition strategy unless requirements were reduced. This effectively closed the door to a classical NDI solution.

The second source subcontractor effort, which ITT was to manage, was put on hold in Jun 86 due to ITT's engineering/management problems on the ground radio. Current strategy, as briefed at the Dec 86 JRMB, is for the Army to select and manage the second source.

The SINGGARS is expected to satisfy mission requirements.

c. Changes Since "As of" Date -- N/A

8. Decision Coordinating Paper (DCP) Threshold Breaches:

Approved Decision Coordinating Paper (DCP) #156, Cover Sheet #2, dated 5 July 1984. A quarterly SAR was submitted as of 30 September 1985 which notified OSD of anticipated breach in schedule milestone thresholds for First Article Test Completion and Production Delivery Begins.

9. Schedule:

a. Milestones --

	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
Milestone O (ROC Approval)	Dec 74/Dec 74	Dec 74
ASARC I	Oct 75/Oct 75	Oct 75
Milestone I (DSARC I)	Feb 76/Feb 76	Feb 76
DAPR	Jun 77/Jun 77	Jun 77
Award AD Contracts	Apr 78/Apr 78	Apr 78
DA Program Review	Dec 81/Dec 81	Dec 81
Final Design Reviews	Apr 82/Apr 82	Apr 82
Complete DT/OT - I/II	Dec 83/Dec 83	Dec 83
Begin Limited DT/OT	Aug 82/Aug 82	Aug 82
Complete Limited DT/OT	Dec 82/Dec 82	Dec 82
Begin Maturity DT/OT	Jul 83/Jul 83	Jul 83
Complete Maturity DT/OT	Dec 83/Dec 83	Dec 83
Milestone IIIA (ASARC III)	Sep 83/Sep 83	Sep 83
Initial Prod Cont Award	Dec 83/Dec 83	Dec 83
First Article Test Complete	Jun 85/Jan 88	Jan 88 (Ch-1)
Production Delivery Begins	Aug 85/Jan 88	Jan 88 (Ch-2)
Complete Follow-on Evaluation		
Operational Test: Start	-- /Mar 88	Mar 88 (ch-3)
Complete	-- /May 88	May 88 (ch-3)
Milestone IIIB (JRMB)	-- /Sep 88	Sep 88 (ch-3)
Third Option Award	-- /Jan 89	Jan 89 (ch-3)
IOC (1st Div Equipped)	Oct 87/Dec 89	Dec 89 (Ch-4)

b. Previous Change Explanations --

Late start of First Article Test (FAT) plus problems encountered during the first phase of testing indicated that previous estimates of FAT completion and start of Production Delivery would not be met. Impact on IOC and determination of new dates for the effected milestones was under review by the PM Office.

c. Current Change Explanations --

- (Ch-1) All First Article Tests with the exception of reliability testing were completed in Sep 86 (vs Jun 85). However, FAT will not be fully completed until after Production Reliability Acceptance Test has been conducted. PRAT will take place Nov 87-Jan 88, after pattern failure fixes and redesigned modules have been incorporated into the production hardware, and prior to acceptance of first production deliveries.
- (Ch-2) First production delivery rescheduled from Aug 85 to Jan 88 as part of the contract rebaselining currently expected to be completed in 2Q FY87.
- (ch-3) These schedule milestones are being added for the first time.
- (Ch-4) IOC rescheduled from Oct 87 to Dec 89 at the 11 Dec 86 JRMB due to the change in production delivery schedule.

d. References --

Production Estimate: Draft Decision Coordinating Paper (DCP) #156, dated September 1983, for the Single Channel Ground and Airborne Radio System (SINGARS).

Approved Program: FY 88/89 President's Budget.

10. Technical/Operational Characteristics: 1/

a. Technical --	Prod Estimate/ Appr Program	Demonstrated Performance 2/	Current Estimate
Frequency Band	30-87.975 MHz/ 30-87.975 MHz	30-87.975MHz 3/	30-87.975 MHz
Number of Channels	2320/2320	2320 3/	2320
Channel Spacing	25 KHz/25 KHz	25 KHz 3/	25 KHz
Weight(Manpack w/COMSEC)	22.5 Lbs/ 22.5 Lbs	22.5 Lbs	22.5 Lbs
Power Requirements	28 Vdc/28 Vdc	28 Vdc 3/	28 Vdc
Communications Range: (Voice & Data @ 16Kbps @ 10 ⁻¹ Ber)			
Manpack	8 KM/8 KM	8 KM 4/	8 KM
Vehicular	35 KM/35 KM	27.5 KM 5/	35 KM
Airborne	TBD/35 KM	60 KM 6/	35 KM
(Data @ 16 Kbps @ 10 ⁻³ Ber)			
Manpack	4.5 KM/4 KM	2 KM 7/	4 KM
Vehicular	17.5 KM/17 KM	19 KM 8/	17 KM
Airborne	TBD/17 KM	9/	17 KM

b. Operational --

Mean Time Between Failure			
Ground 10/	1250 Hrs/1250 Hrs	517 Hrs 8/	1250 Hrs
Airborne	750 Hrs/750 Hrs	9/	750 Hrs
ECCM	3500 Hrs/3500 Hrs	2228 Hrs 11/	3500 Hrs
Mean Time To Repair (MTTR):			
Organizational Level	15 Min/15 Min	35.7 Min 11/	15 Min
Direct Support (DS)	45 Min/45 Min	63.9 Min 11/	45 Min
General Support (GS)	2 Hrs/ 2 Hrs	1.78 Hrs 11/	2 Hrs

c. Previous Change Explanations -- Demonstrated performance of development models will be displayed until completion of FAT and FOE.

d. Current Change Explanations -- N/A

e. References --

Production Estimate: Draft Decision Coordinating Paper (DCP) #156, dated September 1983, for the Single Channel Ground and Airborne Radio System (SINGARS).

Approved Program: FY 88/89 President's Budget.

10. Technical/Operational Characteristics: (Continued)

FOOTNOTES:

- 1/ Technical/operational characteristic parameters are not yet available for the integrated COMSEC radio.
- 2/ Data for specified technical and operational demonstrated performance on production models will be available subsequent to completion of First Article Tests and Follow-on Evaluation.
- 3/ First Article Test (FAT) models were used.
- 4/ Fire Support Team - Vehicle (FIST-V)/SINGGARS Test (Jul 1985) using Modified Advanced Development Models (MADM) radio. This was maximum range tested.
- 5/ SINGGARS Operational Assessment (Aug-Sep 1984) using MADM radios. Operational Assessment testing was limited to 27.5 KM due to path restrictions. Development testing successfully completed links in excess of 40 KM (no line-of-sight restrictions).
- 6/ Demonstrated in Limited DT (Feb-Nov 86) at Ft Monmouth, NJ in a Huey aircraft.
- 7/ Maturity Development Test (MDT) (Jul-Dec 1983) using ADM model radios. Although these results are not indicative of later model radios, this test is not scheduled to be rerun until production radios are available.
- 8/ Tactical Command, Control and Communications Vehicle (TC3V)/SINGGARS Customer Test (Feb 85) using MADM radios with OE-254 antennas. Since purpose of this test was not to verify this technical characteristic, longer ranges and use of whip antennas were not attempted. Earlier testing of this characteristic is not indicative of the performance of SINGGARS. Testing to verify this performance is not scheduled to be rerun until production radios are available.
- 9/ No test results are available at this time for either development or production models of the airborne radio.
- 10/ Since both Manpack and Vehicular have the same MTBF, they have been combined and designated as Ground.
- 11/ Maturity Operational Test (MOT) (Oct-Dec 1983) using ADM model radios.

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a. Cost --	Production Estimate	Changes	Current 1/ Estimate
Development (RDT&E)	154.4 2/	+32.6	187.0
Procurement	4013.3	-30.2	3983.1
Weapon System	(3609.5)	(+335.6)	(3945.1)
Flyaway	(3583.6)	(+340.0)	(3923.6)
Major System Equip	(3151.8)	(+438.7)	(3590.5)
Ancillary Equip	(431.8)	(-98.7)	(333.1)
Other Weapon System	(25.9)	(-4.4)	(21.5)
Initial Spares	(403.8)	(-365.8)	(38.0)
Construction (MILCON)	0.0	0.0	0.0
Total FY84 Base-Year \$	4167.7	+2.4	4170.1
Escalation	1444.0	+38.3	1482.3
Development (RDT&E)	(-19.0)	(+4.8)	(-14.2)
Procurement	(1463.0)	(+33.5)	(1496.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Total Then-Year \$	5611.7	+40.7	5652.4

1/ Current estimate does not reflect other service requirements for SINGGARS. Other service requirements identified to date are as follows:

USAF 3,411 R/Ts \$34.6M (FY84 Base-Year \$)
 USMC 33,382 R/Ts \$310.2M (FY84 Base-Year \$)
 USN 3,730 R/Ts \$37.6M (FY84 Base-Year \$)

Other service requirements will be included in the next Baseline Cost Estimate and addressed in the next SAR submission.

2/ Does not match initial SAR due to pre-base year amounts included as actuals, not base year dollars, in initial SAR.

b. Quantities --			
Development (RDT&E)	62	+61 3/	123
Procurement	292853	-1329	291524
Total	292915	-1268	291647

3/ Of the 61 unit increase, 53 are new prototypes under the integrated COMSEC effort. The other 8 units, first reported in the 31 Dec 84 SAR, were actually a correction to the Production Estimate (PdE). The dollars associated with the 8 prototypes were included in the PdE but the development quantity did not include these units.

c. Unit Cost --

Procurement:

FY84 Base-Year \$	.0137	+.0000	.0137
Then-Year \$	.0187	+.0001	.0188

Program:

FY84 Base-Year \$	.0142	+.0001	.0143
Then-Year \$	.0192	+.0002	.0194

d. Approved Design to Cost Goal -- None

e. Foreign Military Sales -- None

f. Nuclear Costs -- None

12. Program Acquisition/Current Procurement Unit Cost Summary:
 (Current [Then Year] Dollars in Millions)

	Current Year		Budget Year
	Current Est (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	UCR Baseline (Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	5652.4	5527.5	5652.4
(2) Quantity	291647	291639	291647
(3) Unit Cost	.0194	.0190	.0194
b. Current Procurement --	(FY 1987)	(FY 1987) <u>1/</u>	(FY 1988)
(1) Cost	12.6	22.6	36.7
Less CY Adv Proc	0	0	0
Plus PY Adv Proc	0	0	0
Net Total	12.6	22.6	36.7
(2) Quantity	0	0	720
(3) Unit Cost	N/A	N/A	.0510

1/ Adjusted to amounts appropriated.

SINGARS, December 31, 1986

13. Cost Variance Analysis:

a. Summary — (Current [Then-Year] Dollars in Millions)

	RDT&E	PROC	TOTAL
Production Estimate	135.4	5476.3	5611.7
Previous Changes:			
Economic	-0.9	-417.7	-418.6
Quantity	+11.3	-49.3	-38.0
Schedule	-	+327.8	+327.8
Engineering	+8.7	-	+8.7
Estimating	-2.5	+389.8	+387.3
Other	-	-	-
Support	-	-351.4	-351.4
Subtotal	+16.6	-100.8	-84.2
Current Changes:			
Economic	-0.1	-26.5	-26.6
Quantity	-	-	-
Schedule	-	+297.3	+297.3
Engineering	-	-	-
Estimating	+20.9	-10.9	+10.0
Other	-	-	-
Support	-	-155.8	-155.8
Subtotal	+20.8	+104.1	+124.9
Total Changes	+37.4	+3.3	+40.7
Current Estimate	172.8	5479.6	5652.4

13. Cost Variance Analysis: (Continued)
 (FY84 Constant [Base-Year] Dollars in Millions)

	RDT&E	PROC	TOTAL
- Production Estimate	154.4	4013.3	4167.7
Previous Changes:			
Quantity	+9.7	-33.3	-23.6
Schedule	-	+20.3	+20.3
Engineering	+7.0	-	+7.0
Estimating	-2.1	+316.1	+314.0
Other	-	-	-
Support	-	-255.0	-255.0
Subtotal	+14.6	+48.1	+62.7
Current Changes:			
Quantity	-	-	-
Schedule	-	-	-
Engineering	-	-	-
Estimating	+18.0	+36.9	+54.9
Other	-	-	-
Support	-	-115.2	-115.2
Subtotal	+18.0	-78.3	-60.3
Total Changes	+32.6	-30.2	+2.4
Current Estimate	187.0	3983.1	4170.1

b. Previous Change Explanations --

RDTE

Economic: Revised escalation indices.
 Quantity: Addition of 45 prototypes for Integrated COMSEC (ICOM).
 Engineering: Redesign radio and COMSEC device or ICOM.
 Estimating: Reduction in FY 86 and FY 87 Program Budget Guidance for engineering development effort.

PROC

Economic: Revised escalation indices.
 Quantity: Reduction of 1329 airborne radios.
 Schedule: Stretchout in procurement due to funding constraints and delay due to problems in FAT.
 Estimating: Revised estimates for warranty, COMSEC module, installation kits and revised cost-quantity relationship.
 Support: Reclassification of initial spares from procurement to Army Stock Fund.

SINGGARS, December 31, 1986

13. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDTE</u>		
Revised Dec 86 escalation rates. (Economic)	N/A	-0.1
Revised estimate for integrated COMSEC effort. (Estimating)	+18.0	+20.9
NOTE: Additional 8 prototypes do not incur additional cost or effort. These are pilot models which previously were not planned to be delivered to the Government.		

(2) PROCUREMENT

Revised Dec 86 escalation rates. (Economic)	N/A	-26.5
Schedule changes due to FAT delays. (Schedule)	--	+297.3
Changes in requirements for KGV-10 (freq. module)	-123.0	-161.4
o Initial Spares not required. (Support)	(-38.0)	(-52.5)
o Additional Requirement for KGV-10s to meet radio production requirement. (Estimating)	(+38.0)	(+52.5)
o Revised unit cost. (Estimating)	(-123.0)	(-161.4)
Revised estimate, Battlefield Electronics CEOI System (BECS). (Estimating)	-40.0	-57.1
Revised estimate, installation kits. (Estimating)	+161.9	+155.2
Reduced requirement for ground radio initial spares. (Support)	-72.8	-98.8
Revised cost estimate for data. (Support)	-4.4	-4.6

d. References --

Production Estimate -- Draft Decision Coordinating Paper (DCP) #156, dated
September 1983, for the Single Channel Ground and Airborne Radio System
(SINGGARS).

SINGARS, December 31, 1986

14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

Initial SAR Estimate to Current Estimate --

PAUC (Production Estimate)	Changes								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
.0192	-.0015	-.0001	+.0021	.0000	+.0014	-.0017	0	+.0002	.0194

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

SINGARS Development:

ITT Corp., A/OD, Ft. Wayne, IN,
DAAB07-78-C-0150, CPIF,
Award: 4 Apr 1978

Definitized: (N/A since scope of
contract continues to change).

Current Contract Price

Target	Ceiling	Qty
\$48.8	N/A	39

Initial Contract Price

Target	Ceiling	Qty
\$5.4	N/A	43

Estimated Price At Completion

Contractor	Program Manager
\$48.8	\$48.8

Cost Variance ^{1/}

Schedule Variance ^{1/}

Previous Cum Variances
Cumulative Variances to Date (10/26/86)
Net Change

0	0
0	0
0	0

Explanation of Change: (N/A since scope of
contract continues to change).

b. Procurement --

SINGARS (Ground):

ITT Corp., A/OD, Ft. Wayne, IN, ^{2/}
DAAB07-84-C-K503, FFP,
Award: 2 Dec 1983

Definitized: (N/A since all negotiations
were definitized at time of contract award)

Current Contract Price

Target	Ceiling	Qty
\$194.5	N/A	12,100

Initial Contract Price

Target	Ceiling	Qty
\$53.8	N/A	650

Estimated Price At Completion

Contractor	Program Manager
\$194.5	\$194.5

^{1/} Cost of work schedule performed and paid have been the same; therefore, there has
not been a variance reported in CPR.

15. Contract Information: (Then-Year Dollars in Millions)SINGARS (Airborne)

ITT Corp., A/OD, Ft. Wayne, IN, 2/
 DAABO7-85-C-K561, FFP,
 Award: 31 May 1985
 Definitized: N/A

Initial Contract Price
Target Ceiling Qty
 \$19.5 N/A 150

Current Contract Price
Target Ceiling Qty
 \$19.6 N/A 150

Estimated Price At Completion
Contractor Program Manager
 \$19.6 \$19.6

2/ Contract will reach dollar threshold for SAR reporting upon award of options to current contract. Cost Performance Report is not required for FFP Contract.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 52.0% (13 yrs/25 yrs)

(2) Percent Program Cost Appropriated: 8.8% (\$497.0/\$5652.4)

b. Appropriation Summary -- (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Years (FY76-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93-99)</u>	<u>Total</u>
RDT&E	140.9	15.9	9.4	6.6 <u>1/</u>	172.8
Procurement	356.1	36.7	1744.2	3342.6	5479.6
APA	24.7	0	0	0	24.7
OPA	331.4	36.7	1744.2	3342.6	5454.9
<u>Total</u>	497.0	52.6	1753.6	3349.2	5652.4

FOOTNOTE:

1/ Beyond FYDP RDTE reflects requirements for the portion of the approved integrated COMSEC effort which is unfunded in the FYDP.

16. Program Funding Summary (Cont'd):

c. Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Adv Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E 1/

1976				.8			.5	6.6
1977				.2			.2	2.9
1977				3.2			2.0	5.5
1978				9.7			6.2	6.8
1979				19.7			13.7	8.4
1980				26.7			20.5	10.6
1981				29.3			24.9	10.6
1982	8			14.3			13.4	7.6
1983	54			14.7			14.5	4.9
1984				10.3			10.5	3.8
1985	8			9.9			10.5	3.4
1986				11.4			12.4	2.9
1987				10.3			11.6	3.1
1988				13.7			15.9	3.5
1989	34			7.8			9.4	3.5
1990	19			0.0			0.0	3.3
1991				0.0			0.0	2.9
1992	0			0.0			0.0	2.4
1993				5.0			6.6	2.4
Subtotal	123			187.0			172.8	

FOOTNOTE:

- 1/ Beyond FYDP RDTE reflects requirements for the portion of the integrated COMSEC effort which is unfunded in FYDP.
- 2/ RDTE units cannot be identified to a specific fiscal year's funds and are therefore shown in the year of delivery. Additional quantity includes 4 each ground and airborne ICOM pilot models which are now planned to be delivered to the government.

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Adv Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement (APA) 1/

1985	<u>2/</u> 150	5.7	10.3	19.6			21.4	3.4
1986	0			0.5			0.6	2.9
1987	0			2.3			2.7	3.1
Subtotal	150	5.7	10.3	22.4			24.7	

FOOTNOTES:

- 1/ OPA inflation indices were used since airborne radios are communications-electronics equipment. All requirements for airborne radios will be funded in the OPA appropriation beginning in FY 88.
- 2/ Reflects the planned quantity for the dollars cited in the FY 88/89 President's Budget.

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Adv Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement (OPA) 1 /

1983	175	1.0	16.1	18.1			18.6	4.9
1984	1325		60.4	61.7			65.5	3.8
1985	10600		111.2	115.2			126.1	3.4
1986	400	4.6	83.8	98.3			111.3	2.9
1987	0		5.4	8.5			9.9	3.1
1988	720		28.5	30.4			36.7	3.5
1989	17200	2.5	301.4	309.6			384.3	3.5
1990	17450	6.3	303.6	315.9			402.4	3.3
1991	22350	0.1	349.0	353.9			462.1	2.9
1992	26150	0.1	365.7	370.6			495.4	2.4
1993	28321		415.0	417.3			571.2	2.4
1994	28350		354.1	356.4			499.6	2.4
1995	26130		294.2	295.9			424.7	2.4
1996	25500		284.0	285.7			419.9	2.4
1997	25500		270.2	271.9			409.2	2.4
1998	25500		265.5	266.2			410.2	2.4
1999	35703		384.1	385.1			607.8	2.4
Subtotal	291374	14.6	3892.2	3960.7			5454.9	
Total Proc	291524	20.3	3902.5	3983.1			5479.6	
Total Program	291647	20.3	3922.8	4170.1			5652.4	

1 / Includes only those funds for KGV-10 (T99500) required to support the SINGGARS program.

16. Program Funding Summary (Cont'd):

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1976	.5	.5	.5
1977	.2	.2	.2
1977	2.0	2.0	2.0
1978	6.2	6.2	6.2
1979	13.7	13.7	13.7
1980	20.5	20.5	20.5
1981	24.9	24.9	24.9
1982	13.4	13.4	13.4
1983	14.5	14.5	13.8
1984	10.5	10.5	10.2
1985	10.5	10.5	9.1
1986	12.4	12.2	6.1
1987	11.6	5.7	.9
To Complete	31.9	N/A	N/A
Total	172.8	134.8	121.5

Appropriation: Procurement (APA)

1985	21.4	18.7	6.6
1986	0.6	0.0	0.0
1987	2.7	0.0	0.0
To Complete	0	N/A	N/A
Total	24.7	18.7	6.6

16. Program Funding Summary (Cont'd):

Appropriation: Procurement (OPA)

1983	18.6	18.6	10.3
1984	65.5	49.6	36.7
1985	126.1	102.9	9.5
1986	111.3	0.4	0.4
1987	9.9	0	0
To Complete	5123.5	N/A	N/A
Total	5454.9	168.2	46.9

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year	Production Rates (Quantity/Year) - Airborne Radio			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1985 (APA)	N/A	<u>1/</u> 600	600	600
1986	N/A	720	0	720
1987	N/A	1200	0	1200
1988 (OPA)	N/A	1800	720	1800
1989 (OPA)	N/A	2400	1200	2400
1990 (OPA)	N/A	2400	1450	2400
1991 (OPA)	N/A	2400	1850	2400
1992 (OPA)	N/A	<u>2/</u> 2400	2150	2400
1993 (OPA)	N/A	0	2821	2850
1994 (OPA)	N/A	0	2850	2850
1995 (OPA)	N/A	0	<u>1/</u> 2400	2400

FOOTNOTES:

1/ Differs from procurement quantity due to funded delivery period of less than 12 months.

2/ Differs from procurement quantity due to funded delivery period of more than 12 months (final buy-out).

17. Production Rate Data (Cont'd):

Fiscal Year	Production Rates (Quantity/Year) - Ground R/T (OPA)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1983	N/A	<u>1/</u> 1050	<u>1/</u> 1050	1050
1984	N/A	<u>1/</u> 2650	<u>1/</u> 2650	2650
1985	N/A	<u>2/</u> 8250	<u>2/</u> 8250	8250
1986	N/A	<u>1/</u> 16780	<u>1/</u> 600	16780
1987	N/A	23430	0	23430
1988	N/A	21993	0	23430
1989	N/A	33000	16000	33000
1990	N/A	33000	16000	33000
1991	N/A	33000	20500	33000
1992	N/A	33000	24000	33000
1993	N/A	33000	25500	33000
1994	N/A	33000	25500	33000
1995	N/A	0	25500	33000
1996	N/A	0	25500	33000
1997	N/A	0	25500	33000
1998	N/A	0	25500	33000
1999	N/A	0	<u>2/</u> 25500	33000

FOOTNOTES:

1/ Differs from procurement quantity due to funded delivery period of less than 12 months.

2/ Differs from procurement quantity due to funded delivery period of more than 12 months.

17. Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item - SINGGARS	Production Estimate	Variance (CE less Pde)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	\$4167.7	\$+2.4	\$4170.1	\$+15.4	\$4154.7
(TY \$)	\$5611.7	\$+40.7	\$5652.4	\$+59.9	\$5592.5
PAUC (BY \$)	\$.0142	\$+.0001	\$.0143	\$+.0001	\$.0142
(TY \$)	\$.0192	\$+.0002	\$.0194	\$+.0002	\$.0192

NOTE: For a production line of this type and for these quantities, the current contractor estimates that there is a range of 10,800 - 21,480 ground R/Ts per year for which the unit cost does not change based on production rate. A similar range exists for the second source ground radio producer and for the airborne radio. Program cost changes due to schedule changes are addressed in the Cost Variance Analysis paragraph.

c. Schedule Variance --

Airborne Radio	Production Estimate	Variance (CE less Pde)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (Mo/Yr)	12/84	+5 mo	05/85	0	05/85
Duration (in Months)	121	+6 mo	127	+13 mo	114
End Date (Mo/Yr)	01/95	+11 mo	12/95	+13 mo	11/94

Ground Radio	Production Estimate	Variance (CE less Pde)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (Mo/Yr)	12/83	0	12/83	0	12/83
Duration (in Months)	150	+64 mo	214	+64 mo	150
End Date (Mo/Yr)	06/96	+64 mo	10/01	+64 mo	06/96

d. Deliveries (Plan/Actual) --

	<u>To Date</u>
RDT&E	70/70
Procurement	6050/0

18. Operating and Support Costs: N/A

~~CONFIDENTIAL~~SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)

PROGRAM: STANDARD Missile (SM-2 Block II MR/ER)

AS OF DATE: December 31, 1986

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
FEB 27 1987
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): Standard Missile 2 Block II Medium Range (AEGIS) (SM-2 Blk II MR (AEGIS)/RIM-66G), STANDARD Missile 2 Block II Medium Range (Vertical Launch) - (SM-2 Blk II MR (VL)/RIM-66H), STANDARD Missile 2 Block II Medium Range (TARTAR)-(SM-2 Blk II MR (TARTAR)/RIM-66J) and STANDARD Missile 2 Block II Extended Range (TERRIER)-(SM-2 Blk II ER (TERRIER)/RIM-67C).

2. DoD Component: Department of the Navy

3. Responsible Office and Telephone Number:

Director, Guided Missile Division
Program Office (SEA 62Z3)
Naval Sea Systems Command
Department of the Navy
Washington, DC 20362-5101

CAPT D.G. MacDougall, USN
ASSIGNED: October 1983
AUTOVON: 222-0663

4. Program Elements/Procurement Line Items:

Procurement: P.E. 24229N, APPN 1507 ICN 2233
Standard MR SM-2 2234
Standard ER SM-2 2239

RDT&E: P.E. 64366N
63318N proj. S1632
63321N proj. S1671 (shared funding)
64365N

5. Related Programs: FFG 7 Frigate, CG 47 AEGIS Cruiser, and DDG 51 AEGIS Destroyer Ship Classes, and TERRIER CG/NTU, TARTAR CGN/NTU, and Vertical Launch System.

~~Classified by 6880 VINST S-5513.3~~
~~Declassify on: 31 December 1993~~

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6. Mission and Description: The STANDARD Missile Medium Range (SM-2 MR) is a solid propellant, tail controlled surface-to-air and surface-to-surface missile. The Block I production was initiated in FY 1980 and incorporated command guidance, inertial reference system and monopulse receiver to improve range, accuracy and electronic countermeasure (ECM) resistance. The SM-2 Block II MR missile began Pilot Production in FY 1983 and incorporates all digital guidance, new ordnance and a new dual thrust rocket motor to further improve range, speed and system fire power. This missile will be operational on the AEGIS DDG 51 ARLEIGH BURKE Class destroyers and the CG 47 TICONDEROGA Class cruisers. It will also be operational on the TARTAR NTU cruisers and the FFG 7 PERRY Class frigates.

The STANDARD Missile Extended Range (SM-2) Block I (ER) (67B produced FY 1976 through FY 1983) and Block II (67C production began in FY 1982 and continues) are planned for deployment in all 31 TERRIER Guided Missile Destroyers and Cruisers. The SM-2 Block II missile incorporates improved propulsion, fuze, warhead and guidance designs to cope with the more stringent anti-ship missile (ASM) threats.

7. Program Highlights:

a. Significant Historical Developments -- The STANDARD Missile 2, Block I, (RIM-67C), Extended Range Development program was initiated in August 1976. The Block II is an improved missile with capability to counter high speed, higher altitude anti-ship missiles in an advanced ECM environment. Based upon TECHEVAL and OPEVAL results the CNO recommended approval of limited production in May 1983. The Block II improvements are required to meet the Advanced Anti-Ship Missile (ASM) threats of the mid 1980s.

The STANDARD Missile 2, Medium Range, Block II (RIM-66H) is a derivative of the STANDARD Missile 2, Block II Extended Range that incorporated a new rocket motor, and a modified airframe for compatibility with the vertical launcher system. Initial problems encountered in the development of the new rocket motor have been solved as 35 successive successful motor firings were achieved during motor qualification. The successful TECHEVAL/OPEVAL of the extended range missile round contributed substantially to the validation of the medium range missile round since there is a high commonality between the two rounds. On this and the successful rocket motor qualification, initial pilot production of 30 medium range rounds was approved for FY 83 in order to provide missiles for CSSQT and FOT&E testing in the CG 47 AEGIS Cruisers, the first medium range Block II ship. The Block II improvements are required to meet the Advanced Anti-ship Missile (ASM) threats of the mid 1980s.

The Milestone IIIC ARC was conducted on 20 February 1985. On 8 June 1985 SECNAV approved limited production (Lot #3) for a FY 85 buy of 255 ER missiles and limited production (Lot #2) for a FY 85 buy of 529 MR missiles.

b. Significant Developments Since Last Report -- The Milestone IIID Decision Memorandum was signed on 15 May 1986. SECNAV approved limited production for a FY 86 buy of 470 ER missiles (Lot #4) and 846 MR missiles (Lot #3). Follow producer source selection of the GC&A was awarded to Raytheon Company on 6 June 1986.

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SM-2 MR/ER, December 31, 1986

The Milestones IIIE ARB was conducted October 1986 and the Navy Program Decision Meeting was held on 26 November 1986. As a result, the Approval for Full Production Decision Memorandum was signed 17 December 1986. The Standard Missile Program is meeting all mission requirements.

c. Changes Since "As Of" Date -- None

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are no threshold breaches to AEGIS DCP #16 Rev 2, dated May, 1978.

9. Schedule:

SM-2 Block I/Block II MR (RIM-66 G/H/J)

a. Milestones --	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
(U) First Flight Test (Development Tests)	Feb 83/Feb 83	Feb 83
(U) MR Pilot Production Approved (Block II)	Jun 83/Jun 83	Jun 83
(U) (Lot #1) Approval for Limited Production	Feb 84/Feb 84	Feb 84
(U) DT/OT and OPEVAL	Sep 84/Sep 84	Sep 84
(U) (Lot #2) Approval for Limited Production	Jun 85/Jun 85	Jun 85
(b)(1)		
(U) (Lot #3) ALP	Apr 86/May 86	May 86 (CH-2)
(b)(1)		
(U) Milestone IIIE (AFP)	Dec 84/Dec 86	Dec 86 (CH-4)

b. Previous Change Explanations --
FOT&E in USS VINCENNES slipped from Nov 85 to Apr 86 to accommodate missile delivery schedule and launcher correction. AFP slipped to Sep 86 as a result of FOT&E.
Lot #2 ALP slipped from Mar 85 to Jun 85. The ARC was held in Feb 85 and the Decision Memorandum was signed by SECNAV Jun 85.

c. Current Change Explanations --

(b)(1)

d. References --

Production Estimate: Milestone IIIE NPDM of 17 December 1986.
Approved Program: FY88 President's Budget

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SM-2 MR/ER, December 31, 1986

SM-2 Block I/Block II ER (RIM-67C)

a. Milestones --

(U) OPEVAL Completed (Block II)	Mar 83/Mar 83	Mar 83
(U) ER Pilot Production Approved	Apr 82/Apr 82	Apr 82
(U) (Lot #1) Approval for Limited Production	Jun 83/Jun 83	Jun 83
(U) (Lot #2) Approval for Limited Production	Feb 84/Feb 84	Feb 84
(U) (Lot #3) Approval for Limited Production	Mar 85/Mar 85	Mar 85

(b)(1)

(U) (Lot #4) Approval for Limited Production	Apr 86/May 86	May 86 (CH-1)
--	---------------	---------------

(b)(1)

(U) Milestone IIIE (AFP)	Dec 84/Dec 86	Dec 86 (CH-3)
--------------------------	---------------	---------------

b. Previous Change Explanations --

AFP schedule slipped from Dec 84 to Sep 86 as a result of schedule change of FOT&E USS VINCENNES.

c. Current Change Explanations --

(CH-1) Lot #4 ALP slipped from Apr 86 to May 86 due to ASN scheduling.

(b)(1)

(CH-3) Approval for Full Production slipped from Sep 86, the last reported approved program, to Dec 86 due to rescheduling of the ARB to Oct 86 and completion of the NPDM in Dec 86.

d. References --

Production Estimate: Milestone IIIE NPDM of 17 December 1986.

Approved Program: FY88 President's Budget.

10. Technical/Operational Characteristics:

SM-2 MR Block II

a. Technical --

Prod Estimate/
Appr Program

Demonstrated
Performance

Current
Estimate

(b)(1)

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SM-2 MR/ER, December 31, 1986

b. Operational --

(b)(1)

c. Previous Change Explanations --

- 1/(U) Flight test rounds #33/34 and 35 fired 26/27 November 1984 as part of DT/OT in USS TICONDEROGA CG 47. Simulations verify production estimate.
- 2/(U) Four pilot production rounds (60304,5 and 60315,18) fired on 25 October and 20, 21 November 1985 as part of FOT&E in USS VINCENNES, CG 49. Simulations verify production estimates.
- 3/(U) Demonstrated in ground and flight tests.

d. Current Change Explanations -- None.

e. References --

Production Estimate: Milestones IIIE NPDM of 17 December 1986.

Approved Program: FY88 President's Budget

10. Technical/Operational Characteristics:

SM-2 ER Block II
a. Technical --

Prod Estimate/
Appr Program

Demonstrated
Performance

Current
Estimate

(b)(1)

b. Operational --

Prod Estimate/
Appr Program

Demonstrated
Performance

Current
Estimate

(b)(1)

c. Previous Change Explanations --

- 1/ Pilot production missiles fired 11 October 1984 in USS MAHAN DDG 42. Simulations verify production estimate.

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d. Current Change Explanations --

2/ Pilot production missiles fired 26 February-1 March 1985 in USS MAHAN DDG 42. Simulations verify production estimate; demonstrated performance of 8.5 is result of final data analysis.

3/ Demonstrated in ground and flight tests.

e. References --

Production Estimate: Milestone IIIE NPDM of 17 December 1986.

Approved Program: FY88 President's Budget.

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11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)SM-2 MR Block I/Block II

a. Cost --	Prod Estimate/ Appr Program	Changes	Current Estimate
Development (RDT&E)	\$ 314.6	\$ 302.1	\$ 616.7
Procurement	3334.1	1486.7	4820.8
GC&A	(1641.2)	(789.3)	(2430.5)
Propulsion	(485.6)	(440.9)	(926.5)
Fuze	(213.0)	(286.2)	(499.2)
Other (Hardware)	(289.6)	(- 192.8)	(96.8)
Other (Proc Support)	(247.6)	(126.6)	(374.2)
TOTAL FLYAWAY	(2877.0)	(1450.2)	(4327.2)
Non-Recurring Prod Support	(202.7)	(12.7)	(215.4)
Fleet Support	(159.0)	(20.2)	(179.2)
Initial Spares	(95.4)	(3.6)	(99.0)
Construction	-	-	-
Total: FY 84 Base-Year \$	3648.7	1788.8	5437.5
Escalation	934.2	149.5	1083.7
Development (RDT&E)	(26.7)	(47.3)	(74.0)
Procurement	(907.5)	(102.2)	(1009.7)
Construction	-	-	-
Total Then-Year \$	\$ 4582.9	1938.3	6521.2
b. Quantities --			
Development (RDT&E)	88	-	88
Procurement	6195	4509	10,704
Total	6283	4509	10,792
c. Unit Cost --			
Procurement:			
FY 84 Base-Year \$	\$ 0.538	\$ -0.088	\$ 0.450
Then-Year \$	0.685	-0.140	0.545
Program:			
FY 84 Base-Year \$	0.581	-0.077	0.504
Then-Year \$	\$ 0.729	\$ -0.125	\$ 0.604

d. Approved Design to Cost Goal -- No design-to-cost goals apply to the SM-2 program, as this program was initiated in 1966, prior to design-to-cost implementation.

e. Foreign Military Sales -- None.

f. Nuclear Costs -- None.

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)SM-2 ER Block I/Block II

a. Cost --	Prod Estimate/ Appr Program	Changes	Current Estimate
Development (RDT&E)	\$ 333.8	\$ 1.6	\$ 335.4
Procurement	2589.0	- 186.9	2402.1
GC&A	(1275.5)	(- 146.0)	(1129.5)
Propulsion	(408.0)	(- 94.8)	(313.2)
Fuze	(155.6)	(2.5)	(158.1)
Other (Hardware)	(42.0)	(- 8.5)	(33.5)
Other (Proc Support)	(252.4)	(64.1)	(316.5)
TOTAL FLYAWAY	(2133.5)	(183.0)	(1950.5)
Non-Recurring Prod Support	(186.2)	(- 4.2)	(182.0)
Fleet Support	(171.9)	(19.2)	(191.1)
Initial Spares	(97.4)	(- 18.9)	(78.5)
Construction	-	-	-
Total: FY 84 Base-Year \$	2922.8	(- 185.3)	2737.5
Escalation	547.1	- 424.6	122.5
Development (RDT&E)	(26.5)	(- 11.8)	(14.7)
Procurement	(520.6)	(- 412.8)	(107.8)
Construction	-	-	-
Total Then-Year \$	\$ 3469.9	(- 609.9)	2860.0
b. Quantities --			
Development (RDT&E)	0	0	0
Procurement	4583	-610	3973
Total	4583	-610	3973
c. Unit Cost --			
Procurement:			
FY 84 Base-Year \$	\$ 0.565	\$ 0.040	\$ 0.605
Then-Year \$	0.679	-0.046	0.632
Program:			
FY 84 Base-Year \$	0.638	0.051	0.689
Then-Year \$	\$ 0.757	\$ -0.037	0.720
d. Approved Design to Cost Goal -- No design-to-cost goals apply to the SM-2 program, as this program was initiated in 1966, prior to design-to-cost implementation.			
e. Foreign Military Sales -- None.			
f. Nuclear Costs -- None.			

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11. Program Acquisition Cost : (Current Estimate in Millions of Dollars)SM-2 Block II MR/ER (Summary)

a. Cost --	Prod Estimate/ Appr Program	Changes	Current Estimate
Development (RDT&E)	\$ 648.4	\$ 303.7	\$ 952.1
Procurement	5923.1	1299.8	7222.9
GC&A	(2916.7)	(643.3)	(3560.0)
Propulsion	(893.6)	(346.1)	(1239.7)
Fuze	(368.6)	(288.1)	(657.3)
Other (Hardware)	(331.6)	(201.3)	(130.3)
Other (Proc Support)	(500.0)	(190.7)	(690.7)
<u>TOTAL FLYAWAY</u>	(5010.5)	(1267.2)	(6277.7)
Non-Recurring Prod Support	(388.9)	(8.5)	(397.4)
Fleet Support	(330.9)	(39.4)	(370.3)
Initial Spares	(192.8)	(- 15.3)	(177.5)
Construction	-	-	-
Total: FY 84 Base-Year \$	<u>6571.5</u>	<u>1603.5</u>	<u>8175.0</u>
Escalation	1481.3	- 275.1	1206.2
Development (RDT&E)	(53.2)	(35.5)	(88.7)
Procurement	(1428.1)	(- 310.6)	(1117.5)
Construction	-	-	-
Total Then-Year \$	<u>\$ 8052.8</u>	<u>\$ 1328.4</u>	<u>\$ 9381.2</u>
b. Quantities --			
Development (RDT&E)	88	0	88
Procurement	<u>10,778</u>	<u>3,899</u>	<u>14,677</u>
Total	<u>10,866</u>	<u>3,899</u>	<u>14,765</u>
c. Unit Cost --			
Procurement:			
FY 84 Base-Year \$	\$ 0.549	\$ -0.057	\$ 0.492
Then-Year \$	0.682	-0.113	0.569
Program:			
FY 84 Base-Year \$	0.604	-0.050	0.554
Then-Year \$	\$ 0.741	\$ -0.105	\$ 0.636

d. Approved Design to Cost Goal -- No design-to-cost goals apply to the SM-2 program, as this program was initiated in 1966, prior to design-to-cost implementation.

e. Foreign Military Sales -- None.

f. Nuclear Costs -- None.

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12. Program Acquisition/Current Procurement Unit Cost Summary:
 (Current (Then-Year) Dollars in Millions)

SM-2 MR Block I/Block II

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Estimate</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. <u>Program Acquisition --</u>			
(1) Cost	6521.2	5674.9	6521.2
(2) Quantity	10792	9092	10792
(3) Unit Cost	0.604	0.624	0.604
b. <u>Current Procurement</u>	(FY 1987)	(FY 1987) ^{1/}	(FY 1988)
(1) Cost	489.2	489.2	419.8
Less CY Adv Proc	-	-	-
Plus PY Adv Proc	-	-	-
Net Total	489.2	489.2	419.8
(2) Quantity	844	844	800
(3) Unit Cost	0.580	0.580	0.525

SM-2 ER Block I/Block II

a. <u>Program Acquisition</u>			
(1) Cost	2860.0	3397.7	2860.0
(2) Quantity ^{2/}	3973	4468	3973
(3) Unit Cost	0.720	0.760	0.720
b. <u>Current Procurement</u>	(FY 1987)	(FY 1987) ^{1/}	(FY 1988)
(1) Cost	216.2	216.2	180.5
Less CY Adv Proc	-	-	-
Plus PY Adv Proc	-	-	-
Net Total	216.2	216.2	180.5
(2) Quantity	350	350	350
(3) Unit Cost	0.618	0.618	0.516

^{1/}FY87 Appropriation Act^{2/}Quantities include only SM-2, not SM-1

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13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

SM-2 MR Block I/Block II

	RDT&E	PROC	TOTAL
Production Estimate	341.3	4241.6	4582.9
Previous Changes:			
Economic	- 13.9	- 352.4	- 366.3
Quantity	-	+1442.9	+1442.9
Schedule	-	+ 9.3	+ 9.3
Engineering	-	+ 48.7	+ 48.7
Estimating	+ 56.7	- 153.1	- 96.4
Other	-	-	-
Support	-	+ 53.8	+ 53.8
Subtotal	+ 42.8	+1049.2	+1092.0
Current Changes:			
Economic	- 3.1	- 132.7	- 135.8
Quantity	-	+1080.2	+1080.2
Schedule	-	- 406.7	- 406.7
Engineering	+ 335.1	0.0	+ 335.1
Estimating	- 25.4	- 6.3	- 31.7
Other	-	-	-
Support	-	+ 5.2	+ 5.2
Subtotal	+ 306.6	+ 539.7	+ 846.3
Total Changes	+ 349.4	1588.9	+1938.3
Current Estimate	690.7	5830.5	6521.2

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13. Cost Variance Analysis (Cont'd): (FY 1984 Constant (Base Year) Dollars in Millions)SM-2 MR Block I/Block II (Cont'd)

	RDT&E	PROC	TOTAL
Production Estimate	314.6	3334.1	3648.7
Previous Changes:			
Economic	-	-	-
Quantity	-	+1040.7	+1040.7
Schedule	-	-	-
Engineering	-	+ 39.1	+ 39.1
Estimating	+ 42.5	- 113.5	- 71.0
Other	-	-	-
Support	-	+ 40.4	+ 40.4
Subtotal	+ 42.5	+1006.7	+1049.2
Current Changes:			
Economic	-	-	-
Quantity	-	+ 866.1	+ 866.1
Schedule	-	- 375.6	- 375.6
Engineering	278.5	0.0	+ 278.5
Estimating	- 18.9	- 6.6	- 25.5
Other	-	-	0.0
Support	-	- 3.9	- 3.9
Subtotal	+ 259.6	480.0	+ 739.6
Total Changes	+ 302.1	+1486.7	+1788.8
Current Estimate	616.7	4820.8	5437.5

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation rates

Estimating: Decreases associated with CSS, SBIR, NIF reductions and addition of program years (Estimating)

PROCUREMENT

Economic: Revised escalation rates

Quantity: Increased production (FY 85 and 86) to support AEGIS Cruisers. Due to the Navy's policy change in reaching the Inventory Objectives (IO), procurement quantities for FY 87 through FY 89 were reduced 780 missiles. The FY 90 program year addition (1700 missiles) to the SAR resulted in a total net increase of 990 missiles

13. Cost Variance Analysis (Cont'd):SM-2 MR Block I/Block II (Cont'd)

CNO reduction to line with Ship/fill requirements FY 87-89 (-275 missiles) Increase to FY 90 (100 missiles), addition of FY 91 program year (1995 missiles) for net increase of 1819 missiles (Quantity)

Schedule: Schedule adjustment due to addition of program year and continued support of TERRIER Cruisers and New Threat Upgrade Ships

Engineering: Introduction Phase I of low altitude improvements and introduction Phase II MK 45TDD

Estimating: Decrease associated with CSS, NIF and estimating cost for hardware

Support: Change in Initial Spares requirements, Non-recurring production and Fleet Support

Increase in Production Engineering and Evaluation Services and directed "Forward-Funding" of I&CO equipment for realignment purposes in production for second source (Support)

c. Current Change Explanations --

(1) <u>RDT&E</u>	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised escalation rates (Economic)	N/A	- 3.1
Increase reflects program restructuring caused by decision to pursue AEGIS ER missile (Engineering)	+ 259.6	+ 309.7
Correct previous categorization error Dec 84 SAR (Engineering)	+ 18.9	+ 25.4
Correct previous categorization error Dec 84 SAR (Estimating)	- 18.9	- 25.4
(2) <u>Procurement</u>		
Revised escalation rates (Economic)	N/A	- 132.7
Addition of program year (2010 missiles as a continuing program) for net increase of 1700 missiles (Quantity)	+ 866.1	+1120.0

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13. Cost Variance Analysis (Cont'd):

SM-2 MR Block I/Block II (Cont'd)

Schedule shift of FY 88 - FY 91 missiles ✓ to FY 92 (Schedule)	-375.6	-446.5
Correct previous categorization error Dec 84 SAR (Quantity)	-	- 39.8
Correct previous categorization error Dec 84 SAR (Schedule)	-	+ 39.8
Net change due to annualization and realignment of support costs (support)	- 10.5	- 1.1
Correct previous categorization error Dec 83 SAR (Support)	+ 6.6	+ 6.3
Correct previous categorization error Dec 83 SAR (Estimating)	- 6.6	- 6.3

d. References --

Production Estimate: - Milestone IIIE NPDM of 26 November 1986.

Approved Program: FY 88 President's Budget

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13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

SM-2 ER Block I/Block II

	RDT&E	PROC	TOTAL
Production Estimate	360.3	3109.6	3469.9
Previous Changes:			
Economic	- 15.4	- 331.9	- 347.3
Quantity	-	+ 179.0	+ 179.0
Schedule	-	-	-
Engineering	-	+ 21.7	+ 21.7
Estimating	+ 57.6	- 79.7	- 22.1
Other	-	-	-
Support	-	+ 96.5	+ 96.5
Subtotal	42.2	- 114.4	- 72.2
Current Changes:			
Economic	- 3.1	- 58.7	- 61.8
Quantity	-	- 303.6	- 303.6
Schedule	-	+ 86.4	+ 86.4
Engineering	- 29.2	-	- 29.2
Estimating	- 20.1	- 126.1	- 146.2
Other	-	-	-
Support	-	- 83.3	- 83.3
Subtotal	- 52.4	- 485.3	- 537.7
Total Changes	- 10.2	- 599.7	- 609.9
Current Estimate	350.1	2509.9	2860.0

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13. Cost Variance Analysis (Cont'd): (FY 1984 Constant (Base Year) Dollars in Millions)SM-2 ER Block I/Block II (Cont'd)

	RDT&E	PROC	TOTAL
Production Estimate	333.8	2589.0	2922.8
Previous Changes:			
Economic	-	-	-
Quantity	-	+ 122.6	+ 122.6
Schedule	-	-	-
Engineering	-	17.5	17.5
Estimating	+ 43.5	- 67.7	- 24.2
Other	-	-	-
Support	-	+ 92.4	+ 92.4
Subtotal	+ 43.5	+ 164.8	+ 208.3
Current Changes:			
Economic	-	-	-
Quantity	-	- 180.7	- 180.7
Schedule	-	+ 0.4	+ 0.4
Engineering	- 15.4	-	- 15.4
Estimating	- 26.5	- 75.1	- 101.6
Other	-	-	-
Support	-	- 96.3	- 96.3
Subtotal	- 41.9	- 351.7	- 393.6
Total Changes	+ 1.6	- 186.9	- 185.3
Current Estimate	335.4	2402.1	2737.5

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation rates

Estimating: Decreases associated with CSS, SBIR, NIF reductions and addition of program years (Estimating)

PROCUREMENT

Economic: Revised escalation rates

Quantity: Due to the addition of FY 90 program year (1150 missiles) to the SAR and the policy change in reaching the Inventory Objectives (IO) with resulted in a decrease of 335 missiles for FY 86-90, the total net increase to the program is 835 missiles

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13. Cost Variance Analysis (Cont'd):SM-2 ER Block I/Block II (Cont'd)

CNO reduction to line with Ship/fill requirements FY 87-90
(-1530 missiles) Addition of FY 91 program year (+1150
missiles) Net reduction 930 missiles (Quantity)

Engineering: Introduction Phase I of low altitude improvements and
introduction Phase II MK 45 TDD

Estimating: Decrease associated with CSS, NIF and estimating cost for
hardware (Estimating)

Support: Change in Initial Spares requirements, Non-recurring
production and Fleet Support

Increase in Production Engineering and Evaluation Services
and directed "Forward-Funding" of I&CO equipment for
realignment purposes in production for second source
(Support)

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13. Cost Variance Analysis (Cont'd):SM-2 ER Block I/Block II (Cont'd)c. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation rates	N/A	- 3.1
Decrease reflects program restructuring caused by decision to pursue AEGIS ER missile within SM-2 MR (Engineering)	- 41.9	- 49.3
Correct previous categorization error Dec 84 SAR (Engineering)	+ 26.5	+ 20.1
Correct previous categorization error Dec 84 SAR (Estimating)	- 26.5	- 20.1
(2) <u>Procurement</u>		
Revised escalation rates	N/A	- 58.7
Net reduction of 495 missiles due to ship/fill requirements. Addition of program year as a continuing program (Quantity)	-180.3	-239.6
Schedule shift of FY 88 - FY 91 missiles to FY 92 (Schedule)	-	+ 22.4
Correct previous categorization error Dec 84 SAR (Quantity)	- 0.4	- 64.0
Correct previous categorization error Dec 84 SAR (Schedule)	+ 0.4	+ 64.0
Decrease associated with Graham Rudman budget cuts, reprogramming to MR, NIF and DPSB reductions (Estimating)	- 75.8	- 96.3
Decrease associated with decrease in quantity of missiles (Support)	- 95.6	-113.1
Correct previous categorization error Dec 83 SAR (Support)	- 0.7	+ 29.8
Correct previous categorization error Dec 83 SAR (Estimating)	+ 0.7	- 29.8

d. References --Production Estimate: - Milestone IIIE NPDM of 26 November 1986.Approved Program: FY 88 President's Budget

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13. Cost Variance Analysis (Cont'd):

a. Summary -- (Current (Then-Year) Dollars in Millions)

SM-2 Block II MR/ER (Summary)

	RDT&E	PROC	TOTAL
Production Estimate	701.6	7351.2	8052.8
Previous Changes:			
Economic	- 29.3	- 684.3	- 713.6
Quantity	-	+1621.9	+1621.9
Schedule	-	+ 9.3	+ 9.3
Engineering	-	+ 70.4	+ 70.4
Estimating	114.3	- 232.8	- 118.5
Other	-	-	-
Support	-	+ 150.3	+ 150.3
Subtotal	85.0	+ 934.8	+1019.8
Current Changes:			
Economic	- 6.2	- 191.4	- 197.6
Quantity	-	+ 776.6	+ 776.6
Schedule	-	- 320.3	- 320.3
Engineering	+ 305.9	0.0	+ 305.9
Estimating	- 45.5	- 132.4	- 177.9
Other	-	-	-
Support	-	- 78.1	- 78.1
Subtotal	+ 254.2	+ 54.4	+ 308.6
Total Changes	+ 339.2	+ 989.2	+1328.4
Current Estimate	1040.8	8340.4	9381.2

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13. Cost Variance Analysis (Cont'd): (FY 1984 Constant (Base Year) Dollars in Millions)SM-2 Block II MR/ER (Summary)

	RDT&E	PROC	TOTAL
Production Estimate	648.4	5923.1	6571.5
Previous Changes:			
Economic	-	-	-
Quantity	-	+1163.3	+1163.3
Schedule	-	-	-
Engineering	-	+ 56.6	+ 56.6
Estimating	+ 86.0	- 181.2	- 95.2
Other	-	-	-
Support	-	+ 132.8	+ 132.8
Subtotal	+ 86.0	+1171.5	+1257.5
Current Changes:			
Economic	-	-	-
Quantity	-	+ 685.4	+ 685.4
Schedule	-	- 375.2	- 375.2
Engineering	+ 263.1	0.0	+ 263.1
Estimating	- 45.4	- 81.7	- 127.1
Other	-	-	0.0
Support	-	- 100.2	- 100.2
Subtotal	+ 217.7	+ 128.3	+ 346.0
Total Changes	+ 303.7	+1299.8	+1603.5
Current Estimate	952.1	7222.9	8175.0

13. Cost Variance Analysis (Cont'd):SM-2 Block I/Block II MR/ER (Summary)

c. Current Change Explanations --

(1) <u>RDT&E</u>	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised escalation rates (MR: -3.1, ER: -3.1)	N/A	-3.1
Program restructuring caused by decision to pursue AEGIS ER missile within SM-2 MR (Engineering) (MR: +259.6, +309.7; ER: -41.9, -49.3)	+ 217.7	+ 260.4
Correct previous categorization error Dec 84 SAR (Engineering) (MR: +18.9, +25.4; ER: +26.5, +20.1)	+ 45.4	+ 45.5
Correct previous categorization error Dec 84 SAR (Estimating) (MR: -18.9, -25.4; ER: -26.5, -20.1)	- 45.4	- 45.5

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(2) Procurement

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised escalation rates (Economic)	N/A	-191.4
Addition of program year (Quantity) (MR: +866.1, +1120.0)		
Net reduction of 495 missiles (Quantity) (ER: -180.3, -239.6)	+685.8	+880.4
Schedule shift of FY 87-91 missiles to FY 92 (Schedule) (MR: -375.6, -446.5; ER: -, +22.4)	-375.6	-424.1
Correct previous categorization errors: Dec 84 SAR		
Quantity (MR: -, -39.8; ER: -0.4, -64.0)	- 0.4	-103.8
Schedule (MR: -, +39.8; ER: +0.4, +64.0)	+ 0.4	+103.8
Support (MR: +6.6, +6.3; ER: -0.7, +29.8)	+ 5.9	+ 36.1
Estimating (MR: -6.6, -6.3; ER: +0.7, -29.8)	- 5.9	- 36.1
Annualization and realignment of support costs (Support) (MR: -10.5, -1.1)		
Decrease associated with decrease in quantity (Support) (ER: -95.6, -113.1)	-106.1	-114.2
Decrease associated with Graham-Rudman budget cuts, reprogramming to MR, NIF and DPSB reductions (Estimating) (MR: -75.8, -96.3)	- 75.8	- 96.3

14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)SM-2 MR Block I/Block II

a. Initial SAR Estimate to Current Baseline Estimate -- N/A

b. Current Baseline Estimate to Current Estimate --

PAUC (PdE)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
.729	-.047	-.070	-.037	+.036	-.012	-	+.005	-0.125	0.604

SM-2 ER Block I/Block II

a. Initial SAR Estimate to Current Baseline Estimate -- N/A

b. Current Baseline Estimate to Current Estimate --

PAUC (PdE)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
.757	-.103	+.085	+.022	-.002	-.042	-	+.003	-.037	.720

15. Contract Information: (Then-Year Dollars in Millions)a. PROCUREMENT --

<u>SM-2 FY 86 GC&A Production</u> General Dynamics Pomona, California N00024-86-C-5301, FFP Award: 23 September 1986 Definitized: 23 September 1986	Initial Contract Price		
	Target	Ceiling	Qty
	\$330.5	N/A	1071

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$330.5	N/A	1071	N/A	N/A

Previous Cumulative Variances:	<u>Cost Variance</u>	<u>Schedule Variance</u>
Cumulative Variances To Date:	--	--
Net Change:	--	--

Explanation of Change: N/A for FFP Contract

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15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

<u>SM-2 FY 85 GC&A Production</u>			<u>Initial Contract Price</u>		
<u>General Dynamics</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Pomona, California					
N00024-85-C-5501, FPI			\$248.1	\$279.9	730
Award: 4 September 1985					
Definitized: 4 September 1985					
 <u>Current Contract Price</u>			 <u>Estimated Price At Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$248.1 ^{1/}	279.9	730	\$250.9	\$250.9	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances:			0.0	0.0	
Cumulative Variances To Date:			+8.1	+6.8	
Net Change:			+8.1	+6.8	

Explanation of Change: Favorable variance is result of 66,000 hours of cost transfers from FY 84 production contract.

Reference: CPR as of 11/86; Basic Contract

<u>SM-2 FY 84 GC&A (MR/ER) Production</u>			<u>Initial Contract Price</u>		
<u>SM-2 MR FY 85 DTRM Production</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>General Dynamics</u>					
Pomona, California					
N00024-84-C-5501, CPIF/AF			\$210.6	N/A	490
Award: 30 November 1984					
Definitized: 30 November 1984					
 <u>Current Contract Price</u>			 <u>Estimated Price At Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$231.2	N/A	490	\$233.0	\$233.0	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances:			0.0	0.0	
Cumulative Variances To Date:			-2.6	-8.0	
Net Change:			-2.6	-8.0	

Explanation of Change: Cumulative cost and schedule variances reported against subcontractor (THIOLKOL WASATCH). Contractor states that contract will complete within cost.

Reference: CPR as of 11/86.

^{1/} 2.8M for Performance Project has been set aside in addition to the target price.

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SM-2 MR/ER, December 31, 1986

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

<u>SM-2 FY 86 GC&A Production</u>			<u>Initial Contract Price</u>		
<u>Raytheon Company</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Bristol, Tennessee					
N00024-86-C-5382, FPIP			\$107.8	\$119.8	230
Award: 6 June 1986					
Definitized: 6 June 1986					
 <u>Current Contract Price</u>			 <u>Estimated Price At Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$107.8	\$119.8	230	\$107.8	\$107.8	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances:			--	--	
Cumulative Variances To Date:			+ .5	- .3	
Net Change:			+ .5	- .3	

Explanation of Change: Negative schedule variance is result of delays in the receipt of engineering test data. Contractor states that contract will complete within cost.

Reference: CPR as of 12/86

<u>SM-2 MR FY 83 Block II Production</u>			<u>Initial Contract Price</u>		
<u>General Dynamics</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Pomona, California					
N00024-84-C-5513, CPIF/AF			\$85.1	N/A	170
Award: 30 November 1984					
Definitized: 30 November 1984					
 <u>Current Contract Price</u>			 <u>Estimated Price At Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$ 91.5	N/A	170	\$ 91.5	\$ 91.5	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances:			0.0	0.0	
Cumulative Variances To Date:			-1.3	-1.3	
Net Change:			-1.3	-1.3	

Explanation of Change: Unfavorable position reported primarily against subcontract THIOKOL WASATCH/GE for the MK 104 DTRM.

Reference: CPR dated 11/86; N00024-84-C-5513 (P00011)

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SM-2 MR/ER, December 31, 1986

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

<u>SM-2 FY 85 MK 104 DTRM Production</u>			<u>Initial Contract Price</u>	
			<u>Target</u>	<u>Ceiling</u>
<u>Morton Thiokol, Inc.</u>				<u>Qty</u>
<u>Brigham City, UT</u>				
<u>N00024-85-C-5546, FPI</u>			\$ 61.4	\$76.7
<u>Award: 29 August 1985</u>				511
<u>Definitized: Exp May 1987</u>				

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$ 61.4	\$76.7	511	\$ 61.4	\$ 61.4

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances:	--	--
Cumulative Variances To Date:	--	--
Net Change:	--	--

Explanation of Change: No variances reported to date. Contract negotiations have been finalized. Budget is in process of being prepared.

Reference: CPR as of 11/86.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)SM-2 MR Block I/Block II

a. Program Status --

- (1) Percent Program Completed: 62% or 8 out of 13 years
 (2) Percent Program Cost Appropriated: 32.8% or 2,137.3/6521.2

b. Appropriation Summary --

	(Then-Year Dollars in Millions)				
<u>Appropriation</u>	<u>Current & Prior Yrs</u>	<u>Budget Year</u>	<u>Balance FYDP</u>	<u>To Complete Beyond FYDP</u>	<u>Total</u>
	<u>(FY80-86)</u>	<u>(FY87)</u>	<u>(FY88-92)</u>	<u>(FY93)</u>	
RDT&E	273.9	96.3	320.5	-	690.7
Procurement	1863.4	419.8	3547.3	-	5830.5
Total	2137.3	516.1	3867.8	-	6521.2

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SM-2 MR/ER, December 31, 1986

16. Program Funding Summary: (Current Estimate in Millions of Dollars)SM-2 MR Block I/Block II

c. Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1982	88		-	146.2			137.6	7.6
1983	-		-	16.2			15.9	4.9
1984	-		-	9.8			10.0	3.8
1985	-		-	13.9			14.6	3.4
1986	-		-	41.8			45.3	2.9
1987	-		-	45.1			50.5	3.1
1988	-		-	83.2			96.3	3.5
1989	-		-	104.2			124.7	3.5
1990	-		-	88.9			109.6	3.3
1991	-		-	39.8			50.4	2.9
1992	-		-	27.6			35.8	2.4
Subtotal	88		-	616.7			690.7	
Appropriation: PROCUREMENT								
1980	30		21.8	30.0			23.7	11.8
1981	70		35.0	44.8			39.4	11.6
1982	120		48.8	61.3			58.5	14.3
1983	150		96.7	127.4			128.7	9.0
1984	390		242.1	279.8			295.6	8.0
1985	529		283.1	312.9			339.5	3.4
1986	846		393.7	436.2			488.8	2.9
1987	844		358.7	422.2			489.2	3.1
1988	800		322.3	350.7			419.8	3.5
1989	1310		488.4	529.2			652.7	3.5
1990	1615		580.4	649.1			822.1	3.3
1991	1990		686.5	753.7			978.1	2.9
1992	2010		769.7	823.5			1094.4	2.4
Subtotal	10704		4327.2	4820.8			5830.5	
Total	10792		4327.2	5437.5			6521.2	

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SM-2 MR/ER, December 31, 1986

16. Program Funding Summary: (Current Estimate in Millions of Dollars)SM-2 MR Block I/Block II

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1982	137.6	137.6	137.6
1983	15.9	15.9	15.9
1984	10.0	10.0	10.0
1985	14.6	15.4	12.2
1986	45.3	18.1	13.5
1987	50.5	2.0	0.0
1988	96.3	-	-
1989	124.7	-	-
1990	109.6	-	-
1991	50.4	-	-
1992	35.8	-	-
Subtotal	690.7	199.0	189.2
Appropriation: PROCUREMENT			
1980	23.7	23.6	23.5
1981	39.4	39.4	39.1
1982	58.5	58.5	37.3
1983	128.7	128.8	89.1
1984	295.6	295.6	223.6
1985	339.5	214.6	74.5
1986	488.8	330.7	3.8
1987	489.2	1.7	0.0
1988	419.8	-	-
1989	652.7	-	-
1990	822.1	-	-
1991	978.1	-	-
1992	1094.4	-	-
Subtotal	5830.5	1,094.6	490.9
Total	6521.2	1,293.6	680.1

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SM-2 MR/ER, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)SM-2 ER Block I/Block II

a. Program Status --

(1) Percent Program Completed: 71% or 12 out of 17 years

(2) Percent Program Cost Appropriated: 64.9% or 1857.0/2860.0

b. Appropriation Summary --

Appropriation	Current & Prior Yrs (FY80-86)	(Then-Year Dollars in Millions)			Total
		Budget Year (FY88)	Balance FYDP (FY89-92)	To Complete Beyond FYDP (FY93)	
RDT&E	239.4	20.2	90.5	-	350.1
Procurement	1617.6	180.5	711.8	-	2509.9
Total	1857.0	200.7	802.3	-	2860.0

c. Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars		Total	Then-Year Dollars		Total	Escl Rate (%)
		Flyaway			Advance Proc			
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1982	-	-	-	177.9			167.4	7.6
1983	-	-	-	7.4			7.3	4.9
1984	-	-	-	7.1			7.3	3.8
1985	-	-	-	13.9			14.6	3.4
1986	-	-	-	19.2			20.8	2.9
1987	-	-	-	19.7			22.0	3.1
1988	-	-	-	17.4			20.2	3.5
1989	-	-	-	18.8			22.5	3.5
1990	-	-	-	24.9			30.7	3.3
1991	-	-	-	13.4			17.0	2.9
1992	-	-	-	15.7			20.3	2.4
Subtotal	-	-	-	335.4			350.1	

SM-2 MR/ER, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)SM-2 ER Block I/Block II

c. Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: PROCUREMENT								
1976	22		53.9	92.5			48.4	6.6
1977	36		60.4	73.8			42.9	3.7
1978	40		61.3	74.3			48.2	6.8
1979	40		51.8	65.3			46.8	8.7
1980	55		41.3	51.9			41.0	11.8
1981	275		121.3	153.5			135.0	11.6
1982	375		180.8	225.4			215.4	14.3
1983	350		196.1	269.5			272.3	9.0
1984	100		68.6	103.1			108.9	8.0
1985	255		131.1	164.6			178.7	3.4
1986	425		204.8	235.4			263.8	2.9
1987	350		159.8	186.5			216.2	3.1
1988	350		136.7	150.8			180.5	3.5
1989	325		127.7	148.5			179.8	3.5
1990	325		121.6	136.4			172.8	3.3
1991	325		117.0	137.3			178.4	2.9
1992	325		116.3	136.0			180.8	2.4
Subtotal	3973		1950.5	2402.1			2509.9	
Total	3973		1950.5	2737.5			2860.0	

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SM-2 MR/ER, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)SM-2 ER Block I/Block II (Cont'd)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1982	167.4	167.4	167.4
1983	7.3	7.3	7.3
1984	7.3	8.0	7.5
1985	14.6	15.4	12.2
1986	20.8	18.1	13.5
1987	22.0	2.0	0.0
1988	20.2	-	-
1989	22.5	-	-
1990	30.7	-	-
1991	17.0	-	-
1992	20.3	-	-
Subtotal	350.1	201.0	190.2

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SM-2 MR/ER, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)SM-2 ER Block I/Block II (Cont'd)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: PROCUREMENT			
1976	48.4	48.4	48.4
1977	42.9	42.8	41.4
1978	48.2	48.1	46.8
1979	46.8	47.3	45.8
1980	41.0	41.0	39.8
1981	135.0	135.0	130.0
1982	215.4	215.4	202.9
1983	272.3	272.3	198.2
1984	108.9	108.9	76.9
1985	178.7	129.0	50.6
1986	263.8	168.3	15.6
1987	216.2	2.3	0.0
1988	180.5	-	-
1989	179.8	-	-
1990	172.8	-	-
1991	178.4	-	-
1992	180.8	-	-
Subtotal	2509.9	1258.7	896.4
Total	2860.0	1459.7	1086.6

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SM-2 MR/ER, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)SM-2 Block II MR/ER (Summary)

b. Appropriation Summary --

Appropriation	Current & Prior Yrs (FY80-86)	(Then-Year Dollars in Millions)			Total
		Budget Year (FY88)	Balance FYDP (FY89-92)	To Complete Beyond FYDP (FY93)	
RDT&E	513.3	116.5	411.0	-	1040.8
Procurement	3481.0	600.3	4259.1	-	8340.4
Total	3994.3	716.8	4670.1	-	9381.2

c. Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars		Escl Rate (%)	
		Flyaway		Total	Advance Proc			Total
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1982	88	-	-	324.1	-	-	305.0 7.6	
1983	-	-	-	23.6	-	-	23.2 4.9	
1984	-	-	-	16.9	-	-	17.3 3.8	
1985	-	-	-	27.8	-	-	29.2 3.4	
1986	-	-	-	61.0	-	-	66.1 2.9	
1987	-	-	-	64.8	-	-	72.5 3.1	
1988	-	-	-	100.6	-	-	116.5 3.5	
1989	-	-	-	123.0	-	-	147.2 3.5	
1990	-	-	-	113.8	-	-	140.3 3.3	
1991	-	-	-	53.2	-	-	67.4 2.9	
1992	-	-	-	43.3	-	-	56.1 2.4	
Subtotal	88	-	-	952.1	-	-	1040.8	

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SM-2 MR/ER, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)SM-2 Block II MR/ER (Summary)

c. Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: PROCUREMENT								
1976	22		53.9	92.5			48.4	6.6
1977	36		60.4	73.8			42.9	3.7
1978	40		61.3	74.3			48.2	6.8
1979	40		51.8	65.3			46.8	8.7
1980	85		63.1	81.9			64.7	11.8
1981	345		156.3	198.3			174.4	11.6
1982	495		229.6	286.4			273.9	14.3
1983	500		292.8	396.9			401.1	9.0
1984	490		310.7	382.9			404.5	8.0
1985	784		414.2	477.5			518.2	3.4
1986	1271		598.5	671.6			752.6	2.9
1987	1194		518.5	608.7			705.4	3.1
1988	1150		459.0	501.5			600.3	3.5
1989	1635		616.1	677.7			832.5	3.5
1990	1940		702.0	785.5			994.9	3.3
1991	2315		803.5	891.0			1156.5	2.9
1992	2335		886.0	959.5			1275.2	2.4
Subtotal	14677		6277.7	7222.9			8340.4	
Total	14765		6277.7	8175.0			9381.2	

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17. Production Rate Data:SM-2 MR Block I/Block IIa. Annual Production Rates -- 1/

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate <u>2/</u>	Maximum <u>2/</u>
1983	30	30	150	150
1984	390	390	390	390
1985	475	475	529	529
1986	830	830	846	846
1987	1225	1225	844	844
1988	1340	1340	800	800
1989	1545	1545	1310	1310
1990			1615	1615
1991			1990	1990
1992			2010	2010

b. Cost Variance --

Item	Production Estimate	Variance (CE less PDE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BY \$)	3648.7	1790.8	5437.5	0	5437.5
(TY \$)	4582.9	1940.8	6521.2	0	6521.2
PAUC (BY \$)	0.581	-0.077	0.504	0	0.504
(TY \$)	0.729	-0.125	0.604	0	0.604

c. Schedule Variance --

Item	Production Estimate	Variance (CE less PDE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	7/83	N/A	7/83	N/A	7/83
Duration (in Months)	96 mos.	24 mos.	146 mos	0	146 mos.
End Date (Mo/Yr)	7/91	N/A	7/95	N/A	7/95

d. Deliverables (Plan/Actual) --

	To Date
RDT&E	88/88
Procurement	199/199

1/ Block II only. Delivery period is 12 months from 1st delivery to last.

2/ Quantity shown is budget quantity, figures do not include lead time.

Producing at maximum economic rate.

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SM-2 MR/ER, December 31, 1986

17. Production Rate Data:SM-2 ER Block I/Block II

a. Annual Production Rates -- 1/

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate 2/	Maximum 2/
1982	35	35	375	375
1983	140	140	350	350
1984	100	100	100	100
1985	255	255	255	255
1986	500	500	425	425
1987	935	935	350	350
1988	650	650	350	350
1989	950	950	325	325
1990			325	325
1991			325	325
1992			325	325

b. Cost Variance --

Item	Production Estimate	Variance (CE less PDE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BY \$)	2922.8	-183.9	2737.5	0	2737.5
(TY \$)	3469.9	-608.2	2860.0	0	2860.0
PAUC (BY \$)	0.638	-0.052	0.689	0	0.689
(TY \$)	0.757	-0.037	0.720	0	0.720

c. Schedule Variance --

Item	Production Estimate	Variance (CE less PDE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr)	7/82	N/A	7/82	N/A	7/82
Duration (in Months)	108 mos.	24 mos.	156 mos.	0	156 mos.
End Date (Mo/Yr)	7/91	N/A	7/95	N/A	7/95

d. Deliverables (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	65/65

Note: Production is above the minimum economic rate and less than the maximum rate for facilitization.

18. Operating and Support Costs: N/A.

- 1/ Block II only. Delivery period is 12 months from 1st delivery to last.
 2/ Quantity shown is budget quantity; figures do not include lead time.
 Producing at maximum economic rate.

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SELECTED ACQUISITION REPORT (RCS DD-COMP (Q&A) 823)
PROGRAM: AN/BSY-1 (SUBACS BASIC) (U)

AS OF DATE: December 31, 1986

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1. (U) Designation/Nomenclature (Popular Name): AN/BSY-1 CH-1
2. (U) DoD Component: U. S. Navy
3. (U) Responsible Office and Telephone Number:

AN/BSY-1 Submarine Combat
 System Project, PMS417
 Naval Sea Systems Command
 Washington, D.C. 20362

CDR P. F. SCHISLER, USN
 Assigned: September 1984
 Area Code 202/746-0032
 AUTOVON 286-0032

4. (U) Program Elements:

RDT&E:

PE63524 - S1346 SUBACS (FY82 and Prior)
 PE64524 - S1347 AN/BSY-1
 PE64503 - S0219 TAC 110 ARRAYS
 TAC 120 TBX Integration
 TAC 270 HF (High Frequency) Transait
 PE63504 - S0223 Submarine Active Detection Sonar (SADS)
 PE24281 - S0239 MIDAS (Mine and Ice Detection and Avoidance Sonar)

5. (U) Related Programs: None

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DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (OASD-PA)
 DEPARTMENT OF DEFENSE

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AN/BSY-1, December 31, 1986

6. ~~(S)~~ Mission and Description:

a. (U) Mission Area -- The SSN 688 Submarine Combat System supports the SSN mission to conduct prompt and sustained combat operations. The fundamental warfare tasks supporting this mission are: Anti-Submarine Warfare (ASW), Anti-Surface Warfare, Strike Warfare and Mine Warfare. Supporting warfare tasks for the SSN are: Special Warfare; Ocean Surveillance; Intelligence/Reconnaissance; Command, Control, and Communications (C³); and Electronic Warfare.

(b)(1)

7. (U) Program Highlights (Since Last Report):

a. (U) The program was restructured into two separate Combat Systems. This restructuring was caused by a projected shortfall of \$853 million to develop and deploy the three versions of the Combat System approved in October 1983. The \$853 million shortfall was identified by the Naval Sea Systems Command in August 1984 and attributed to insufficiently funded requirements, budget cuts, planning errors, and contractor cost overruns.

b. (U) A zero base RDT&E funding and requirements audit initiated in August 1984 resulted in replanning of the program to ensure cost, schedule and performance requirements could be achieved within approved funding. The restructured AN/BSY-1 (formerly SUBACS BASIC) is reflected in this revision of the SAR.

c. (U) Replan III for the AN/BSY-1 is for ships authorized in FY83-FY88. Replan III spreads the development risk over three phases (May 87 for initial ship's delivery, September 88 for ship's deployment, and post September 88 for Find, Fix and Retest). Replan III resulted in the cancellation of the intermediate configuration (SUBACS A) and those improvements moved to the FY89 Combat System (formerly SUBACS B and B¹). The AN/BSY-1 configuration was modified to eliminate the Distributed System Data Bus (DSDB), substituting lower risk architecture using AN/UYK-43 computers. AN/BSY-1 is expected to satisfy all current mission requirements.

d. (U) Changes since December 31, 1986 - None

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AN/BSY-1, December 31, 1986

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated November 1985) threshold breaches.

AN/BSY-1 is expected to satisfy all current mission requirements.

	<u>PLANNING ESTIMATE/ APPROVED PROGRAM</u>	<u>CURRENT ESTIMATE</u>	
9. (S) <u>SCHEDULE:</u>			
a. (S) <u>Milestones</u> —			
1 (U) Program Initiated (MENS Approved)	Nov 80	Nov 80	
(U) <u>DSARC I</u> Approve Design Definition SUBACS A and Concept Development SUBACS B	Sep 83	Sep 83	
(U) <u>DSARC II</u> Approve FSD SUBACS BASIC	Sep 83	Sep 83	
(U) Award FSD Contract SUBACS BASIC	Oct 83	Dec 83	
Approve FSD SUBACS A and Design Definition of B	Sep 85	Cancelled	CH-1
DSARC Program Review		Mar 86	CH-4
DSARC II AN/BSY-1 Program Review	Oct 87	Not required	CH-4
DSARC II AN/BSY-1 Program Review	Oct 86	Not required	CH-4
SSN 751 Delivery	Jun 88	Nov 87	
Start TECH/OPEVAL AN/BSY-1	Jan 89	Jan 89	CH-1
(U) <u>DSARC III</u> Review of TECH/OPEVAL Results	Oct 89	Oct 89	CH-1

(b)(1)

b. (U) Explanation of Changes -- Change 1 reflects Replan III for the AN/BSY-1.

c. (U) References -- Planning Estimate: NDCP SUBACS BASIC, dated 15 Nov 1985; Approved Program: FY88 President's Budget

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AN/BSY-1, 31 December 1986

10. ~~(S)~~ TECHNICAL/OPERATIONAL CHARACTERISTICS AN/BSY-1:*

a. ~~(S)~~ TECHNICAL -- ~~(S)~~

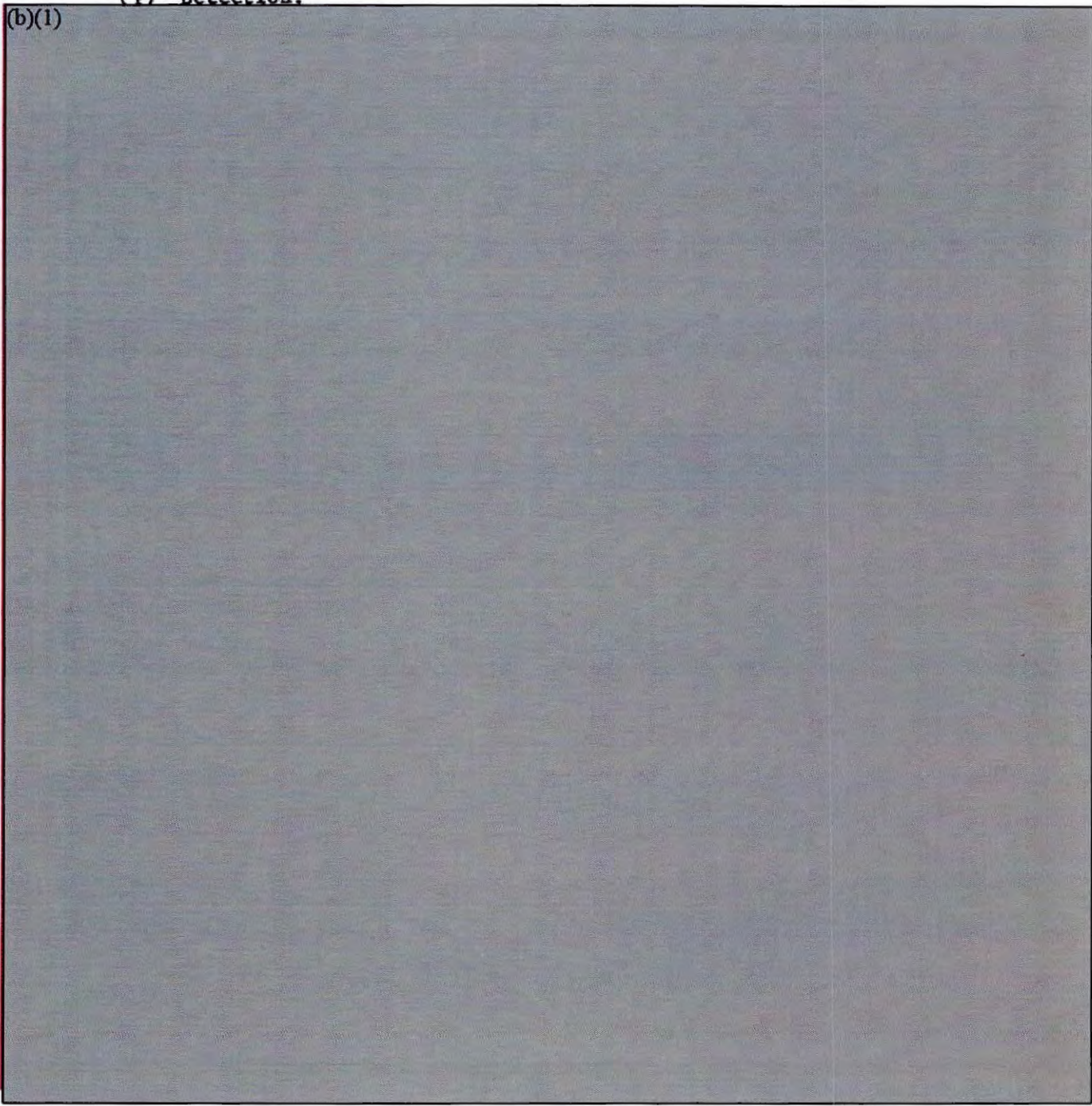
PLANNING
ESTIMATE/
APPROVED
PROGRAM

DEMONSTRATED
PERFORMANCE

CURRENT
ESTIMATE

~~(S)~~ Acoustic Subsystem
Figure of Merit
(1) Detection:

(b)(1)



~~CONFIDENTIAL~~

AN/BSY-1, 31 December 1986

10 ~~CONFIDENTIAL~~ TECHNICAL/OPERATIONAL CHARACTERISTICS AN/BSY-1: (Cont'd)

		<u>PLANNING ESTIMATE/ APPROVED PROGRAM</u>	<u>DEMONSTRATED PERFORMANCE</u>	<u>CURRENT ESTIMATE</u>
a. CONFIDENTIAL	<u>TECHNICAL -- (Cont'd)</u>			
CONFIDENTIAL	<u>Acoustic Subsystem</u> <u>Figure of Merit (Cont'd)</u>			

(b)(1)



~~CONFIDENTIAL~~ Combat Control Subsystems
(1) Localization

(b)(1)



10. ~~(S)~~ TECHNICAL/OPERATIONAL CHARACTERISTICS AN/BSY-1: (Cont'd) ~~(S)~~

a. ~~(S)~~ TECHNICAL -- (Cont'd) ~~(S)~~

PLANNING ESTIMATE/ APPROVED PROGRAM	DEMONSTRATED PERFORMANCE	CURRENT ESTIMATE
--	-----------------------------	---------------------

~~(S)~~ Combat Control Subsystem ~~(S)~~
(Cont'd)

(b)(1)

[Redacted]

(2) Weapon Order Generation

- Max Number of Weapons
That Can Be Preset
Concurrently

(b)(1)

[Redacted]

- Max Number of Weapons
That May Be Post-
Launch Controlled
Concurrently

(b)(1)

[Redacted]

- Max Number of
Targets For Which
Orders May Be
Generated

(b)(1)

[Redacted]

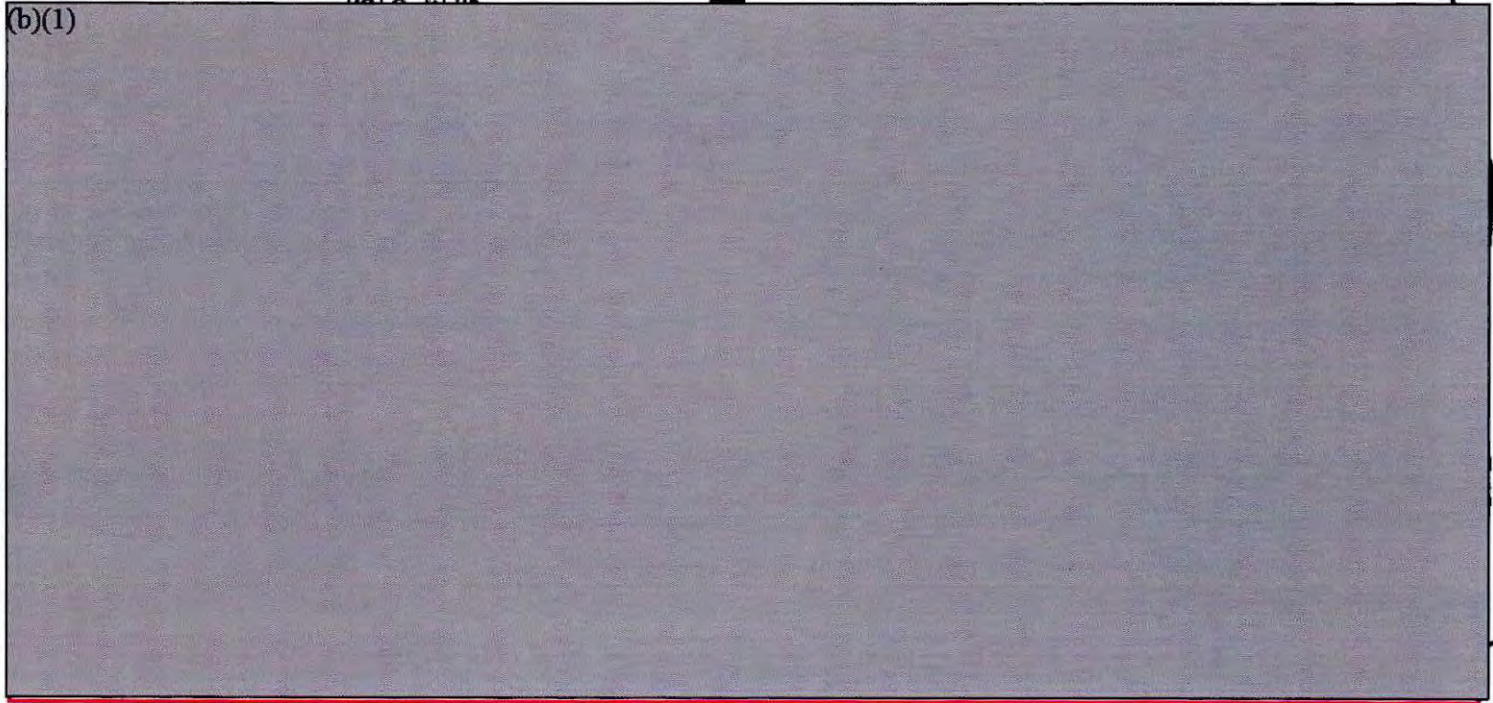
~~CONFIDENTIAL~~

AN/BSY-1, 31 December 1986

10. ~~CONFIDENTIAL~~ TECHNICAL/OPERATIONAL CHARACTERISTICS AN/BSY-1: (Cont'd)

		<u>PLANNING ESTIMATE/ APPROVED PROGRAM</u>	<u>DEMONSTRATED PERFORMANCE</u>	<u>CURRENT ESTIMATE</u>
a. CONFIDENTIAL	TECHNICAL -- (Cont'd)			
	(3) Over-The-Horizon - Submarine Operational Data Link			

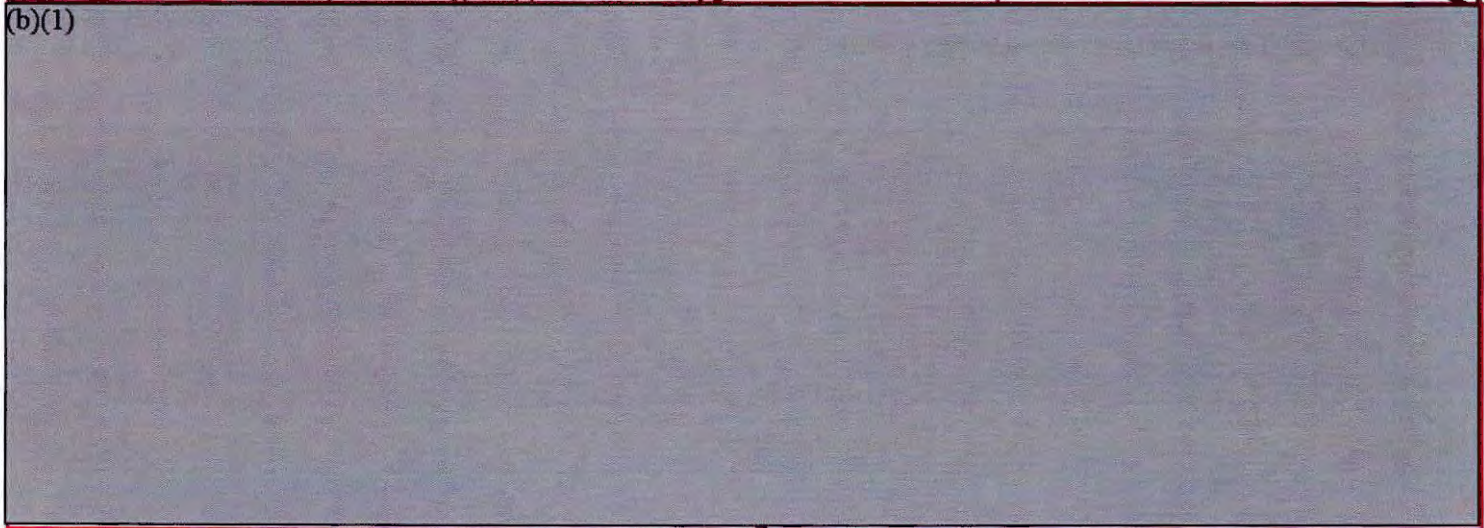
(b)(1)



b. ~~CONFIDENTIAL~~ OPERATIONAL --

~~CONFIDENTIAL~~ Acoustic Subsystem
Detection Ranges, Yards

(b)(1)



~~CONFIDENTIAL~~

AN/BSY-1, 31 December 1986

10. ~~(S)~~ TECHNICAL/OPERATIONAL CHARACTERISTICS AN/BSY-1: (Cont'd)

b. ~~(S)~~ OPERATIONAL -- (Cont'd)

PLANNING
ESTIMATE/
APPROVED
PROGRAM

DEMONSTRATED
PERFORMANCE

CURRENT
ESTIMATE

~~(S)~~ Acoustic Subsystem
Detection Ranges, Yards
(Cont'd)

(b)(1)

~~CONFIDENTIAL~~

AN/BSY-1, December 31, 1986

10. ~~(S)~~ TECHNICAL/OPERATIONAL CHARACTERISTICS AN/BSY-1: (Cont'd) }

b. (S)	OPERATIONAL - (Cont'd) }	PLANNING		
		ESTIMATE/ APPROVED <u>PROGRAM</u>	<u>DEMONSTRATED</u> <u>PERFORMANCE</u>	<u>CURRENT</u> <u>ESTIMATE</u>

(b)(1)

AN/BSY-1, December 31, 1986

~~(S)~~ 10. ~~(S)~~ TECHNICAL/OPERATIONAL CHARACTERISTICS AN/BSY-1: (Cont'd) ~~(S)~~

b. ~~(S)~~ OPERATIONAL -- (Cont) ~~(S)~~

PROGRAM
REVIEW
12/85

IOT&E
LAND-BASED
[3]

MATURITY
THRESHOLDS

(b)(1)



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AN/BSY-1, December 31, 1986

10. ~~CONFIDENTIAL~~ TECHNICAL/OPERATIONAL CHARACTERISTICS AN/BSY-1: (Cont'd)

(b)(1)

11. Program Acquisition: (Current Estimate in Millions of FY1984 Dollars)

a. Cost --	Development ^{1/} Estimate	Changes	Current Estimate
<u>Development</u> (RDT&E)	2027.5 ^{2/}	- 893.8	1133.7 ^{2/}
<u>Procurement</u> (OPN)	944.9	- 539.5	405.4
<u>Construction</u>	---	---	---
Total: Constant FY84 \$	2972.4	-1,433.3	1,539.1
<u>Escalation</u>			
Development	319.4	- 245.6	73.8
Procurement	535.8	- 426.7	109.1
Construction	---	---	---
<u>TOTAL THEN-YEAR \$ ^{3/}</u>	<u>3827.6</u>	<u>-2105.6</u>	<u>1722.0</u>

b. Quantities -- N/A

c. Unit Cost -- N/A

d. Approved Design-to-Cost Goal --

e. Foreign Military Sales -- None

f. Nuclear Costs -- None

^{1/} Development estimate includes all approved technical requirements before AN/BSY-1 was separated from AN/BSY-().

^{2/} Includes \$237.5 for Prior Years, \$129.2 in FY84, \$183.1 in FY85 and \$198.7 in FY86 actuals.

^{3/} Production systems for new construction ships fall under the SCN appropriation and are reported in the SSN SAR. Support equipment procurement is reported in this SAR.

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AN/BSY-1, December 31, 1986

12. Program Acquisition/Current Procurement Unit Cost Summary: (Current
(Then Year) Dollars in Millions)

	(FY 1987)		(FY 1988)
	Current Year		Budget Year
	SAR Current	UCR Baseline	UCR Baseline
a. Program Acquisition	Estimate	Estimate	Estimate
(1) Cost	1722.0	1722.0	1722.0
(2) Quantity ^{1/}	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A
b. Current Procurement	(FY 1987)	(FY 1988)	(FY 1989)
(1) Cost	N/A	N/A	N/A
Less CY Adv Proc	N/A	N/A	N/A
Plus PY Adv Proc	N/A	N/A	N/A
Net Total	N/A	N/A	N/A
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

Note:

Not Applicable. Production systems for new construction ships are under the appropriation and are included in the SSN 688 SAR.

^{1/} One Team Trainer is budgeted in each of the years FY87 and FY88; two Team Trainers are budgeted in FY92; one Module Screening and Repair Activity (MSRA) is budgeted in each of the years FY87, FY88 and FY91; and a Software Maintenance Facility is budgeted in FY89.

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AN/BSY-1, December 31, 1986

13. Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Baseline Estimate	2346.9	1480.7	-	3827.6
Previous Changes:				
Economic	- 36.7	- 35.4	-	- 72.1
Quantity	- 69.1	-	-	- 62.1
Schedule	+ 15.5	+ 9.5	-	+ 25.0
Engineering	+ 26.8	+ 1.1	-	+ 27.9
Estimating	- 31.0	+ 51.8	-	+ 20.8
Other	-1050.9	-1586.7	-	-2637.6
Support	-	+ 386.6	-	+ 386.6
Subtotal	-1138.4	-1173.1	-	-2311.5
Current Changes				
Economic	- 11.5	- 4.7	-	- 16.2
Quantity	-	+ 108.9	-	+ 108.9
Schedule	-	-	-	-
Engineering	+ 5.4	+ 48.6	-	+ 54.0
Estimating	+ 5.1	+ 54.1	-	+ 59.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	- 1.0	+ 206.9	-	+ 205.9
Total Changes	-1139.4	- 966.2	-	-2105.6
Current Estimate	1207.5	514.5	-	1722.0

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AN/BSY-1, December 31, 1986

13. Cost Variance Analysis: (Cont'd)

(FY 1984 Constant Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Baseline Estimate	2027.5	944.9	-	2972.4
Previous Changes:				
Economic		-	-	-
Quantity	- 57.0	-	-	- 57.0
Schedule	+ 13.2	+ 12.4	-	+ 25.6
Engineering	+ 22.6	+ 0.8	-	+ 23.4
Estimating	- 16.1	+ 32.7	-	+ 16.6
Other	- 866.5	-1051.5	-	-1918.0
Support	-	+ 309.6	-	+ 309.6
Subtotal	- 903.8	- 696.0	-	-1599.8
Current Changes:				
Economic	-	-	-	-
Quantity	-	+ 82.1	-	+ 82.1
Schedule	-	-	-	-
Engineering	+ 5.4	+ 36.6	-	+ 42.0
Estimating	+ 4.6	+ 37.8	-	+ 42.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+ 10.0	+ 156.5	-	+ 166.5
Total Changes	- 893.8	- 539.5	-	-1433.3
Current Estimate	1133.7	405.4	-	1539.1

b. Previous Change Explanations --

RDT&E

Economic: Revised Escalation Indices
 Quantity: Removed EDM and LBTS
 Schedule: Rephasing of chassis and software boot development (CC/A)
 Engineering: ECPs to the Combat Control/Acoustic Subsystem, Submarine Active Detection Sonar Transmit Group (TG) and High Frequency Transmitter (HFT); AN/UYK-43 rearchitecture; revised OPEVAL/TECHEVAL support.
 Estimating: Software, Basic Operator Trainer (BOT) and Weapons Launch System Operator Trainer (WLSOT) cost growth; correction for administrative effort; CC/A, TG and HFT overrun projections.
 Other: Separation of the AN/BSY-1 from the AN/BSY-()

Procurement

Economic: Revised Escalation Indices
 Schedule: Change of backfit equipment and earlier deliveries to meet accelerated ship building schedule.
 Engineering: Configuration changes to enhance capability.
 Estimating: Estimating changes.
 Other: Separation of the AN/BSY-1 from the AN/BSY-()
 Support: Redefinition of support requirements for trainers and spares.

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13. Cost Variance Analysis: (Cont'd)c. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base Year \$</u>	<u>Then Year \$</u>
(1)	<u>RDT&E</u>		
o	Revised Jan 87 economic escalation rates. (Economic)	-	- 11.5
o	Changes to CC/A configuration; upgrade of C4.1 software boot; changes in TECHEVAL/OPEVAL (Engineering)	+ 5.4	+ 5.4
o	Projection of overruns on Submarine Active Detection Sonar Transmit Group contract; requirements for engineering support (Estimating)	+ 4.6	+ 5.1
(2)	<u>Procurement</u>		
o	Revised Jan 87 economic escalation rates (Economic)		- 4.7
o	Addition of MSRA, Team Trainers and associated spares to support an increased number of operational systems (Quantity)	+ 82.1	+ 108.9
o	Upgrade of Team Trainers to provide additional combat control processing; upgrade of Maintenance Trainer to provide additional combat control processing; addition of acoustic and combat control minibays and compile facility to Software Maintenance Facility (Engineering)	+ 36.6	+ 48.6
o	Increase in Product Improvement and Overhaul Material needs because of extended program. (Estimating)	+ 37.8	+ 54.1

- d. References -- Development Estimate: SDDM, dated October 5, 1983, subject "Submarine Advanced Combat System (SUBACS) DSARC I/IIA Decision Memorandum."

-- Approved Program: FY1988 President's Budget

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AN/BSY-1, December 31, 1986

14. Program Acquisition Unit Cost (PAUC) History:*

a. Initial SAR Estimate to Current Baseline Estimate -- N/A

b. Current Baseline Estimate to Current Estimate -- N/A

* Not Applicable. Production systems for new construction ships are procured under SCN appropriation and are included in the SSN 688 report.

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --
AN/BSY-1 FSD portion only*:
 IBM Corp., Manassas, VA,
 N00024-83-C-6083, CPIF (Cost Capped), \$89.0 N/A 3.0
 Award: December 2, 1982 (CC/A Mod awarded December 22, 1983)
 Definitized: December 2, 1982 (CC/A Mod definitized December 22, 1983)

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1034.0	\$1034.0	5.0	\$1034.0	\$1034.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-80.2	\$-65.4
Cumulative Variances To Date (10/17/86)	\$-14.1	\$-55.6
Net Change	\$+66.1	\$+ 9.8

Explanation of Change: IBM's favorable net change in the cost and schedule variances is largely due to the replanning and restructuring of the program. The previous cumulative variances reported above reflect the old baseline, while the cumulative variances to date reflect the new baseline. The program manager's estimate at completion remains at the ceiling price and is within approved funding.

	<u>Initial Contract Price</u>		
<u>SADS TG FSD:</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Raytheon Co., Portsmouth, RI, N00024-81-C-6236, CPAF, Award: June 30, 1981 Definitized: June 30, 1981	\$54.2	N/A	3.0

* The data reported above is for the FSD portion of the 6083 contract, which was definitized in February 1986 at a ceiling price of \$1034.0M. This is a capped CPIF contract with no further liability to the Government above the \$1034.0M ceiling price. The FY85/SPARES portions of the contract are SCN/NSF funding only and therefore have not been added to the data as in previous reporting periods.

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AN/BSY-1, December 31, 1986

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$127.1	N/A	6.0	\$132.3	\$136.9
Previous Cumulative Variances			Cost Variance	Schedule Variance
Cumulative Variances To Date (10/26/86)			\$- 7.7	\$-1.0
Net Change			\$-14.6	\$-1.2
			\$- 6.9	\$-0.2

Explanation of Change: Raytheon's unfavorable net change in the cost variance is largely due to additional effort caused by vendor, producibility and fit problems and rework/upgrade of modules as a result of testing; higher material costs than planned for the Sonar Transmitter Unit, the Primary Power/Transmit Control Unit and the Aperture Switch Assembly in the FY84 Buy; extensive engineering work to support Manufacturing and to develop EOs to reflect required design changes; and an increased failure rate and the addition of two major ECOs (switch mode power supply and saturable reactor) that have required rework of all Modular Power Amplifiers built, as well as a complete retest. The unfavorable net change in the schedule variance is not significant. The program manager's estimate at completion is within approved funding.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

- (1) Percent Program Completed: 44% (7/16 yrs.)
- (2) Percent Program Cost Appropriated: 60% (\$1032.8/\$1722.0)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current and Prior Years (FY81-FY87)	Budget Year (FY88)	Balance to Complete FYDP (FY89-FY92)	Beyond FYDP (FY93-FY96)	Total
RDT&E	959.1	133.2	115.2	---	1207.5
Procurement	73.0	62.5	316.4	62.6	514.5
MILCON	---	---	---	---	---
Total	1032.1	195.7	431.6	62.6	1722.0

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AN/BSY-1, December 31, 1986

16. Program Funding Summary: (Current Estimate in Millions of Dollars (Cont'd))

c. (U) Annual Summary --

Fiscal Year	Qty	FY84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
			Appropriation: RDT&E					
PRIOR	-	-	-	251.0	-	-	237.5	-
FY84	-	-	-	126.3	-	-	129.2	3.8
FY85	-	-	-	174.1	-	-	183.1	3.4
FY86	-	-	-	184.1	-	-	199.4	2.9
FY87	-	-	-	187.6	-	-	209.9	3.1
F788	-	-	-	115.0	-	-	133.2	3.5
FY89	-	-	-	74.0	-	-	88.6	3.5
FY90	-	-	-	20.0	-	-	24.6	3.3
FY91	-	-	-	1.6	-	-	2.0	2.9
Subtotal				1133.7			1207.5	-

Fiscal Year	Qty	FY84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
			Appropriation: OPN					
FY86	-	-	-	0.9	-	-	1.0	2.9
FY87	-	-	-	62.0	-	-	72.0	3.1
FY88	-	-	-	52.1	-	-	62.5	3.5
FY89	-	-	-	86.5	-	-	106.9	3.5
FY90	-	-	-	11.0	-	-	14.0	3.3
FY91	-	-	-	84.3	-	-	109.5	2.9
FY92	-	-	-	64.5	-	-	86.0	2.4
FY93	-	-	-	5.2	-	-	7.1	2.4
FY94	-	-	-	0.0	-	-	0.0	2.4
FY95	-	-	-	34.9	-	-	49.9	2.4
FY96	-	-	-	3.9	-	-	5.6	2.4
Subtotal				405.3			514.5	-
Total				1539.0			1722.0	

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AN/BSY-1, December 31, 1986

16. Program Funding Summary: (Current Estimate in Millions of Dollars (Cont'd)

d. Obligations and Expenditures-

Fiscal Year	Total	Obligated	Expended
Appropriation: RDT&E			
PRIOR	237.5	200.4	198.4
FY84	129.2	129.2	127.8
FY85	183.1	183.1	180.2
FY86	199.4	198.7	168.0
FY87	209.9	120.2	50.7
TO COMPLETE	248.4	N/A	N/A
Total	1207.5	831.6	725.1

17. Production Rate Data: N/A

Production Systems for new construction ships are procured under the SCN appropriation and are reported in the SSN SAR. Only support equipment procurement is reported in this SAR.

A-24 TOW-2

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SELECTED ACQUISITION REPORT (RCS: DD-COMP (Q&A) 823)

PROGRAM: TOW 2

86-018

AS OF DATE:

December 31, 1986

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CONCURRENCE IN CLASSIFICATION
AS MARKED

FEB 26 1987

3 FEB 26 1987
JHEC DATE FOR REVIEW OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1.(U) Designation and Nomenclature (Popular Name): M220E4, Heavy Anti-tank/
Assault Weapon System (TOW 2)

2.(U) DoD Component: U.S. Army

3.(U) Responsible Office and Telephone Number:

TOW Project Office
U.S. Army Missile Command
Redstone Arsenal, AL

PM: COL James B. Lincoln
Assigned: April 30, 1984
AUTOVON 746-7194

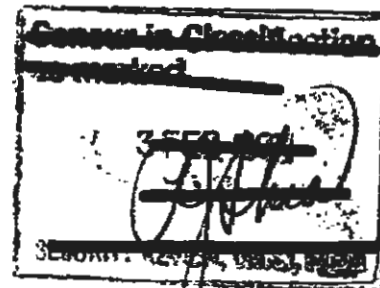
4.(U) Program Elements:

RDT&E: PE 23802 PROJECT D336
PROCUREMENT: APPN 2032, SSN C59300, C61700, CA0253, CA0258
APPN 2035, SSN BL5295, K42500 (Both Sunk)

5.(U) Related Programs:

Not Applicable

CLASSIFIED BY: TOW Security
Classification Guide
Date: 2 Oct 1986
DECLASSIFY ON: 31 Dec 88



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TOW 2, December 31, 1986

6.(U) Mission and Description:

The TOW 2 system is an upgrading of the Basic TOW System necessitated by an existing and postulated future threat. The Basic TOW (tube-launched, optically tracked, wire-guided) System is a crew-portable, heavy anti-tank, assault weapon designed to attack and defeat armored vehicles and other targets such as field fortifications. Concurrent with lethality improvements, the TOW 2 System hardens against obscurants and electro-optical countermeasures.

7.(U) Program Highlights:

a. (U) Significant Historical Developments --

The FY 1986 buy of TOW 2A missiles was awarded to Hughes Aircraft Co., contract DAAH01-86-C-0220 on 7 Aug 86 for a dollar value of \$165,434,439. The FY 1986 buy includes 23,970 missiles (16,125 TOW 2A, 3,817 TOW 2, 3,099 I-TOW, 341 Basic Tow and 588 Practice TOW) for the U.S. Army, U.S. Marine Corps and FMS Customers. Program Budget Decision 690A, Subject: Multiyear Procurement approves a multiyear acquisition strategy for Army and U.S. Marine Corp for FY 1988-1992. The funding profile in this SAR reflects the savings which would be realized from such a strategy.

The TOW Missile deliveries during FY 86 totaled 39,613. There were 24,715 TOW 2 deliveries (22,445 for the Army, 2,200 for the Marines, 70 for DOD payback to the Army inventory and 2,130 for Special Defense Acquisition Fund (SDAF). A total of 12,312 I-TOW, 1,279 Basic, 1,307 Practice missiles were delivered to FMS customers.

Texas Instruments, Inc. and Kollsman Instruments Company continued to work toward delivery of night sight units. Kollsman delivered performance demonstration test AN/TAS-4A sights to the government which were tested and accepted. Texas Instruments, Inc. delivered performance demonstration test units (AN/TAS-4C) for testing; however, these units did not meet specification. A contract for 935 AN/TAS-12C's was awarded to Kollsman. This was originally a split-buy limited competition between Kollsman and Texas Instruments; however, Texas Instruments did not offer a fair and reasonable price. An engineering services contract was awarded to Texas Instruments in December 1986 for effort through 1987.

b. (U) Significant Developments Since Last Report --

The TOW 2B Program received Missile Command System Requirement Review Board (SRRB) and Materiel Acquisition Review Board (MARB) and TRADOC Materiel Evaluation Committee (TMEC) approval during FY86. Concurrently, Product Improvement Proposal (PIP) No. 1-86-03-3026 (TOW 2B) completed appropriate PIP Review. Prior to TOW 2B RFP release, external funding alterations rendered the approved program unexecutable and the RFP was not released as planned. The funding resolution is currently being worked between HQ DA and HQ AMC and RFP release is being delayed until all funding issues are resolved. The program may require restructuring based upon funding availability and contractual timing. The TOW 2B requirement is still valid and the RFP will be released pending restructuring and contractual implications. TOW 2B is expected to meet mission requirements.

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c. (U) Changes Since "As of" Date -- None.

8.(U) Decision Coordinating Paper (DCP) Threshold Breaches: None.

9.(U) Schedule:

a. (U) <u>Milestones</u>	<u>Production/Approved Estimate /Program</u>	<u>Current Estimate</u>
Program Go-ahead	Sep 78/Sep 78	Sep 78
R&D Contract Award	Dec 78/Dec 78	Dec 78
TOW 2 IPR	Sep 81/Sep 81	Sep 81
1st TOW 2 Production Contract	Dec 81/Dec 81	Dec 81
FUED	Jul 83/Jul 83	Jul 83
IOC	Sep 83/Oct 83	Oct 83

b. (U) Explanation of Changes - None.

c. (U) Reference - (1) (U) Production estimate: IPR approved by HQDA
Message, DAMA-WSM-S, dated 9 Oct 1981.

(2) (U) Approved Program: FY 88-89 President's Budget

10. ~~(S)~~ Technical/Operational Characteristics:

a.(U) <u>Technical</u>	<u>Production/Approved Estimate /Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
1.(U) System Ready to Fire Ground Mount System Weight (lbs) (Launcher in Tripod & 1 Missile)	276/276	276	276
2.(U) a. Missile Weight (in lbs.) (Tactical missile in Container)	63.4/63.4	63.4	63.4
b. Launcher Weight (in lbs.)	216/216	216	216
b.(U) <u>Operational</u>			
1.(U) Range (meters)			
a. (U) Minimum	65M/65M	65M	65M
b. (U) Maximum	3.75KM/3.75KM	3.75KM	3.75KM
2.(U) System Reliability (%)	91.6/91.6	91.6	91.6

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3. (a) Probability of Hit Given a Reliable
Round Fired at a Moving Target in the
Following Environment:

(Basic/TOW 2) (Basic/TOW 2) (Basic/TOW 2)

(b)(1)

10.(U) Technical/Operational Characteristics (cont):

c. (U) Explanation of Changes -- None.

d. (U) Reference -- (1) (U) Pd Est: IPR approved by HQDA Message,
DAMA-WSM-S, dated 9 Oct 1981.

(2) (U) Approved Program: FY88-FY89 President's Budget

11.(U) Program Acquisition Cost:

	<u>Production Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development	107.0	+ 40.9	147.9
Procurement	2,195.1	- 86.0	2109.1
Heat Missile	(1,299.3)	(-138.7)	(1160.6)
Launcher	(7.0)	(- 7.0)	(-0-)
AN/TAS 4/4A Night Sight	(363.2)	(- 89.5)	(273.7)
Ground Supt Retrofit	(325.8)	(+188.2)	(514.0)
Night Sight Retrofit	(26.1)	(- 12.8)	(13.3)
Total Flyaway	(2,021.4)	(- 59.8)	(1961.6)
Training Missile	(28.1)	(- 28.1)	(-0-)
Other Ground Supt. Equip.	(75.2)	(- 31.1)	(44.1)
SURGE, Production Capability	(48.9)	(- 15.7)	(33.3)
Total Other Wpn Sys	(152.2)	(- 74.8)	(77.4)
Initial Spares	(21.5)	(+ 48.6)	(70.1)
Total: constant FY84\$	2,302.1	- 45.1	2257.0
Escalation	321.7	-134.2	187.5
Development	(-15.7)	(+ 5.6)	(-10.1)
Procurement	(337.4)	(-139.8)	(197.6)
Construction	(0)	(0)	(0)
Total Program Cost	2,623.8	-179.3	2444.5
b. (U) Quantities --			
Development (RDT&E)	113	-0-	113
Procurement	141,224	-15,368	125,856
Total	141,337	-15,368	125,969

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	<u>Production Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
c. (U) <u>Unit Cost --</u>			
<u>Procurement:</u>			
FY84 Base-Year \$	.016	.001	.017
Then-Year \$	.018	.001	.018
<u>Program:</u>			
FY84 Base-Year \$	.016	.003	.018
Then-Year \$	.019	.001	.019

d. (U) Approved Design to Cost Goal -- None.

e. (U) Foreign Military Sales -- Sales of TOW 2 to date consist of 4,372 TOW 2 missiles, value \$49 million and 101 launchers, value \$10 million. In addition, 65,350 TOW 2 missiles, value \$66 million and 60 launchers, value \$6 million have been procured with SDAF funds. 1028 missiles and 35 launchers have been committed to Turkey and 1371 missiles to Norway from the SDAF account. Countries committed to TOW 2 upgrade consist of: Canada, Denmark, Germany, Netherlands, Norway, Sweden, Switzerland and Turkey. Ratio of missiles to launchers sales is low since majority of FMS customers are electing to purchase modification kits through direct sales.

f. (U) Nuclear Costs -- None.

12.(U) Program Acquisition/Current Procurement Unit Cost Summary:

(Current (Then Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Estimate</u> (Dec 86 SAR)	<u>UCR Baseline</u> (DEC 85 SAR)	<u>UCR Baseline</u> (Dec 86 SAR)
a. (U) <u>Program Acquisition</u>			
(1) (U) Cost	2444.5	2631.1	2444.5
(2) (U) Quantity	125,969	128,696	125,969
(3) (U) Unit Cost	.019	.020	.019
b. (U) <u>Current Procurement</u>	(FY87)	(FY87 APPN)	(FY88)
(1) (U) Cost	161.1	161.1	160.4
Less CY Adv Proc	0	0	0
Plus PY Adv Proc	20.9	20.9	0
Net Total	182.0	182.0	160.4
(2) (U) Quantity	9,350	9,350	9,416
(3) (U) Unit Cost	.019	.019	.017

c. (U) Previous Change Explanations -- None.

d. (U) Current Change Explanations -- None.

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13.(U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Baseline Estimate (PdE)	\$91.3	\$2532.5	-0-	2623.8
Previous Changes:				
Economic	- 0.4	-104.6	-	-105.0✓
Quantity	-	-166.0	-	-166.0✓
Schedule	-	+ 85.6	-	+ 85.6
Engineering	+55.9	+251.6	-	+307.5
Estimating	-	-151.4	-	-151.4
Other	-	-	-	-
Support	-	+ 36.6	-	+ 36.6
Subtotal	+55.5	- 48.2	-0-	+ 7.3
Current Changes:				
Economic	- 2.1	- 48.3	-	- 50.4✓
Quantity	-	- 36.3	-	- 36.3✓
Schedule	-	+ 26.7	-	+ 26.7
Engineering	- 6.9	- 22.0	-	- 28.9
Estimating	-	- 49.3	-	- 49.3
Other	-	-	-	-
Support	-	- 48.4	-	- 48.4
Subtotal	- 9.0	-177.6	-0-	-186.6
Total Changes	+46.5	-225.8	-0-	-179.3
Current Estimate	137.8	2306.7	-0-	2444.5

(FY 1984 Constant (Base-Year Dollars in Millions))

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	\$107.0	2195.1	-0-	2302.1
Previous Changes:				
Quantity	-	-114.2	-	-114.2✓
Schedule	-	+ 26.6	-	+ 26.6
Engineering	+48.2	+191.9	-	+240.1
Estimating	-	- 93.4	-	- 93.4
Other	-	-	-	-
Support	-	+ 17.2	-	+ 17.2
Subtotal	+48.2	+ 28.1	-0-	+ 76.3
Current Changes:				
Quantity	-	- 26.6	-	- 26.6✓
Schedule	-	+ 10.7	-	+ 10.7
Engineering	-7.3	- 19.9	-	- 27.2
Estimating	-	- 37.8	-	- 37.8
Other	-	-	-	-
Support	-	- 40.5	-	- 40.5
Subtotal	- 7.3	-114.1	-0-	-121.4
Total Changes	+40.9	- 86.0	-0-	- 45.1
Current Estimate	147.9	2109.1	-0-	2257.0

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b. (U) Previous Change Explanations --

(1) (U) RDT&E

Economic: revised escalation indices

Engineering: enhancement to TOW 2 warhead

(2) (U) Procurement

Economic: revised escalation indices

Quantity: reduction of TOW 2 missile quantity

Schedule: stretch-out of missile procurements

Engineering: funding of approved PIPs

Estimating: changes in Night Sight acquisition strategy

Support: increase in requirement for GSE.

c. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) (U) <u>RDT&E</u>		
Revised Dec 86 economic escalation rates. (Economic)		- 2.1
° Reduced Funding for a Lethality Improvement to TOW 2 Missile. (Engineering)	- 7.3	- 6.9
(2) <u>Procurement</u>		
Revised Dec 86 economic escalation rates. (Economic)	N/A	- 48.3
° Reduction of 2,727 TOW 2 missiles from the Procurement Plan (Quantity).	- 26.6	- 36.3
° Buying missiles later at less than ori- ginally scheduled production rate (Schedule).	+ 10.7	+ 26.7
° Decreased funding for approved PIPs (Engineering)	- 19.9	- 22.0
° Approved multiyear savings for TOW 2 missile and changes in Night Sight acquisition strategy (Estimating).	- 37.8	- 49.3
° Reduced funding for initial spares, SURGE and ancillary ground equipment (Support)	- 40.5	- 48.4
(3) <u>MILCON</u>	N/A	N/A

d. (U) References --

Production Estimate: Production IPR approved by HQDA Message,
DAMA-WSM-5, dated 9 Oct 1981.

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14.(U) Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

PAUC Initial SAR Estimate	Changes							PAUC (CURRENT ESTIMATE)	
	ECON	QTY	SCH	ENGR	EST	SPT	OTHER		TOTAL
.019	-.001	-.001	+.001	+.002	-.001	-.000	-0-	-0-	.019

15.(U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E: None.

(b)(4)



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15.(U) Contract Information (Cont):

b(4)

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) (U) Percent Program Completed: 66.7% (10 yrs/15 yrs)

(2) (U) Percent Program Cost Appropriated: 65.5% (\$1601.2/\$2444.5)

b. (U) Appropriation Summary --

<u>Appropriation</u>	<u>Current & Prior Yrs (FY78-87)</u>	(Then-Year Dollars in Millions)			<u>TOTAL</u>
		<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Beyond FYDP</u>	
RDT&E	104.2	18.9	14.7	-	137.8
Procurement	1497.1	160.4	649.2	-	2306.7
MILCON	-	-	-	-	-
TOTAL	1601.3	179.3	663.9	-	2444.5

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16.(U) Program Funding Summary (Cont):

c. (U) Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

APPROPRIATION: RDT&E

1978				8.1			5.3	11.06
1979	113			14.4			10.3	12.61
1980				32.5			25.7	11.42
1981				25.8			22.5	7.58
1982				6.5			6.1	7.60
1983				2.2			2.2	4.90
1984				4.7			4.8	3.80
1985				11.3			11.9	3.40
1986				9.7			10.6	2.90
1987				4.3			4.8	3.10
1988				16.2			18.9	3.50
1989				12.2			14.7	3.50
Subtotal	113			147.9			137.8	

APPROPRIATION: PROCUREMENT (MIPA: ACT II & ACT III) ^{1/}

1981	3875		151.9	151.9			120.6	11.90
1982	10008		207.2	228.2			207.1	14.30
1983	12000		191.2	194.7			192.6	9.00
1984	18000		192.4	212.8			229.6	8.00
1985	12000		184.3	221.6			243.4	3.40
1986	12000		142.8	178.6			201.4	2.90
1987	9350		134.0	138.2		20.9	161.1	3.10
1988	9416		124.0	133.2			160.4	3.50
1989	8719		115.5	123.9			153.5	3.50
1990	9455		119.2	123.6			157.3	3.30
1991	9929		128.2	131.2			170.9	2.90
1992	11104		125.5	125.5			167.5	2.40
Subtotal	125856		1816.2	1963.4			2165.4	

1/ (U) 1981-1985 Reflects Actuals

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16.(U) Program Funding Summary (Cont):

c. (U) Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Esc1 Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
APPROPRIATION: OPA								
1981			30.5	30.5			27.8	11.90
1982			33.0	33.0			32.3	7.60
1983			44.1	44.1			45.3	4.90
1984			33.7	33.7			35.9	4.30
1985								
1986								
1987								
1988								
1989								
Subtotal			141.3	141.3			141.3	
Total	125969		1957.5	2252.6			2444.5	

d. (U) Obligations and Expenditures --

FISCAL YEAR	Then-Year Dollars (Current Estimate in Millions)		
	TOTAL	OBLIGATED	EXPENDED

APPROPRIATION: RDT&E

1978	5.3	5.3	5.3
1979	10.3	10.3	10.3
1980	25.7	25.7	25.7
1981	22.5	22.5	22.5
1982	6.1	6.1	5.8
1983	2.2	2.2	2.2
1984	4.8	4.8	4.5
1985	11.9	11.9	7.3
1986	10.6	9.0	2.7
1987	4.8	.5	0
TO COMPLETE	33.6	N/A	N/A
TOTAL	137.8	98.3	86.3

APPROPRIATION: MIPA

1981	120.6	120.6	120.6
1982	207.1	205.5	191.9
1983	192.6	145.4	133.1
1984	229.6	190.5	154.1
1985	243.4	212.8	101.4
1986	201.4	153.8	19.5
1987	161.1	0	0
TO COMPLETE	809.6	N/A	N/A
TOTAL	2165.4	1028.6	720.6

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16.(U) Program Funding Summary (Cont):

APPROPRIATION: OPA

1981	27.8	1/	N/A	N/A
1982	32.3		N/A	N/A
1983	45.3		10.9	10.4
1984	35.9		29.6	19.7
TO COMPLETE	-0-	2/	N/A	N/A
TOTAL	141.3		40.5	30.1

1/ (U) Executed by CECOM

2/ (U) Transferred to MIPA effective FY85

17.(U) Production Rate Data:

a. (U) Annual Production Rate -- (NOTE: The annual production rates shown differ from the annual funded quantities because the funded delivery period is 6 mos for FY86 and 6 mos for FY87. Also, funded deliveries include U.S. Marine Corp) and Foreign Military Sales.

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1986	N/A	21,628	24,000 1/	30,000
1987	N/A	19,187	18,700	30,000
1988	N/A	16,441	16,790	30,000
1989	N/A	15,400	15,400	30,000
1990	N/A	15,100	15,090	11,661
1991	N/A	14,750	14,750	
1992	N/A	14,700	14,700	

1/ (U) Plant shut-down in Aug 84 resulted in stockpiled assets which were accepted with the resumption of production exceeding the normal maximum rate.

b. (U) Cost Variance -- Dollars in Millions (NOTE: Subject to limitations on production rates above.)

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	2302.1	-45.1	2257.0	+112.8	2144.2
(TY \$)	2623.8	-179.3	2444.5	+235.0	2322.3
PAUC (BY \$)	0.016	+ 0.002	0.018	+ 0.001	0.017
(TY \$)	0.019	0.0	0.019	+ 0.001	0.018

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17.(U) Production Rate Data (Cont):

c. (U) Schedule Variance --

	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (Mo/Yr)	4/82	N/A	4/82	N/A	4/82
Duration (in Mos)	132	N/A	132	36	96
End Date (Mo/Yr)	3/93	N/A	3/93	N/A	5/90

d. (U) Deliveries (Plan/Actual) --

RDT&E
Procurement

To Date
113/113
74,600/57,600

18.(U) Operating and Support Costs: N/A

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N-37 T45TS

SAR-86-059

- 490.6 m
Dec 1984 schedule
should be
under
estimating

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A) 823)
PROGRAM: T45TS

AS OF DATE: December 31, 1986

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1. Designation and Nomenclature (Popular Name): T45TS Navy Undergraduate Jet Flight Training ~~SECRETED~~ (GOSHAWK)
FOR OPEN PUBLICATION

2. DoD Component: Department of the Navy

MAR 03 1987 22

3. Office and Telephone Number:

Naval Air Systems Command
PMA-273, Rm. 844, JP-1
Washington, D.C. 20361-1273

Capt. B. G. Marshall, USN
Assigned: June 14, 1985
AV 222-7392; COMM (202)692-7392

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

4. Program Elements/Procurement Line Items:

RDT&E: PE 63208N APPN 1319 Project No. W1142

PROCUREMENT: PE 84745N APPN 1506 ICN 0338
ICN 0348

5. Related Programs: Navy Aircrew Common Ejection Seat (NACES)

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6. Mission and Description: The T45TS is an integrated system designed to provide undergraduate jet pilot training for prospective Navy/Marine Corps pilots and selected international students to meet aircrew requirements in the 1990's and beyond. A jet strike pilot training rate requirement of approximately 600 pilots annually is projected through the year 2000. The T-45 Training System (T45TS) is comprised of aircraft, simulators, academics, a training integration system (TIS), and contractor logistic support. The T-45A GOSHAWK aircraft is a derivative of the British Aerospace HAWK aircraft. The HAWK is a tandem seat aircraft powered by a single Rolls-Royce Adour turbofan engine. The T-45A is being adapted to provide the capability for carrier catapult and arrested landings and has an adapted engine, the F-405 (Rolls-Royce designation Adour Mk 861-49). The simulator suite includes both Instrument Flight Trainers (IFT) and Operational Flight Trainers (OFT). Academics include textbook materials, classroom aids and a computer-assisted instruction (CAI) system. The TIS utilizes existing hardware and software to provide planning, scheduling, and tracking of training events in order to achieve required training efficiency. Contractor logistic support has been structured to provide for future competition of maintenance support services to ensure that the system will be supported in the most cost effective manner. The T45TS will replace existing T-2C intermediate and TA-4J advanced jet trainer aircraft, simulators, and associated equipment.

7. Program Highlights:

a. Significant Historical Developments -- Development of the T45TS was initiated in 1975 when the Navy perceived that both the T-2B/C and TA-4J aircraft would need to be replaced during the early 1990's due to age and attrition. As a result, a series of studies was conducted to confirm the feasibility of developing a single aircraft for both intermediate and advanced undergraduate jet pilot training. A Mission Element Need Statement (MENS) was approved in 1979. In August 1980, contracts were awarded for the development/definition of two training system alternatives - a system concept with a new design aircraft and one with an existing or derivative aircraft. In March 1981, a Request for Proposal (RFP) for Pre-Full Scale Development (Pre-FSD) was released and on 19 November 1981, the Navy announced the selection of Douglas Aircraft Company (DAC) as the winner of the competition to further develop the system based on a derivative variation of the British Aerospace HAWK aircraft. The Pre-FSD contract was awarded to DAC in September 1982 and in the same year the aircraft was formally designated the T-45A. Until November 1983, entry into FSD was based on a two phase acquisition strategy involving the initial production of 54 Field Carrier Landing Practice (Dry) T-45B aircraft and subsequent development and production of 251 carrier capable (Wet) T-45A aircraft. However, Congressional guidance in November, 1983 to procure only carrier capable aircraft resulted in a major redirection of the acquisition strategy and adjustments in planned costs and milestones.

A Secretary of Defense Decision Memorandum (SDDM), resulting from a successful DSARC Milestone I/II Review, was issued in October 1984 authorizing the T45TS program to enter full scale engineering development (FSED). A \$9.5 million letter contract was signed on October 2, 1984 with the prime contractor, Douglas Aircraft Corporation, to initiate a firm-fixed price, incrementally funded contract for development of the system at a total cost of approximately \$511.9 million (TY\$) over a six year period. Price definitization was subsequently reached in September 1985.

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7. Program Highlights (Cont'd):

b. Significant Developments Since Last Report -- After extensive negotiations, contract definitization was reached in May 1986 on a firm-fixed price FSED contract of \$511.9 million (TY\$) which conforms with the ceiling price established by the Navy. The FSED contract also includes three limited production options for the procurement of 60 aircraft with associated ground training systems and logistic support hardware/software in FY 88 through FY 90. The \$1,337 million not-to-exceed option price contains major contract terms and conditions such as flyaway cost containment, contractor investment in rate tooling and expanded warranty protection provisions. Developmental Test & Evaluation (DT&E) included tests on aircrew escape systems, avionics and antennas. OPEVAL is currently scheduled for March 1990. Based on current projections, T45TS is expected to satisfy all mission requirements.

c. Changes Since "As Of" Date -- None

8. Decision Coordinating Paper (DCP) Threshold Breaches: Approved DCP of November 4, 1985 reflected flight design weight of 12,699 pounds. Subsequent definitization of FSED contract established weight at 12,758 lbs. OSD notified during PRE-DSARC briefing November 6, 1985.

9. Schedule:

a. Milestones --

	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>
Program Initiated (Preliminary Design Study)	Jul 75/Jul 75	Jul 75
Requirements Validation Study	Mar 78/Mar 78	Mar 78
Mission Element Need Statement (MENS)		
Approved/ MS Zero	Jun 79/Jun 79	Jun 79
Request For Quotation (RFQ) For Concept Definition	Dec 79/Dec 79	Dec 79
Alternative System Exploration (ASE)		
Contract Award	Nov 80/Nov 80	Aug 80
Project Charter Approved	Aug 80/Aug 80	Aug 80
ASE Studies Completed	Mar 81/Mar 81	Mar 81
RFQ For Demonstration/Validation (Pre-FSED)	Mar 81/Mar 81	Mar 81
Sustaining Engineering Contract Award	Nov 81/Nov 81	Nov 81
Demonstration/Validation		
Contract Award (Pre-FSED)	Sep 82/Sep 82	Sep 82
Program Redirection (All Carrier Qualified)	-- /Nov 83	Nov 83
Advanced Development Contract Award	-- /Jul 84	Jul 84
Milestone I/II (DSARC)	-- /Sep 84	Sep 84
FSED Letter Contract Award	Sep 84/Oct 84	Oct 84
Milestone IIIA Approval Pilot		
Production (APP) (JRMB)	-- /Sep 87	Sep 87 (Ch-1)
T-45A First Flight	Jan 88/Dec 87	Dec 87
Milestone IIIB Approval Limited		
Production (ALP) (JRMB)	-- /Sep 88	Sep 88 (Ch-1)
Milestone IIIC Approval Limited		
Production (ALP) (JRMB)	-- /Sep 89	Sep 89 (Ch-1)
Complete Navy Technical Evaluation (NTE)	Jan 90/Oct 89	Oct 89
Complete OPEVAL	Jun 90/Mar 90	Mar 90
Initial Operational Capability (IOC)	May 91/Sep 90	Sep 90
Milestone IIID Authorized Full		
Production (AFP) (JRMB)	-- /Oct 90	Oct 90

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9. Schedule (Cont'd):

b. Previous Change Explanations --

DSARC I/II was completed in September, 1984 and IOC redefined as delivery of the 12th production aircraft projected for October, 1990. Similarly, Milestone III D (AFP) was projected for October, 1990 based on the development schedule. Subsequent definitization of the FSED contract established the delivery date of the 12th production aircraft as September 1990.

c. Current Change Explanations --

(Ch-1) First time milestone shown

d. References --

Planning Estimate: Draft SCP of January, 1984.

Approved Program: FY 1988 President's Budget.

10. Technical/Operational Characteristics:

a. Technical --	Planning Estimate/ Appr Program	Demonstrated Performance	Current Estimate
Wing Span (ft)	30.81/30.81	N/A	30.81
Length (ft)	39.26/39.26	N/A	39.26
Height (ft)	13.42/13.42	N/A	13.42
Wing Area (Sq. ft.)	179.64/179.64	N/A	179.64
Flight Design Weight (lbs)	12,420/12,758	N/A	12,758
b. Operational --			
Pilot Training Rate (Annual)	600/600	N/A	600
Aircraft			
(1) Utilization Rate (Hr/Yr)	720/720	N/A	720
(2) Max Range (NM)	1,000/1,000	N/A	1,000
(3) Speed			
(a) Max Level Flt (Mach)	.80/.85	N/A	.85
(b) Approach (Kts)	115-125/125	N/A	125
(4) Sustained G's @ 15,000 ft.	3.0/3.4	N/A	3.4
(5) Mean Flight Hours Between Failure (MFHBF)	3.2/3.2	N/A	3.2
(6) Direct Maintenance Man Hours per Flight Hour (DMMH/FH)	10.0/10.0	N/A	10.0
(7) Mission Capability (%)	85%/85%	N/A	85%
Simulator Availability (% Sched)			
(1) Instrument Flight Trainer (IFT)	96%/95%	N/A	95%
(2) Operational Flight Trainer (OFT)	95%/95%	N/A	95%

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10. Technical/Operational Characteristics (Cont'd):

b. Operational --	<u>Planning Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Academics			
(1) Computer Aided Instruction (CAI) System Availability (% Sched)	98%/95%	N/A	95%
Training Integration System (TIS)			
(1) Availability (% Sched)	99%/95%	N/A	95%

c. Previous Change Explanations --

More sophisticated analyses of inherent HAWK capabilities increased the maximum range estimate from 994 to the SDDM threshold of 1000 and decreased the sustained G's estimate from the SDDM threshold of 3.6 to 3.4. The TIS availability estimated was reduced from 99% to 95% because of DTC considerations. The CAI availability estimate has now been established as an actual contract specification value. Definitized FSED contract changed Flight Design Weight from 12,699 to 12,758 pounds. OSD notified during PRE-DSARC Briefing November 6, 1985.

d. Current Change Explanations --None

e. References --

Planning Estimate: Draft SCP of January, 1984

Approved Program: FY 1988 President's Budget.

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost --	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
Development (RDT&E)	\$1150.3	-625.5	524.8
Procurement	2604.3	+523.8	3128.1
Airframe/CFE	(1259.1)	(+469.8)	(1728.9)
Engine/Accessories (GFE)	(363.6)	(-363.6)	(0.0)
Electronics (GFE/CFE)	(136.6)	(+50.0)	(186.6)
Change Allowance (ECO)	(42.9)	(+3.4)	(46.3)
Other GFE	(17.7)	(+15.6)	(33.3)
Nonrecurring	(35.4)	(+43.4)	(78.8)
Total Flyaway	(1855.3)	(+218.6)	(2073.9)
Other Wpn Sys Cost	(577.5)	(+275.5)	(853.0)
Initial Spares	(171.5)	(+29.7)	(201.2)
Construction (MILCON)	--	+17.0	17.0
Total FY 84 Base-Year \$	3754.6	-84.7	3669.9
Escalation	1707.4	-653.2	1054.2
Development (RDT&E)	(192.6)	(-129.7)	(62.9)
Procurement	(1514.8)	(-527.5)	(987.3)
Construction (MILCON)	(--)	(+4.0)	(4.0)
Total Then-Year \$	5462.0	-737.9	4724.1

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11. Program Acquisition Cost (Cont'd):

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
b. Quantities --			
Development (RDT&E)	4	-2	2
Procurement	300	--	300
Total	304	-2	302
c. Unit Cost --			
Procurement:			
FY 84 Base-Year \$	\$8.7	\$+1.7	\$10.4
Then-Year \$	13.7	--	13.7
Program:			
FY 84 Base-Year \$	12.4	-0.2	12.2
Then-Year \$	\$18.0	\$-2.4	\$15.6
d. Approved Design to Cost Goal --	N/A		
e. Foreign Military Sales --	None		
f. Nuclear Costs --	None		

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>	<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>(Dec 85* SAR)</u>
		<u>Dec 86 SAR</u>
a. Program Acquisition --		
(1) Cost	4724.1	4813.3
(2) Quantity	302	302
(3) Unit Cost	15.6	15.9
b. Current Procurement --	(FY 1987)	(FY 1987)
(1) Cost	55.2	55.2
Less CY Adv Proc	(55.2)	(55.2)
Plus PY Adv Proc	0.0	0.0
Net Total	0.0	0.0
(2) Quantity	0	0
(3) Unit Cost	N/A	N/A
		(FY 1988)
		371.5
		(29.5)
		55.2
		397.2
		12
		33.1

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13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1342.9	4119.1	-	5462.0
Previous Changes:				
Economic	-14.8	-638.3	-	-653.1
Quantity	-23.8	-	-	-23.8
Schedule	-619.6	+16.0	-	-603.6
Engineering	-11.8	+338.2	-	+326.4
Estimating	+21.2	-14.5	-	+6.7
Other	-	-	-	-
Support	-104.7	+403.4	-	+298.7
Subtotal	-753.5	+104.8	-	-648.7
Current Changes:				
Economic	-7.9	-93.0	-	-100.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+5.5	-65.2	+21.0	-38.7
Other	-	-	-	-
Support	+7.7	+49.7	-	+50.4
Subtotal	-1.7	-108.5	+21.0	-89.2
Total Changes	-755.2	-3.7	+21.0	-737.9
Current Estimate	587.7	4115.4	21.0	4724.1

(FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1150.3	2604.3	-	3754.6
Previous Changes:				
Quantity	-24.7	-	-	-24.7
Schedule	-497.4	-	-	-497.4
Engineering	-18.4	+254.3	-	+235.9
Estimating	+18.8	+12.1	-	+30.9
Other	-	-	-	-
Support	-109.1	+269.2	-	+160.1
Subtotal	-630.8	+535.6	-	-95.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+4.8	-47.8	+17.0	-26.0
Other	-	-	-	-
Support	+5.5	+36.0	-	+36.5
Subtotal	+5.3	-11.8	+17.0	+10.5
Total Changes	-625.5	+523.8	+17.0	-84.7
Current Estimate	524.8	3128.1	17.0	3669.9

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13. Cost Variance Analysis (Cont'd):

b. Previous Change Explanations --

RDT&E

Economic: revised escalation indices
 Quantity: decrease from four to two flight test aircraft
 Schedule: milestone schedule adjustments to accommodate reduction in flight test program and earlier first flight of prototype aircraft, deletion of T-45B aircraft funding in accordance with Congressional direction
 Engineering: reduction in requirements for flight testing and tooling and use of existing production engine vice an extensively redeveloped engine and emerging system changes to reduce O&S costs
 Estimating: revision of methodology for estimating engineering hours, accounting and estimating adjustments to accommodate revised escalation rates
 Support: reduced manpower and material to support a two vice a four flight test article program and use of a TIS based on an adaptation of a previously developed computerized instructional system, restoral of prior Navy In-House support reductions

Procurement

Economic: revised escalation indices
 Schedule: revised aircraft procurement schedule
 Engineering: revised estimates to reflect restructured system characteristics approved at DSARC I/II.
 Estimating: change in dollar/pound exchange rate
 Support: more refined estimate of ILS requirements

c. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised Dec 86 economic escalation rates. (Economic)	N/A	-7.9
Accounting and estimating adjustments to accommodate revised escalation rates and prior year actuals. (Estimating)	+4.8	+5.5
Restoral of prior Navy In-House support reductions (Support)	+5	+7
(2) <u>Procurement</u>		
Revised Dec 86 economic escalation rates. (Economic)	N/A	-93.0
Change in U.S. dollar/British pound exchange rate, accounting and estimating adjustments. (Estimating)	-47.8	-65.2
Estimate of ILS requirements for aircraft and ground training systems. (Support)	+36.0	+49.7
(3) <u>MILCON</u>		
New estimate of system specific MILCON (Estimating)	+17.0	+21.0

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13. Cost Variance Analysis (Cont'd):

d. References --

Planning Estimate: Draft SCP dated January, 1984

14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate --N/A

b. Current Baseline Estimate to Current Estimate --

PAUC (Planning Est)	Changes								PAUC (Current) (Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
18.0	-2.5	-.1	-2.0	+1.1	-.1	--	+1.2	-2.4	15.6

15. Contract Information: (Then-year Dollars in Millions)

a. RDT&E --

T-45 Training System:

Douglas Aircraft Co., Long Beach, CA,

N00019-84-C-0240, FFP

Award: October, 1984

Definitized: May, 1986

Initial Contract Price

Target	Ceiling	Qty
\$511.9	N/A	2

Current Contract Price

Target	Ceiling	Qty
\$511.9	N/A	2

Estimated Price At Completion

Contractor	Program Manager
\$511.9	\$511.9

Cost/Schedule Variances: None/FFP Contract

b. Procurement -- N/A (FY 88 Option Date: 1 December, 1987)

c. MILCON -- N/A

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 50.0% (8 yrs/16 yrs)

(2) Percent Program Cost Appropriated: 8.7% (\$411.4/\$4724.1)

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16. Program Funding Summary: (Cont'd)

b. Appropriation Summary --

Appropriation	(Then-Year Dollars in Millions)				TOTAL
	Current & Prior Yrs (FY80-87)	Budget Year (FY88)	Balance FYDP (FY89-92)	To Complete Beyond FYDP (FY93-95)	
RD&E	356.2	96.0	135.5	-	587.7
Procurement	55.2	371.5	2103.8	1584.9	4115.4
MILCON	--	9.2	11.8	-	21.0
Total	411.4	476.7	2251.1	1584.9	4724.1

c. Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Esc1 Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RD&E

1980				4.2	1/		4.2	10.5
1981				1.6	1/		1.6	10.6
1982				5.0	1/		5.0	7.6
1983				7.9	1/		7.9	4.9
1984				24.8	1/		24.8	3.8
1985				64.2			67.5	3.4
1986				107.1			116.0	2.9
1987				115.5			129.2	3.1
1988				82.9			96.0	3.5
1989				73.4			87.8	3.5
1990				19.2			23.7	3.3
1991				19.0			24.0	2.9
Subtotal	2			524.8			587.7	

Appropriation: Procurement

1987				46.2	55.2		55.2	3.1
1988	12	40.5	175.5	310.0	29.5	55.2	371.5	3.5
1989	24	8.2	213.2	338.0	40.6	29.5	417.5	3.5
1990	24	5.4	188.2	345.0	48.3	40.6	437.7	3.3
1991	48	5.2	300.4	459.0	46.7	48.3	596.3	2.9
1992	48	5.1	288.4	490.4	48.6	46.7	652.3	2.4
1993	48	4.9	281.2	444.7	49.2	48.6	605.7	2.4
1994	48	4.8	276.3	376.4	51.5	49.2	525.2	2.4
1995	48	4.7	271.9	318.4		51.5	454.0	2.4
Subtotal	300	78.8	1995.1	3128.1	369.6	369.6	4115.4	

1/ The following amounts must be added to the reflected actuals to bring them to Base Year 1984 dollars: 1980: +0.9, 1981: +0.2, 1982: +0.3, 1983: +0.1, 1984: -0.5.

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16. Program Funding Summary (Cont'd):

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Esc1 Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: MILCON								
1988				7.7			9.2	3.5
1989				--			--	3.5
1990				6.2			7.8	3.3
1991				3.1			4.0	2.9
Subtotal				17.0			21.0	
Total	302			3669.9			4724.1	

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1980	4.2	4.2	4.2
1981	1.6	1.6	1.6
1982	5.0	5.0	5.0
1983	7.9	7.9	7.9
1984	24.8	24.8	23.4
1985	67.5	67.5	64.9
1986	116.0	116.0	86.4
To Complete	360.7	N/A	N/A
Total	587.7	227.0	193.4

17. Production Rate Data:

a. Annual Production Rates -- (NOTE: The annual production rates shown differ from the annual funded quantities because the funded delivery period is 36 months for each production buy.)

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1988	4	N/A	4	N/A
1989	8	N/A	8	N/A
1990	8	N/A	8	N/A
1991	16	N/A	16	N/A
1992	16	N/A	16	N/A
1993	16	N/A	16	N/A
1994	16	N/A	16	N/A
1995	16	N/A	16	N/A

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17. Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	N/A	N/A	3669.9	N/A	N/A
(TY \$)	N/A	N/A	4724.1	N/A	N/A
PAUC (BY \$)	N/A	N/A	12.2	N/A	N/A
(TY \$)	N/A	N/A	15.6	N/A	N/A

c. Schedule Variance --

	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum Economic
Start Date (Mo/Yr)	N/A	N/A	12/87	N/A	N/A
Duration (in Months)	N/A	N/A	118	N/A	N/A
End Date (Mo/Yr)	N/A	N/A	9/97	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RD&E	0/0
Procurement	0/0

18. Operating and Support Costs: N/A

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ASAS/ENSCE

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

Program: ASAS/ENSCE

86-023

AS OF DATE: 31 Dec 1986

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FEB 26 1987 5

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. (U) Designation/Nomenclature (Popular Name): Army "All Source Analysis System (ASAS)" and Air Force "Enemy Situation Correlation Element (ENSCE)."

2. (U) DOD Component: Department of the Army as Executive Agent for Joint Army/Air Force Program.

3. (U) Responsible Office and Telephone Number:

Joint Tactical Fusion Program
Management Office (JTFFMO)
1500 Planning Research Drive
McLean, Virginia 22102-5099

PM: BG William E. Harmon
Assigned: 26 November 1984
Commercial: (703) 556-2930

4. (U) Program Elements/Procurement Line Items:

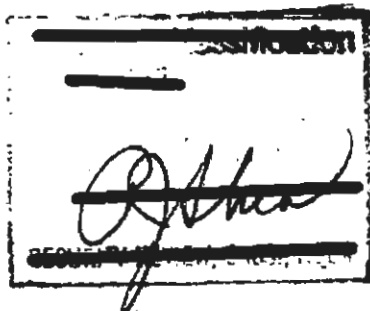
RDTE: PE 64321 PROJ D926 (Shared Funding)

PE 64321F (Air Force) (Shared Funding)

PROCUREMENT: SSN K28800 APPN 2035

AF 3080 -Cost Element 1683790 (Communications
Electronics Spares)

-Cost Element 1683xxx (Electronic and
Telecommunications Equipment)

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5. (U) Related Programs: Army PE 63745 (Tactical ESM Systems), and Army PE 35885G (Tactical Cryptologic Program). Extensive coordination is conducted with other services and with national intelligence agencies to ensure that duplication of effort is avoided.

6. (U) Mission and Description:

(b)(1)



b. (U) The ASAS/ENSCE is a system employing a modular approach to the development. These modules consist of the following:

(1) (U) ASAS/ENSCE Interface Module (AIM). The AIM will provide remote workstation access to the ASAS systems. It will be configured to operate either within an enclave, communicating on the local area network, or outside of an enclave, communicating via service area communications.

(2) (U) Forward Sensor Interface and Control (FSIC) Module. (ASAS only). The FSIC is a data concentrator which receives information in automated and manual form from the forward division sensors located in the Brigade area and automatically relays it to the division ASAS for processing. It identifies high priority sensor reports and routes them to the FSIC operator for sanitization and subsequent release to the brigade headquarters. Additional functions include voice radio and sensor/EW management support.

(3) (U) Intelligence Data Processing (IDP) Module. The IDP receives, processes, stores and transmits information to support analysis, production and dissemination of military intelligence at the TOC (Tactical Operations Center) and supporting CEWI unit, and the Tactical Air Control Center. This module contains software and analyst workstations.

(4) (U) Communications Processor and Interface (CPI) Module. This module provides the interface for all voice and data communications for ASAS/ENSCE enclaves. It will accept inputs from the FSIC (Division only), IDP, and AIM Modules, perform security release and message distribution functions, interface with Service Area Communications and perform internal communications functions.

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(5) (U) The Portable ASAS/ENSCE Workstation (PAWS) is one of the major modules of ASAS/ENSCE and is the primary user interface to the system. The PAWS has been designed as a family of smart workstations to satisfy the needs for system workstations, remote workstations, training workstations and possibly the workstation needs of other systems. The PAWS consists of a 32 bit computer system with dual high resolution color graphic displays, local area network access units and an array of high capacity computer peripherals. It also incorporates advanced video disk technology for map background display.

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- This joint service program was developed at Congressional request to acquire ASAS/ENSCE to meet the critically needed requirements for an automated intelligence command and control system. As a result of Congressional review and Department of Army guidance all ASAS/ENSCE modules were downsized into smaller shelters which were more appropriate to the battlefield environment. During FY 85 the ASAS/ENSCE program developed the AIM Brassboard (ABB) which possesses near-term limited processing capability. PAWS replaced the previous MMI as the primary user interface to the system, which gave increased flexibility to the ASAS/ENSCE system. Field trials for AIM/FSIC were also successfully completed.

b. (U) Significant Developments Since Last Report -- October, 1986 marked delivery of the RDT&E ASAS/ENSCE Interface Module (AIM) and Forward Sensor Interface and Control (FSIC) modules to Ft. Hood. These modules were shipped to the III Corps/2nd Armor Division, Ft. Hood, TX.

(U) A memorandum for Record (MFR) was signed on 4 September 1986 by Mr. J. R. Sculley, Assistant Secretary of the Army (Research, Development and Acquisition) approving a directed procurement of Limited Capability Configurations (LCCs) through NASA/JPL on behalf of the Army. This Directed Acquisition allows procurement of these limited systems. Modules used in the LCC were tested and evaluated during field trials/user's tests at Fort Hood.

(U) In addition, other program highlights were the completion of the PACAF/USAFE ASAS/ENSCE Software Critical Design Review (CDR) at USAFE. The CDR for PAWS was held in September, 1986. Although the Board is currently assessing the outcome of the CDR, initial indication show it to be successful. The ASAS/ENSCE Software Release-1 (R1) In-Process Review (IPR) was successfully completed as were Functional and Physical Configuration Audits (FCA/PCA) of the AIM and FSIC modules.

c. (U) This SAR represents a baselining from planning to development and the inclusion of Air Force ENSCE as reflected in the FY 88 President's Budget.

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- d. ASAS/ENSCE is expected to satisfy mission requirements.
- e. Changes Since "As Of" Date -- None
8. (U) Decision Coordinating Paper (DCP) Threshold Breaches:
None.

9. (U) Schedule:

a. (U) Milestones -- Planning Estimate/ Dev Estimate
 Approved Program Current Estimate

ASAS Acquisition Strategy	Nov 82/Nov 82	Nov 82/Nov 82
OSD/Congressional Approval of Acquisition Strategy	Feb 83/Feb 83	Feb 83/Feb 83
Implementing Contractor Award	Mar 83/Mar 83	Mar 83/Mar 83
Functional Capabilities Document Complete	Dec 83/Dec 83	Dec 83/Dec 83
Preliminary Design Review (Architecture)	Feb 84/Feb 84	Feb 84/Feb 84
Joint Oversight Group (ASARC Authority)	Mar 84/Mar 84	Mar 84/Mar 84
Request for Proposals	May 84/May 84	May 84/May 84
JTFP Letter of Instruction	Jul 84/Jul 84	Jul 84/Jul 84
Award Baseline System Contracts (Development)	Oct 84/Dec 84	Dec 84/Dec 84
Preliminary Design Review (Development)	May 85/Nov 85	Nov 85/Nov 85
ABB Testing	Aug 85/Aug 85	Aug 85/Aug 85
AIM/FSIC Testing	Jul 86/Jul 86	Jul 86/Jul 86
IDP/CPI Testing	Nov 87/Nov 87	Nov 87/Nov 87

(b)(1)

- b. (U) Previous Change Explanations --
- (U) Date of Award slipped due to congressional language freezing funds until Dec 84.
- (U) PDR slipped due to Congressional/DA staff reduction of the program.
- c. (U) Current Change Explanation -- None
- d. (U) References - Letter of Instruction for Joint Tactical Fusion Program (JTFP) Special Task Force (STF), 5 Jul 1984; Chief of Staff, Army Letter, 10 Nov 1982, Subj: All Source Analysis System (ASAS) Acquisition Strategy; Functional Capabilities Document (FCD), 7 Dec 1983.

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(U) Planning Estimate: FY 86 R&D Congressional Descriptive Summary.

(U) Development Estimate: January, 1987 FYDP.

(U) Approved Program: FY88/89 President's Budget

10. (U) Technical/Operational Characteristics:

<u>Planning Estimate/ Approved Program</u>	<u>Demonst Perform</u>	<u>Development Estimate/ Current Estimate</u>
--	----------------------------	---

a. (U) TECHNICAL/OPERATIONAL

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(b)(1)



b. (U) Previous/Current Change Explanations - None

11. (U) Program Acquisition Costs: (Current Estimate in Millions of Dollars)

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Development Estimate/ Current Estimate</u>
a. (U) Cost -			
Development (RDTE)	563.1	+376.5	939.6
Procurement	449.2	+273.4	722.6
Construction (MILCON)	7.8	-7.8	-0-
Total FY84 Base-Year \$	1020.1	+642.1	1662.2
(U) Escalation --	190.5	157.2	347.7
Development (RDTE)	(+65.1)	(+74.0)	(+139.1)
Procurement	(+123.6)	(+85.0)	(+208.6)
Construction (MILCON)	(+1.8)	(-1.8)	(-0-)
Total Then-Year \$	1210.6	+799.3	2009.9

b. (U) Quantities -- Average unit of measure for ASAS has not been approved, although the FY87-92 FYDP has identified quantities for submodules.

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- c. (U) Unit Cost --TBD
- d. (U) Approved Design to Cost Goal --

o Qty:TBD			
o Peak Rate: TBD			
o FY84 Base-Year \$	TBD	TBD	TBD
Then-Year \$	TBD	TBD	TBD
o Qty: TBD			
o Peak Rate: TBD			
FY84 Base-Year \$	TBD	TBD	TBD
Then-Year \$	TBD	TBD	TBD

e. (U) Foreign Military Sales - None

f. (U) Nuclear Costs --None

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>(Dec 86 SAR)</u>	<u>(Dec 85 SAR)</u>	<u>(Dec 86 SAR)</u>
a. Program Acquisition --			
(1) Cost	2009.9	1689.5	2009.9
(2) Quantity <u>1/</u>	TBD	TBD	TBD
(3) Unit Cost	TBD	TBD	TBD
b. Current Procurement --	(FY 1987)	(FY 1987 APPN)	(FY 1988)
(1) Cost			
Less CY Adv Proc	93.5	93.5	53.8
Plus PY Adv Proc	-0-	-0-	-0-
Net Total	93.5	93.5	53.8
(2) Quantity <u>1/</u>	TBD	TBD	TBD
(3) Unit Cost	TBD	TBD	TBD

FOOTNOTE:

1/ Average unit of measure for ASAS has not been approved, although the FY 87-92 FYDP has identified quantities for submodules.

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13. Cost Variance Analysis:

a. (U) Summary -- Current (Then Year) Dollars in Millions

	RDTE	PROCUREMENT	MILCON	TOTAL
Planning Est	628.2	572.8	9.6	1210.6
Previous Changes:				
Economic	-88.8	-173.4	-.4	-262.6
Quantity				
Schedule				
Engineering	+200.3	+455.8		+656.1
Estimating	+28.2	-120.2		-92.0
Other				
Support				
SUBTOTAL	+ 139.7	+162.2	-.4	+301.5
Current Changes:				
Economic	-73.4	-143.6	-0-	-217.0
Quantity				
Schedule				
Engineering				
Estimating	+ 384.2	+339.8	-9.2	+714.8
Other				
Support				
SUBTOTAL	+310.8	+196.2	-9.2	+497.8
Total Changes	+450.5	+358.4	-9.6	+799.3
Current Estimate/ Development Estimate	1078.7	931.2	0	2009.9

Footnote:

1. MILCON removed as not system specific to ASAS/ENSCE.
2. Previous SARs included TACSIM; this baseline SAR tracks pure ASAS/ENSCE \$.

(U) Summary -- FY 84 Constant Dollars (Base-Year) in Millions

	RDTE	PROC	MILCON	TOTAL
Planning Est	563.1	449.2	7.8	1020.1
Previous Changes:				
Quantity				
Schedule				
Engineering	+137.2	+261.7	0	+398.9
Estimating	+9.0	-97.1		-88.1
Other				
Support				
SUBTOTAL	+146.2	+164.6	0	+310.8
Current Changes:				
Quantity				
Schedule				
Engineering				
Estimating	+230.3	+108.8	-7.8	+331.3
Other				
Support				
SUBTOTAL	+230.3	+108.8	-7.8	+331.3
Total Changes	+376.5	+273.4	-7.8	+642.1
Current Estimate/ Development Estimate	939.6	722.6	0	1662.2

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ASAS/ENSCE, 31 December, 1986

b. (U) Previous Change Explanation --

(1) (U) RDTE:

Economic: Revised escalation rate.

Engineering: Program redefined as a result of Congressional direction.

(2) (U) Procurement:

Economic: Revised escalation rate.

Engineering: Authorized allowance objective has not been determined; therefore, procurement program also lacks sufficient out-year definition.

(3) (U) MILCON

Economic: Revised escalation rates.

c. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base Year</u>	<u>Then Yr</u>
(1) (U) RDTE		
Revised Jan 87 economic escalation rates. (Economic)	None	-73.4
Total program redefinition to allow for pure ASAS/ENSCE (Estimating)	+122.4	+263.5
The inclusion of ENSCE funding (Estimating)	+107.9	+120.7
(2) (U) Procurement		
Revised Jan 87 escalation rates (Economic)	None	-143.6
Total program redefinition to allow for pure ASAS/ENSCE. (Estimating)	+53.2	+268.4
The inclusion of ENSCE funding (Estimating)	+55.6	+71.4
(3) (U) MILCON: Deleted - not ASAS/ENSCE specific. (Estimating)	-7.8	-9.2

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of year dollars)

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ASAS/ENSCE, 31 December, 1986

- a. (U) Initial SAR Estimate to Current Baseline Estimate -- TBD

PAUC Initial SAR Est)	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	PAUC (Dev Est)
TBD	0	0	0	0	0	0	0	0	TBD

- b. (U) Current Baseline Estimate to Current Estimate --TBD

15. (U) Contract Information: (Then-Year Dollars in Millions)

- a. (U) RDTE -- The National Science Foundation has listed JPL as a Federally Funded Research & Development Center (FFRDC) (FFRDC) under the cognizance of the National

Aeronautics and Space Administration. JPL's role for the ASAS/ENSCE baseline phase is that of a Systems Engineering and Technical Direction (SE/TD) contractor, which includes a significant number of project management functions normally attributed to a government program office such as, technical integration and management functions associated with system development, to include architectural design, RFP completion, competitive contracting for prototypes (JPL would let major contracts during this phase), acceptance testing, conduct of government reviews and associated contract management of industrial contractors. Although JPL is the prime contractor, JTFP does not have a contract with JPL for the ASAS effort. JPL is performing under a Task Order against a NASA contract. JPL's role during the objective system phase (production) will be that of a System Engineering/Technical Assistance (SE/TA) contractor, providing sustaining engineering and technical assistance to the JTFPMO.

Initial Contract Price		
Target	Ceiling	Qty
TBD	TBD	TBD

- b. (U) Procurement -- Directed Acquisition of LCC's is being done done through JPL as described above.
- c. (U) MILCON -- None

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

- a. (U) Program Status --

(b)(4)

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~~CONFIDENTIAL~~ ASAS/ENSCE, 31 December, 1986

- b. ~~CONFIDENTIAL~~ Appropriation Summary --
(Then-Year Dollars in Millions)

(b)(1)

- c. ~~CONFIDENTIAL~~ Annual Summary --

(b)(1)

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d. (U) Obligations and Expenditures --

Appropriation: RDTE

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
1986	169.5	161.0	110.2
1987	173.2	164.5	112.6
TOTAL	342.7	325.6	222.8

Appropriation: Procurement

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
1987	93.5	88.8	32.7
TOTAL	93.5	88.8	32.7

17. (U) Production Rate Data: None

18. (U) Operating and Support Costs: N/A

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A-16 MLRS-TGW

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: MLRS TGW

86-034

AS OF DATE: December 31, 1986

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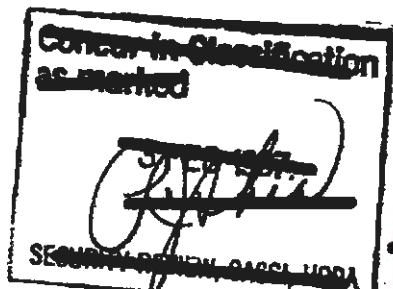
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1. (U) <u>Designation/Nomenclature (Popular Name):</u>	Multiple Launch Rocket System
Terminal <u>Guidance Warhead (MLRS TGW)</u>	
2. (U) <u>DoD Component:</u>	Department of the Army
3. (U) <u>Responsible Office and Telephone Number:</u>	
MLRS Project Office	PM: COL Nicholas Hurst
Program Management Division	Assigned: 7 January 1985
Redstone Arsenal, AL 35898-5700	AUTOVON: 746-1195
	Commercial: 205-876-1195
4. (U) <u>Program Elements:</u>	
RDT&E: PE 63303 Project D216	
Procurement: TBD	
MILCON: TBD	
5. (U) <u>Related Programs:</u>	Basic MLRS, XM447 fuze, Scatterable Mine Warhead, Battery Computer System, TACFIRE, Field Artillery Meteorological Data System, Bradley Fighting Vehicles, test set AN/MSM-105, Sense and Destroy Armor (SADARM), Army Tactical Missile System (ATACMS).

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (DASD-PA)
DEPARTMENT OF DEFENSE



~~CLASSIFIED BY: MLRS TGW Security~~
~~Classification Guide~~
~~dated 19 June 1986~~
~~DECLASSIFY BY: OADR~~

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MLRS TGW, December 31, 1986

6. (U) Mission and Description:

a. (U) The concept of a TGW for the MLRS envisions the attack of armored targets from above using highly accurate and lethal submunitions dispensed from an MLRS rocket. There is an urgent need for an autonomous, terminal homing, indirect fire-and-forget capability to defeat hard point targets such as armored vehicles and equipment before they are committed into the central battle, therefore reducing their presentation rate. The TGW for the MLRS will contain multiple submunitions packaged within the rocket warhead section. The TGW consists of a dispenser and six terminally guided submunitions (TGSM's). The primary mission of the MLRS TGW is to provide rapid fire, non-nuclear capability to destroy a wide spectrum of stationary and moving, medium hard to very hard, armored targets. The Army intends to develop this warhead in cooperation with the Republic of France (FR), the Federal Republic of Germany (GE), and the United Kingdom (UK) under a Memorandum of Understanding (MOU) dated 3 December 1983.

b. (U) This system is intended to supplement cannon and rocket artillery rather than replace equipment and/or munitions in the current inventory. The TGW will be fully integrated into the existing MLRS and be compatible with the components of the system as required in the specification for the rocket, launch pod/container (LP/C), AT2 fuze, and fire control. A modified self-propelled launcher loader (SPLL) being produced for the basic MLRS program will be able to fire the MLRS TGW rounds.

7. (U) Program Highlights:

a. (U) Significant Historical Developments --

(1) (U) In a Memorandum for the Secretary of the Army dated 14 February 1977, the Secretary of Defense directed the Army to prepare a plan for compliance with congressional guidance on terminal homing options in the MLRS program. An "MLRS Terminal Homing Plan" was structured to complement the basic MLRS development schedule. It was approved by DA and forwarded to OSD. Congress appropriated FY80 research, development, test, and evaluation (RDTE) funding under a separate program element to support concept definition studies for MLRS TGW.

(2) (U) In July 1979, the U.S., UK, FR, and GE concluded a Memorandum of Understanding (MOU) for the cooperative development of the MLRS. In the MOU, the four nations have acknowledged an operational requirement for weapon systems with the general characteristics compatible with the basic MLRS system. Those general characteristics are described as the Best Technical Approach (BTA) for development. The BTA is a horizontally gliding terminally guided submunition with a millimeter wave seeker and a shaped charge lethal mechanism.

(3) (U) The development of the TGW is being carried out under Supplement Number 3 to the MLRS MOU signed December 1983. Under the terms of the MOU Supplement, the total international development program costs will be shared in the ratio of U.S. - 40 percent, and FR, GE, and UK - 20 percent each. Each

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MLRS TGW, December 31, 1986

7. (U) Program Highlights (Continued):

country will be responsible for total funding of any internal national task they decide to do in addition to the agreed international development program.

(4) (U) The ASARC/DSARC I for TGW was conducted in August/September 1984. Approval was received to enter into the component demonstration substage (CDS) of the program. A contract was awarded to MDTT Joint Venture on 29 November 1984 by the U.S. Army Missile Command (MICOM), acting on behalf of the Governments of FR, GE, UK, and the U.S. MDTT Joint Venture consists of Martin Marietta Corporation (U.S.), Thomson-Brandt (FR), Thorn EMI Electronics Limited (UK), Diehl GmbH and Company (GE), and MDTT, Inc. MICOM also awarded a contract to LTV Aerospace Division, the MLRS prime contractor, for integration of the TGW into the Basic MLRS. LTV Aerospace and MDTT will be associate prime contractors for development of the total MLRS TGW weapon system.

b. (U) Significant Developments Since Last Report --

(1) (U) The MLRS TGW program has been revised to reflect a 14 1/2 month schedule slip in completion of the CDS with a projected cost of \$183.3. The revised schedule and projected cost were approved for implementation on 4 December 1986 by the Joint Steering Committee. The TGW development contract will be modified to reflect a 46 month CDS phase. The change modification is scheduled to be negotiated in February 1987.

(2) (U) Development of the TGW brassboards is continuing with emphasis on software/seeker development. Brassboard BBIR was upgraded to the higher power BB1H configuration and delivered to Meppen Test Range in Germany. The captive flight test-1 (CFT-1) software for the first series of captive flight tests has been delivered to Meppen. Both the hardware and software are undergoing integration and checkout in preparation for captive flight test. Captive testing will gather target and clutter data in the winter environment.

(3) (U) On 23 October 1986, the Joint Steering Committee (JSC) approved the contractor's recommended configuration of three terminally guided submunitions (TGSMs) each 914mm long and 110mm in diameter. The proposed tactical TGSM configuration of 635mm length by 100mm diameter was no longer feasible due to growth in the hardware, particularly the signal processing electronics and the need for a more robust lethal mechanism to defeat the revised armor threat.

(4) (U) MLRS TGW is a pre-milestone II program. IAW the FY 1987 DOD authorization act, SARs for pre-milestone II programs may reflect costs limited to the development program. Accordingly, the costs included in this report reflect the MLRS TGW development program only.

(5) (U) The MLRS TGW is expected to satisfy the mission requirement.

c. (U) Changes Since "as of" Date --- None.

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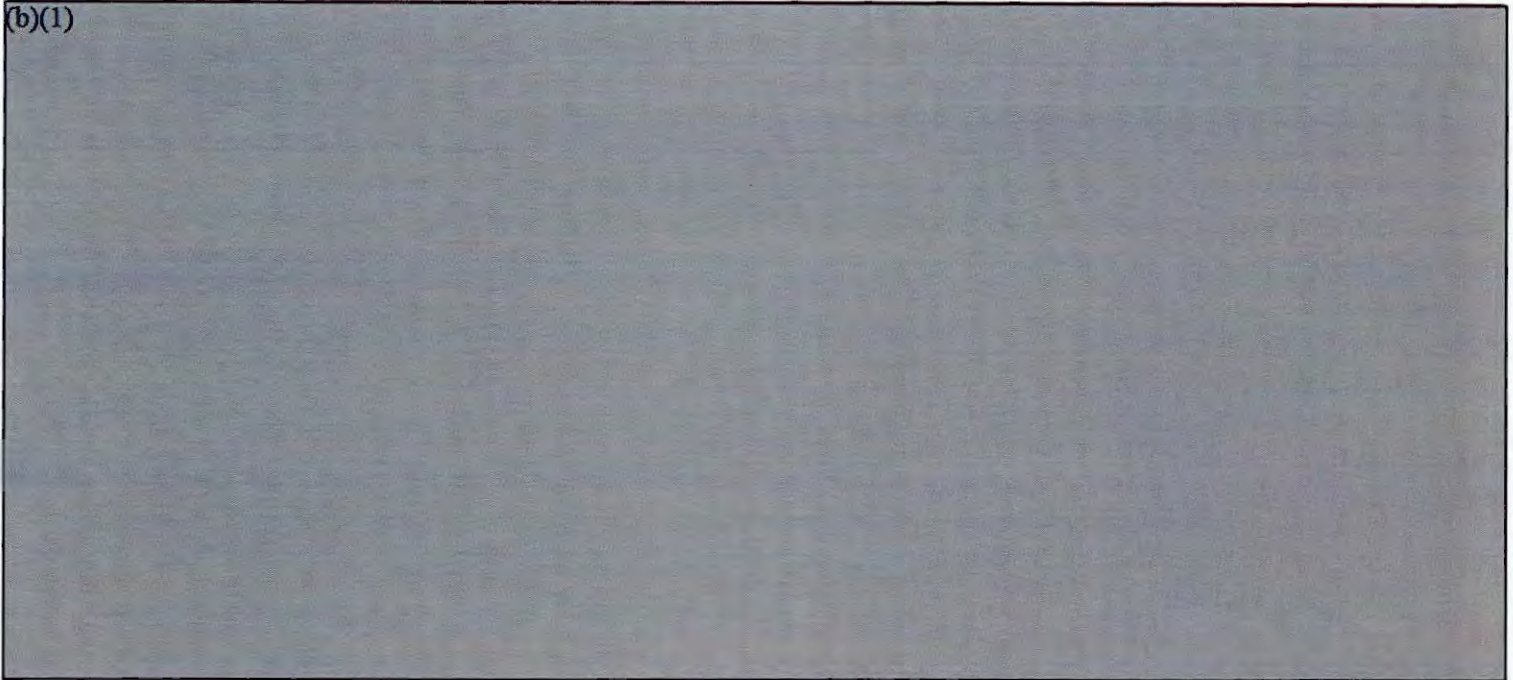
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MLRS TGW, December 31, 1986

8. (U) System Concept Paper (SCP) Threshold Breaches:

(U) There are currently no SCP (dated July 1984) or Secretary of Defense Memorandum (SDDM) (dated 14 November 1984) threshold breaches.

9. (U) Schedule:



b. (U) Previous Change Explanations -- Initial milestone dates established per ASARC/DSARC I. These milestones were "TBD" in initial SAR (Sep 84). Three month slip in completion of the component demonstration substage (CDS) due to the difficulty and precision of work at the component design and fabrication level.

c. (U) Current Change Explanations --

(CH-1): Program milestones reflect a 14 1/2-month slip in the completion of the component demonstration substage (CDS) due to the difficulty in achieving CDS technical objectives, (seeker power, guidance algorithms, signal processing electronics and lethal mechanism to defeat revised armor threat).

d. (U) References --

Planning Estimate: SCP for MLRS TGW, July 1984.

Approved Program: FY 1988-1989 President's Budget.

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MLRS TGW, December 31, 1986

10. (U) Technical/Operational Characteristics: 1/

	<u>Plng Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. (U) Technical --			
(U) Effectiveness	TBD/TBD	N/A	TBD
(U) Range (km)	TBD/TBD	N/A	TBD
Maximum	TBD/TBD	N/A	TBD
Minimum	TBD/TBD	N/A	TBD
b. (U) Operational --			
Reliability	TBD/TBD	N/A	TBD
Rocket	TBD/TBD	N/A	TBD
TGSM	TBD/TBD	N/A	TBD
Availability	TBD/TBD	N/A	TBD
c. (U) Previous Change Explanations -- None			
d. (U) Current Change Explanations -- None			
e. (U) References --			
Planning Estimate: See Note 1/.			
Approved Program: See Note 1/.			

1/ Deferral of action to approve MLRS TGW goals and thresholds has been requested by HQDA pending completion of the component demonstration substage (CDS). A system Required Operational Capability (ROC) will be established just prior to the end of CDS and presented at the next milestone (ASARC/JRMB II).

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MLRS TGW, December 31, 1986

11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars) 1/

	Planning Estimate	Changes	Current Estimate
a. (U) Cost --			
Development (RDT&E) 2/	190.7	+76.9	267.6
Procurement 3/	TBD		TBD
Flyaway	(-)	(-)	(-)
Peculiar Support Equip	(-)	(-)	(-)
Other Weapon Sys Cost	(-)	(-)	(-)
Initial Spares	(-)	(-)	(-)
Construction (MILCON) 3/	TBD		TBD
Total FY84 Base Year \$	190.7	+76.9	267.6
Escalation	20.5	+26.5	47.0
Development (RDT&E)	(20.5)	(+26.5)	(47.0)
Procurement			
Construction (MILCON)			
Total Then-Year \$	211.2	+103.4	314.6
b. (U) Quantities -- N/A			
c. (U) Unit Cost -- N/A			
d. (U) Approved Design to Cost Goal --			
	(Design to cost goals have not been established)		
e. (U) Foreign Military Sales -- None			
f. (U) Nuclear Costs -- None			

1/ The program acquisition cost shown reflects only the U.S. share of MLRS TGW.

2/ Total international development program cost is established at \$704.6M. In accordance with the MOU, the U.S. will pay 40 percent of the international program cost. Cost shown reflects U.S. share of the agreed international program cost plus other U.S. national tasks.

3/ Since MLRS TGW is a pre-milestone II program, procurement costs of \$414.4 million and MILCON costs of \$11.5 million (then-year dollars) have been deleted from the Planning Estimate baseline IAW the provisions of the FY 1987 Authorization Act.

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MLRS TGW, December 31, 1986

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Current (Then Year) Dollars in Millions)

NOTE: IAW FY 1987 DOD Authorization Act, unit cost reporting shall not apply to pre-Milestone II programs that are reporting on the development program only.

13. (U) Cost Variance Analysis: 1/

a. (U) Summary -- (Current (Then Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Planning Estimate	211.2	TBD	TBD	211.2
Previous Changes:				
Economic	-8.7	-37.3	-1.6	-47.6
Quantity				
Schedule	+ 4.8	+ 2.1	+0.3	7.2
Engineering				
Estimating	+90.6	-42.1	+1.3	+49.8
Other				
Support				
Subtotal	+ 86.7	-77.3	0.0	+9.4
Current Changes:				
Economic	-3.3	+37.3	+1.6	+35.6
Quantity				
Schedule	+17.5	- 2.1	-0.3	+15.1
Engineering	+ 1.5			+ 1.5
Estimating	+ 1.0	+42.1	-1.3	+41.8
Other				
Support				
Subtotal	+16.7	+77.3	0.0	+94.0
Total Changes	+103.4	0.0	0.0	+103.4
Current Estimate	314.6	TBD	TBD	314.6

1/ Since MLRS TGW is a pre-milestone II program, procurement costs of \$414.4 million and MILCON costs of \$11.5 million (then-year dollars) have been deleted from the program baseline IAW the provisions of the FY 1987 Authorization Act.

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MLRS TGW, December 31, 1986

13. (U) Cost Variance Analysis (Continued):

(FY 1984 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	190.7	TBD	TBD	190.7
Previous Changes:				
Quantity				
Schedule	+ 4.0		-0.1	+3.9
Engineering				
Estimating	+60.4	-64.7	+0.7	-3.6
Other				
Support				
Subtotal	+64.4	-64.7	+0.6	+0.3
Current Changes:				
Quantity				
Schedule	+10.3		+0.1	+10.4
Engineering	+ 1.3			+1.3
Estimating	+ 0.9	+64.7	-0.7	+64.9
Other				
Support				
Subtotal	+12.5	+64.7	-0.6	+76.6
Total Changes	+76.9	0.0	0.0	+76.9
Current Estimate	267.6	TBD	TBD	267.6

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices through January 1986.

Schedule: Previous total represented the funded portion of the FYDP only and did not include total TGW development program (recategorized to estimating under current change explanations). Three month schedule slip.

Estimating: Refinement of costs resulting from ASARC/DSARC I decision and directed U.S. requirements. Adjustments in development program to offset three month schedule slip.

Procurement

Economic: Revised escalation indices through January 1986.

Schedule: Start of low-rate production was rescheduled (recategorized to estimating).

Estimating: Correction to move dollars from schedule to estimating category resulting from reschedule of start of low-rate production.

MILCON:

Economic: Revised escalation indices through January 1986.

Schedule: Cost associated with reschedule of MCA requirement.

Estimating: Adjustment of base program to compensate for escalation adjustments not taken.

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MLRS TGW, December 31, 1986

13. (U) Cost Variance Analysis (Continued):

c. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) ROD&E

December 1986 economic escalation rates

N/A -3.3

RODTE 14 1/2 month schedule extension of component demonstration substage (CDS) (SCHEDULE)

+10.3 +17.5

Cost growth associated with qualifying new vendor for the IEU bulk storage memory created by Motorola's decision to close its facility. (ESTIMATING)

+ 0.9 + 1.0

Engineering changes applicable to TGSM configuration change and revised threat. (ENGINEERING)

+ 1.3 + 1.5

(2) Procurement

Offsets to prior cost variances associated with the deletion of procurement costs in accordance with the FY 1987 Authorization Act

o Economic

N/A +37.3

o Schedule

0.0 -2.1

o Estimating

+64.7 +42.1

(3) MILCON

Offsets to prior cost variances associated with the deletion of MILCON costs in accordance with the FY 1987 Authorization Act

o Economic

N/A +1.6

o Schedule

+0.1 -0.3

o Estimating

-0.7 -1.3

d. (U) References --

Planning Estimate: FY 1985 President's Budget.

14. (U) Program Acquisition Unit Cost (PAUC) History: N/A

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MLRS TGW, December 31, 1986

15. (U) Contract Information:

a. (U) RDT&E --

TGW Component Demonstration

MDTT, Inc., Orlando, FL
DAAH01-85-C-A004, CP1F
Award: November 1984
Definitized: November 1984

Initial Contract Price		
Target	Ceiling	Qty
\$ 99.9	N/A	N/A

Current Contract Price		
Target	Ceiling	Qty
\$ 99.9	N/A	N/A

Estimated Price at Completion	
Contractor	Program Manager
\$185.9	\$185.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$ -2.4	\$ -7.8
Cumulative Variances To Date (10/31/86)	-0.4	-2.4
Net Change	\$ +2.0	\$ +5.4

Explanation of Change: Due to technical problems that are causing an additional 14 1/2-month schedule slip and a \$90.3M cost growth, the contractor was authorized an over target budget baseline. The PM's estimate represents the rebaselined amount. The over target baseline was implemented in 31 August 1986.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

- (1) (U) Percent Program Completed: 53.8% (7 years/13 years)
- (2) (U) Percent Program Cost Appropriated: 36.1% (\$113.6/\$314.6)

b. (U) Appropriation Summary --

Appropriation	Current +	Budget	Balance to Complete		TOTAL
	Prior Yrs (FY80-87)	Year (FY88)	FYDP (FY89-92)	Beyond FYDP (FY93-02)	
RDT&E	113.6	29.6	171.4	0	314.6
TOTAL	113.6	29.6	171.4	0	314.6

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MLRS TGW, December 31, 1986

16. (U) Program Funding Summary (Continued):

c. (U) Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars		Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc			Total
	Rkt	Nonrec	Rec		Debit	Credit	

Appropriation: RDT&E

1980				0.6			0.5	10.6
1981				0.3			0.3	10.6
1982				1.1			1.0	7.6
1983				2.4			2.4	4.9
1984				15.2			15.5	3.8
1985				23.1			24.4	3.4
1986				26.2			28.5	2.9
1987				36.5			41.0	3.1
1988				25.5			29.6	3.5
1989				30.9			37.1	3.5
1990				33.2			41.1	3.3
1991				39.2			49.8	2.9
1992				33.4			43.4	2.4
Total				267.6			314.6	-

d. (U) Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1980	0.5	0.5	0.5
1981	0.3	0.3	0.3
1982	1.0	1.0	1.0
1983	2.4	2.3	2.3
1984	15.5	15.5	15.4
1985	24.4	24.4	22.8
1986	28.5	27.6	20.1
1987	41.0	4.9	0
To complete	201.0	0	0
Total	314.6	76.5	62.4

17. (U) Production Rate Data:

a. (U) Annual Production Rates -- N/A

18. (U) Operating and Support Costs: N/A

A-13 LHX

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: LIGHT HELICOPTER FAMILY (LHX)

86-032

AS OF DATE: December 31, 1986

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FOR OPEN PUBLICATION

FEB 26 1987

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-ISA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): Light Helicopter Family (LHX)
2. DoD Component: U.S. Army
3. Responsible Office and Telephone Number:

LHX Project Manager's Office
U.S. Army Aviation Systems Command
(AVSCOM)
St. Louis, MO 63120-1798

Brigadier General Ronald K. Andreson
Assigned: August 1984
AUTOVON 693-1800
Commercial (314) 263-1800

4. Program Elements/Procurement Line Items:

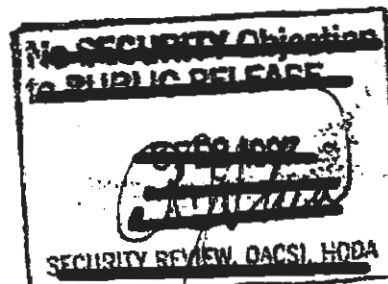
RDT&E: PE 63220 Project D325
PE 64216 Project DC72 (Shared Funding)
PE 64223 Project D327

PROCUREMENT: TBD

MILCON: TBD

5. Related Programs: Air-to-Air Stinger Missile System; Anti-tank Missile System

6. Mission and Description: The LHX will be a highly capable, survivable, affordable, and supportable family of twin-engine, advanced technology helicopters that meets the operational requirements of the U.S. Army in the mid-1990s and beyond. The LHX family will have two variants, scout/attack (SCAT) and utility (U) with common dynamic components and subsystems. The LHX family will replace the AH-1, OH-58A/C, OH-6, and UH-1 fleets and augment and complement the operational capabilities of the BLACK HAWK, Apache, and AHIP. The SCAT will be single



87-034

operation. The objectives of the LHX program are to increase Army aviation world-wide tactical capabilities, increase readiness, improve supportability, reduce operating and support costs, and correct major deficiencies in the current light fleet. The LHX will be operationally effective in adverse weather and night operations, capable of conducting nap-of-the-earth operations, self-deployable to Europe, and rapidly transportable by intertheater tactical air transport. The LHX will conduct air-to-air combat, deep attack, continuous day and night operations on an integrated battlefield, allow more rapid tailoring of units to meet the demands of the fluid battlefield, and provide increased ability to remain effective in battle. SCAT armament will include the HELLPRE anti-tank missile system, air-to-air Stinger missile system, and a turreted automatic gun. The LHX will be fielded in units that have combat, combat support, and combat service support missions.

7. Program Highlights:

a. Significant Historical Developments -- Following the Army's first Army Aviation Mission Area Analysis (AAMAA) in January 1982, which identified aviation deficiencies in the current fleet, the Army's senior leadership endorsed the AAMAA recommendation to replace the current light fleet with the LHX at the Army Aviation Systems Program Review in March 1982. Advanced Development effort was initiated in October 1983 under the Advanced Rotorcraft Technology Integration (ARTI) Program. In December 1983, the LHX Justification for Major Systems New Start (JMSNS) was approved by the Office of the Secretary of Defense (OSD). On 19 July 1985, competitive Firm Fixed Price (FFP), Full-Scale Development (FSD) contracts were awarded for development of a 1200 shaft horsepower class, advanced-technology engine, designated as the T800. On 19 August 1985, the LHX Letter of Agreement (LOA) was approved by the Department of the Army (DA). On 30 December 1985, the first draft Request for Proposal for the LHX Aircraft System was released to industry.

b. Significant Developments Since Last Report -- The basic ARTI contractual effort was completed with the conduct of the single-pilot feasibility simulation demonstrations (February-May 1986) and the final contractor presentations to the Government (May-July 1986). Industry consensus is that the single-pilot LHX SCAT is feasible. The Government assessment of ARTI results concluded that basic tasks of aircraft flight control, navigation, and communications could be effectively accomplished within acceptable workload limits of a single pilot, but additional simulation effort is required to confidently assess the workload related to night nap-of-the-earth pilotage, target acquisition, and air-to-air engagement. ARTI effort has been expanded with the award of FFP contracts to the LHX teams of McDonnell Douglas Helicopter Company/Bell Helicopter Textron, Inc. and Boeing Vertol/Sikorsky Aircraft Company in September 1986 to concentrate on improving the fidelity of the simulation for these critical combat tasks.

The LHX acquisition strategy was revised to include competition throughout the aircraft system development program, culminating in full prototype fly-off prior to a production decision.

The second draft of the LHX aircraft system RFP was released to industry on 24 November 1986.

LHX, December 31, 1986

Developmental Test/Early User Test and Experimentation (DT/EUTE) is scheduled to begin December 1992.

LHX is required to submit only RDT&E costs for the December 1986 SAR.

The LHX aircraft system is expected to satisfy the mission requirement.

c. Changes Since "As Of" Date -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: N/A

9. Schedule:

a. Milestones --	Plan Estimate/ ^{1/} <u>Approved Program</u>	Current ^{2/} <u>Estimate</u>
T800 Engine FSD Contract Awards	Jul 85/Jul 85	Jul 85
Milestone I/II (ASARC/JRMB I/II)	Feb/Mar 87/Jun/Jul 87	Jun/Jul 87 (CH-1)
Issue RFP for Air Vehicle	Mar 87/Apr 87	Apr 87 (CH-1)
Contract Awards for Air Vehicle (Phase I)	Oct 87/Jan 88	Jan 88 (CH-1)
T800 Engine Source Selection (FSD Down Selection)	Sep 88/Sep 88	Sep 88
Contract Award for Air Vehicle (Phase II) <u>3/</u>	Jul 89/N/A	N/A (CH-1)
First Flight (FSD Hardware)	Sep 91/Apr 91	Apr 91 (CH-1)
T800 Engine Production Contract Award	Jan 93/Aug 90	Aug 90 (CH-1)
DT/EUTE Completed	Nov 93/May 93	May 93 (CH-1)
Milestone III (ASARC/JRMB III)	Jan 94/Jun 93	Jun 93 (CH-1)
Air Vehicle Production Contract Award	Jan 94/Jun 93	Jun 93 (CH-1)
First Air Vehicle Production Delivery	Jul 95/Jan 95	Jan 95 (CH-1)
First Unit Equipped	May 96/Nov 95	Nov 95 (CH-1)

b. Previous Change Explanations -- N/A

c. Current Change Explanations --

(CH-1) All milestones were revised from the AMC approved Acquisition Strategy (16 December 1985) to reflect the current 1995 IOC Acquisition Strategy as briefed to the Chief of Staff of the Army on 10 November 1986.

9. Schedule (Cont'd):d. References --

Planning Estimate: AMC Approved Acquisition Strategy (16 December 1985).

Current Estimate: LHX 1995 IOC Acquisition Strategy as briefed to the Chief of Staff of the Army on 10 November 1986.

Approved Program: FY 1988/1989 President's Budget.

Footnotes:

- ¹ Planning Estimate milestones were based on the AMC approved Acquisition Strategy.
- ² Current Estimate milestones are based on the LHX 1995 IOC Acquisition Strategy.
- ³ Phase I/Phase II concept is no longer applicable under the new strategy.

10. Technical/Operational Characteristics:

a. <u>Technical --</u>	<u>Plan Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
SCAT Primary Mission Gross Weight (PMGW) (lbs):	8,500/9,500		9500 (CH-1)
Flight Performance (Primary Mission):			
SCAT Vertical Rate of Climb (VROC) feet per minute (FPM) 4000'/95°F. at structural design gross weight	500/500		500
Cruise Speed at PMGW, 4,000'/95°F. (Max Continuous Power):			
(a) SCAT (knots):	170/170		170
(b) Utility (knots):	160/160		160
Reliability			
Mean Time Between Essential Maintenance Action (MTBEMA) (hours)	4.5/4.5		4.5
Mean Time Between Mission Affecting Failure (MTBMAF) (hours)	8.4/8.4		8.4

10. Technical/Operational Characteristics (Cont'd):

a. <u>Technical</u> (Continued)--	<u>Plan Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Operational Availability (Peacetime)	86/86		86
Maintainability			
Mean Time to Repair (MTTR) (hours)	1/.7		.7 (CH-2)
Maintenance Manhours per Flight Hour (MMH/FH)	2.8/2.6		2.6 (CH-3)
b. <u>Operational</u> --	<u>Plan Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Payload (Primary Mission)			
SCAT (Expendable Ordnance)			
HELLFIRE Missiles:	4/6		6 (CH-4)
STINGER Missiles:	2/4		4 (CH-4)
Gun Ammo, 500 rds.	TBD/386		386 (CH-4)
UTAS (Ordnance/Troops)			
STINGER Missiles:	2/TBD		TBD
Troops:	6/6		6
Air Transportability in C-141B (No. of Aircraft/Hours Load- Unload):			
SCAT	4/1.5/3/1.5		3/1.5 (CH-5)
UTAS	3/1.5/2/1.5		2/1.5 (CH-5)
Self-Deployable (NM):	1260/1260		1260
c. Previous Change Explanations --	N/A		
d. Current Change Explanations --			
(CH-1)	Weight increase from 8,500 to 9,500 lbs. reflects most current weight estimates.		
(CH-2)	MTTR revised from 1.0 to 0.7 hours to reflect results of Reliability, Availability, and Maintainability (RAM) data analysis.		
(CH-3)	MMH/FH revised from 2.8 to 2.6 hours to reflect results of Reliability, Availability, and Maintainability (RAM) data analysis.		
(CH-4)	PMGW weapon load increased from 4 to 6 missiles to reflect emerging results of LHX Cost and Operational Effectiveness Analysis (COEA).		

10. Technical/Operational Characteristics (Cont'd):

(CH-5) Number of aircraft loaded per hour decreased from 4/1.5 to 3/1.5 (SCAT) and 3/1.5 to 2/1.5 (UTAS) to reflect increase in size of aircraft.

e. References --

Planning Estimate: Letter of Agreement approved by DA, 19 August 1985. Draft Required Operational Capability (ROC) document dated 18 December 1985.

Current Estimate: Draft ROC document, dated 10 December 1986.

Approved Program: FY 1988/1989 President's Budget.

11. <u>Program Acquisition Cost:</u>	(Current Estimate in Millions of Dollars)		
	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E) ^{1/}	1756.2	+1215.3	2971.5
Procurement ^{2/}	TBD	-----	TBD
Air Vehicle	TBD	-----	TBD
Engine	TBD	-----	TBD
Initial Spares	TBD	-----	TBD
Construction (MILCON)	TBD	-----	TBD
Total FY 84 Base-Year \$	1756.2	+1215.3	2971.5
Escalation	376.8	+ 294.0	670.8
Development (RDT&E)	(376.8)	(+ 294.0)	(+670.8)
Procurement	(-0-)	(-0-)	(-0-)
Construction (MILCON)	(-0-)	(-0-)	(-0-)
Total Then-Year \$	2133.0	+1509.3	3642.3

- b. Quantities -- N/A
- c. Unit Cost -- TBD
- d. Approved Design to Cost Goal -- N/A
- e. Foreign Military Sales -- TBD
- f. Nuclear Costs -- TBD

^{1/} Planning estimate includes RDT&E funding for FY 84 through FY 91 as reflected in the FY 87 President's budget. The Current Estimate includes RDT&E funding for FY 84 through FY 92 based on the FY 88/89 President's budget.

^{2/} Since the LHX is a pre-milestone II program, procurement costs of \$516.9 million (then-year dollars) were deleted from the Planning Estimate baseline IAW the provisions of the FY 1987 Authorization Act.

12. Program Acquisition/Current Procurement Unit Cost Summary:
 (Current (Then-Year) Dollars in Millions)

NOTE: In accordance with the provisions of the FY 1987 Authorization Act, unit cost reporting shall not apply to pre-milestone II programs that are reporting on the development program only.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions) 1/ 2/

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2133.0	TBD	TBD	2133.0
Previous Changes:	N/A	N/A	N/A	N/A
Current Changes:				
Economic	- 24.0	----		- 24.0
Quantity	----	----		----
Schedule	----			----
Engineering	----			----
Estimating	+1533.3	----		+1533.3
Other	----	----		----
Support	----	----		----
Subtotal	+1509.3	----	N/A	+1509.3
Total Changes:	+1509.3	----	N/A	+1509.3
Current Estimate:	3642.3	TBD	TBD	3642.3

b. Previous Change Explanations -- N/A

1/ Planning Estimate includes funding only for FY 84 through FY 91 as reflected in the FY 1987 President's Budget. The Current Estimate includes FY 84 through FY 92 based on the FY 1988/1989 President's Budget.

2/ Since the LHX is a pre-milestone II program, procurement costs of \$516.9 million (then-year dollars) were deleted from the Planning Estimate baseline IAW the provisions of the FY 1987 Authorization Act.

13. Cost Variance Analysis (Cont'd):

b. Summary -- (FY 1984 Constant (Base-Year) Dollars in Millions) ^{1/}

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1756.2	TBD	TBD	1756.2
Previous Changes:	N/A	N/A	N/A	N/A
Current Changes:				
Quantity	-----			-----
Schedule	-----			-----
Engineering	-----			-----
Estimating	+1215.3	-----		+1215.3
Other	-----			-----
Support	-----	-----		-----
Subtotal	+1215.3	-----	N/A	+1215.3
Total Changes:	+1215.3	-----	N/A	+1215.3
Current Estimate:	2971.5	TBD	TBD	2971.5

c. Current Change Explanations --

	Dollars in Millions	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised December 1986 economic escalation rates (Economic)	N/A	- 24.0
Acquisition Strategy Revised to include competition throughout development, culminating in full prototype fly-off prior to a production decision. (Estimating)	+ 688.3	+ 855.6
Addition of funds for contractor tooling (Estimating).	+ 96.5	+ 118.0
FY 1988-1989 President's Budget adds 1 year to program funding (Estimating)	+ 430.5	+ 559.7
(2) <u>Procurement</u> - N/A		
(3) <u>MILCON</u> - N/A		

13. Cost Variance Analysis (Cont'd):

d. References --

Planning Estimate: AMC Approved Acquisition Strategy (16 December 1985).

Current Estimate: LHX 1995 IOC Acquisition Strategy as briefed to the Chief of Staff of the Army on 10 November 1986.

14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate -- TBD

b. Current Baseline Estimate to Current Estimate - TBD

15. Contract Information: (Then-Year Dollars in Millions)a. RD&E --Initial Contract Price

<u>Engine</u>	<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>
AVCO/Pratt & Whitney	240.0 <u>1/</u>	TBD <u>2/</u>	72 <u>5/</u>
AVCO, Stratford, CT			
P&W, West Palm Beach, FL			
DAAJ09-85-C-B019			
Award: July 19, 1985			
Definitized: July 19, 1985 (Date of contract award)			
Type: FFP with CPIF option			

Current Contract PriceEstimated Price at Completion

<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>
240.1 <u>3/</u>	TBD	72

<u>Contractor</u>	<u>Program Manager</u>
TBD	TBD

Previous Cumulative VariancesCost Variance Schedule Variance

N/A

N/A

N/A

15. Contract Information: (Then-Year Dollars in Millions)b. RD&E --

<u>Engine</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>
LHTEC Allison Garrett Turbine Division, Indianapolis, IN Garrett Turbine Engine Co., Phoenix, AZ DAAJ09-85-C-B017 Award: July 19, 1985 Definitized: July 19, 1985 (Date of contract award) Type: FFP with CPIF option	264.0 ^{4/}	TBD ^{2/}	72

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Quantity</u>	<u>Contractor</u>	<u>Program Manager</u>
264.1 ^{3/}	TBD	72	TBD	TBD
<u>Previous Cumulative Variances</u>			<u>Cost Variance</u>	<u>Schedule Variance</u>
N/A			N/A	N/A

Footnotes:

^{1/} Target price includes:

Basic Contract (FFP)	209.6
Options (FFP)	6.6
A/V Support (CPIF)	23.8
	240.0

^{2/} Ceiling price to be negotiated for CPIF option.^{3/} Contract modifications in the amount of \$0.1M were awarded 30 September 1986 to the basic contract for air vehicle system/engine interface documentation and technical effort.^{4/} Target price includes:

Basic Contract (FFP)	212.3
Options (FFP)	11.8
A/V Support (CPIF)	39.9
	264.0

^{5/} Only the winning contractor team will produce deliverable engines.

NOTE: Estimated price at completion for the contractors and the PM is competition sensitive. Following down selection of the winning contractor team, data will be available for release.

LHX, December 31, 1986

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: (4 yrs./TBD)
(Years Funds Appropriated/Total Program Years)
- (2) Percent Program Cost Appropriated: (317.1/TBD)
(Funds Appropriated to Date in Millions/Total Program Funding in Millions)

b. Appropriation Summary --

<u>Appropriation</u>	<u>Current \$ Prior Yrs. (FY 84-87)</u>	<u>Budget Year (FY 88)</u>	(Then-Year Dollars in Millions)		<u>Total</u>
			<u>FYDP (FY 89-92)</u>	<u>Balance to Complete Beyond FYDP</u>	
RDTE	317.1	402.3	2922.9	TBD	3642.3
PROC	-0-	-0-	-0-	TBD	TBD
MILCON	-0-	-0-	TBD	TBD	TBD
TOTAL	317.1	402.3	2922.9	TBD	3642.3

c. Annual Summary --

<u>Fiscal Year</u>	<u>Qty</u>	<u>FY 84 Base-Year Dollars</u>		<u>Then-Year Dollars</u>		<u>Escl Rate %</u>
		<u>Flyaway</u>	<u>Total</u>	<u>Advance Proc</u>	<u>Total</u>	
		<u>Nonrec</u>	<u>Rec</u>	<u>Debit</u>	<u>Credit</u>	
		<u>Appropriation: RDT&E</u>				
1984			1.0		1.0	3.8
1985			68.3		71.6	3.4
1986			98.4		107.2	2.9
1987			122.2		137.3	3.1
1988			346.1		402.3	3.5
1989			498.0		598.0	3.5
1990			659.4		815.8	3.3
1991			747.7		* 949.4	2.9
1992			430.4		* 559.7	2.4
TOTAL			2971.5		3642.3	

LHX, December 31, 1986

d. Obligations and Expenditures --

Then-Year Dollars (Current Estimate in Millions)

Fiscal Year	Total	Obligated Appropriation: RDT&E	Expended
1984	1.0	1.0	1.0
1985	71.6	71.4	44.3
1986	107.2	106.4	77.8
1987	137.3	81.6	.3
Subtotal	317.1	260.4	123.4
To Complete	TBD	N/A	N/A
Total	TBD	260.4	123.4

* The FY 1988/1989 President's Budget reflects 50.6 (FY91) and 59.6 (FY92) in PE64216 Project DC72. The LHX share of those funds reported in this SAR is 30.7 (FY91) and 29.8 (FY92).

17. Production Rate Data:

- a. Annual Production Rates -- N/A
- b. Cost Variance - Dollars in Millions -- N/A
- c. Schedule Variance -- N/A
- d. Deliveries (Plan/Actual) --

	<u>To Date</u>
RDT&E	0/0
Procurement	0/0

18. Operating and Support Costs: N/A

A-17 MSE

DATE'S SUBMISSION TO OSD
DATE 8 FEB 1987

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

86-035

PROGRAM: Mobile Subscriber Equipment (MSE)

AS OF DATE: December 31, 1986

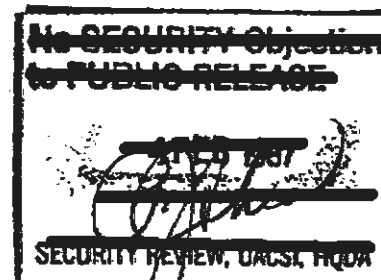
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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (DASD-PA)
DEPARTMENT OF DEFENSE



1. Designation and Nomenclature (Popular Name):

Mobile Subscriber Equipment (MSE)

2. DOD Component: U.S. Army

3. Responsible Office and Telephone Number:

PM MSE
Ft. Monmouth, NJ 07703-5210

Colonel John R. Power
Assigned: January 23, 1986
AV 995-2524; COMM (201) 544-2524

4. Program Elements/Procurement Line Items:

RDT&E: None
PROCUREMENT: APPN 2035 SSN BB1610
MILCON: None

5. Related Programs: None

6. Mission and Description: The mission of MSE is to provide the tactical U.S. Army commander with a secure, automatic, mobile and survivable tactical telephone system capable of passing data, facsimile, and voice traffic throughout the corps area of operations and allow commanders and their staffs to communicate while moving as well as stationary. The MSE system is being procured through a nondevelopmental item (NDI) procurement acquisition strategy. MSE will, for the first time, enable the Army to fully implement the Air Land Battle doctrine.

DASD(PA) LFOISR 87-T-0397

MSE, December 31, 1986

The MSE system will field the total force of an equivalent of 5 corps and 28 divisions. The major items of equipment will be integrated into the following functional areas: Subscriber Terminals, Mobile Subscriber Access, Wire Subscriber Access, Area Coverage and System Control. The MSE System provides the Army with a new capability and will not replace any existing system.

7. Program Highlights:

a. Significant Historical Developments -- The MSE system is part of the TRI-TAC architecture and was identified as the division backbone communication system in the Army's INTACS Objective System, approved in October 1975, and revalidated by TRADOC in Msg R241200Z Feb 81, Subject: Mobile Subscriber Equipment.

OSD Memorandum dated 13 Oct 79 approved the Joint Operational Requirement (JOR) for MSE and continued the assignment of the Army as the acquisition agent.

OSD Memorandum dated 8 Jan 80 approved the Mission Element Need Statement (MENS) for MSE.

HQ DA (DCSRDA) Message dated 6 Aug 82 directed AMC to proceed immediately with actions necessary to obtain the MSE system.

In Nov 82, guidance was received from the Under Secretary of the Army to procure MSE using a non-developmental approach.

The JOR and MENS were updated and expanded to include corps and divisions in the MSE Operational Capabilities Document (MSEODC) dated 24 May 84.

On 5 Nov 85, GTE was declared the winning contractor by the Secretary of the Army.

On 19 Dec 85, the basic contract was signed.

On 31 Dec 85, Option 1 of the contract was signed.

b. Significant Developments Since Last Report -- As noted in the footnote on pg. 5 of the baseline MSE SAR (Dec. 31, 1985) the Army programmed \$840M as a planning wedge in FY91 for projected force structure additions. The 48 units identified in the baseline SAR included the procurement of the Army force structure through FY90 at a total cost of 4.294B and did not include the FY91 planning wedge. Additional Army units have been validated in subsequent Total Army Analysis (TAA) processes (TAA92 and TAA93). The TAA process identified the requirement for MSE equipment for 2 new divisions and 3 Corps Area Signal Companies. Additionally, 5 Separate Brigades are required to be equipped with MSE equipment to allow them to perform their mission in accordance with force alignments contained in FY86 Defense Guidance. These requirements will be met by using FY91 funding. The total quantity of MSE required sets has increased from 48 to 50. The cost of these 2 division sets to be procured in FY91 is \$360M. The resulting total MSE program acquisition cost is \$4.654B. It should be stressed that MSE is being procured with a firm-fixed price contract and that the cost of any specific component has not changed since the last SAR. The MSE system is expected to satisfy the mission requirements.

c. Changes Since "As Of Date" -- None

8. Decision Coordinating Paper (DCP) Threshold Breaches: None. The MSE program is documented in the MSE Operational/Capabilities Document (MSEODC), 24 May 84.

MSE, December 31, 1986

9. Schedule:

a. Milestones —

	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
Program Initiated	Aug 82/Aug 82	Aug 82
Issue Request for Proposal	Jul 84/Jul 84	Jul 84
Type Classification (Std) Approved	Nov 85/Nov 85	Nov 85
Contract Award (Production)	Dec 85/Dec 85	Dec 85
First Production Delivery (On-Site)	Apr 88/Feb 88	Feb 88
First Unit Equipped/IOC	May 88/Apr 88	Apr 88
User Follow-On Test & Eval Completed	Aug 88/Sep 88	Sep 88

b. Previous Change Explanations — N/A

c. Current Change Explanations — Redefinition of milestone terms.

d. References —

Production Estimate: MSE Operational Capabilities Document (MSEOCD),
24 May 84.

Approved Program: FY88-92 President's Budget

10. Technical/Operational Characteristics:

	<u>Pdn Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. Technical			
MSE Switching Equipment			
Node Center Switch			
Max # of Local Subscribers	24/24	TBD	24
# of Digital Transmission Groups	16/16	TBD	16
Operating Temperature <u>1/</u>	-40° to 120° F/ -40° to 120° F	TBD	-40° to 120° F
Large Extension Switch			
Max # of Local Subscribers	176/176	TBD	176
# of Digital Transmission Groups	8/8	TBD	8
Operating Temperature <u>1/</u>	-40° to 120° F/ -40° to 120° F	TBD	-40° to 120° F/
Small Extension Switch			
Max # of Local Subscribers	41/41	TBD	41
# of Digital Transmission	1/1	TBD	1
Operating Temperature <u>1/</u>	-40° to 120° F/ -40° to 120° F	TBD	-40° to 120° F/
MSE Radio Equipment			
UHF			
Frequency			
Band I	225-400 Mhz/225-400 Mhz	TBD	225-400 Mhz
Band III	1350-1850 Mhz/1350-1850 Mhz	TBD	1350-1850 Mhz
Output Power			
Band I	10 watts/10 watts	TBD	10 watts
Band III	5 watts/ 5 watts	TBD	5 watts

1/ Ambient Temperature External to the Assemblage

10. Technical/Operational Characteristics (Cont'd):

	<u>Pdn Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
MSE Radio Equipment (Cont'd)			
Data Rates	256,512,1024Kbps/ 256,512,1024Kbps	TBD	256, 512, 1024Kbps
Operating Temperature <u>1/</u>	-40° to 120° F/ -40° to 120° F	TBD	-40° to 120° F
VHF			
Frequency	30-88 Mhz/30-88 Mhz	TBD	30-88 Mhz
Output Power	14-18 watts/14-18 watts	TBD	14-18 watts
Data Rates	16Kbps/16Kbps	TBD	16Kbps
Operating Temperature	-40° to 120° F/ -40° to 120° F	TBD	-40° to 120° F

b. Operational

Set-up/Tear Down Time (Node)	30 Min/30 Min	TBD	30 Min
Max Vehicle Curb Weight	8600 lbs/8800 lbs	TBD	8800 lbs(ch-1)
Max MSE Radio Operating Ranges			
VHF	15 Km/15 Km	TBD	15 Km
UHF	40 Km/40 Km	TBD	40 Km

c. Previous Change Explanations -- N/A.

d. Current Change Explanations -- (ch-1) This change was due to the installation of an airlift cross member & vehicle modifications.

e. References -- MSE System Specification, dated 8 July 1985.

Production Estimate: MSE System Specifications, 8 Jul 85.

Approved Program: FY88-92 President's Budget.

1/ Ambient Temperature External to the Assemblage

MSE, December 31, 1986

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost --	Production Estimate	Changes	Current Estimate
Development (RDT&E)	\$ -	-	\$ -
Procurement	4,428.5	-367.3	4,061.2
Subscriber Terminals	(157.4)	(-35.6)	(121.8)
Mobile Subscriber Access	(548.2)	(-60.9)	(487.3)
Wire Subscriber Access	(1,198.2)	(-101.7)	(1,096.5)
Area Coverage	(1,587.4)	(-125.4)	(1,462.0)
System Control Center	(116.4)	(-35.2)	(81.2)
Initial Spare Parts	(160.4)	(2.0)	(162.4)
Warranty	(166.3)	(-3.7)	(162.6)
Contractor Fielding	(166.3)	(-3.8)	(162.5)
Other Weapon Sys. Cost	(327.9)	(-3.0)	(324.9)
Construction (MILCON)	-	-	-
TOTAL FY86 Base-Year \$	\$4,428.5	-367.3	\$4,061.2
Escalation --	705.5	-112.7	592.8
Development (RDT&E)	-	-	-
Procurement	(705.5)	(-112.7)	(592.8)
Construction (MILCON)	-	-	-
TOTAL Then-Year \$	\$5,134.0 <u>1/</u>	-480.0	\$4,654.0 <u>1/</u>
b. Quantities --			
Development (RDT&E)	-	-	-
Procurement	<u>48</u>	2	<u>50</u>
TOTAL	48 <u>1/</u>	2	50 <u>1/</u>
c. Unit Cost --			
Procurement:			
FY86 Base-Year \$	\$ 92.3	\$-11.1	\$81.2
Then-Year \$	107.0	-13.9	93.1
Program:			
FY86 Base-Year \$	92.3	-11.1	81.2
Then-Year \$	\$107.0	\$-13.9	\$93.1

1/. The quantity of 50 units identified above represents twenty-eight division signal bns, twenty corps signal bns and two training sets for a total of \$4.654B. All user equipment located in the division/corps areas has been included in the total program acquisition cost.

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11. Program Acquisition Cost(Cont'd)(Current Estimate in Million of Dollars)

d. Approved Design to Cost Goal -- N/A. MSE is a Non-Developmental Item.

e. Foreign Military Sales -- None

f. Nuclear Costs -- None

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Estimate</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>DEC 86 SAR</u>	<u>DEC 85 SAR</u>	<u>DEC 86 SAR</u>
a. Program Acquisition:			
(1) Cost	\$4,654.0	\$5,134.0	\$4,654.0
(2) Quantity	50	48	50
(3) Unit Cost	93.1	107.0	93.1
<u>1/</u> b. Current Procurement--	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	903.7	903.7	1019.8
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

1/ Because this program will purchase a varying number of Subscriber Terminals, Mobile Subscriber Access, Wire Subscriber Access, Area Coverage and System Control Units in a given year, it would not be appropriate to report CPUC for a given FY based on the cost of a total deliverable MSE System.

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13. Cost Variance Analysis

a. Summary — (Current (Then-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Production Estimate	-	\$5,134.0	0	\$5,134.0
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	0	0	0	0
Current Changes:				
Economic	-	-26.8	-	-26.8
Quantity	-	360.0	-	360.0
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-813.2	-	-813.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-480.0	-	-480.0
Total Changes	-	-480.0	-	-480.0
Current Estimate	-	\$4,654.0	-	\$4,654.0

13. Cost Variance Analysis (Cont'd)

(FY1986 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	\$4,428.5	0	\$4,428.5
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	0	0	0	0
Current Changes:				
Quantity	-	293.4	-	293.4
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-660.7	-	-660.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-367.3	-	-367.3
Total Changes	-	-367.3	-	-367.3
Current Estimate	-	\$4,061.2	-	\$4,061.2

b. Previous Change Explanations -- None

c. Current Change Explanations --	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Procurement		
(a) Economic - Revised indices dated 12 Dec 86	N/A	-26.8
(b) Quantity - Increased qty for 2 additional units in FY91	293.4	360.0
(c) Estimating - Change due to revision of force structure requirements	-660.7	-813.2

d. References --

Production Estimate: MSE Contracts DAAB07-86-C-K022, DAAB07-86-D-K023.

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14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Estimate:

PAUC (Initial SAR Est)	CHANGES								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
107.0	—	2.9	—	—	-16.8	—	—	—	93.1

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E — N/A

b. Procurement

Basic Contract: Target Initial Contract Price
GTE Corp., Needham Heights, MA N/A \$4,145.7 Qty
DAAB07-86-C-K022, FFP, 48
Award: 19 Dec 85
Definitized: 19 Dec 85

Current Contract Price			Estimated Price at Completion	
Target	Ceiling	Qty	Contractor	Prog. Manager
N/A	\$4,476.5	50	\$4,476.5	\$4,476.5

Requirements Contract (IK's Only):

Initial Contract Price

GTE Corp., Needham Heights, MA Target Ceiling Qty
DAAB07-86-D-K023, FFP (Delivery Order Based), N/A \$40.9 9,416
Award: 19 Dec 85
Definitized: 19 Dec 85

Current Contract Price			Estimated Price at Completion	
Target	Ceiling	Qty	Contractor	Prog. Manager
N/A	\$42.1	10,007	\$42.1	\$42.1

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15. Contract Information (Cont'd)

	<u>Cost Variance</u>	<u>Schedule variance</u>
Previous Cumulative Variances:	-	-
Cummulative Variance to Date (12/29/86)	-	-
Net Change	-	-

Explanation of Change: N/A

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status —

(1) Percent Program Completed: 42.8% (3 yrs/7 yrs)

(2) Percent Program Cost Appropriated: 27.9% (\$1,302.3/4,654.0)

b. Appropriation Summary —

<u>Appropriation</u>	<u>Current & Prior Yrs (FY85-87)</u>	(Then-Year Dollars in Millions)			<u>Total</u>
		<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-91)</u>	<u>Beyond FYDP</u>	
RDT&E	-	-	-	-	-
Procurement	1,302.3	1,019.8	2,331.9	-	4,654.0
Milcon	-	-	-	-	-
Total	1,302.3	1,019.8	2,331.9	-	4,654.0

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16. Program Funding Summary (Cont'd)

c. Annual Summary --

Fiscal Year	Qty	FY 86 Base-Year Dollars		Then-Year Dollars		Escl	
		Flyaway		Total	Advance Proc	Total	Rate (%)
		Nonrec	Rec	Debit	Credit		
		<u>1/</u>					

Appropriation: RDT&E - N/A

Appropriation: Procurement

1985	TBD		60.6	61.5		63.3	3.4	3/
1986	TBD		302.9	315.0		335.3	2.9	3/
1987	TBD		793.9	823.0		903.7	3.1	
1988	TBD		866.9	899.8		1019.8	3.5	
1989	TBD		820.2	853.4		995.7	3.5	
1990	TBD		778.0	815.1		976.2	3.3	
1991	TBD		283.0	293.4		360.0	2.9	
Subtotal	TBD		3905.5	4061.2		4654.0		
Total	50 2/		3905.5	4061.2		4654.0		

Appropriation: MILCON - N/A

1/ The MSE contract is a price contract. Nonrecurring costs are not separately identified.

2/ The quantity of 50 units identified above represents twenty-eight division signal bns, twenty corps signal bns and two training sets for a total cost of \$4.654B. All user equipment located in the division/corps areas has been included in the total program acquisition cost.

3/ The FYDP Procurement Annex (5 Jan 87) erroneously shows an FY 85 and FY 86 Initial Spares Budgets of \$2.9 and \$5.9 Million that had been included in the Baseline program. The correct OPA procurement value is \$4,654.0 Million.

16. Program Funding Summary (Cont'd)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E - N/A			
Appropriation: Procurement			
1985	63.3	63.3	16.8
1986	335.3	333.7	76.6
1987	903.7	0	0
1988	1019.8	0	0
To Complete	2331.9	0	0
Total	4654.0	397.0	93.4

17. Production Rate Data: Because this program will purchase a varying number of Subscriber Terminals, Mobile Subscriber Access, Wire Subscriber Access, Area Coverage and System Control Units in a given year, it would not be appropriate to report production rates.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The MSE system will be utilized in a peacetime mode 8.2 hours per day, 7 days per week with an annual operating time of 2996.4 hours. The costs are the direct/indirect costs to support the primary personnel and to operate the system. The cost of military personnel & indirect support operations were estimated from Tables of Organization and Equipments (TOEs) developed for the MSE system. Costs applied for the military personnel were the standard composite pay and allowances and the retired accrual factors. The summary costs for replenishment spares were calculated by the Optimum Supply and Maintenance Model (OSAMM) using MTBF, washout rates & other estimated qualitative data from the contractor together with weighted average unit prices developed from firm fixed range prices in the contract. This was developed for the nonstandard Communications-Electronics (C-E) portion. For standard C-E equipment, estimates were developed through the OSAMM model using reliability data furnished by the contractor & unit price data from CECOM. The non C-E equipment costs were developed for vehicles, generators & trailers from historical data furnished by TACOM & TROSCOM. the non C-E maintenance action costs were furnished by the contractor and the C-E maintenance action costs were obtained from the cecom Directorate of Maintenance Engineering (DME). The petroleum, oil & lubricants (POL) cost is based on the number and type of vehicles and generators, the operating scenario (4,243 miles driven per year for active forces and 555 miles driven per year for reserve forces), fuel economy and cost factors for gas & oil. All the O&S costs were based on a life cycle of 17.5 years of deployment. The 17.5 year deployment is comprised of 15 years of a fully deployed MSE system plus an additional 2.5 years to account for the 6 years of a partially deployed MSE system.

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18. Operating and Support Costs: (Cont'd)

b. Costs —

(FY 1986 Constant(Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per MSE System <u>1/</u>
Personnel	12.5
Replenishment Spares	1.0
Depot Maintenance	1.2
POL	0.3
Total	15.0

1/ The Average Annual O&S cost per MSE system is based on a quantity of 50 units which represents twenty-eight division signal bns, twenty corps signal bns and two training sets. All user equipment located in the division/corps areas has been included in the total program acquisition cost.

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)

PROGRAM: SSN 21 CLASS SUBMARINE

AS OF DATE: 31 December 1986

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FEB 27 1987

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (DASD-PA)
DEPARTMENT OF DEFENSE

- [U] Designation/Nomenclature: High Speed Nuclear Attack Submarine/SSN 21 Class
- [U] DoD Component: Department of the Navy
- [U] Responsible Office and Telephone Number:
SSN 21 Program Office PM: CAPT M.S. Firebaugh
PMS394 Assigned: January 1984
Telephone: (202) 692-1888
- [U] Program Elements/Procurement Line Items:
RDT&E:
 PE 25634N, Project S0218 Submarine Silencing
 PE 63561N, Project S0207 Advanced Submarine Control
 PE 63561N, Project S0344 Submarine Auxiliaries
 PE 63561N, Project S0348 Deep Components
 PE 63561N, Project S0364 Submarine Damage Prevention
 PE 63561N, Project S0923 Improved Performance Machinery
 PE 63561N, Project S0971 Submarine Survivability
 PE 63561N, Project S1266 Submarine Propellers
 PE 63562N, Project S0221 Target Strength Reduction
 PE 63562N, Project S0320 Weapons Stowage and Launch
 PE 63569N, Project S1255 Advanced Submarine Technology
 PE 63570N, Project S1914 S6W Nuclear Propulsion Plant
 PE 64561N, Project S1946 SSN 21 Development
 PE 64567N, Project S1803-007 Ship Contract Design

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CLASSIFIED BY: ERDA-008 Classification¹ Guide for the Naval Nuclear
 Propulsion Program, Part 1 & 2 Interpretive Guidance Bulletins
 DECLASSIFY ON: OADR

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PROCUREMENT: 24281N

MILCON: N/A

O&MN: N/A

5. [U] Related Programs:

PE 24281N, Project S0239	Mine Detection and Avoidance
PE 63504N, Project S0223	Submarine Sonar Improvement (Adv)
PE 63522N, Project S1739	Submarine Arctic W/F Development
PE 63522N, Project X0770	Adv Submarine Support Equipment
PE 63560N, Project S0222	Submarine Hull Array Development (Adv)
PE 63560N, Project R1305	Adv Conform Sub Acous S
PE 63528N, Project X0967	Non Acoustic ASW
PE 63569N, Project S1974	Adv Sub Tech
PE 64502N, Project S0742	Submarine Integrated Antenna System
PE 64502N, Project S1411	Submarine Tactical Communication System
PE 64503N, Project S0219	Submarine Sonar Improvement (Eng)
PE 64508N, Project S0166	SPS Improvement
PE 64514N, Project S0247	ESGN
PE 64514N, Project S0253	Navigation System
PE 64515N, Project X0775	Submarine Surveillance Equipment
PE 64520N, Project S0198	Submarine Hull Array Development (Eng)
PE 64524N, Project S1347	AN/BSY-1
PE 64524N, Project S1941	FY89 Combat System
PE 64562N, Project S0236	SSN Combat Control System Improvement (Eng)

6. [U] Mission and Description: The SSN 21 Class Attack Submarine will be quiet, fast, heavily armed, shock resistant, survivable, outfitted with an advanced combat system and capable of contending with the projected enemy threat well into the 21st century. The program provides the advanced technology prototype components and systems to design and construct the SSN 21 Class attack submarine so that the Navy will be better able to aggressively seek out and destroy enemy submarines and surface ships across a broad spectrum of tactical and climatic scenarios.

7. [U] Program Highlights:

a. Significant Historical Developments -- The SSN 21 Class submarine program began July 1982 with the establishment of GROUP TANGO to assess the need for an advanced technology submarine. In December 1982, CNO directed NAVSEA to proceed with feasibility studies. SECNAV approved the conceptual design of the SSN 21 in June 1983, and a new start was authorized by a Program Decision Memorandum in August 1983. In December 1983, SECNAV and SECDEF approved proceeding with preliminary design. Preliminary design contracts subsequently were awarded to Electric Boat and Newport News.

In June 1984, a Secretary of Defense Decision Memorandum, documenting the decisions of the December 1983 SECDEF Program Review, authorized the Navy to proceed with the preliminary design phase for the lead ship of the SSN 21 Class. The SSN 21 program was reviewed in 1984 by the Acquisition Review Board in October, and by SECNAV in December. In addition, a Logistics Review

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Group Audit was conducted in December 1984 and established certification that the SSN 21 ILS Plan for entry into Full Scale Engineering Development. The preliminary design phase for the SSN 21 Class attack submarine was completed in May 1985, with the subsequent Department of Navy Preliminary Design Report approved in August. The SSN 21 program went before the DSARC for Milestone II on 28 June 1985.

b. Significant Developments Since Last Report --

DT-II (Development Test II) is presently underway and will continue through FY93. Major programmatic efforts include Silencing, Target Strength Reduction, Propulsors, Advanced Ship Control, Weapons Stowage and Launch, and Submarine Survivability. DT-III is scheduled for FY94-FY95. OP-III (operational Test-III) and OT-IV are scheduled for FY95/FY96. The Contract Design contracts with Tenneco-Newport News Shipbuilding Division and General Dynamics, Electric Boat Division are nearing completion. The NPDM and JRMB were held in July 1986 and authorization to proceed with detail design of the SSN 21 was granted by OSD on 2 October 1986. A contract for SSN 21 detail design with Tenneco-Newport News Shipbuilding Division is scheduled for award in early 1987. The SSN 21 Class submarine is expected to satisfy the mission requirements.

c. Changes Since As Of 31 December 1986 Report -- None

8. [U] Decision Coordinating Paper (DCP) Threshold Breaches: None

9. [U] Schedule:

a. Milestones --	Development Estimate/ Approved Program	Current Estimate
Program Initiated	Jul 82/Jul 82	Jul 82
Milestone I (DSARC I)	Dec 83/Dec 83	Dec 83
Milestone II (DSARC II)	May 85/May 85	Jun 85 (CH-1)
FSD Contract Award	Jun 85/Jun 85	Jul 85 (CH-2)
Milestone IIB (JRMBI)	Oct 86/Oct 86	Oct 86
Milestone IIIA	Jun 88/Jun 88	Jun 88
First Production		
Contract Award	Nov 88/Nov 88	Nov 88
Milestone IIIB	Mar 90/Mar 90	Mar 90
Delivery (First Ship)	Nov 94/Nov 94	Nov 94
IOC (First Ship)	Nov 94/Nov 94	Mar 95 (CH-3)

b. Previous Changes Explanation --

(CH-1) DSARC II changed from May 85 to Jun 85 due to administrative scheduling delays.

(CH-2) As a result of DSARC II changing from May 85 to Jun 85, the FSD Contract Award was postponed from Jun 85 to Jul 85.

c. Current Change Explanation --

(CH-3) IOC (First Ship) changed from Nov 94 to Mar 95 due to administrative error.

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SSN 21, 31 December 1986

10. ~~(S)~~ Technical/Operational Characteristics:

a. ~~(S)~~ Technical -- Baseline Estimate/
Approved Program

Demonstrated
Performance Current
Estimate

Submarine			
Length	350 ft. (approx)/353 ft.	N/A	353 ft. (CH-1)
Beam Max	40 ft./40 ft.	N/A	40 ft.
Draft Nav.	36 ft. (max)/34 ft.	N/A	34 ft. (CH-2)
Displacement	9100 tons (approx)/9150 tons	N/A	9150 tons (CH-3)

(b)(1)

Propulsion

Type	S6W/S6W	N/A	S6W
SHP	45,000/45,000	N/A	45,000

Crew

Total billets	134 Men/134 Men	N/A	134 Men
Underway	116 Men/108 Men	N/A	108 Men (CH-4)

FY89 Combat System

Mean Time Between Failure (MTBF)

(b)(1)

c. Previous Change Explanation --

(b)(1)

d. Current Change Explanation --

None

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SSN 21, 31 December 1986

10. ~~[U]~~ Technical/Operational Characteristics: (Cont'd)

d. [U] References --

OPNAVINST C9010 Ser 02/5C384451 dtd 13 Dec 85, entitled "APPROVED TOP LEVEL REQUIREMENT (TLR) FOR THE SEAWOLF CLASS (SSN 21) NUCLEAR ATTACK SUBMARINE"

11. [U] Program Acquisition Cost

(Current Estimate in Millions of Dollars)

	Development Estimate	Changes	Current Estimate
a. Cost --			
Development (RDT&E)	1724.6	+247.3	1971.9
Procurement	1425.0	4224.8	5649.8
Basic Ship Cost	(883.6)	(2016.5)	(2900.1)
GFE	(494.2)	(2002.3)	(2496.5)
Other	(2.8)	(41.6)	(44.4)
OF/PD	(44.4)	(164.4)	(208.8)
Construction (MILCON)	0	0	0
Total FY85 Base-Year \$	3149.6	4472.1	7621.7
Escalation	725.4	909.3	1634.7
Development	(188.0)	(32.9)	(220.9)
Procurement	(537.4)	(876.4)	(1413.8)
Construction (MILCON)	0	0	0
Total Then-Year \$	3875.0	5381.4	9256.4*
b. Quantities --			
Development (RDT&E)	0	0	0
Procurement	1	4	5
Total	1	4	5
c. Unit Cost --			
Procurement:			
FY85 Base-Year \$	1425.0	-295.0	1130.0
Then-Year \$	1962.4	-549.7	1412.7
Program:			
FY85 Base-Year \$	3149.6	-1625.3	1524.3
Then-Year \$	3875.0	-2023.7	1851.3

*Excludes FY 92 Advanced Procurement for the FY 93 ships.

d. Approved Design to Cost Goal -- N/A. Per NAVSEA letter Ser 01722/299, Subject: Programs Subject to Design to Cost Principles, dated 14 September 1984. The SSN 21 is not subject to formal Design to Cost Principles.

e. Foreign Military Sales -- None.

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f. Nuclear Costs -- SSN 21 draws upon general reactor plant research and development work performed by the Department of Energy but this contribution cannot be quantified.

12. [U] Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	Current Estimate (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	UCR Baseline (Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	9256.4	6820.6	9256.4
(2) Quantity	5	3	5
(3) Unit Cost	1851.3	2273.5	1851.3
b. Current Procurement -- (FY1987)		(FY1987)	(FY1988)
(1) Cost	375.0	375.0	257.6
Less CY Adv Proc	N/A	N/A	257.6
Plus PY Adv Proc	N/A	N/A	N/A
Net Total	N/A	N/A	0
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

13. [U] Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1912.6	1962.4	0.0	3875.0
Previous Changes:				
Economic	-22.9	-196.9	-	-219.8
Quantity	-	+2688.5	-	+2688.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+216.8	+100.7	-	+317.5
Other	-	-	-	-
Support	-	+159.4	-	+159.4
Subtotal	193.9	2751.7	0.0	2945.6
Current Changes:				
Economic	-22.7	-120.5	-	-143.2
Quantity	-	+2392.3	-	+2392.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+109.0	+.8	-	+109.8
Other	-	-	-	-
Support	-	+76.9	-	+76.9
Subtotal	86.3	2349.5	0.0	2435.8
Total Changes	280.2	5101.2	0.0	5381.4
Current Estimate	2192.8	7063.6	0.0	9256.4

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13. [U] Cost Variance Analysis (Cont'd):

(FY1985 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1724.6	1425.0	0.0	3149.6
Previous Changes:				
Quantity	-	+2069.3	-	+2069.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+167.1	+82.6	-	+249.7
Other	-	-	-	-
Support	-	+110.8	-	+110.8
Subtotal	167.1	2262.7	0.0	2429.8
Current Changes:				
Quantity	-	+1866.1	-	+1866.1
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+80.2	+42.4	-	+122.6
Other	-	-	-	-
Support	-	+53.6	-	+53.6
Subtotal	80.2	1962.1	-	2042.3
Total Changes	247.3	4224.8	0.0	4472.1
Current Estimate	1971.9	5649.8	0.0	7621.7

b. Previous Change Explanation --

(Dollars in Millions)
Base-Year Then-Year

(1) RDT&E

Revised Jan 86 Economic Escalation Rates (Economic)	N/A	-22.9
Congressional Adjustments (Estimating)	+17.4	+18.4
Delete Arctic Warfare (PE 63522-S1739) (Estimating)	-86.3	-97.6
Addition of FY1991 RDT&E Rqmts for the SSN 21 Program (Estimating)	+205.1	+252.9
Revised Program Rqmts (Estimating)	+30.9	+43.1

(2) Procurement

Revised Jan 86 Economic Escalation Rates (Economic)	N/A	-196.9
Addition of 2 Submarines (Quantity)	+2069.3	+2688.5

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(2) Procurement (Cont'd)

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Refinement of Estimates to Reflect Later Contract/Pricing Data (Estimating)	+82.6	+100.7
Additional Outfitting/Post Delivery for Quantity Add (Support)	+110.8	+159.4

c. Current Change Explanations

(1) RD&E

Revised Jan 86 Economic Escalation Rates (Economic)	N/A	-22.7
Congressional Adjustments (Estimating - Gramm/Rudman/Hollings - Undistributed Reduction)	-29.8	-31.8
Addition of FY1992 RD&E Rqmts for the SSN21 Program (Estimating)	+159.3	+199.8
Revised Program Rqmts (Estimating)	-49.3	-59.0

(2) Procurement

Revised Jan 86 Economic Escalation Rates (Economic)	N/A	-120.5
Addition of 2 Submarines (Quantity)	1866.1	+2392.3
Refinement of Estimates to Reflect Later Contract/Pricing Data (Estimating)	+42.4	+0.8
Additional Outfitting/Post Delivery for Quantity Add (Support)	+53.6	+76.9

(3) MILCON -- N/A

d. References -- SECNAV Memo dated 13 Dec 83.

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SSN 21, 31 December 1986

14. [U] Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate --

PAUC (Initial SAR Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
3875.0	0	0	0	0	0	0	0	0	3875.0

b. Current Baseline to Current Estimate --

PAUC (Initial SAR Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
3875.0	-72.6	-2083.8	-	-	+85.5	-	+47.2	-2023.7	1851.3

15. [U] Contract Information: (Then - Year Dollars in Millions)Development

Improved Performance Machinery Program
General Dynamics/EB Division, Groton, CT
N00024-83-C-4181, CPFF

Award: January 10, 1983

Definitized: January 10, 1983

Initial Contract Price

Target	Ceiling	Qty
24.1	24.1	N/A

Current Contract Price

Estimated Price at Completion

Target	Ceiling	Qty
234.0	234.0	N/A

Contractor	Program Manager
234.0	234.0

Cost VarianceSchedule VariancePrevious Cumulative Variances^{1/}

N/A

N/A

Cumulative Variances to Date^{1/}

N/A

N/A

Net Change

N/A

N/A

^{1/} The Department of the Navy has not required CPR or C/SSR data on this contract. The FY87 IPMP Phase III competitive requirement invokes the C/SCSC requirement.

SSN 21 Propulsion Plant Design
Westinghouse Electric Corporation, Pittsburgh, PA
N00024-79-C-4026, CPFF

Award: October 13, 1978

Definitized: October 13, 1978

Initial Contract Price

Target	Ceiling	Qty
5.6	5.6	N/A

Current Contract Price

Estimated Price at Completion

Target	Ceiling	Qty
143.0	143.0	N/A

Contractor	Program Manager
143.0	143.0

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SSN 21, 31 December 1986

15. [U] Contract Information: (Cont'd)

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances ^{1/}	N/A	N/A
Cumulative Variances to Date	N/A	N/A
Net Change	N/A	N/A

- ^{1/} NAVMAT ltr MAT 0244:EAO of 18 Dec 1972 waives the Navy implementation of DOD Instruction 7000.2 for Naval Nuclear Propulsion Contracts.

Large Scale Vehicle Manufacture
 Sperry Corporation, Great Neck, NY
 N00024-84-C-5339, CPFF

Award: February 10, 1984

Definitized: February 10, 1984

Initial Contract Price

Target	Ceiling	Qty
18.4	18.4	N/A

Current Contract Price

Target	Ceiling	Qty
45.8	45.8	N/A

Estimated Price at Completion

Contractor	Program Manager
56.0	60.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances ^{1/}	N/A	N/A
Cumulative Variances to Date	N/A	N/A
Net Change	N/A	N/A

- ^{1/} The Department of the Navy has not required CPR or C/SSR data on this contract. The Navy is evaluating the contractor's estimate to complete, and investigating conversion to a FPI contract.

SSN 21 Nuclear Components

General Electric Corporation, Schenectady, NY

N00024-87-C-4001, CPFF

Award: November 7, 1986

Definitized: November 7, 1986

Initial Contract Price

Target	Ceiling	Qty
88.0	88.0	N/A

Current Contract Price

Target	Ceiling	Qty
88.0	88.0	N/A

Estimated Price at Completion

Contractor	Program Manager
310.0	310.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances ^{1/}	N/A	N/A
Cumulative Variances to Date	N/A	N/A
Net Change	N/A	N/A

- ^{1/} NAVMAT ltr MAT 0244:EAO of 18 Dec 72 waives the Navy implementation of DOD Instruction 7000.2 for Naval Nuclear Propulsion Program procurements.

15. [U] Contract Information: (Cont'd)

SSN 21 Nuclear Components

Westinghouse Electric Corp., Wilkins Township, PA

N00024-87-C-4000

Award: November 7, 1986

Definitized: November 7, 1986

Initial Contract Price

Target	Ceiling	Qty
70.2	70.2	N/A

Current Contract Price

Target	Ceiling	Qty
70.2	70.2	N/A

Estimated Price at Completion

Contractor	Program Manager
350.0	350.0

Cost VarianceSchedule VariancePrevious Cumulative Variances^{1/}

N/A

N/A

Cumulative Variances to Date

N/A

N/A

Net Change

N/A

N/A

^{1/} NAVMAT ltr MAT 0244:EAO of 18 Dec 72 waives the Navy implementation of DOD Instruction 7000.2 for Naval Nuclear Propulsion Program procurements.

16. [U] Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 26.7% (4/15)

(2) Percent Program Cost Appropriated: 15.3% (1418.3/9256.4)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY84-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance FYDP (FY89-92)</u>	<u>to Complete Beyond FYDP</u>	<u>Total</u>
RDT&E	1043.3	264.2	885.3	-	2192.8
Procurement	375.0	257.6	6146.5	284.5	7063.6
MILCON	-	-	-	-	-
Total	1418.3	521.8	7031.8	284.5	9256.4

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SSN 21, 31 December 1986

16. [U] Program Funding Summary (Cont'd)

c. Annual Summary --

Fiscal Year	Qty	FY Base-Year Dollars		Then-Year Dollars		Escl Rate (%)	
		Nonrec	Rec	Total	Advance Proc		
					Debit (-)		Credit (+)
Appropriation: RDT&E							
1984	0		110.6	110.6		109.2 3.8	
1985	0		257.2	257.2		261.5 3.4	
1986	0		351.5	351.5		368.2 2.9	
1987	0		281.3	281.3		304.4 3.1	
1988	0		236.0	236.0		264.2 3.5	
1989	0		207.6	207.6		240.3 3.5	
1990	0		187.9	187.9		224.1 3.3	
1991	0		180.5	180.5		221.1 2.9	
1992	0		159.3	159.3		199.8 2.4	
Subtotal	0		1971.9	1971.9		2192.8 N/A	

Appropriation: Procurement						
1987	0		329.9	329.9	375.0	375.0 3.1
1988	0		220.0	220.0	257.6	257.6 3.5
1989	1		1230.6	1230.6	632.6 393.0	1481.0 3.5
1990	0		472.2	472.2	583.0	583.0 3.3
1991	2		1804.6	1804.6	563.1 187.1	2282.7 2.9
1992	2		1389.6	1389.6	600.0	1799.8 2.4
1993	0		16.5	16.5		21.9 2.4
1994	0		31.9	31.9		43.3 2.4
1995	0		66.8	66.8		92.9 2.4
1996	0		57.5	57.5		81.9 2.4
1997	0		23.2	23.2		33.8 2.4
1998	0		4.2	4.2		6.2 2.4
1999	0		2.8	2.8		4.5 2.4
Subtotal	5		5649.8	5649.8	1795.7 1795.7	7063.6 N/A
Total	5		7621.7	7621.7	1795.7 1795.7	9256.4 N/A

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SSN 21, 31 December 1986

16. [U] Program Funding Summary (Cont'd)

c. Annual Summary --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1984	109.2	109.2	106.3
1985	261.5	261.5	255.6
1986	368.1	364.5	271.8
1987	304.4	135.1	9.0
Total	1043.3	870.3	642.7
Appropriation: SCN			
1987	375.0	214.5	0.0
Total	375.0	214.5	0.0

17. N/A

18. N/A

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q & R) B23)

PROGRAM: T-AO 187 CLASS FLEET OILER

AS OF DATE: 31 December 1986

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FEB 27 1987 22

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE1. Designation/Nomenclature (Popular Name):

T-AO 187 CLASS FLEET OILER

2. DOD Component:

U.S. Navy (NAVSEA)

3. Responsible Office and Telephone Number:

Auxiliary/Special Mission Ship	PM: CAPT W.C. Pfister
Acquisition Project Office (PMS383)	Assigned: 10/03/84
Department of the Navy (NAVSEA)	Autovon: 222-3507
Washington, D.C. 20362	Commercial: (202) 692-3507

4. Program Elements:RDT&E: 63564N; 64567N (Shared funding)
Procurement (SCN): 24441N, APPN 1611, ICN 50255. Related Programs:

AOE 6 Class

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PROGRAM: T-AO 187 Class Fleet Oiler
AS OF DATE: 31 December 1986

6. Mission and Description:

DESCRIPTION: A 180,000 barrel capacity twin screw, 20 knot sustained speed, diesel driven Fleet Oiler with a 677.5 foot overall length, a 97.5 foot beam, and a 35 foot maximum navigational draft. Accommodations are for a 106 Military Sealift Command crew, a Navy Command, Control and Communications Team of 21 men and 10 transient personnel; a total of 137.

MISSION: The Fleet Oiler operates as a unit of an underway replenishment group or independently, to furnish petroleum (POL) products to operating forces at sea. The ship transports bulk POL from shore depots to Combat Support Ships (AOE), Replenishment Oilers (AOR) and other Fleet Oilers (AO & T-AO) effecting delivery and consolidation underway. The ship delivers bulk POL and delivers and receives fleet freight, mail and personnel, replenishing combatants and support forces underway and in port. The ship will be capable of replenishing from 5 stations simultaneously.

7. Program Highlights (Since Last Report):

- a. Significant Historical Developments - The T-AO-187 Class program was approved by DCP# S0859-SL on 7 December 1981 followed by the production contract award in November 1982. Production started on the first ship in April 1984 with a delivery of December 1986.
- b. Significant Developments since Last Report - One ship deleted in FY91.
- c. Changes Since "As of" Date - N/A

8. Decision Coordinating Paper (DCP) Threshold Breaches: N/A9. Schedule:

a. Milestones	<u>Production Estimate</u>	<u>Current Estimate</u>
CNO Executive Board	June 80	June 80
Characteristics Approved	Feb 81	Feb 81
DSARC I	Mar 80	Mar 80
DCP #S0859-SL Approved	Dec 81	Dec 81
Production Contract Award	Nov 82	Nov 82
Production Started-First Ship	Apr 84	Apr 84
Launch - First Ship	Aug 85	Aug 85
Acceptance Trials-First Ship	Jul 86	Sept 86
Delivery - First Ship	Sep 86	Dec 86
Initial Operating Capability	1st Qtr FY 87	2nd Qtr FY 87

- b. Explanation of Changes: Technical problems associated with main reduction gears.
- c. References: NDCP S0859-SL approved 7 December 1981

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PROGRAM: T-AO 187 Class Fleet Oiler
AS OF DATE: 31 December 1986

10. Technical/Operational Characteristics:

	<u>Development Estimate</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. <u>Technical</u>			
Length Overall	677.5 feet	N/A	677.5 feet
Beam Max.	97.5 feet		97.5 feet
Draft Navigational	35.0 feet		35.0 feet
Displacement	40,000.0 long tons		40,000.0 long tons
Propulsion			
(1) Type	2 Diesel Engines twin shaft Controllable Reversible Pitch Propellers		2 Diesel Engines twin shaft Controllable Reversible Pitch Propellers
(2) SHP	16,000 Each		16,000 Each
Accommodations	137		137
b. <u>Operational</u>			
Speed Max.	20 Knots	N/A	20 Knots
Endurance	6000 NM		6000 NM
Aramament	None		None
Cargo	180,000 Barrels		180,000 Barrels

c. Previous Change Explanation: N/A

d. Current Change Explanation: N/A

e. References:

Production Estimate: NDCP S0859-SL approved 7 December 1981

Approved Program: FY 1988 Presidents Budget

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PROGRAM: T-AO 187 Class Fleet Oiler
AS OF DATE: 31 December 1986

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

a. Cost	Development Estimate	Changes	Current Estimate
Development (RDT&E)	15.8	+ 3.0	18.8
Procurement	2591.9	- 255.8	2336.1
Total Sailaway	(2518.4)	(- 269.0)	(2249.4)
Other Weapon System Costs	-	-	-
Initial Spares	-	-	-
Total FY84 Base-Year \$	(2518.4)	(- 269.0)	(2249.4)
Escalation	583.0	-247.7	335.3
Development (RDT&E)	(.4)	+ .3	(.7)
Procurement	(582.6)	(-248.0)	(334.6)
Total Then-Year \$	3190.7	-500.5	2690.2*

*Excludes FY 92 Advanced Procurement for FY 93 ships.

b. Quantities

Development (RDT&E)	-	-	-
Procurement	17	+ 1	18
Total	17	+ 1	18

c. Unit Cost

Procurement:

FY84 Base-Year \$	152.46	- 22.68	129.78
Then-Year \$	186.79	- 38.42	148.37

Program:

FY84 Base-Year \$	153.39	- 22.56	130.83
Then-Year \$	187.69	- 38.23	149.46

d. Approved Design to Cost Goal: N/A (Not required by OR)

e. Foreign Military Sales: N/A

f. Nuclear Costs: N/A

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PROGRAM: T-AO 187 Class Fleet Oiler
AS OF DATE: 31 December 1986

12. Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>
a. Program Acquisition			
(1) Cost	2690.2	3060.5	2690.2
(2) Quantity	18	19	18
(3) Unit Cost	149.461	161.079	149.461
b. Current Procurement (FY 87) (FY 87) (FY 88)			
(1) Cost	273.5	292.2	402.9
Less CY Adv Proc	-	-	-
Plus PY Adv Proc	-	-	-
Net Total	273.5	292.2	402.9
(2) Quantity	2	2	2
(3) Unit Cost	136.750	146.100	201.450

13. Cost Variance Analysis:

a. Summary: (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	TOTAL
Baseline Estimate (PdE)	16.2	3174.5	3190.7
Previous Changes:	-	-	-
Economic	-	-112.4	-112.4
Quantity	-	+358.4	+358.4
Schedule	-	-	-
Engineering	-	-	-
Estimating	-2.0	-374.2	-376.2
Other	-	-	-
Support	-	-	-
SUBTOTAL	-2.0	-128.2	-130.2
Current Changes:	-	-	-
Economic	-	- 50.7	- 50.7
Quantity	-	-180.8	-180.8
Schedule	-	-	-
Engineering	-	-	-
Estimating	+5.3	-144.1	-138.8
Other	-	-	-
Support	-	-	-
SUBTOTAL	+5.3	-375.6	-370.3
TOTAL CHANGES	+3.3	-503.8	-500.5
CURRENT ESTIMATE	19.5	2670.7	2690.2

PROGRAM: T-AO 187 Class Fleet Oiler
AS OF DATE: 31 December 1986

13. Cost Variance Analysis (Cont'd):

(FY 1984 Constant Dollars (Base Year) in Millions)

	RD&E	PROC	TOTAL
Baseline Estimate (PdE)	15.8	2591.9	2607.7
Previous Changes:	-	-	-
Economic	-	-	-
Quantity	-	+270.1	+270.1
Schedule	-	-	-
Engineering	-	-	-
Estimating	- 1.6	-310.5	-312.1
Other	-	-	-
Support	-	-	-
SUBTOTAL	- 1.6	- 40.4	- 42.0
Current Changes:	-	-	-
Economic	-	0.0	0.0
Quantity	-	-103.7	-103.7
Schedule	-	-	-
Engineering	-	-	-
Estimating	+ 4.6	-111.7	-107.1
Other	-	-	-
Support	-	-	-
SUBTOTAL	+ 4.6	-215.4	-210.8
TOTAL CHANGES	+ 3.0	-255.8	-252.8
CURRENT ESTIMATE	+18.8	2336.1	2354.9

b. Previous Change Explanation:

	BASE-YEAR	THEN-YEAR
(1) <u>RD&E</u>		
- Transfer of contract design to SCN from RD&EN, FY87 and subsequent. (EST)	- 1.6	- 2.0
(2) <u>Procurement</u>		
- Adjustments for revised inflation indices. (ECONOMIC)	N/A	-112.4
- Two additional ships added to program, FY91. (QUANTITY)	+270.1	+358.4
- Decrease to procurement costs of FY 1987-1990 ships, based on favorable award of FY 1985-1986 ships. (ESTIMATING)	-211.5	-209.9
- Various Congressional adjustments to FY 1982-1986 ships. (ESTIMATING)	- 99.0	-164.3

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PROGRAM: T-AO 187 Fleet Oiler
AS OF DATE: 31 DECEMBER 1986

(3) MILCON

N/A

N/A

c. Current Change Explanations

BASE-
YEAR

THEN-
YEAR

(1). RDT&E

Additional design required for design of
Twin-Skeg Hull form (Estimating)

+ 4.6

+ 5.3

(2). PROCUREMENT

Congressional Recissions and Adjustments
(Economic)

0.0

- 50.7

Delete one ship FY-91 with associated
OF/PD costs (Quantity)

-103.7

-180.8

Decrease FY 88-91 ships based on award
of FY 85-87 ships and decrease cost of
85-87 ships based on projected final end
costs (Estimating)

-111.7

-144.1

(3) MILCON

N/A

N/A

d. References: NDCP - S0859-SL approved 7 December 1981

14. Program Acquisition Unit Cost (PAUC) History:

a. Initial SAR Estimate to Current Baseline Estimate
Same as current Baseline Estimate.

b. Current Baseline Estimate to Current Estimate

PAUC (Baseline Estimate)	Changes (Then Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
187.7	-9.6	+9.9	-	-	-28.6	-	-9.9	-	149.5

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement

Initial Contract Price
Target Ceiling Qty

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15. Contract Information (Cont'd)

			<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	492.2	595.1	4		

Avondale Shipyard, Inc.
New Orleans, LA N00024-83-C-2012 (FPI)
November 12, 1982

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
498.0	601.8	4	492.7	495.7

			<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	221.5	247.1	2		

Avondale Shipyard, Inc.
New Orleans, LA N00024-85-C-2131 (FPI)
June 28, 1985

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
220.6	246.2	2	222.5	221.6

			<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	320.6	378.8	3		

Pennsylvania Shipbuilding, Co.
Chester, PA N00024-85-C-2115 (FPI)
May 6, 1985

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
322.1	380.6	3	328.6	328.7

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variance	- 22.8	- 2.6
Cumulative Variances to Date	+ 6.2	- 11.8
Net change	+ 29.0	- 9.2

Explanation of Change:

Cost Variance: Significant start up costs at PENN SHIP, (New Yard)
Poor initial productivity and higher than anticipated labor and overhead costs.

Schedule Variance: The first contract at AVONDALE experienced technical difficulties and Logistic Support delays (Since Corrected). PENN SHIP has experienced start-up problems that are commonly associated with a new shipyard.

The Program Manager's estimate remains within approved funding.

UNCLASSIFIED

PROGRAM: T-AO 187 Class Fleet Oiler
AS OF DATE: 31 DECEMBER 1986

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status:

(1) Percent Program Completed: 56.25% (9/16)

(2) Percent Program Cost Appropriated: 61.42 (1652.4/2690.2)

b. Appropriation Summary:

Appropriation	Current \$ Prior Yrs. (FY82-87)	(Then-Year Dollars in Millions)			Total
		Budget Year (FY88)	Balance FYDP (FY89-91)	To Complete Beyond FYDP (FY92)	
RD&E	16.1	2.9	.5	-	19.5
Procurement	1580.4	286.9	776.0	27.4	2670.7
Total	1596.5	289.8	776.5	27.4	2690.2

c. Annual Summary:

Fiscal Year	Qty	FY84 Base-Year Dollars		Then-Year Dollars			Escl Rate %
		Flyaway		Total	Advance Proc		
		Nonrec	Rec		Debit	Credit	

Appropriation: RD&E

1982	-	-	-	12.0	-	-	12.0	-
1983	-	-	-	1.0	-	-	1.0	-
1984	-	-	-	.3	-	-	.3	-
1985	-	-	-	.3	-	-	.3	3.5
1986	-	-	-	.1	-	-	.1	3.5
1987	-	-	-	2.1	-	-	2.4	3.5
1988	-	-	-	2.5	-	-	2.9	3.5
1989	-	-	-	.3	-	-	.3	3.5
1990	-	-	-	.2	-	-	.2	3.5
1991	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-
Subtotal	-	-	-	18.8	-	-	19.5	-

Appropriation: Procurement

1982	1	-	-	179.1	-	-	179.1	-
1983	1	-	-	142.0	-	-	142.0	-
1984	2	-	-	271.6	-	-	291.0	-
1985	3	-	-	400.2	-	-	437.0	-
1986	2	-	-	229.2	-	-	257.8	-
1987	2	-	-	235.7	-	-	273.5	-
1988	2	-	-	240.0	-	-	286.9	3.5
1989	2	-	-	218.7	-	-	268.7	3.5
1990	2	-	-	262.1	-	-	330.4	2.9
1991	1	-	-	136.9	-	-	176.9	2.4
1992	-	-	-	12.8	-	-	16.9	2.4
Balance to	-	-	-	-	-	-	-	-
Complete	-	-	-	7.8	-	-	10.5	-
Subtotal	18	-	-	2336.1	-	-	2670.7	-
Total	18	-	-	2354.9	-	-	2690.2	-

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PROGRAM: T-AO 187 Class Fleet Oiler
AS OF DATE: 31 December 1986

16. Program Funding Summary (cont'd):d. Obligations and Expenditures

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1982	12.0	12.0	12.0
1983	1.0	1.0	1.0
1984	.3	.3	.3
1985	.3	.3	.3
1986	.1	.1	.1
1987	2.4	-	-
1988	2.9	-	-
1989	.3	-	-
1990	.2	-	-
Balance To			
Complete	-	-	-
Total	19.5	13.7	13.7

Appropriation: SCN

1982	179.1	168.4	150.5
1983	142.0	132.3	112.9
1984	291.0	263.1	200.5
1985	437.0	358.4	129.8
1986	257.8	203.3	17.5
1987	273.5	-	-
1988	286.9	-	-
1989	268.7	-	-
1990	330.4	-	-
1991	176.9	-	-
1992	16.9	-	-
Balance To			
Complete	10.5	-	-
Total	2670.7	1125.5	611.2

17. Production Rate Data: Not Applicable18. Operating and Support Costs:

a. Assumptions and Ground Rules - N/A

b. Costs - N/A

5. AF-32

SRAM II

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SAR-86-095

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

PROGRAM: SHORT RANGE ATTACK MISSILE (SRAM) II

As of Date: December 31, 1986

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE1. (U) Designation and Nomenclature (Popular Name): XAGM-131A/Short Range Attack Missile (SRAM II)2. (U) DOD Component: US Air Force3. (U) Responsible Office
SRAM II Program Office
Aeronautical Systems Division
Wright-Patterson AFB, OH 45433Col Herbert L. Bevelhymmer
Assigned: July 23, 1984
AV 785-5080;
COMM (513) 255-50804. (U) Program Elements/Procurement Line Items:
RDT&E: PE 63364F
PROCUREMENT: PE 11218F APPN 3020 ICN ADVASM
O&M: NA
MILCON: NA5. (U) Related Programs: B-1B

(b)(1)

~~FORMERLY RESTRICTED DATA~~
~~Unauthorized disclosure subject to adminis-~~
~~trative and criminal sanctions. Handle as~~
~~Restricted Data in foreign dissemination.~~
~~Section 144.b. Atomic Energy Act, 1954.~~

~~Classified By: SRAM II SCS, 25 Mar 86~~

SAF/PAS

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87-0065-T

87 0297

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(b)(1)



7. (U) Program Highlights:

a. (U) Significant Historical Developments -- The SRAM II program was a new start in FY85. The decision to initiate the program was made in September 1982, following an unsuccessful attempt to establish a new production source for the existing SRAM rocket motor. An accelerated acquisition approach was chosen for SRAM II because of the need to field an operational system in the early 1990s. Thus, the normal Concept Exploration and Demonstration/Validation Phases were combined to form a System Definition Phase. A competition was conducted and contracts were awarded (February 1985) to three major aerospace contractors (Boeing Aerospace, Martin Marietta Orlando Aerospace, and McDonnell Douglas Astronautics) for system definition studies and component risk reduction testing. In addition, integration study contracts were awarded to Rockwell and Boeing Military Airplane Company for B-1B integration.

(U) In August 1985, after four months of detailed trade studies by the three contractors and a two-month Air Force evaluation of the trade studies, decisions were made on two key missile characteristics. A missile size of approximately two-thirds of the existing SRAM was selected to allow carriage of twelve missiles on a modified B-1B multipurpose launcher. For missile propulsion, a solid rocket motor was chosen since this technology met all performance requirements at the least estimated cost. Risk reduction work, including firings of full-scale rocket motor candidate designs and tests of candidate missile inertial navigation units using test bed aircraft to simulate bomber and missile flights, were successfully completed. Contractor and government agencies reviewed a draft request for proposal (RFP) and provided comments for inclusion into the final full scale development (FSD) and initial production RFP.

(b)(1)



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(b)(1);(b)(3):42 USC §2168(a) (1)(C)--(FRD)

(U) The Source selection for FSD and initial production was completed with Boeing Aerospace announced as the winner on 5 December 1986. The contract award (fixed price incentive fee) will be delayed until approximately March 1987 to allow completion of Congressionally directed report comparing the cost effectiveness of a re-motored SRAM versus SRAM II and an in-production warhead versus a new warhead. Congressional language within the FY87 Department of Defense Authorization Act requires submission of this report prior to obligating any FY87 funds.

c. (U) Changes Since "As Of" Date -- None

8. (U) Systems Concept Paper (SCP) Threshold Breaches: There are currently no SCP (dated 1 February 1985) threshold breaches. The draft SCP was submitted to OSD on 9 July 1985. A draft Decision Coordinating Paper (DCP) (dated 8 December 1986) is currently being finalized to support the Milestone II decision process.

9. (U) Schedule:

a. (U) Milestones --

	Planning Estimate/ Approved Program	Current Estimate
System Concept Paper	Feb 85/Feb 85	Feb 85
Milestone II	Jun 87/Jun 87	Jun 87*
Missile PDR	Jul 87/Jul 87	Aug 87 (ch 1)
Missile CDR	Jun 88/Jun 88	Aug 88 (ch 1)
First Live Launch	Oct 89/Oct 89	Aug 89 (ch 1)
AFSARC IIIa (Low Rate Production)	Apr 90/Apr 90	May 90 (ch 2)
AFSARC IIIb (Full Production)	Sep 91/Sep 91	Jul 92 (ch 2)
IOC (50 missiles)	Mar 92/Mar 92	Apr 93 (ch 2)

*Milestone II Briefing completed Jan 87. Final Documentation and Action Items to be completed Jun 87.

b. (U) Previous Change Explanations -- None

c. (U) Current Change Explanations --

(Ch 1) These minor changes resulted from schedules developed throughout the source selection process by the government and winning contractor. Missile PDR was slipped from July 87 to Aug 87. Missile CDR was delayed from June 88 to Aug 88. First live launch was moved from October 89 to Aug 89.

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(Ch 2) These delays result from the deletion of FY89 production funding. AFSARC III A was slipped from Apr 90 to May 90. AFSARC III B was delayed from Sept 91 to Jul 92. IOC was moved from Mar 92 to Apr 93.

d. References --

Planning estimate: FY 87 Descriptive Summary

Approved Program: Draft SCP, dated February 1, 1985, subject, "SRAM II Systems Concept Paper"

10. (U) Technical/Operational Characteristics:

	<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. (U) Technical --			
(U) Reliability/Availability			
Reliability excluding warhead	TBD/0.95	N/A	0.98 (Ch 1)
Availability excluding warhead	TBD/0.95	N/A	0.95 (Ch 1)
(U) Size (Length/ Diameter) (in)	168/15/168/15	N/A	168/15
(U) Weight (pounds)	1800/1800	N/A	1805 (Ch 1)
b. (U) Operational --			

(b)(1);(b)(3):42 USC §2168(a) (1)(C)--(FRD)

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(b)(1)



c. (U) Previous Change Explanations -- None

d. (U) Current Change Explanations --

(b)(1)



e. (U) References --

Planning Estimate: Draft Systems Concept Paper (SCP) dated
February 1, 1985.

Approved Program: Draft Systems Concept Paper (SCP) dated
February 1, 1985.

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11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	Planning Estimate	Change	Current * Estimate
a. Cost --			
Development (RDT&E)	864.2	-22.4	841.8
Procurement	1366.9	-424.8	942.1
Airframe	(244.5)	(-21.3)	(223.2)
Engine	(303.0)	(-60.9)	(242.1)
Nav/Guidance	(515.6)	(-130.3)	(385.3)
Total Flyaway	(1063.1)	(-212.5)	(850.6)
Other Weapon System Cost	(250.5)	(-170.4)	(80.1)
Initial Spares	(53.3)	(-41.9)	(11.4)
Construction (MILCON)	N/A	N/A	N/A
Total FY83 Base-Year \$	2231.1	-447.2	1783.9
Escalation	833.4	-152.3	681.1
Development (RDT&E)	(216.7)	(-8.3)	(208.4)
Procurement	(616.7)	(-144.0)	(472.7)
Construction (MILCON)	N/A	N/A	N/A
Total Then-Year \$	3064.5	-599.5	2465.0
b. Quantities --			
Development (RDT&E)	N/A	N/A	N/A
Procurement	1633	0.0	1633
Total	1633	0.0	1633
c. Unit Cost --			
Procurement:			
FY83 Base-Year \$	.837	-.260	.577
Then-Year \$	1.215	-.349	.866
Program:			
FY83 Base-Year \$	1.366	-.274	1.092
Then-Year \$	1.877	-.368	1.509
d. Approved Design-to-Cost Goal -- TBD			
e. Foreign Military Sales -- None			
f. Nuclear Costs -- TBD			

* The current estimate included in this submission reflects the FY88/89 President's Budget. The start of the production program was slipped from FY 89 to FY 90.

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12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition --			
(1) Cost	2465.0	3064.5 *	2465.0
(2) Quantity	1633	1633	1633
(3) Unit Cost	1.509	1.877	1.509
b. Current Procurement --	N/A		

* The FY87 President's Budget overstated the funding requirements for 1633 units.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1080.9	1983.6	0.0	3064.5
Previous Changes:				
Economic				0.0
Quantity				0.0
Schedule				0.0
Engineering				0.0
Estimating				0.0
Other				0.0
Support				
Subtotal	0.0	0.0	0.0	0.0
Current Changes:				
Economic	-10.7	-32.4		-43.1
Quantity				0.0
Schedule		+87.6		+87.6
Engineering				0.0
Estimating	-194.4	-325.0		-519.4
Other				0.0
Support	+174.4	-299.0		-124.6
Subtotal	-30.7	-568.8	0.0	-599.5
Total Changes	-30.7	-568.8	0.0	-599.5
Current Estimate	1050.2	1414.8	0.0	2465.0

13. Cost Variance Analysis (Cont'd):

(FY83 Constant (Base-Year) Dollars in Millions)

:	:	RDT&E	:	PROC	:	MILCON	:	TOTAL	:
:	Planning Estimate	:	864.2	:	1366.9	:	0.0	:	2231.1
:	Previous Changes:	:	:	:	:	:	:	:	:
:	Quantity	:	:	:	:	:	:	0.0	:
:	Schedule	:	:	:	:	:	:	0.0	:
:	Engineering	:	:	:	:	:	:	0.0	:
:	Estimating	:	:	:	:	:	:	0.0	:
:	Other	:	:	:	:	:	:	0.0	:
:	Support	:	:	:	:	:	:	0.0	:
:	Subtotal	:	0.0	:	0.0	:	0.0	:	0.0
:	Current Changes:	:	:	:	:	:	:	:	:
:	Quantity	:	:	:	:	:	:	0.0	:
:	Schedule	:	:	:	:	:	:	0.0	:
:	Engineering	:	:	:	:	:	:	0.0	:
:	Estimating	:	-159.5	:	-212.5	:	:	-372.0	:
:	Other	:	:	:	:	:	:	0.0	:
:	Support	:	+137.1	:	-212.3	:	:	-75.2	:
:	Subtotal	:	-22.4	:	-424.8	:	0.0	:	-447.2
:	Total Changes	:	-22.4	:	-424.8	:	0.0	:	-447.2
:	Current Estimate	:	841.8	:	942.1	:	0.0	:	1783.9

b. Previous Change Explanations -- N/A

c. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year(1) RDT&E

Revised economic escalation indices (economic)	0.0	-10.7
Contractor proposals received in competitive source selection were used to revise program estimate (estimating)	-159.7	-194.6
Adjustment for current and prior year escalation (estimating)	+0.2	+0.2
Revised B-1B integration and support estimate based on source selection analysis of contractor proposal (support)	+137.1	+174.4

13. Cost Variance Analysis (Cont'd):(2) Procurement

Revised economic escalation indices (economic)	0.0	-32.4
Production funding deferred two years and annual quantities rephased (schedule)	0.0	+87.6
Contractor proposals received in competitive source selection were used to revise program estimate (estimating)	-212.5	-325.0
Previous estimate based on SRAM-A analogy. Current estimate based on contractor proposal in response to SRAM II support concept (support)	-170.4	-237.5
Current estimate for initial spares based on contractor proposal in response to SRAM II support concept (support)	-41.9	-61.5

d. References --

Planning Estimate: FY 1987 President's Budget, February 1986

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

a. Initial SAR Estimate to Current Estimate

PAUC	Changes								PAUC
(Initial									(Current
SAR Est									Est)
/PE)	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1.877	-.027	--	.053	--	-.318	--	-.076	-.368	1.509

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XAGM-131A, December 31, 1986

13 Contract Information: (Millions of Then Year \$)(Current Estimate in Millions of Dollars)

a. RDT&E ---

System Definition Studies	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Boeing Aerospace Co., Seattle, WA F33657-84-C-0302, FFP Award: February 13, 1985*	4.230	4.230	N/A
Martin - Marietta, Orlando, FL F33657-84-C-0301, FFP Award: February 13, 1985*	4.356	4.356	N/A
McDonnell-Douglas Astronautics Co. St. Louis, MO F33657-84-C-0303, FFP Award: February 13, 1985*	4.485	4.485	N/A

* Deleted, DOD FY87 Authorization Act requires reporting on six largest contracts, \$40.0M or more.

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XAGM-131A, December 31, 1986

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 30.8% (4 yrs/13 yrs)
 (2) Percent Program Cost Appropriated 4.6% (\$114.5M/\$2465.0M)

b. Appropriation Summary -- (Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY84-87)	Budget Year (FY88)	Balance to Complete FYDP (FY89-92)	Beyond FYDP (FY93-96)	Total
RDT&E	114.5	220.4	715.3		1050.2
Procurement	0.0	0.0	321.8	1093.0	1414.8
MILCON	0.0	0.0	0.0	0.0	0.0
Total	114.5	220.4	1037.1	1093.0	2465.0

c. Annual Summary --

Fiscal Year	Qty	FY 83 Base Year		Then Year		Escl Rate (%)		
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit			Credit
Appropriation: RDT&E								
1984				5.9			6.3	3.8
1985				11.0			12.0	3.4
1986				26.3			29.7	2.9
1987				57.0			66.5	3.1
1988				182.6			220.4	3.5
1989				185.7			231.6	3.5
1990				265.3			340.6	3.3
1991				81.0			106.7	2.9
1992				27.0			36.4	2.4
Subtotal				841.8			1050.2	

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XAGM-131A, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --*

Fiscal Year	Qty	FY 83 Base Year			Then Year			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: Procurement								
1990				8.7	7.7		12.0	3.3
1991	25	50.4	44.1	113.1	11.4	(7.7)	159.2	2.9
1992	75	1.3	73.1	104.5	32.1	(11.4)	150.6	2.4
1993	300	21.1	151.5	183.1	31.0	(32.1)	270.0	2.4
1994	400	15.2	104.6	193.3	31.0	(31.0)	292.0	2.4
1995	400	8.9	156.9	181.6	32.0	(31.0)	281.0	2.4
1996	433	4.6	159.0	157.8		(32.0)	250.0	2.4
Subtotal	1633	100.4	749.2	942.1	145.2	(145.2)	1414.8	
Total	1633			1783.9	145.2	(145.2)	2465.0	

*The current estimate included in this submission reflects the FY 89/90 President's Budget. The start of the production program was slipped from FY 89 to FY 90.

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XAGM-131A, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures —

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1984	6.3	4.3	4.3
1985	12.0	11.3	10.4
1986	29.7	16.4	6.3
1987	66.5	0.0	0.0
To Comp	935.7	N/A	N/A
Total	1050.2	32.0	21.0
Appropriations: Procurement and MILCON — N/A			

Reflects program office records as of 31 Dec 86

17. Production Rate Units: N/A

18. Operating and Support Costs: N/A

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

PROGRAM: MICROWAVE LANDING SYSTEM (MLS)

AS OF DATE: 31 December 1986

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1. Designation and Nomenclature (Popular Name): Microwave Landing System (MLS)2. DoD Component: U.S. Air Force3. Responsible Office and Telephone Number:

Airborne Voice Communications Systems Directorate
Electronic Systems Division
Hanscom AFB, MA 01731-5000

PM: Colonel Rodney J. Sayles
Assigned: 14 January 1985
AV 478-4952
Comm (617) 377-4952

4. Program Elements/Procurement Line Items:

RDT&E: PE 35114F Project 2759 (Shared Funding)

PROCUREMENT: APPN 3010 ICN C13000 (Shared Funding)
APPN 3080 ICN 833010 (Shared Funding)

O&M: PE 35114F (Shared Funding)
PE 72207F (Shared Funding)

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (CASD-PA)
DEPARTMENT OF DEFENSE

SAF/PAS

87-0047-T

MLS, 31 December 1986

5. Related Programs: None

6. Mission and Description:

a. Mobile Microwave Landing System (MMLS) (formerly Tactical MLS): The Mobile Microwave Landing System is a precision approach guidance system which will provide an off-airfield capability for operation in adverse weather and support initial deployment of ground forces, forward area supply, medical evacuation and special operating forces. The Mobile MLS ground system is common with the FAA Civil System and generates microwave guidance signals, identical to the FAA system enabling MLS equipped aircraft to continuously display aircraft position relative to a pre-selected courseline and glideslope during approach to a minimum guidance altitude (decision height). The MMLS will replace mobile Precision Approach Radars (PAR).

b. Fixed Base Microwave Landing System: The Fixed Base Microwave Landing System (FBMLS) will be identical to the FAA's civil system and is intended as a replacement for the present fixed base PARs and Instrument Landing System (ILS). The Air Force is consolidating tri-service FBMLS requirements and coordinating with the FAA for systems acquisition under the FAA's second and third MLS contracts.

c. Commercial Microwave Landing System Avionics (CMLSA): The Commercial Microwave Landing System Avionics equipment modified and tested as necessary for integration and installation into cargo, tanker, trainer, bomber, and operational support aircraft will interoperate with the Civil and Military Ground Systems.

7. Program Highlights:

a. Significant Historical Developments:

(1) In January 1983, the Air Force was designated the lead service for DOD MLS activities. In July 1983, the North Atlantic Treaty Organization (NATO) nations agreed to transition from PAR to the MLS as the standard NATO military precision landing system at Main Operating Bases (MOBs).

(2) In November 1985 the results of a HQ USAF ROADMAP Study of all Traffic Control and Landing Systems (TRACALS) aids, increased the Tactical MLS weight requirement from 500 lbs to a max of 1000 lbs and deleted air droppability requirements. The name of the program changed from Tactical MLS to Mobile MLS to reflect the relaxed requirements.

(3) On 27 Nov 85 HQ USAF notified Congress of the restructured Mobile MLS program based on a system specification 85% common with FAA. Release of the request for proposals for the Mobile MLS was held pending further discussions with the Congressional Committees. On 22 May 1986, the FAA and USAF signed a Memorandum of Agreement (MOA) linking the acquisition schedules of the Mobile MLS and civil fixed MLS systems. The intent is to provide industry an opportunity to bid on one or both programs. If bidding on both programs, the contractor should demonstrate to the government the benefits from common designs or hardware.

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b. Significant Developments Since Last Report

(1) An overall MLS avionics architecture was briefed to OSD on 17 Dec 1986. A decision was made to continue with a Technology Demonstration of the High Reliability Military MLS Avionics design. FY88 President's Budget reinstated outyear funding for the restructured Mobile MLS and Commercial MLS Avionics.

(2) The Mobile MLS, Commercial MLS Avionics and Fixed Base MLS are expected to satisfy the mission requirements as directed.

c. Changes since 31 December 1986 -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: N/A9. Schedule:

a. Milestones --

Planning Estimate/
Approved Program

Current Estimate

(1) MMLS

Service Component Program
Initiation

Jan 83/Jan 83

Jan 83

System Operational Concept
MAC TMLS

Sep 84/Sep 84

Sep 84

System Operational Concept

Sep 85/Sep 85

TBD

MMLS Development Contract Award

Jun 86/Dec 86

Nov 87 (Ch-1)

MMLS IOT&E Completion

Sep 88/Dec 88

Mar 90 (Ch-1)

MMLS Production Contract Award

Oct 88/Jun 89

May 90 (Ch-1)

MMLS Initial Operational Capability

Sep 89/Jun 90

May 91 (Ch-1)

(2) FBMLS

FBMLS Program Initiated

Jan 83/Jan 83

Jan 83

FBMLS Production Contract
Award (FAA)

Jun 87/Jun 87

Nov 87 (Ch-1)

FBMLS First System Delivery (FSD)

Mar 90/Mar 90

Aug 90 (Ch-1)

(3) CMLSA

CMLSA Contract award

May 87/May 87

May 87 (Ch-2)

CMLSA DT&E/IOT&E Complete

Sep 88/ Sep 88

Sep 88 (Ch-2)

CMLSA Production Decision

Dec 88/ Dec 88

Dec 88 (Ch-2)

CMLSA Initial Operational Capability

Oct 90/Oct 90

Oct 90 (Ch-2)

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9. Schedule: (Cont'd)

b. Previous Change Explanations --

Milestones were clarified to reflect the change in direction from a Tactical MLS system to a Mobile MLS system. Fixed Base MLS milestones were added. As a result of HQ USAF hold on RFP release pending resolution of Congressional concerns and completion of the TRACALS Roadmap Study, the System Operational Concept milestone was changed from September 1985 to TBD, Mobile MLS Development Contract Award from June 1986 to December 1986, Mobile MLS Production Contract Award from October 1988 to June 1989, and Mobile MLS IOC from September 1989 to June 1990.

Delays were caused by change in acquisition strategy. Air Force and FAA have agreed to release RFPs and award contract simultaneously causing Mobile MLS Development Contract Award date to slip from December 1986 to June 1987. Subsequent milestones also slipped as follows: Mobile MLS IOT&E Completion from December 1988 to December 1989, Mobile MLS Production Contract Award from June 1989 to March 1990, and Mobile MLS IOC from June 1990 to September 1990.

FBMLS Production Contract Award (FAA) and FBMLS First System Delivery milestone dates were established (previously TBD).

c. Current Change Explanations --

(Ch-1) Due to delay caused by Congressional hold on the FAA procurement RFP release and resulting FY88 USAF funding reduction, the Mobile MLS Development Contract Award changed from June 1987 to November 1987, Mobile MLS IOT&E Completion from December 1989 to March 1990, Mobile MLS Production Contract Award from March 1990 to May 1990 and Mobile IOC from September 1990 to May 1991. FBMLS Production Contract Award changed from June 1987 to November 1987 and FBMLS First System Delivery from March 1990 to August 1990.

(Ch-2) Commercial MLS Avionics Milestones added.

d. References --

(1) Planning Estimate :

- (a) Air Force Communications Command (AFCC) General Operating Requirement(GOR) 702-78, Advanced Military Landing System, 16 February 1978.
- (b) USDRE Memo, 13 January 1983, Subject: Service Responsibility for Microwave Landing System Activities.
- (c) Microwave Landing System (MLS) PMD 4030(1)/PE 35114F, 3 January 1984.
- (d) MAC System Operational Concept (SOC), 10 September 1984.

(2) Approved Program : RDT&E Descriptive Summary, 12 May 1986

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10. Technical/Operational Characteristics:

	Planning Estimate/ Approved Program	Demonstrated Performance	Current Estimate
a. Technical --			
(1) MMLS			
Degrees of Azimuth Coverage	$\pm 40 / \pm 40$	N/A	± 40
Degrees of Elevation Coverage	0.9 to 15/0.9 to 15	N/A	0.9 to 15
Range in Nautical Miles (Min)	15/15	N/A	15
Operating Temperature Range in degrees Fahrenheit	-60 to +120/-60 to +120	N/A	-60 to +120
(2) FBMLS			
Degrees of Azimuth Coverage (to 20 NM)	$\pm 40 / \pm 40$	N/A	± 40
Degrees of Elevation Coverage	0.9 to 15/0.9 to 15	N/A	0.9 to 15
Range in Nautical Miles	20 / 20	N/A	20
Operating Temperature Range in degrees Fahrenheit	-68 to +131/-68 to +131	N/A	-68 to +131
(3) CMLSA			
Mean Time between Corrective Maintenance Action (Receiver Processor) in hours	5,000 / NA	N/A	5,000 (Ch-1)
System Mean Time between Critical Failures in hours	7,000 / NA	N/A	7,000 (Ch-1)
System Mean Time between Corrective Maint. Action in hours	2,000 / NA	N/A	2,000 (Ch-1)
b. Operational --			
(1) MMLS			
Percent Interoperable with International Civil Aviation Organization (ICAO) MLS Equipment	100/100	N/A	100
Number of selectable channels from 5031 MHz to 5090.7 MHz	200/200	N/A	200
Field Assembly personnel/ time (minutes) required	2/30 / 2/30	N/A	2/30

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10. Technical/Operational Characteristics: (Cont'd)

	Planning Estimate/ Approved Program	Demonstrated Performance	Current Estimate
b. Operational -- (Cont'd)			
(2) FBMLS			
Percent Interoperable with International Civil Aviation Organization (ICAO)	100/100	N/A	100
Number of selectable channels from 5031-5090.7 MHz	200/200	N/A	200
(3) CMLSA			
Critical Failures per year	.1 / N/A	N/A	.1 (Ch-1)
c. Previous Change Explanations -- FBMLS technical/operational characteristics were added.			
d. Current Change Explanations -- (Ch-1) CMLSA technical/operational characteristics were added.			
e. References --			
(1) Planning Estimate :			
(a) Air Force Communications Command (AFCC) General Operating Requirement (GOR) 702-78, Advanced Military Landing System, 16 February 1978.			
(b) USDRE Memo, 13 January 1983, Subject: Service Responsibility for Microwave Landing System Activities.			
(c) Microwave Landing System (MLS) PMD 4030(1)/PE 35114F, 3 January 1984.			
(d) MAC System Operational Concept (SOC), 10 September 1984.			
(2) Approved Program : RDT&E Descriptive Summary, 12 May 1986			

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11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost --	Planning Estimate	Changes	Current Estimate
(1) Ground Systems			
Development (RDT&E)	29.9	-8.7	21.2
Procurement	47.8	+108.8	156.6
MMLS	(39.4)	(-5.6)	(33.8)
FBMLS	-	(+100.0)	(100.0)
Total Flyaway	(39.4)	(+94.4)	(133.8)
Peculiar Support	-	-	-
Other Weapon/System Cost	-	-	-
Initial Spares	(8.4)	(+14.4)	(22.8)
MMLS	(8.4)	(+0.1)	(8.5)
FBMLS	-	(+14.3)	(14.3)
Operations & Maintenance (O&M)	-	+35.5	35.5
Total FY82 Base-Year \$	77.7	+135.6	213.3
Escalation	26.2	+67.2	93.4
Development (RDT&E)	(7.4)	(-1.6)	(5.8)
Procurement	(18.8)	(+51.3)	(70.1)
Ops & Maint (O&M)	-	(+17.5)	(17.5)
Total Then-Year \$	103.9	+202.8	306.7
(2) Commercial Avionics			
Development (RDT&E)	4.7	+0.8	5.5
Procurement	16.4	-2.8	13.6
Comm Avionics	(15.2)	(-2.6)	(12.6)
Total Flyaway	(15.2)	(-2.6)	(12.6)
Peculiar Support	-	-	-
Other Weapon/System Cost	-	-	-
Initial Spares	(1.2)	(-0.2)	(1.0)
Operations & Maintenance (O&M)	6.7	+0.2	6.9
Total FY 82 Base-Year \$	27.8	-1.8	26.0
Escalation	12.3	-2.0	10.3
Development (RDT&E)	(0.9)	(+0.2)	(1.1)
Procurement	(9.1)	(-2.4)	(6.7)
Ops & Maint (O&M)	(2.3)	(+0.2)	(2.5)
Total Then-Year \$	40.1	-3.8	36.3

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11. Program Acquisition Cost (Cont'd) (Current Estimate in Millions of Dollars)

	Planning Estimate	Changes	Current Estimate
b. Quantities --			
(1) Ground Systems			
Development (RDT&E)	2	0	2
Procurement	128	+210	338
Total	130	+210	340
(2) Commercial Avionics			
Development (RDT&E)	0	0	0
Procurement	376	0	376
Total	376	0	376
c. Unit Cost --			
(1) Ground Systems			
Procurement:			
FY82 Base-Year \$	0.373	+0.090	0.463
Then-Year \$	0.520	+0.151	0.671
Program:			
FY82 Base-Year \$	0.598	+0.029	0.627
Then-Year \$	0.799	+0.103	0.902
(2) Commercial Avionics			
Procurement:			
FY 82 Base-Year \$	0.044	-0.008	0.036
Then-Year \$	0.068	-0.014	0.054
Program:			
FY 82 Base-Year \$	0.074	-0.005	0.069
Then-Year \$	0.107	-0.010	0.097
d. Approved Design to Cost Goal -- N/A			
e. Foreign Military Sales -- N/A			
f. Nuclear Costs -- N/A			

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12. Program Acquisition/Current Procurement Unit Cost Summary:
 (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	Current Est Dec 86 SAR	UCR Baseline Dec 85 SAR	UCR Baseline Dec 86 SAR
a. Program Acquisition --			
(1) Ground Systems			
(a) Cost	306.7	285.3	306.7
(b) Quantity	340	340	340
(c) Unit Cost	0.902	0.839	0.902
(2) Commercial Avionics			
(a) Cost	36.3	38.4	36.3
(b) Quantity	376	376	376
(c) Unit Cost	0.097	0.102	0.097
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Ground Systems			
(a) Cost	N/A	N/A	5.3
Less CY Adv Proc	N/A	N/A	0
Plus FY Adv Proc	N/A	N/A	0
Net Total	N/A	N/A	5.3
(b) Quantity	N/A	N/A	7
(c) Unit Cost	N/A	N/A	0.757
(2) Commercial Avionics			
No procurement program in the current or budget year.			

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13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

(1) Ground System

	RDT&E	PROC	O&M	TOTAL
Planning Estimate	37.3	66.6	0	103.9
Previous Changes:				
Economic	-0.4	-1.8	-	-2.2
Quantity	-	+157.0	+15.8	+172.8
Schedule	-	+1.5	-	+1.5
Engineering	-	-	-	-
Estimating	-25.1	+8.3	-	-16.8
Other	-	-	-	-
Support	-	+26.1	-	+26.1
Subtotal	-25.5	+191.1	+15.8	+181.4
Current Changes:				
Economic	-1	-2.1	-	-2.2
Quantity	-	-	-	-
Schedule	-	+7.1	-	+7.1
Engineering	-	-	-	-
Estimating	+15.3	-31.8	-	-16.5
Other	-	-	-	-
Support	-	-4.2	+37.2	+33.0
Subtotal	+15.2	-31.0	+37.2	+21.4
Total Changes	-10.3	+160.1	+53.0	+202.8
Current Estimate	27.0	226.7	53.0	306.7

(FY 1982 Constant Dollars (Base-Year) in Millions)

	RDT&E	PROC	O&M	TOTAL
Planning Estimate	29.9	47.8	0	77.7
Previous Changes:				
Quantity	-	+109.7	+10.9	+120.6
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-20.1	+6.0	-	-14.1
Other	-	-	-	-
Support	-	+18.1	-	+18.1
Subtotal	-20.1	+133.8	+10.9	+124.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+11.4	-21.3	-	-9.9
Other	-	-	-	-
Support	-	-3.7	+24.6	+20.9
Subtotal	+11.4	-25.0	+24.6	+11.0
Total Changes	-8.7	+108.8	+35.5	+135.6
Current Estimate	21.2	156.6	35.5	213.3

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13. Cost Variance Analysis (Cont'd):

a. Summary

(2) Commercial Avionics

(Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	O&M	TOTAL
Planning Estimate	5.6	25.5	9.0	40.1
Previous Changes:				
Economic	-0.1	-1.2	-0.2	-1.5
Quantity	-	-	-	-
Schedule	-	+0.4	+0.1	+0.5
Engineering	-	-	-	-
Estimating	-2.6	+1.5	+0.2	-0.9
Other	-	-	-	-
Support	-	+0.2	-	+0.2
Subtotal	-2.7	+0.9	+0.1	-1.7
Current Changes:				
Economic	-	-1.2	-	-1.2
Quantity	-	-	-	-
Schedule	-	+0.6	-	+0.6
Engineering	-	-	-	-
Estimating	+3.7	-5.0	-	-1.3
Other	-	-	-	-
Support	-	-0.5	+0.3	-0.2
Subtotal	+3.7	-8.1	+0.3	-2.1
Total Changes	+1.0	-5.2	+0.4	-3.8
Current Estimate	6.6	20.3	9.4	36.3

(FY 1982 Constant Dollars (Base-Year) in Millions)

	RDT&E	PROC	O&M	TOTAL
Planning Estimate	4.7	16.4	6.7	27.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-2.3	+0.9	+0.1	-1.3
Other	-	-	-	-
Support	-	+0.1	-	+0.1
Subtotal	-2.3	+1.0	+0.1	-1.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+3.1	-3.5	-	-0.4
Other	-	-	-	-
Support	-	-0.3	+0.1	-0.2
Subtotal	+3.1	-3.8	+0.1	-0.6
Total Changes	+0.8	-2.8	+0.2	-1.8
Current Estimate	5.5	13.6	6.9	26.0

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13. Cost Variance Analysis (Cont'd) :

b. Previous Change Explanations --

(1) Ground Systems

(a) RD&E

ECONOMIC: Revised escalation indices.

ESTIMATING: OSD reduction pending further definition of development effort.

(b) PROCUREMENT

ECONOMIC: Revised escalation indices.

QUANTITY: Addition of 256 FBMLS and reduction of 46 MMLS.

SCHEDULE: Compressed MMLS buy.

ESTIMATING: Increase in MMLS estimating costs.

SUPPORT: Additional spares for FBMLS.

(c) O&M

QUANTITY: Added installation of 256 FBMLS.

(2) Commercial Avionics

(a) RD&E

ECONOMIC: Revised escalation indices.

ESTIMATING: OSD reduction pending further definition of development effort.

(b) PROCUREMENT

ECONOMIC: Revised escalation indices.

SCHEDULE: Delay in flyaway procurement.

SUPPORT: Delay in support procurement.

ESTIMATING: Increase in estimated B-Kit costs.

(c) O&M

ECONOMIC: Revised escalation indices.

SCHEDULE: Installation delay.

ESTIMATING: Increase in estimated installation costs.

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13. Cost Variance Analysis (Cont'd) :

c. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) Ground Systems

(a) RD&E

Revised economic escalation indices (Economic)	-	-0.1
Restoration of outyear funds based on further definition of effort (Estimating)	+11.4	+15.3

(b) Procurement

Revised economic escalation indices (Economic)	-	-2.1
Congressional directed delay in procurement (Schedule)	-	+7.1
Refinement of estimated costs of hardware (Estimating)	-21.3	-31.8
Refinement in estimated support costs (Support)	-3.7	-4.2

(c) O&M

Increase in estimated installation cost (Support)	+24.6	+37.2
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(2) Associated Commercial Avionics

(a) RD&E

Restoration of outyear funds based on further definition of effort (Estimating)	+3.1	+3.7
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(b) Procurement

Revised economic escalation indices (Economic)	-	-1.2
Rephasing of flyaway procurement schedule (Schedule)	-	+0.6
Refinement in estimated cost of hardware (Estimating)	-3.5	-5.0
Refinement in estimated support costs (Support)	-0.3	-0.5

(c) O&M

Increase in estimated installation cost (Support)	+0.1	+0.3
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d. Reference -- FY86 President's Budget

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14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

Initial SAR/Planning Estimate to Current Estimate

(1) Ground Systems

PAUC (Initial SAR/ Planning Est)	Changes (Then Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
0.799	-0.013	+0.015	+0.025	-	-0.098	+0.174	-	+0.103	0.902

(2) Commercial Avionics

PAUC (Planning Estimate)	Changes (Then Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
0.107	-0.007	-	+0.003	-	-0.006		-	-0.010	0.097

15. Contract Information: (Then-Year Dollars in Millions)

None

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Ground Systems

(a) Percent Program Completed: 26.7% (4 yrs/15 yrs)

(b) Percent Program Cost Appropriated: 1.1% (\$3.5/\$306.7)

(2) Commercial Avionics

(a) Percent Program Completed: 37.5% (3 yrs/8 yrs)

(b) Percent Program Cost Appropriated: 16.5% (\$6.0/\$36.3)

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16. Program Funding Summary: (Cont'd) (Current Estimate in Millions of Dollars)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY84-87)	Budget Year (FY88)	Balance To Complete FYDP (FY89-93)	Beyond FYDP (FY94-98)	Total
(1) Ground Systems					
RD&E	3.5	10.4	13.1	--	27.0
Procurement	-	5.3	149.5	71.9	226.7
O&M	-	-	<u>17.8</u>	<u>35.2</u>	<u>53.0</u>
Total	3.5	15.7	180.4	107.1	306.7
(2) Commercial Avionics					
RD&E	6.0	0.6	-	-	6.6
Procurement	-	-	20.3	-	20.3
O&M	-	-	<u>9.4</u>	-	<u>9.4</u>
Total	6.0	0.6	29.7	-	36.3

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)
 c. Annual Summary --
 (1) Ground Systems

Fiscal Year	Qty	FY 82 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1984	-	-	-	0.7	-	-	0.8	3.8
1985	-	-	-	0.9	-	-	1.0	3.4
1986	-	-	-	1.1	-	-	1.3	2.9
1987	-	-	-	0.3	-	-	0.4	3.1
1988	-	-	-	8.2	-	-	10.4	3.5
1989	-	-	-	10.0	-	-	13.1	3.5
Subtotal	2	-	-	21.2	-	-	27.0	-

Appropriation: Procurement

1988	7	-	3.6	4.1	-	-	5.3	3.5
1989	22	-	9.1	10.4	-	-	13.9	3.5
1990	71	-	29.9	36.5	-	-	50.3	3.3
1991	57	-	21.1	25.5	-	-	38.0	2.9
1992	38	-	14.7	16.9	-	-	24.4	2.4
1993	38	-	14.9	16.8	-	-	24.9	2.4
1994	38	-	14.9	16.8	-	-	25.5	2.4
1995	38	-	14.8	16.8	-	-	26.1	2.4
1996	29	-	10.8	12.8	-	-	20.3	2.4
Subtotal	338	-	133.8	156.6	-	-	226.7	-

Appropriation: O&M

1991	-	-	-	2.6	-	-	3.6	2.9
1992	-	-	-	4.5	-	-	6.3	2.4
1993	-	-	-	5.5	-	-	7.9	2.4
1994	-	-	-	5.5	-	-	8.1	2.4
1995	-	-	-	5.5	-	-	8.3	2.4
1996	-	-	-	5.5	-	-	8.5	2.4
1997	-	-	-	5.5	-	-	8.7	2.4
1998	-	-	-	0.9	-	-	1.6	2.4
Subtotal	-	-	-	35.5	-	-	53.0	-
Total	340	-	133.8	213.3	-	-	306.7	-

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary (Cont'd) --

(2) Commercial Avionics

Fiscal Year	Qty	FY 82 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1985	-	-	-	0.9	-	-	1.0	3.4
1986	-	-	-	2.2	-	-	2.7	2.9
1987	-	-	-	1.9	-	-	2.3	3.1
1988	-	-	-	0.5	-	-	0.6	3.5
1989	-	-	-	-	-	-	-	-
Subtotal	-	-	-	5.5	-	-	6.6	-

Appropriation: Procurement

1989	160	-	5.8	6.3	-	-	9.2	3.5
1990	167	-	5.3	5.7	-	-	8.6	3.3
1991	49	-	1.5	1.6	-	-	2.5	2.9
Subtotal	376	-	12.6	13.6	-	-	20.3	-

Appropriation: O&M

1990	-	-	-	2.9	-	-	3.9	3.3
1991	-	-	-	3.1	-	-	4.2	2.9
1992	-	-	-	0.9	-	-	1.3	2.4
Subtotal	-	-	-	6.9	-	-	9.4	-
Total	376	-	12.6	26.0	-	-	36.3	-

MLS, 31 December 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

(1) Ground Systems (Note 1)

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1984	0.8	0.8	0.8
1985	1.0	1.0	1.0
1986	1.3	1.3	0.5
1987	0.4	0.4	-
1988	10.4	-	-
1989	13.1	-	-
Total	27.0	3.5	2.3

(2) Commercial Avionics (Note 1)

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1985	1.0	1.0	1.0
1986	2.7	0.9	0.3
1987	2.3	-	-
1988	0.6	-	-
Total	6.6	1.9	1.3

17. Production Rate Data: N/A18. Operating and Support Costs: N/A

NOTE 1: Reflects Program Office data as of 31 December 1986 ESD/STAR.

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

PROGRAM: ADVANCED TACTICAL FIGHTER

AS OF DATE: December 31, 1986

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1. ~~(S)~~ Designation/Nomenclature (Popular Name): Advanced Tactical Fighter/ATF2. (U) DoD Component: U.S. Air Force3. (U) Responsible Office and Telephone Number:

ATF Program Office
Aeronautical Systems Division
Wright-Patterson AFB, OH 45433-6503

Col J. Fain
Assigned: December 1, 1986
AV 785-4167; COMM (513) 255-4167

4. (U) Program Elements/Procurement Line Items:

RDTSE: PE 63230F
PE 64239F
PE 64227F BPAC 643143 (shared funding)
PE 63109F BPAC 623393 (shared funding)
PE 64250F

5. (U) Related Programs: Not Applicable

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~~Classified By: ATF SCS, dated 1 June 83
Declassify on: OADR~~

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DEPARTMENT OF DEFENSE

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87-0315

6. (U) Mission and Description: The Advanced Tactical Fighter (ATF) program addresses demonstration/validation and full scale development of the next generation air superiority fighter aircraft. The ATF will replace the F-15 in the mid-1990's to counter the emergence of large numbers of advanced Soviet fighters. The ATF program from the outset has placed balanced emphasis on performance, survivability, reliability/maintainability and affordability. The ATF concept is characterized by an advanced materials airframe, a new engine, balanced controlled observables and advanced avionics in a highly integrated design.

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- Seven weapon system contractors participated in the concept development phase with their final reports being delivered in May 84. The Joint Advanced Fighter Engine program awarded two contracts in Sept 83 to build demonstrator engines with new technologies required to support the ATF mission. Seven contracts were awarded for PAVE PILLAR, the Integrated Avionics pre-design effort, in 1985. VHSIC insertion efforts were started for equipment which would be necessary to complete a fully integrated aircraft. The Request for Proposal (RFP) for the Demonstration/Validation phase was released to industry in October 1985. As a result of Packard Commission recommendations and AFSC redirection, the Demonstration / Validation RFP was modified to require two flying prototypes and a ground based avionics prototype from each of two contractors. The Source Selection Evaluation Board completed its work in mid-September, 1986.

b. (U) Significant Developments Since Last Report -- The ATF program received Milestone I approval and began the Demonstration/Validation phase by awarding two contracts in Oct 86. The two winning contractors were Lockheed, teamed with General Dynamics and Boeing; and Northrop, teamed with McDonnell Douglas. Each contractor team will fabricate and demonstrate a ground-based prototype avionics integration laboratory, and construct and flight test two prototype air vehicles. Due to the early flight experience with the prototype aircraft, the FSD phase of the program has been changed to include nine flight test aircraft, as compared with 12 previously. ATF-related INEWS/ICNIA development funding has now been incorporated into the current estimate. The ATF as currently planned will satisfy its mission requirements.

c. (U) Changes Since "As of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches -- None

9. (U) Schedule:

a. (U) Milestones --

	Planning Estimate/ Approved Program*	Current Estimate
1. Mission Element Need Statement Approval	Nov 81/Nov 81	Nov 81
2. Concept Development Contract Award	Sep 83/ --	Sep 83
3. Milestone I (JRMB I)	Sep 85/ --	Oct 86
4. Dem/Val Contract Award	Oct 85/ --	Oct 86
5. Milestone II (JRMB II)	Dec 88/ --	Jan 91
6. Milestone III (JRMB III)	Dec 91/ --	Jan 95
7. IOC**	Sep 95/Sep 95	Mar 96 (Ch-1)

* The approved program sets the beginning date and year of IOC goal, but does not contain the detailed schedule milestones.

** IOC is defined as delivery of one combat-coded squadron.

b. (U) Previous Change Explanations --

Milestones 9.a.3 and 4 changed due to the delay in obtaining the necessary program approval from senior Air Force personnel. Subsequently milestones 9.a.3 - 6 changed due to redirection of the Demonstration/Validation phase of the program to include prototyping, to align the program with the Packard Commission recommendations.

c. (U) Current Change Explanations --

(Ch-1) IOC changed to be consistent with JRMB Milestone II and III projections.

d. (U) References --

Planning Estimate: Advanced Tactical Fighter, Mission Element Need Statement, approved by Defense Resources Board Nov 23, 1981

Approved Program: Tactical Air Forces (TAF), Statement of Operational Need, Nov 9, 1984

~~(SECRET)~~

(ATF, December 31, 1986, page 4)

10. (U) Technical/Operational Characteristics:

a. (U) Technical* --	<u>Plan Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
----------------------	--	-------------------------------------	-----------------------------

(b)(1)

b. (U) Operational* --

(U) TAKE-OFF GROSS WEIGHT (Primary Air Superiority Mission) (Internal Fuel Only) (Lbs)	50,000/TBD	N/A	50,000
--	------------	-----	--------

(b)(1)

*(U) Specific technical and operational characteristics for this aircraft are still being determined. These planning estimates may change markedly as tradeoffs are accomplished during the Demonstration/Validation phase (currently FY 86-91).

c. (U) Previous Change Explanations -- None

d. (U) Current Change Explanations -- None

e. (U) References --

Planning Estimate: Advanced Tactical Fighter, Mission Element Need Statement, approved by Defense Resources Board Nov 23, 1981

Approved Program: Tactical Air Forces (TAF), Statement of Operational Need, Nov 9, 1984

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11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

	Planning Estimate	Changes	Current Estimate
a. (U) Cost --			
Development (RDT&E)	\$ 11785.5	\$ -1713.5	\$ 10072.0
Procurement	--	--	--
Construction (MILCON)	--	--	--
Total FY 85 Base-Year \$	11785.5	-1713.5	10072.0
Escalation	3508.5	-937.1	2571.4
Development (RDT&E)	(3508.5)	(-937.1)	(2571.4)
Procurement	--	--	--
Construction (MILCON)	--	--	--
Total Then Year \$	\$ 15294.0	\$ -2650.6	\$ 12643.4

b. (U) Quantities --			
Development (RDT&E)	12	-3	9
Procurement	N/A	N/A	N/A
Total	12	-3	9

c. (U) Unit Cost -- Not Applicable

d. (U) Approved Design to Cost Goal -- None

e. (U) Foreign Military Sales -- None

f. (U) Nuclear Costs -- None

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est	UCR Baseline	UCR Baseline
	Dec 86 SAR	Dec 85 SAR	Dec 86 SAR
a. (U) Program Acquisition * --			
(1) Cost **	12643.4	12389.7	12643.4
(2) Quantity	9	12	9
(3) Unit Cost	N/A	N/A	N/A

* RDT&E only

** 85 to 86 cost change reflects quantity decrease, support and estimating increases, including addition of INEWS/ICNIA.

b. (U) Current Procurement -- Not Applicable

13. (U) Cost Variance Analysis:

a. (U) Summary--(Current (Then-Year) Dollars in Millions)

	RD&E	PROC	TOTAL
Planning Estimates	15294.0	--	15294.0
Previous Changes			
Economic	-634.5	--	-634.5
Quantity	0.0	--	0.0
Schedule	+257.8	--	+257.8
Engineering	0.0	--	0.0
Estimating	-2537.0	--	-2537.0
Other	0.0	--	0.0
Support	0.0	--	0.0
Subtotal	-2913.7	--	-2913.7
Current Changes			
Economic	-31.3	--	-31.3
Quantity	-467.7	--	-467.7
Schedule	+149.3	--	+149.3
Engineering	0.0	--	0.0
Estimating	+330.8	--	+330.8
Other	0.0	--	0.0
Support	+282.0	--	+282.0
Subtotal	263.1	--	263.1
Total Changes	-2650.6	--	-2650.6
Current Estimate	12643.4	--	12643.4

(FY 1985 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	TOTAL
Planning Estimates	11785.5	--	11785.5
Previous Changes			
Quantity	0.0	--	0.0
Schedule	0.0	--	0.0
Engineering	0.0	--	0.0
Estimating	-1826.1	--	-1826.1
Other	0.0	--	0.0
Support	0.0	--	0.0
Subtotal	-1826.1	--	-1826.1
Current Changes			
Quantity	-369.0	--	-369.0
Schedule	0.0	--	0.0
Engineering	0.0	--	0.0
Estimating	+263.0	--	+263.0
Other	0.0	--	0.0
Support	+218.6	--	+218.6
Subtotal	+112.6	--	+112.6
Total Changes	-1713.5	--	-1713.5
Current Estimate	10072.0	--	10072.0

b. (U) Previous Change Explanations --

RDT&E

Economic: revised economic escalation indices

Schedule: Milestone I (JRMB I) decision delayed

Estimating: adjustment for prior year escalation, updated estimating methodology and Gramm-Rudman cuts.

Procurement -- Not ApplicableMILCON -- Not Applicable

c. (U) Current Change Explanations:

(Dollars in Millions)
Base-Year Then-Year(1) (U) RDT&ERevised economic escalation
indices. (Economic)

-- -\$31.3

Reduction in FSD aircraft to 9 because
of prototyping in Dem/Val. Prototypes
are non-deliverables. (Quantity)

-\$369.0 -\$467.7

c. (U) Current Change Explanations: (continued)

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revision of program estimate to reflect funding constraints. (Schedule)	—	+\$149.3
Adjustment for current and prior year escalation change. (Estimating)	+\$3.3	+\$3.6
Reduced current year funding. (Estimating)	-\$37.9	-\$41.2
Addition of INEWS/ICNIA Avionics effort. (Estimating)	+256.9	+315.7
Revised estimating methodology with information gained from Dem/Val Source Selection. (Estimating)	+\$40.7	+\$52.7
Simulator funding included in program estimate. (Support)	+\$218.6	+\$282.0

(2) (U) Procurement — Not Applicable(3) (U) MILCON — Not Applicable

d. (U) References —

Planning Estimate: Advanced Tactical Fighter, Mission Element
Need Statement, approved by Defense Resources Board Nov 23, 1981

14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

Not Applicable

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E —			Initial Contract Price		
<u>Engine:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Pratt & Whitney Aircraft Group,			\$ 207.6	N/A	2
West Palm Beach, Florida					
F33657-83-C-0092, FFP					
Award: September 30, 1983					
Definitized: September 30, 1983					
Current Contract Price			Estimated Price at Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$ 207.6	N/A	2	\$ 207.6	\$ 207.6	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances					
Cumulative Variances to Date			N/A*	N/A*	
Net Change					

* N/A: No CPR (FFP Contract)

Engine:
 General Electric Co., Cincinnati, OH
 F33657-83-C-0281, FFP
 Award: September 30, 1983
 Definitized: September 30 1983

Current Contract Price
Target Ceiling Qty
 \$ 208.0# N/A 2

Initial Contract Price
Target Ceiling Qty
 \$ 207.6 N/A 2

Estimated Price at Completion
Contractor Program Manager
 \$ 208.0 \$ 208.0

Cost Variance Schedule Variance

Previous Cumulative Variances
 Cumulative Variances to Date N/A* N/A*
 Net Change

Change due to payment for use of natural gas in lieu of GFE fuel.

Airframe:
 Lockheed Corporation, Burbank, CA
 F33657-86-C-2085, FFP
 Award: October 31, 1986
 Definitized: October 31, 1986

Current Contract Price
Target Ceiling Qty
 \$ 691.0 N/A N/A

Initial Contract Price
Target Ceiling Qty
 \$ 691.0 N/A N/A

Estimated Price at Completion
Contractor Program Manager
 \$ 691.0 \$ 691.0

Cost Variance Schedule Variance

Previous Cumulative Variances
 Cumulative Variances to Date N/A* N/A*
 Net Change

Airframe:
 Northrop Corporation, Hawthorne, CA
 F33657-86-C-2087, FFP
 Award: October 31, 1986
 Definitized: October 31, 1986

Current Contract Price
Target Ceiling Qty
 \$ 691.0 N/A N/A

Initial Contract Price
Target Ceiling Qty
 \$ 691.0 N/A N/A

Estimated Price at Completion
Contractor Program Manager
 \$ 691.0 \$ 691.0

Cost Variance Schedule Variance

Previous Cumulative Variances
 Cumulative Variances to Date N/A* N/A*
 Net Change

* N/A: No CPR (FFP contract)

b. (U) Procurement -- Not Applicable

c. (U) MILCON -- Not Applicable

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

- (1) Percent Program Completed: 35.7 % (5 yrs / 14 yrs)
(Years Funds Appropriated/Total Program Years)
- (2) Percent Program Cost Appropriated: 4.4 % (\$550.1M / \$12643.4M)
(Funds Appropriated To Date in Millions/Total Program Funding in Millions)

b. (U) Appropriation Summary --

Appropriation	(Then-Year Dollars in Millions)				
	Current & Prior Yrs (FY83-87)	Budget Year (FY88)	Balance to Complete FYDP (FY89-92)	Beyond FYDP (FY93-96)	Total
RDT&E	\$ 550.1	\$ 546.9	\$ 4524.9*	\$ 7021.5	\$ 12643.4
Procurement	\$ --	\$ --	\$ --	\$ --	\$ --
MILCON	\$ --	\$ --	\$ --	\$ --	\$ --
Total	\$ 550.1	\$ 546.9	\$ 4524.9	\$ 7021.5	\$ 12643.4

* The ATF program is executable within the total approved RDT&E and the total approved for all appropriations within the FYDP, however adjustments will be necessary within the FYDP between Procurement and RDT&E appropriations in FY91 and FY92.

c. (U) Annual Summary --

Fiscal Year	FY 85 Base-Year Dollars				Then-Year Dollars			Escl Rate (%)
	Qty	Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1983	--	--	--	21.1	--	--	20.0	4.9
1984	--	--	--	34.5	--	--	34.1	3.8
1985	--	--	--	89.1	--	--	90.8	3.4
1986	--	--	--	145.3	--	--	152.8	2.9
1987	--	--	--	232.2	--	--	252.4	3.1
1988	--	--	--	486.6	--	--	546.9	3.5
1989	--	--	--	643.1	--	--	747.2	3.5
1990	--	--	--	976.3	--	--	1168.7	3.3
1991	--	--	--	1169.6	--	--	1436.2	2.9
1992	--	--	--	932.2	--	--	1172.8	2.4
1993	--	--	--	2203.7	--	--	2838.4	2.4
1994	--	--	--	1932.3	--	--	2548.7	2.4
1995	--	--	--	1015.5	--	--	1370.9	2.4
1996	--	--	--	190.6	--	--	263.5	2.4
Subtot	9	--	--	10072.0	--	--	12643.4	

Appropriation: Procurement

1992	--	--	--	--	--	--	--	--
Subtot	--	--	--	--	--	--	--	--
Total	9			10072.1	--	--	3.4	

d. (U) Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated **	Expended **
Appropriation: RDT&E			
1983	20.0	19.9 *	19.8
1984	34.1	33.5 *	33.4
1985	90.8	90.0 *	86.8
1986	152.8	150.0	139.9
1987	252.4	160.5	71.1
To Complete	12093.3	N/A	N/A
Total	12643.4	453.9	351.0

* Prior year obligations do not equal appropriation totals due to allowances for contingent liabilities on JAFE contracts.

** Reflects program office records as of 31 December, 1986.

17. (U) Production Rate Data:

Not Applicable.

18. (U) Operating and Support Costs:

Not Applicable.

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SELECTED ACQUISITION REPORT (RCS: DD COMP (Q&A) 823)

PROGRAM: (U) Mark XV Identification, Friend or Foe (IFF) System

AS OF DATE: 31 December 1986

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DIRECTORATE FOR FREEDOM OF INFORMATION
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DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature: Mark XV Identification, Friend or Foe (IFF) System

2. (U) DoD Component: U.S. Air Force is lead service in this tri-service program.

3. (U) Responsible Office and Telephone Number:

Combat Identification System Program Office
Aeronautical Systems Division
Wright-Patterson AFB, OH 45433-6503

Mr Thomas J. Fowler
Assigned: 21 Jan 85
AV: 785-6611;
Comm: (513) 255-6611

4. (U) Program Elements/Procurement Line Items:

RDT&E:	Air Force	PE 63742F	Project 642599	(Shared funding)
		PE 64725F	Project 642598	(Shared funding)
		PE 64725F	Project 643592	(Tri-service core program)
	Army	PE 63706A	Project D297	(Shared funding)
		PE 64709A	Project D530	(Shared funding)
	Navy	PE 64211N	Project W1253	

5. (U) Related Programs: Mark XII Technical Improvement Program (Mark XII TIP), Integrated Communication Navigation Identification Avionics (ICNIA) and Non Cooperative Target Recognition (NCTR) programs.

Classified by: ~~SECRET~~ 29 Oct 82
Review: ~~SECRET~~

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Mark XV, 31 December 1986

6. (U) Mission and Description: The Mark XV is a replacement for the outdated Mark X/XII direct, cooperative aircraft Identification Friend or Foe (IFF) system. It is required to realize the full potential of our beyond visual range weapons. The Mark XV is an Air Force lead tri-service, NATO interoperable, retrofit acquisition program with a goal of maximum form, fit, function and plug compatibility (F3PC). It will provide necessary performance improvements including resistance to deception (spoofing), jamming, and exploitation, while maintaining compatibility with existing Mark X/XII systems and current and future civil air traffic control functions.

7. (U) Program Highlights:

a. (U) Significant Historical Developments -- A concept design phase was initiated in Jun 80 with the approval of the Joint Mission Element Need Statement (JMENS) and concept design contracts were awarded to three contractor teams in Oct 80. Final contractor reports were submitted in Aug 81. An RFP for Demonstration/Validation was issued in Jul 82. The RFP was restructured in Jan 83 into a two phase program. Phase I (brassboard waveform demonstration) contracts were awarded to Bendix and Texas Instruments in May 83. A Multi-Command Required Operational Capability (MROC) document, which details the tri-service requirement for an improved Question and Answer (Q&A) system, was approved by all services in Jul 84. DSARC I was held in Jul 84 and resulted in a Secretary of Defense Decision Memorandum (SDDM) directing exercise of the Phase II Demonstration/Validation contract options, restructure of the Mark XV program to include more Form, Fit and Function risk reduction studies, acceleration of the program to start FSD in FY87, and a requirement to stay within approved funding levels. Subsequent to the SDDM, Congressional funding cuts in FY85 slipped the start of FSD to FY88.

b. (U) Significant Developments Since Last Report --

(1) (U) At the NATO Identification System (NIS) project director's meeting on 8-10 Dec 86, agreement was reached among the five participating nations on a refined NATO standardized agreement (STANAG). The document provides an agreed technical basis for the development programs of the nations.

(2) (U) Effective with the FY88 President's Budget the Army's and Navy's FY88-92 FSD core program (the portion common to all services) total obligation authority (TOA) was transferred to the Air Force budget line. This allows for increased core program funding stability. Service unique efforts will continue to be managed by individual services.

(3) (U) Previously reported core program FSD funding shortfalls have been restored in the FY88 PB. Core program funding now supports the approved program schedule (see para 9).

(U) The Mark XV system is expected to satisfy the mission requirements.

c. (U) Changes Since "As Of" Date -- None.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: The date of the latest SDDM is 22 Aug 84. The date of the latest SCP is 16 Nov 84, and is currently being held by the Army Undersecretary of Defense pending Army requirements decision. There are no thresholds established in these documents.

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Mark XV, 31 December 1986

9. (U) Schedule:

a. (U) Milestones --

	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>
Program Initiated	Jun 80/Jun 80	Jun 80
Initial PMD	Nov 81/Nov 81	Nov 81
JRMB I	Jul 84/Jul 84	Jul 84
JRMB II	Mar 88/Mar 88	Mar 88
FSD Contract Award	Jun 88/Jun 88	Jun 88 Ch-1
Critical Design Review	Jun 89/Jun 89	Jun 89 Ch-1
JRMB IIIA	Sep 91/Sep 91	Sep 91 Ch-1
First Production Contract Award	Oct 91/Oct 91	Oct 91 Ch-1
JRMB IIIB	Sep 92/Sep 92	Sep 92 Ch-1
IOC	Sep 94/Sep 94	Sep 94 Ch-1

b. (U) Previous Change Explanations -- FSD Contract Award and subsequent milestones delayed two years to accommodate low funding amount in FY86 President's Budget.

c. (U) Current Change Explanations --(Ch-1) Funding shortfalls noted in para 9.b. (above) were fully restored. Approved program milestones can now be met with approved funding.

d. (U) References --

(1) (U) Planning Estimate: SDDM, 22 August 84 (Unclassified), SCP (draft) 16 November 84 (~~Secret~~), PMD 4015(13)/63742F, 5 April 85 (Unclassified), AFSC Form 56, 63742-85-122, 28 August 85 (Unclassified).

(2) (U) Approved Program: SDDM, 22 August 84 (Unclassified), SCP (draft) 16 November 84 (~~Secret~~), PMD 4015(13)/63742F, 5 April 85 (Unclassified), AFSC Form 56, 63742-85-122, 28 August 85 (Unclassified).

10. ~~(S)~~ Technical/Operational Characteristics:

<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
--	-------------------------------------	-----------------------------

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Mark XV, 31 December 1986

Planning Estimate/
Approved Program

Demonstrated
Performance

Current
Estimate

b. ~~(S)~~ Operational:

(1) (U) System Compatibility (Signals) (Note 1)	MK XV, MK XII, ATRCBS, MODE S/ MK XV, MK XII, ATRCBS, MODE S	MK XV, MK XII ATRCBS, MODE S
(2) (U) Form, Fit, Function and Plug Compatible (FPC) (Note 2)	Direct MK XII retrofit/ Direct MK XII retrofit	Direct MK XII retrofit
(3) (U) Frequency Band	L(D)/L(D)	L(D)
(4) (U) Mean Time Between Failures (MTBF) (Hrs) (Note 3)	1000/1000	1000
(5) (U) Mean Time Between Critical Failures (MTBCF) (Hrs) (Note 4)	370/370	370
(6) (U) Mean Time Between Maintenance (MTBM) (Hrs) (Note 4)	177/177	177
(7) (U) Maintenance False Removal Rate (MFRR) Percent (%)	2/2	2
(8) (U) Mean Time to Repair-On Equipment (Hrs)	0.5/0.5	0.5
(9) (U) Mean Time to Repair-Off Equipment (Hrs)	2.5/2.5	2.5

(b)(1)

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Mark XV, 31 December 1986

c. (U) Previous Change Explanation -- None.

d. (U) Current Change Explanations -- None.

e. (U) References --

Planning Estimate: Mark XV MROC, 16 July 84 ~~(Secret)~~, SDDM, 22 August 84 (Unclassified), and SCP (draft), 16 November 84 ~~(Secret)~~.

Approved Program: Mark XV MROC, 16 July 84 ~~(Secret)~~, SDDM, 22 August 84 (Unclassified), and SCP (draft), 16 November 84 ~~(Secret)~~.

11. (U) Program Acquisition Cost (Current estimate in Millions of Dollars)

a. (U) Cost --	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
Development (RDT&E)	1200.6	-276.4	924.2
Total FY82 Base-Year \$	1200.6	-276.4	924.2
Escalation	471.5	-154.5	317.0
Development (RDT&E)	(471.5)	(-154.5)	(317.0)
Total Then-Year \$	1672.1	-430.9	1241.2
b. (U) Quantities --	N/A		N/A
Development (RDT&E)			
Total			
c. (U) Unit Cost --	N/A		N/A
d. (U) Approved Design to Cost Goal --	N/A		
e. (U) Foreign Military Sales --	N/A		
f. (U) Nuclear Costs --	N/A		

12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions) -- N/A

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13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1672.1	N/A	N/A	1672.1
Previous Changes:	-			-
Economic	-81.7			-81.7
Quantity	-			-
Schedule	+81.2			+81.2
Engineering	-			-
Estimating	+ .1			+ .1
Other	-			-
Support	+ 6.7			+6.7
Subtotal	+ 6.3			+ 6.3
Current Changes:	-			-
Economic	- 8.0			- 8.0
Quantity	-			-
Schedule	-			-
Engineering	-			-
Estimating	-429.2			-429.2
Other	-			-
Support	-			-
Subtotal	-437.2			-437.2
Total Changes	-430.9			-430.9
Current Estimate	1241.2			1241.2

(FY 1982 Constant Dollars (Base-Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1200.6	N/A	N/A	1200.6
Previous Changes:	-			-
Economic	-			-
Quantity	-			-
Schedule	-			-
Engineering	-			-
Estimating	+0.1			+0.1
Other	-			-
Support	+5.7			+5.7
Subtotal	+5.8			+5.8
Current Changes:	-			-
Economic	-			-
Quantity	-			-
Schedule	-			-
Engineering	-			-
Estimating	-282.2			-282.2
Other	-			-
Support	-			-
Subtotal	-282.2			-282.2
Total Changes	-276.4			-276.4
Current Estimate	924.2			924.2

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13. (U) Cost Variance Analysis: (Cont'd)

b. (U) Previous Change Explanations --

(U) RDT&E

Economic: Revised economic escalation indices.

Schedule: Schedule extended two years to FY95 to accommodate low funding amounts in FY 1986 PB; advanced to reflect increased funding in FY87 PB.

Estimating: Adjustment for current and prior year escalation change.

Support: Additional NATO interoperability data.

(U) Procurement -- N/A

(U) MILCON -- N/A

c. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year \$ Then-Year \$

(1) (U) RDT&E

Revised economic escalation indices (Economic)	N/A	-8.0
Change from two independent FSD contractors to a single team (Estimating)	-294.8	-443.1
Adjustment for current and prior year escalation change (Estimating)	+0.6	+0.6
Navy funds obligated by Navy to subor- dinate field activities for Mark XV Matrix support (Estimating)	+10.0	+10.9
Requirement to fund prime contract to ceiling (Estimating)	+2.0	+2.4

(2) (U) Procurement -- N/A

(3) (U) MILCON -- N/A

d. (U) References --

Planning Estimate: FY 1986 President's Budget

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14. (U) Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

Initial SAR/Planning Estimate (PE) to Current Estimate (CE)

PAUC (Initial SAR/ PE)	Changes (Then-Year Dollars in Millions)										PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total			
N/A	-	-	-	-	-	-	-	-	-	-	N/A

15. (U) Contract Information: (Then-Year Dollars in Millions)

RDT&E --

Mark XV IFF:

*Bendix Co., Baltimore MD
F33657-83-C-2099, FPIF,
Award: May 19, 1983
Definitized: June 29, 1983

Initial Contract Price		
Target	Ceiling	Qty
\$14.1	\$16.4	N/A

Current Contract Price	
Target	Ceiling
23.7	27.6

Estimated Price At Completion	
Contractor	Program Manager
27.6	27.6

Initial Contract Price

Mark XV IFF:

*Texas Instruments Co., Lewisville TX
F33657-83-C-2102, FPIF,
Award: May 19, 1983
Definitized: May 19, 1983

Target	Ceiling	Qty
\$18.9	\$23.7	N/A

Current Contract Price	
Target	Ceiling
30.8	38.5

Estimated Price At Completion	
Contractor	Program Manager
38.5	38.5

*Variance analysis deleted. DOD FY87 Authorization Act requires reporting on six largest contracts \$40 million or more.

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16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) (U) Percent Program Completed: 50.0% (8 yrs/16 yrs)

(2) (U) Percent Program Cost Appropriated: 12.4% (\$153.7/\$1241.2)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY80-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance To Complete FYDP</u> (FY89-92)	<u>Beyond FYDP</u> (FY93-95)	<u>Total</u>
RDT&E	153.7	64.8	752.9	269.8	1241.2
Total	153.7	64.8	752.9	269.8	1241.2

c. (U) Annual Summary --

		FY82 Base-Year Dollars			Then-Year Dollars			
Fiscal		Flyaway		Total	Advance Proc		Total	Escl
Year	Qty	Nonrec	Rec		Debit	Credit		Rate
								(%)

Appropriation: RDT&E
Tri-Service

1980	N/A	N/A	N/A	9.8	N/A	N/A	8.5	-
1981				6.5			6.2	11.9
1982				14.2			14.4	9.2
1983				15.7			16.8	4.9
1984				18.5			20.5	3.8
1985				21.8			25.0	3.4
1986				27.2			32.3	2.9
1987				24.6			30.0	3.1
1988				51.2			64.8	3.5
1989				112.3			146.9	3.5
1990				175.2			236.2	3.3
1991				144.5			199.9	2.9
1992				120.0			169.9	2.4
1993				89.8			130.3	2.4
1994				50.0			74.3	2.4
1995				42.9			65.2	2.4
Subtotal				924.2			1241.2	-
Total				924.2			1241.2	-

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Air Force

1980	N/A	N/A	N/A	6.9	N/A	N/A	6.0	-
1981				1.3			1.2	11.9
1982				5.9			6.0	9.2
1983				6.8			7.3	4.9
1984				8.7			9.7	3.8
1985				14.3			16.4	3.4
1986				7.3			8.7	2.9
1987				8.2			10.0	3.1
1988				28.8			36.5	3.5
1989				90.2			118.0	3.5
1990				126.0			169.8	3.3
1991				122.8			169.9	2.9
1992				75.5			106.9	2.4
1993				29.8			43.3	2.4
1994				-			-	2.4
1995				-			-	2.4
Subtotal				532.5			709.7	-

Army

1980	N/A	N/A	N/A	2.9	N/A	N/A	2.5	-
1981				2.6			2.5	11.9
1982				5.8			5.9	9.2
1983				2.8			3.0	4.9
1984				3.6			4.0	3.8
1985				3.7			4.2	3.4
1986				8.5			10.1	2.9
1987				5.3			6.5	3.1
1988				1.6			2.0	3.5
1989				9.3			12.2	3.5
1990				15.1			20.4	3.3
1991				12.4			17.2	2.9
1992				14.0			19.8	2.4
1993				-			-	2.4
1994				-			-	2.4
1995				-			-	2.4
Subtotal				87.6			110.3	-

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Navy

1980	N/A	N/A	N/A	-	N/A	N/A	-	-
1981				2.6			2.5	11.9
1982				2.5			2.5	9.2
1983				6.1			6.5	4.9
1984				6.2			6.8	3.8
1985				3.8			4.4	3.4
1986				11.4			13.5	2.9
1987				11.1			13.5	3.1
1988				20.8			26.3	3.5
1989				12.8			16.7	3.5
1990				34.1			46.0	3.3
1991				9.3			12.8	2.9
1992				30.5			43.2	2.4
1993				60.0			87.0	2.4
1994				50.0			74.3	2.4
1995				42.9			65.2	2.4
Subtotal				304.1			421.2	-

d. (U) Obligations and Expenditures — (As of: 31 Dec 86)

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E Tri-Service

1980	8.5	8.5	8.5
1981	6.2	6.2	6.2
1982	14.4	14.4	12.9
1983	16.8	16.8	16.5
1984	20.5	20.5	20.3
1985	25.0	25.0	22.1
1986	32.3	31.2	15.1
1987	30.0	10.4	0.2
To Complete	1087.5	-	-
Total	1241.2	133.0	101.8

Air Force

1980	6.0	6.0	6.0
1981	1.2	1.2	1.2
1982	6.0	6.0	6.0
1983	7.3	7.3	7.2
1984	9.7	9.7	9.5
1985	16.4	16.4	14.8
1986	8.7	8.7	4.5
1987	10.0	3.3	0.1
To Complete	644.4	-	-
Total	709.7	58.6	49.3

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Army

1980	2.5	2.5	2.5
1981	2.5	2.5	2.5
1982	5.9	5.9	5.9
1983	3.0	3.0	3.0
1984	4.0	4.0	4.0
1985	4.2	4.2	3.6
1986	10.1	9.1	1.0
1987	6.5	3.8	0.0
To Complete	71.6	-	-
Total	110.3	35.0	22.5

Navy

1980	-	-	-
1981	2.5	2.5	2.5
1982	2.5	2.5	1.0
1983	6.5	6.5	6.3
1984	6.8	6.8	6.8
1985	4.4	4.4	3.7
1986	13.5	13.4	9.6
1987	13.5	3.3	.1
To Complete	371.5	-	-
Total	421.2	39.4	30.0

17. (U) Production Rate Data:

(U) Deliveries (Plan/Actual) --

RDT&E

To Date
N/A18. (U) Operating and Support Costs: N/A~~UNCLASSIFIED~~

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: SMALL ICBM

AS OF DATE: December 31, 1986

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 AS AMENDED
 FEB 4 1987 18
 DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (DASD-PA)
 DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): None assigned to date (Small ICBM)

2. DoD Component: U.S. Air Force

3. Responsible Office and Telephone Number:

Ballistic Missile Office
 Norton AFB, CA 92409-6468

Brig Gen Edward P. Barry, Jr.
 Assigned: 4 September 1985
 AV 876-6014; COMM (714) 382-6014

4. Program Elements/Procurement Line Items:

RDT&E: PE 64312F (Shared funding)

PROCUREMENT: N/A 1/

MILCON: N/A 1/

SAS/PAS

87-0068-7

5. Related Programs: Peacekeeper

1/ RDT&E only. Procurement and MILCON data are not available at this time, but will be reported in a future SAR.

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6.(U) Mission and Description: The mission of the Small ICBM weapon system is to enhance the deterrent posture of US strategic forces. Should deterrence fail, the Small ICBM must be able to effectively attack the full spectrum of designated targets with nuclear weapons. The system must provide a prompt retaliatory capability. The Small ICBM missile has three powered, solid propellant stages capable of delivering a single reentry vehicle. The missile is to be transported in a hardened mobile launcher. Small ICBM does not replace an existing system.

7.(U) Program Highlights:

a. Significant Historical Events: In April 1983, the President's Commission on Strategic Forces (Scowcroft Report) recommended beginning engineering development of a single warhead ICBM weighing about 15 tons and having flexibility for development in several basing modes. Rationale was to improve deterrence, promote stability, and enhance arms control efforts. The President endorsed the report, as did Congress by the Authorization Act 1984. In September 1983, the report of Small Missile Independent Advisory Group (Shriever Report) provided an acquisition strategy to the AFSC Commander for the System Definition Phase/Pre-Full-Scale Development (FSD) Phase. This strategy identified technology challenges and emphasized maximum competition. During the next three years, competitive pre-operational prototype tests were accomplished to define concepts and minimize technical risks for FSD.

b. Significant Developments Since last Report: In the fall of 1986, results were provided to the AFSARC and JRMB. The data was subsequently presented to the President, who decided in December 1986 to proceed with FSD of a 37,000 lb single warhead ICBM carried on a hardened mobile launcher (HML) deployed initially at Minuteman ICBM launch facilities (garrison mode), but with a future option for Southwest basing (random movement mode). The entire test program for pre-operational prototype hardware has been successfully completed. The Planning Estimate has changed from a 30,000 lb to 37,000 lb missile in accordance with the FY 1987 Authorization Conference report. Nine full scale development contracts have been awarded. The final FSD contract, for the Weapon Control System, is expected to be awarded during the first quarter of CY 1987. Small ICBM is expected to meet all mission requirements.

c. Changes Since "As Of" Date: None

8.(U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated 1 Nov 86) threshold breaches.

9.(U) Schedule:

a.(U) Milestones --

	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>
(U) Initial Program Management Directive (Pres. directive)	Sep 83/Sep 83	Sep 83
(U) Full Scale Develop.(JRMB II)	Dec 86/Dec 86	Dec 86

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(U)	System Design Review	Mar 87/Mar 87	Mar 87
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(b)(1)

(U)	First Contract Award for		
	Production	Dec 89/Dec 89	Dec 89
(U)	IOC	Dec 92/Dec 92	Dec 92

b.(U) Previous Change Explanations — None.

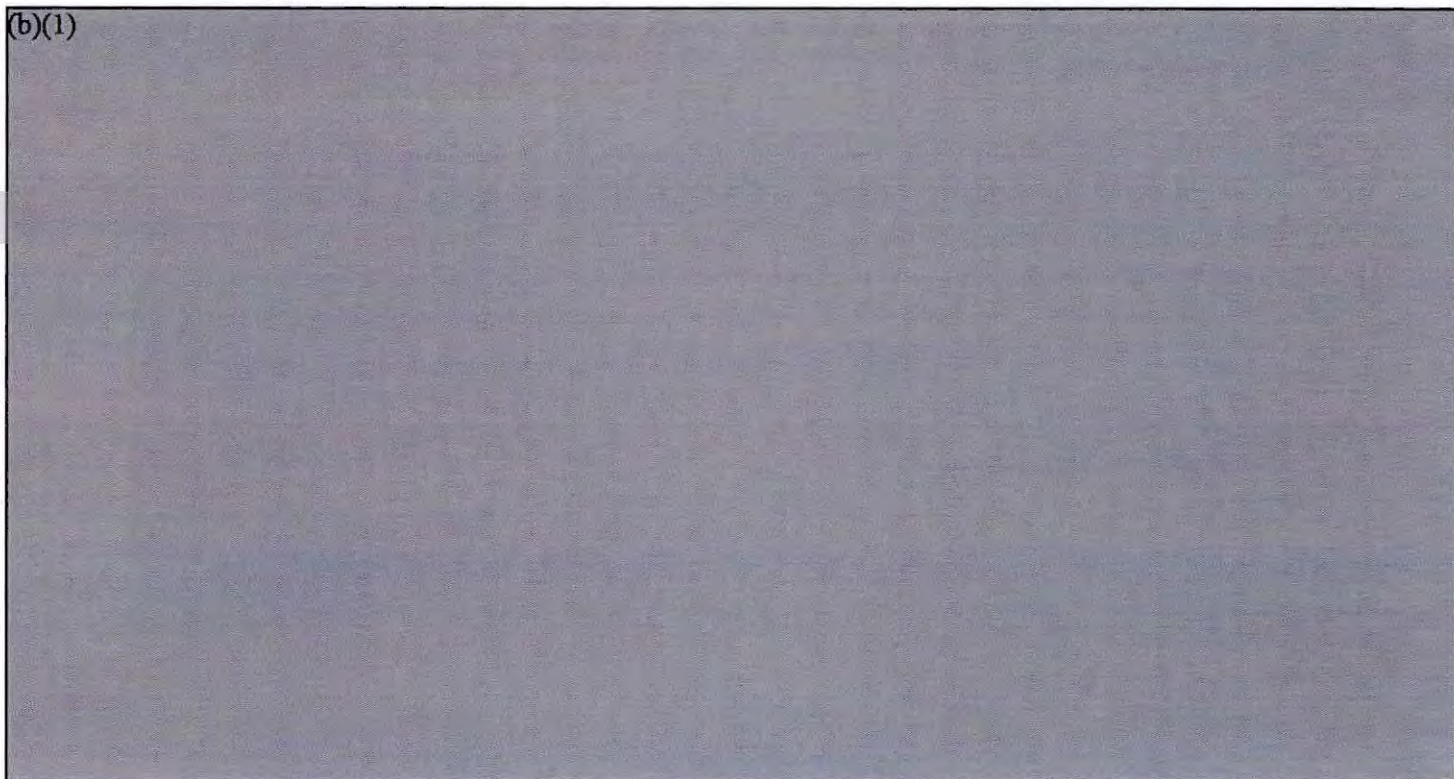
c.(U) Current Change Explanations — None.

d.(U) References —

Planning Estimate: Secretary of Defense Memorandum, dated November 1, 1983 and National Security Decision Directive 178, dated July 10, 1985.

Approved Program: PMD 0075(17), dated 23 Jul 86.

(b)(1)



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c. (U) References

Planning Estimate: Secretary of Defense Memorandum, dated November 1, 1983, and National Security Decision Directive 178, dated July 10, 1985.

Approved Program) PMD 0075(17), dated 23 Jul 86; FY 88 President's Budget.

11. Program Acquisition Cost (Current Estimate in Millions of Dollars) 3/

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost —			
Development (RDT&E)	10585.5	-808.9	9776.6
Procurement	---	---	---
Missile Flyaway	---	---	---
Other Weapon System	---	---	---
Support	---	---	---
Initial Spares	---	---	---
Construction (MILCON)	---	---	---
Total FY84			
Base-Year \$ <u>3/</u>	10585.5	-808.9	9776.6
Escalation	2114.5	-241.3	1873.2
Development (RDT&E)	(2114.5)	(-241.3)	(1873.2)
Procurement	---	---	---
Construction (MILCON)	---	---	---
Total			
Then-Year \$ <u>3/</u>	12700.0	-1050.2	11649.8
b. Quantities —			
Development (RDT&E)	22	---	22
Procurement	---	---	---
Total	22	---	22
c. Unit Cost —			
Procurement:			
FY84 Base-Year \$	---	---	---
Then-Year \$	---	---	---
Program			
FY84 Base-Year \$	---	---	---
Then-Year \$	---	---	---

3/ RDT&E only. Procurement and MILCON data are not available at this time, but will be reported in a future SAR.

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d. Approved Design to Cost Goal — None

e. Foreign Military Sales — None

f. Nuclear Costs — N/A

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current [Then-Year] Dollars in Millions) 4/

	Current Year		Budget Year
	Current Est (Dec 86 SAR)	UCR Baseline (Dec 85 SAR)	UCR Baseline (Dec 86 SAR)
a. Program Acquisition			
(1) Cost	N/A	N/A	N/A
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A
b. Current Procurement	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	N/A	N/A	N/A
Less CY Adv Proc	N/A	N/A	N/A
Plus FY Adv Proc	N/A	N/A	N/A
Net Total	N/A	N/A	N/A
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

4/ N/A. RDT&E only. Procurement data are not available at this time, but will be reported in a future SAR.

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13. Cost Variance Analysis: 5/

a. Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning estimate	12700.0	---	---	12700.0
Previous changes	None	---	---	---
Economic	---	---	---	---
Quantity	---	---	---	---
Schedule	---	---	---	---
Engineering	---	---	---	---
Estimating	---	---	---	---
Other	---	---	---	---
Support	---	---	---	---
Subtotal	---	---	---	---
Current Changes				
Economic	-114.2	---	---	-114.2
Quantity	---	---	---	---
Schedule	---	---	---	---
Engineering	---	---	---	---
Estimating	-936.0	---	---	-936.0
Other	---	---	---	---
Support	---	---	---	---
Subtotal	-1050.2	---	---	-1050.2
Total Changes	-1050.2	---	---	-1050.2
Current Estimate	11649.8	---	---	11649.8

5/ RDT&E only. Procurement and MILCON data are not available at this time, but will be reported in a future SAR.

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13. Cost Variance Analysis (Con't)

(FY 1984 Constant [Base-Year] Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Planning Estimate	10,585.5	—	—	10,585.5
Previous Changes				
Quantity	—	—	—	—
Schedule	—	—	—	—
Engineering	—	—	—	—
Estimating	—	—	—	—
Other	—	—	—	—
Support	—	—	—	—
Subtotal	—	—	—	—
Current Changes:				
Quantity	—	—	—	—
Schedule	—	—	—	—
Engineering	—	—	—	—
Estimating	-808.9	—	—	-808.9
Other	—	—	—	—
Support	—	—	—	—
Subtotal	-808.9	—	—	-808.9
Total Changes	-808.9	—	—	-808.9
Current Estimate	9776.6	—	—	9776.6

b. Previous Change Explanations -- None.

c. Current Change Explanations:

(1) RD&E	(Dollars in Millions)	
	Base-Year	Then-Year
Revised economic escalation indices (Economic)	N/A	-114.2
Adjustment for current and prior year escalation (Estimating)	+20.2	+22.4
Refinement of estimate due to the fully successful build and test of non-operational pre-	-829.1	-958.4

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prototype hardware, and to technology carryover from the Peacekeeper program in areas of propulsion, guidance and assembly and checkout. (Estimating)

(2) Procurement (N/A)

(3) MILCON (N/A)

d. References --

Planning Estimate: PMD 0075(17), dated 23 Jul 86 and FY 1988
President's Budget

14. Program Acquisition Unit Cost (PAUC) History: N/A (RDT&E only)

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>Post Boost Vehicle/Assembly & Test</u>			
Martin Marietta, Denver CO	\$333.5	\$376.0M	N/A
F04704-85-C-0039, FPIF			
Awarded: 26 June 1985			
Definitized: 26 June 1985			

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$346.1M	\$390.7M	N/A	\$346.1M	\$346.1M 6/

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-0.4M	\$-1.8M
Cumulative Variances to Date (30 Nov 86)	\$+0.2M	\$-3.5M
Net Change	\$+0.6M	\$-1.7M

Explanation of Change: Net changes are not significant. No program impact. Contract is over 25% complete. Cost variance is due to additional savings realized for subcontractor materials. Schedule variance is due to slips in internal contract and subcontractors' milestones which caused late release of drawings. Program milestones are being met; however, internal indicators, coupled with inspection trips to key Martin subcontractors, show the potential for future cost growth.

6/ Includes authorized undefinitized work. To prevent disclosure of our negotiating position, the authorized undefinitized work is valued at the contractor's estimate for purposes of this report.

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	Initial Contract Price		
	Target	Ceiling	Qty
Hard Mobile Launcher	\$299.4M	7/ \$335.6M	7/ N/A

Boeing Aerospace Co
Seattle WA
FO4704-87-C-0054, FPIF/AF
Awarded: 23 December 1986
Definitized: 23 December 1986

Current Contract Price			Estimated Price at Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$299.4M	\$335.6M	N/A	\$299.4M	\$299.4M

	Cost Variance	Schedule Variance
Previous Cumulative Variances	---	---
Cumulative Variances to Date	---	---
Net Change	0.0	0.0

Explanation of Change: This is the initial report for this contract. The first cost performance data will be received in February 1987.

7/ Includes basic cost, profit, and 100% of award fee pool at start of contract.

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Small ICBM, December 31, 1986

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Guidance and Control Integration			
Rockwell International (Autonetics)	\$205.9M 8/	N/A	N/A
Anaheim CA			
FO4704-84-C-0061, CPIF/AF			
Awarded: 25 May 1984			
Definitized: 26 May 1984			

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$235.7M	N/A	N/A	\$235.7M	\$235.7M 9/

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-0.8M	\$-0.3M
Cumulative Variances to Date(30 Nov 86)	\$-1.0M	\$-2.1M
Net Change	\$-0.2M	\$-1.8M

Explanation of Change: Net changes are not significant. No program or contract impact. Contract is currently over 50% complete. Cost variance is due to additional labor and material used for design and fabrication of test equipment for the airborne missile computer and subsystems for the alternate guidance test flights. Schedule Variance is attributable to a delay in subcontract negotiation for the Airborne Power Supply and delivery of test processors. Contractor is meeting all program milestones.

8/ Includes basic cost, fee, and 100% of award fee pool at start of contract. This is a correction of the previous SAR.

9/ Includes authorized undefinitized work. To prevent disclosure of our negotiating position, the authorized undefinitized work is valued at the contractor's estimate for purposes of this report.

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Small ICBM, December 31, 1986

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>Missile Stage II</u>			
Aerojet Nevada Rocket Operations	\$186.4M <u>10/</u>	\$201.2M <u>10/</u>	N/A
Sacramento CA			
F04704-87-C-0050/FPIF/AF			
Awarded: 23 December 1986			
Definitized: 23 December 1986			

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$186.4M	\$201.2M	N/A	\$186.4M	\$186.4M

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	---	---
Cumulative Variances to Date (date)	---	---
Net Change	0.0	0.0

Explanation of Change: This is the initial report for this contract. The first cost performance data will be received in February 1987.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>Missile Stage III</u>			
Hercules, Inc.	\$173.3M <u>10/</u>	\$189.1M <u>10/</u>	N/A
Magna UT			
F04704-87-C-0051/FPIF/AF			
Awarded: 23 December 1986			
Definitized: 23 December 1986			

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$173.3M	\$189.1M	N/A	\$173.3M	\$173.3M

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	---	---
Cumulative Variances to Date (date)	---	---
Net Change	0.0	0.0

Explanation of Change: This is the initial report for this contract. The first cost performance data will be received in February 1987.

10/ Includes basic cost, profit, and 100% of award fee pool at start of contract.

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Small ICBM, December 31, 1986

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>System Support</u>			
Martin Marietta, Denver CO	\$125.3M <u>11/</u>	N/A	N/A
F04704-C-85-0040, CPFF/AF			
Awarded: 26 June 1985			
Definitized: 26 June 1985			

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$132.5M	N/A	N/A	\$132.5M	\$132.5M <u>12/</u>

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$+0.2M	\$-0.2M
Cumulative Variances to Date(30 Nov 86)	\$+0.9M	\$-0.2M
Net Change	\$+0.7M	\$ 0.0M

Explanation of Change: Net changes are not significant. No program or contract impact. Contract is nearly 20% complete. Cost variance is due to savings realized from reduced test analysis. Schedule variance is due to late delivery of the System Requirements Analysis/Data Management System.

11/ Includes basic cost, fee, and 100% of award fee pool at start of contract. This is a correction of the previous SAR.

12/ Includes authorized undefinitized work. To prevent disclosure of our negotiating position, the authorized undefinitized work is valued at the contractor's estimate for purposes of this report.

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Small ICBM, December 31, 1986

16. Program Funding Summary: (Current Estimate in Millions of Dollars) 13/

a. Program Status — 13/

(1) Percent Program Completed: 25% (4 yrs/16 yrs)

(2) Percent Program Cost Appropriated:
22.0% (\$2505.2/\$11649.8)

b. Appropriation Summary — 13/

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY84-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93-99)</u>	<u>Total</u>
RDT&E	2505.2	2233.2	6564.4	347.0	11649.8
Procurement	---	---	---	---	---
MILCON	---	---	---	---	---
Total	2505.2	2233.2	6564.4	347.0	11649.8

13/ RDT&E only. Procurement and MILCON data are not available at this time, but will be reported in a future SAR.

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Small ICBM, December 31, 1986

c. Annual Summary —

:FISCAL :		FY 84 Base-Year Dollars			Then-Year Dollars			:Escl :
: YEAR :	:QTY :	Flyaway		Total	Advance Proc		Total	:Rate :
:	:	Nonrec	Rec	:	Debit	Credit	:	:(%) :
Appropriation: RDT&E								
:1984 :	:	:	:	: 321.9 :	:	:	: 328.3 :	3.8 :
:1985 :	:	:	:	: 435.0 :	:	:	: 458.5 :	3.4 :
:1986 :	:	:	:	: 534.7 :	:	:	: 581.2 :	2.9 :
:1987 :	:	:	:	: 1011.7 :	:	:	: 1137.2 :	3.1 :
:1988 :	:	:	:	: 1920.2 :	:	:	: 2233.2 :	3.5 :
:1989 :	:	:	:	: 1855.8 :	:	:	: 2228.8 :	3.5 :
:1990 :	:	:	:	: 1695.2 :	:	:	: 2098.7 :	3.3 :
:1991 :	:	:	:	: 1132.9 :	:	:	: 1438.8 :	2.9 :
:1992 :	:	:	:	: 613.9 :	:	:	: 798.1 :	2.4 :
:1993 :	:	:	:	: 180.2 :	:	:	: 240.0 :	2.4 :
:1994 :	:	:	:	: 21.3 :	:	:	: 29.0 :	2.4 :
:1995 :	:	:	:	: 14.8 :	:	:	: 20.7 :	2.4 :
:1996 :	:	:	:	: 11.7 :	:	:	: 16.7 :	2.4 :
:1997 :	:	:	:	: 11.4 :	:	:	: 16.7 :	2.4 :
:1998 :	:	:	:	: 11.0 :	:	:	: 16.5 :	2.4 :
:1999 :	:	:	:	: 4.9 :	:	:	: 7.4 :	2.4 :
:Subtotal:	22 :	:	:	: 9776.6 :	:	:	: 1649.8 :	:
:Total :	22 :	:	:	: 9776.6 :	:	:	: 11649.8 :	:

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Small ICBM, December 31, 1986

d. Obligations and Expenditures — 14/

:Fiscal Year Then-Year Dollars (Current Estimate in Millions) :				
:	:	:	:	:
:	Total	Obligated	Expended	:
:	:	:	:	:
Appropriation: RDT&E				
:	:	:	:	:
:1984	: 328.3	: 327.8	: 323.9	:
:	:	:	:	:
:1985	: 458.5	: 458.5	: 444.3	:
:	:	:	:	:
:1986	: 581.2	: 559.6	: 321.1	:
:	:	:	:	:
:1987	: 1137.2	: 364.3	: 6.5	:
:	:	:	:	:
:To Complete	: 9144.6	: N/A	: N/A	:
:	:	:	:	:
:Total	: 11649.8	: 1710.2	: 1095.8	:
:	:	:	:	:

14/ Obligation and expenditure figures reflect program office records as of 31 Dec 86 and reflect only funds available to the program office. They do not include OSD/AF/AFSC withholds.

17. Production Rate Data: N/A (Production quantities not yet defined; will be provided in a future SAR.)

18. Operating and Support Costs: N/A (Production quantities not yet defined; will be provided in a future SAR.)

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SELECTED ACQUISITION REPORT (RCS:ID-COMP(Q&A)823)

PROGRAM: Common Strategic Rotary Launcher

AS OF DATE: December 31, 1986

<u>SUBJECT</u>	<u>INDEX</u>	<u>PAGE</u>
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 FOR OPEN PUBLICATION
 FEB 2 1987 18
 DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (DASO-PA)
 DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): Common Strategic Rotary Launcher (CSRL)2. DoD Component: U.S. Air Force3. Responsible Office and Telephone Number:

B-52 Program Office
 Aeronautical Systems Division
 Wright-Patterson AFB, OH 45433

COL PHIL ROBERTS
 Assigned: Jul 85
 AV 785-7057 COMM (513) 255-7057

4. Program Elements/Procurement Line Items:

RDISE: PE 63258F
 PE 64234F

PROCUREMENT: APRN 3010 ION B05200

MILCON: N/A

O&M: APRN 3400 PE 11113F (Shared funding)

SAF/PAG

87-0070-T

5. Related Programs: OAS/OMI, B-1B, AIB, SRAM II, ALCM, ACM, and future standoff conventional weapons

87-0174

6. Mission Description:

The Common Strategic Rotary Launcher (CSRL) is a multipurpose weapons launcher for strategic internal weapons carriage. The CSRL will accommodate current and projected gravity nuclear weapons, Short Range Attack Missiles (SRAM), Advanced Cruise Missile (ACM) and Air Launched Cruise Missile (ALCM). Space provisions are also provided for MIL-STD 1760 avionics and wiring permitting carriage of future conventional standoff munitions and SRAM II. The CSRL will be common to the B-52H, B-1B, and ATB to the maximum extent practical. For B-52H/B-1B, it provides each aircraft with internal capability to safely load, carry, launch/release, and jettison the following weapons: eight SRAMs (AGM-69A, B-52 carriage only), eight ALCMs (AGM-86B), four ACMs (B-1B only), eight B-61s, eight B-83s, and four B-28s (B-52 only). Weapon loading requirements for the Advanced Technology Bomber (ATB) are covered within the security constraints of that program. The CSRL does not replace any weapon system since the B-52 and B-1 do not presently have internal cruise missile capability.

7. Program Highlights:

a. Significant Historical Developments — The Full Scale Development (FSD) program is currently 90.0% complete. No significant technical problems have been identified to date. From Oct 84 - Oct 85, the CSRL underwent a totally successful qualification testing program which included proof load testing, ground vibration tests, power drive system qualification tests, durability tests, damage tolerance tests and ultimate load tests. All requirements were satisfactorily met or exceeded. Additional CSRL ground tests were initiated with the arrival of the flight test aircraft at Edwards AFB on 1 Aug 85. The ground test to verify upload, download, and reconfiguration requirements were successfully completed on 16 Sep 85. The flight test program began on 17 Sep 85 and included ALCM and gravity bomb jettisons and releases. All flight objectives have been successfully completed with no significant CSRL hardware related problems. Launcher rotation, weapon ejection, and aircraft software/launcher hardware interfaces have been successfully demonstrated. All program objectives and milestones are on schedule to support the directed initial B-52H operational capability of March 1990.

b. Significant Developments Since Last Report — The B-52H CSRL flight testing was successfully completed on 5 Aug 86. The Air Force Operational Test and Evaluation Center (AFOTEC) evaluated the B-52 OAS software during the last five months of flight test to ensure all existing B-52 capabilities had not been disturbed by the addition of the CSRL to the B-52. A final Initial Operational Test and Evaluation (IOT&E) test report was released to HQ USAF on 5 Oct 86 evaluating the CSRL and the associated aircraft software. AN AFOTEC final report briefing was presented to representatives of the HQ USAF Modification Review Group on 10 Oct 86 which stated that there were no CSRL discrepancies. HQ AFSC, HQ AFLC, HQ AFOTEC, and HQ SAC recommended, and HQ USAF approved proceeding with full rate production (Lots II through V). B-1B flight test program started in June 1986.

The CSRL is expected to satisfy the mission requirement.

c. Changes Since "As Of" Date — None

8. Decision Coordinating Paper (DCP) Threshold Breaches: No DCP

9 Schedule:

a. Milestone —

	Production Estimate/ Approved Program	Current Estimate
Demonstration/Validation	Jun 82 / Jun 82	Jun 82
Source Selection	Jun 83 / Jun 83	Jun 83
Full Scale Development	Jun 83 / Jun 83	Jun 83
Preliminary Design Review	Sep 83 / Sep 83	Sep 83
Critical Design Review	Mar 84 / Mar 84	Mar 84
B-52 CSRL Flight Test Initiation	Aug 85 / Aug 85	Aug 85
Completion of B-52 CSRL Qualification Testing	Oct 85 / Oct 85	Oct 85
Low rate initial production	Nov 85 / Nov 85	Nov 85
B-52 CSRL Flight Test Completion	Jan 86 / Jan 86	Aug 86 (CH-1)
IOI&E Final Report (AFOTEC)	Aug 86 / Aug 86	Oct 86 (CH-2)
Full rate production	Nov 86 / Nov 86	Nov 86
B-52 FAC *	Sep 89 / Sep 89	Sep 89
B-52 IOC **	Mar 90 / Mar 90	Mar 90

* B-52 First Alert Capability (FAC) is defined as the capability to place on alert, if so directed, three Offensive Avionics System (OAS) modified B-52Hs loaded with two cruise missiles pylons, cruise missiles and a CSRL.

** B-52 Initial Operational Capability (IOC) consists of one squadron with internal/external cruise missile capability and associated support equipment.

b. Previous Change Explanations — NONE

c. Current Change Explanations —

(CH-1) The B-52 CSRL flight test completion date was extended from Jan 86 to Aug 86 to test and verify Block II software and CSRL/B-28 employment fixes. This task was identified in Program Management Directive (PMD) 2087 (6), dated 21 Apr 86.

(CH-2) The IOI&E final report (AFOTEC) was rescheduled from Aug 86 to Oct 86 because the report is due 60 days after completion of the B-52 CSRL flight test.

d. References —

Production Estimate: PMD NR. R-Q 2087(5), dated 22 Apr 85
PMD NR. 4126(3)/3142, dated 31 Oct 85

Approved Program: Same as Above

10. Technical/Operational Characteristics:

a. Technical —	Production Est/ Approved Program	Demonstrated Performance ¹⁾	Current Estimate
Time required to rotate from an adjacent station (sec)	5/5	4.4 (CH-1)	4.4 (CH-1)
Maximum time required to jet- tison full weapon load (sec)	60/60	45.1 (CH-2)	45.1 (CH-2)
In-commission rate (%) ²⁾	93/93	93	93
Weapon system reliability (%)	96/96	97 (CH-3)	97 (CH-3)
Maximum design weight (lbs)	5000/5000	4703 (CH-4)	4703 (CH-4)

b. Operational —

Capability to carry/release AGM-86B (missiles)	8/8	8	8
Capability to carry/release B-61 (bombs)	8/8	8	8
Capability to carry/release B-28 (bombs)	4/4	4	4
Capability to carry/release B-83 (bombs)	8/8	8	8
Mean time to upload/download a weapon-configured CSRL in B-52H bomb bay (min)	60/60	56 (CH-5)	56 (CH-5)
Mean time to perform single weapon exchange (min)	60/60	53 (CH-6)	53 (CH-6)

- 1) Worst case
- 2) Percentage of CSRL's capable of performing the specific mission with
no corrective maintenance required.

c. Previous Change Explanations — N/A

d. Current Change Explanations —

- (CH-1) Actual time validated by AFOTEC at Edwards AFB
- (CH-2) Actual time validated by AFOTEC at Edwards AFB
- (CH-3) Current predictions validated by AFOTEC at Edwards AFB
- (CH-4) Verified weight of final production configuration (B1-B)
- (CH-5) Actual times verified by SAC/AFOTEC at Edwards AFB
- (CH-6) Actual times verified by SAC/AFOTEC at Edwards AFB

All the changes were derived from CSRL prime item development
specification and an AFOTEC report. Oct 86 (Classified)

e. References —

Production Estimate: FPD NR. R-Q 2087(5), dated 22 Apr 85
FPD NR. 4126(3)/3142, dated 31 Oct 85

Approved Program: Same as Above

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	<u>Production Estimate</u>	<u>Change</u>	<u>Current Estimate</u>
a. Cost —			
Development (RDT&E)	265.6	-23.5	242.1
Procurement	326.6	-79.9	246.7 ✓
Nonrecurring	(12.2)	(+1.3)	(13.5)
Group A - Integration	(66.3)	(+22.6)	(88.9)
Group B - Launcher	(172.7)	(-68.4)	(104.3)
Total Flyaway	(251.2)	(-44.5)	(206.7)
Other Weapon Systems Cost	(51.5)	(-29.0)	(22.5)
Initial Spares	(23.9)	(-6.4)	(17.5)
Construction (MILCON)	0.0	0.0	0.0
O&M	23.1	-3.7	19.4
Total FY82 Base-Year \$	615.3	-107.1	508.2
Escalation	198.5	-59.9	138.6
Development (RDT&E)	(34.6)	(-5.2)	(29.4)
Procurement	(155.3)	(-53.2)	(102.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
O&M	(8.6)	(-1.5)	(7.1)
Total Then-Year \$	813.8	-167.0	646.8
b. Quantities —			
Development (RDT&E: 1 used for destructive testing)	(7)	-	(7)
Procurement (includes retrofit of 6 FSD)	104	-	104
Total	104	-	104
c. Unit Cost —			
Procurement:			
FY82 Base-Year \$	3.140	-0.768	2.372
Then-Year \$	4.634	-1.280	3.354
Program:			
FY82 Base-Year \$	5.916	-1.029	4.887
Then-Year \$	7.825	-1.606	6.219
d. Approved Design-to-Cost Goal — N/A			
e. Foreign Military Sales — N/A			
f. Nuclear Costs — N/A			

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	CURRENT EST	UCR Baseline	UCR Baseline
	DEC 86 SAR	DEC 85	DEC 86 SAR
a. Program Acquisition —			
(1) Cost	646.8	813.8	646.8
(2) Quantity	104	104	104
(3) Unit Cost	6.219	7.825	6.219
b. Current Procurement —	(FY87)	(FY87)*	(FY88)
(1) Cost	74.5	74.5	73.2
Less CY Adv Proc	0.0	0.0	0.0
Plus FY Adv Proc	0.0	0.0	0.0
Net Total	74.5	74.5	73.2
(2) Quantity	26	26	23
(3) Unit Cost	2.865	2.865	3.183

*Adjusted to reflect FY87 appropriations act in accordance with congressional change to SAR.

13. Cost Variance Analysis

a. Summary — (Current (Then-Year) Dollars in Millions)

	ROT&E	PROC	O&M	TOTAL*
Production Estimate	300.2	481.9	31.7	813.8
Previous Changes:				0.0
Economic				0.0
Quantity				0.0
Schedule				0.0
Engineering				0.0
Estimating				0.0
Other				0.0
Support				0.0
Subtotal	0	0	0	0
Current Changes:				0.0
Economic	-0.1	-14.8	-0.4	-15.3
Quantity				0.0
Schedule				0.0
Engineering				0.0
Estimating	-28.6	-67.4	-4.8	-100.8
Other				0.0
Support		-50.9		-50.9
Subtotal	-28.7	-133.1	-5.2	-167.0
Total Changes	-28.7	-133.1	-5.2	-167.0
Current Estimate	271.5	348.8	26.5	646.8

* MILCON: N/A

13. Cost Variance Analysis (Cont'd):

(FY82 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	OGM	TOTAL*
Production Estimate	265.6	326.6	23.1	615.3
Previous Changes:				0.0
Quantity				0.0
Schedule				0.0
Engineering				0.0
Estimating				0.0
Other				0.0
Support				0.0
Subtotal	0	0	0	0
Current Changes:				0.0
Quantity				0.0
Schedule				0.0
Engineering				0.0
Estimating	- 23.5	- 44.5	- 3.7	-71.7
Other				0.0
Support		- 35.4		- 35.4
Subtotal	- 23.5	- 79.9	- 3.7	- 107.1
Total Changes	- 23.5	- 79.9	- 3.7	- 107.1
Current Estimate	242.1	246.7	19.4	508.2

* MILCON: N/A

b. Previous Change Explanations — N/A

13. Cost Variance Analysis (Cont'd):

c. Current Change Explanations -

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
(1) RDT & E		
Revised economic escalation indices (Economic)	N/A	-0.1
A change in program cost due to the refinement of a prior estimate for forecasted engineering orders. (Estimating)	-23.5	-28.6
(2) Procurement		
Revised economic escalation indices (Economic)	N/A	-14.8
Refinement of estimate to account for favorable contract negotiations.	-80.9	-119.6
* Reduction in hardware requirement (Estimating)	(-45.5)	(-68.7)
* Reduction in Weapon System Support Requirements (Support)	(-35.4)	(-50.9)
Adjustments for prior and current year escalation (Estimating)	+1.0	+1.3
(3) O & M		
Revised economic escalation indices (Economic)	N/A	-0.4
A change in cost due to the refinement of a prior estimate for forecasted engineering orders. (Estimating)	-3.7	-4.8

d. References:

Production Estimate: PWD NR. R-Q 2087 (5), dated 22 Apr 85
 PWD NR. 4126 (3)/3142, dated 31 Oct 85

CSRL, December 31, 1986

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then Year \$)

a. Initial SAR Estimate to Current Estimate

PAUC (Initial SAR Est/ PdE)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
7.825	-0.147	—	—	—	-0.969	—	-0.490	-1.606	6.219

15. Contract Information: (Millions of Then Year \$)

a. ROT&E —

Common Strategic Rotary Launcher:

		Initial Contract Price		
		Target	Ceiling	Qty
Boeing Military Airplane Company, Wichita, KS				
F33657-83-C-0533, FPI				
Award: June 22, 1983 (CSRL)		CSRL	\$25.1	\$29.2
April 22, 1984 (CSRL Integration)		CSRLI	\$84.3	\$98.1
Definitized: June 22, 1983 (CSRL)				
April 22, 1984 (CSRLI)				

CSRL/CSRLI Total \$109.4 \$127.3 2

Current Contract Price

Estimated Price At Completion

Target	Ceiling	Qty
\$144.8	\$165.2	7

Contractor	Program Manager
\$144.8	\$139.8

Cost Variance

Schedule Variance

Previous Cumulative Variances	\$+2.3	\$-.7
Cumulative Variances To Date 27 Nov 86	\$+6.0	\$-.3
Net Change	\$+3.7	\$+.4

Explanation of Change: Cost Variance remains as an underrun. The schedule variance has improved and has no impact on the contract.

b. Procurement — N/A

c. MILCON — N/A

d. O&M — N/A

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status —

- (1) Percent Program Completed: 50.0% (6 yrs/12 yrs)
(Years Funds Appropriated/Total Program Years)
- (2) Percent Program Cost Appropriated: 63.4% (\$410.3M/\$646.8M)
(Funds Appropriated To Date/Total Program Funding)

b. Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY82-87)	Budget Year (FY88)	Balance to Complete FYDP (FY89-92)	Beyond FYDP (FY93)	Total
ROI&E	264.9	5.7	0.9	—	271.5
Procurement	145.4	73.2	129.9	.3	348.8
MILCON	—	—	—	—	0.0
O&M	—	0.3	23.0	3.2	26.5
Total	410.3	79.2	153.8	3.5	646.8

c. Annual Summary —

Fiscal Year	Qty	FY 82 Base Year			Then Year			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RUI&E								
1982				21.4			21.9	9.2
1983				59.4			63.6	4.9
1984				55.1			61.2	3.8
1985				49.4			56.7	3.4
1986				40.9			48.4	2.9
1987				10.7			13.1	3.1
1988				4.5			5.7	3.5
1989				.7			0.9	3.5
Subtotal	(7)			242.1			271.5	

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary —

Fiscal Year	Qty	FY 82 Base Year			Then Year			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: Procurement								
1986	5	12.0	17.6	53.3			70.9	2.9
1987	26	0.3	47.9	54.1			74.5	3.1
1988	23		49.3	51.6			73.2	3.5
1989	24		35.2	38.5			56.3	3.5
1990	26	1.2	43.2	48.8			73.2	3.3
1991				.1			.2	2.9
1992				.1			.2	2.4
1993				.2			.3	2.4
Subtotal	104	13.5	193.2	246.7	0.0	0.0	348.8	
Appropriation: MILCON								
N/A							0.0	N/A
Appropriation: O&M (Qty represent A/C installs)								
1988	1			.2			.3	3.5
1989	21			4.4			5.7	3.5
1990	21			4.2			5.6	3.3
1991	21			4.2			5.8	2.9
1992	21			4.2			5.9	2.4
1993	11			2.2			3.2	2.4
Subtotal	(96)			19.4			26.5	
Total	104	13.5	193.2	508.2	0.0	0.0	646.8	

16 Program Funding Summary (Cont'd):

d. Obligations and Expenditures —

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1982	21.9	21.8	21.8
1983	63.6	59.8	59.8
1984	61.2	58.9	58.9
1985	56.7	56.2	54.7
1986	48.4	40.6	31.0
1987	13.1	0.9	0.1
To Comp	6.6	N/A	N/A
Total	271.5	238.2	226.3
Appropriation: Procurement			
1986	70.9	56.7	0.0
1987	74.5	53.8	0.0
To Comp	203.4	N/A	N/A
Total	348.8	110.5	
Appropriation: MILCON			
Total	N/A	N/A	N/A
Appropriation: O&M			
Total	26.5	N/A	N/A

Reflects program office records as of 31 Dec 86.

17. Production Rate Data: (Based upon the Surge Rate) *

Fiscal Year	Production Rates (Quantity/Year)			
	Dev Est	Prd Est	Cur Est	Max
1986	6	6	6	6
1987	21.5	21.5	22.3	22.3
1988	24	24	23	48
1989	24	24	24	48
1990	24	24	24	48

*NOTE: The annual production rates shown differ from the annual funded quantities because the funded delivery period is 10 months for FY86, 14 months for FY87, and 12 months for FY88-90.

b. Cost Variance — Dollars in Millions
(Note: Subject to production rate limitations)

Item	Prod Estimate	Variance (CE-PdE)	Current Estimate	Variance (CE-Max)	Maximum
Prog Acq Cost(BY82\$)	615.3	-107.1	508.2	+0.3	507.9
(TY \$)	813.8	-167.0	646.8	+5.3	641.5
PAUC (BY82 \$)	5.916	-102.9	4.887	+.003	4.884
(TY \$)	7.825	-1.606	6.219	+.051	6.168

c. Schedule Variance — (Note: Subject to production rate limitations)

Item	Prod Estimate	Variance (CE-PdE)	Current Estimate	Variance (CE-Max)	Maximum
Start Date (MO/YR) *	12/87	-	11/87	-	11/87
Duration (Months)	59	-3	56	10	46
End Date (MO/YR)	10/92	-	6/92		8/91

Based upon deliver rates

d. Deliveries To Date (Plan/Actual) — ROI&E 4/4
Proc 0/0

18. Operations and Support Cost:

a. Assumptions and Ground Rules - The baseline Life Cycle Cost (LCC) estimate and LCC analysis are based on a three tier maintenance concept. Operations and Support (O&S) costs are based on total production buys of 104 units, and an operational life of 15 years for the B-52 and 20 years for the B1-B. There are four operational bases for each aircraft type (8 total). Since the CSRL is a dormant system, the failure data represents possessed hours. Initial training and technical publications cost have been priced within the Full Scale Development and production contracts. AFLC LSC Model, Version 1.1 (1979) was used to determine O&S costs.

b. Costs —

(FY 1982 Constant (Base-Year) Dollars)

COST ELEMENTS	AVG ANNUAL COST Per CSRL B-52	AVG ANNUAL COST Per CSRL B-1B
SUPPORT		
-SPARES	1,340	850
-ON EQUIPMENT MAINTENANCE	100	100
-OFF EQUIPMENT MAINTENANCE	1,560	1,030
-INVENTORY	490	410
-MAINTENANCE MANAGEMENT	20	20
-FUEL	390	480
-PERIODIC INSPECTIONS	90	90
-RECURRING TRAINING	770	770
OPERATIONS		
-LOAD OPERATIONS	1,420	1,570
-CLIP BUILD UP & CHECK OUT	2,040	1,770
CSRLI		
-FUEL	3,120	
-O&S	190	
TOTAL O&S COST/YEAR/CSRL	11,530	7,090

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: Titan IV (CELV)

AS OF DATE: December 31, 1986

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1. Designation and Nomenclature (Popular Name): Titan IV, formerly Complementary Expendable Launch Vehicle (CELV)

2. DoD Component: United States Air Force

3. Responsible Office and Telephone Number:

Space Launch and Control Systems
 Director of Expendable Launch
 Systems, Space Division
 Los Angeles AFS, CA 90009

Col Victor W. Whitehead/Program Director
 Assigned: July 1, 1983
 AV 833-0210; COMM (213)643-0210

Col William H. Anders/Program Manager
 Assigned: March 4, 1985
 AV 833-1785, COMM (213)643-1785

4. Program Elements/Procurement Line Items:

RDT&E: PE 35119F (Shared funding)
 PE 35171F (Shared funding)
 PE 34111F (Shared funding)

PROCUREMENT: APPN 3020 ICN MSBSTR

5. Related Programs: Defense Support Program; Military Defense Systems
 Communications Satellite (DSCS); Space Shuttle Operations (IUS)

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JAN 30 1987 18

DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (DASD-PA)
 DEPARTMENT OF DEFENSE

SAF/PAS

B7 0041-1

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6. Mission and Description:

The Titan IV program will not replace any defense programs. It will assure continued access to space for the nation's highest priority space systems. The Titan IV system evolved from the basic family of Titan systems, namely, the Titan IIIB, C, D, E and 34D, which have contributed to national space objectives for more than 25 years. The Titan IV consists of a liquid propellant core of two stages with a pair of large solid rocket motors attached to the core to provide the initial stage of boost from liftoff. While a variety of upper stages may be compatible with the booster, the two upper stages baselined for use on the Titan IV are the Inertial Upper Stage (IUS) and the Centaur G-prime mod. When figured with the Centaur G-prime mod, a single stage liquid propellant restartable upper stage, the Titan IV is capable of matching the Shuttle/Centaur performance by placing a 10,000 pound payload into geosynchronous orbit (GSO). The Titan IV/IUS configuration is capable of placing a 5,000 pound payload into GSO.

7. Program Highlights:

a. Significant Historical Developments -- Development of the Titan IV program is in direct response to a National Security Decision Directive, which directed the DoD to provide assured access to space for critical DoD satellites. Since the contract award, in February 1985, the program has moved forward in a number of technical areas. Critical Design Reviews (CDRs) have been accomplished for the Payload Fairing, Solid Rocket Motors, and the core vehicle sub-systems. Cold Flow testing of the Solid Rocket Motors began in September 1985. Stress analysis has been completed on the Liquid Rocket Engines and the core vehicles' component qualification is nearing completion. A series of booster/Centaur qualification tests will occur prior to the first launch.

As a result of the 28 Jan 86 Space Shuttle Challenger accident, the DoD has embarked upon a recovery plan which includes the acquisition of 13 additional Titan IV Boosters, activation and operation of Titan IV at Vandenberg AFB, and STS/Titan IV dual compatibility for all east coast AF satellites. (Note: Due to the Vandenberg activation and operation costs being totally funded by the classified program, it is not included in this report). To accommodate this larger scale program, several elements of the original ten vehicle program were enhanced and/or accelerated.

b. Significant Developments Since Last Report -- Successfully completed the Critical Design Review in Oct 86, and incorporated a new budget initiative to add an additional launch complex at Vandenberg AFB, Ca.

There are a number of new impacts to the Titan IV program that are not yet embodied in this report. The most significant involves the serious cost impact caused by the NASA cancellation of Centaur on STS. The impacts of completing the necessary development work and the added burden to the Titan IV program are under review, and will be included as soon as the assessment is complete. Contractor proposals are anticipated in Feb 87 to incorporate the impacts of the NASA cancellation.

The Titan IV system is expected to satisfy the mission requirement.

c. Changes Since "As Of Date" -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: None.
There are no SDDMs, SCPs, or DCPs applicable to the Titan IV program.

9. Schedule:

a. Milestones --	Development Estimate/ <u>Approved Program</u>	Current <u>Estimate</u>
Initial Contract Award	Feb 85/Feb 85	Feb 85
Production Start	Oct 85/Oct 85	Oct 85
System Preliminary Design		
Review	Apr 86/Apr 86	Apr 86
System Critical Design Review	Nov 86/Nov 86	Oct 86
First Delivery to Cape		
Canaveral Air Force Station	Feb 88/Feb 88	Feb 88
Initial Launch Capability	Oct 88/Oct 88	Oct 88

b. Previous Change Explanations --

Due to favorable progress driven by the Preliminary Design Review, the Systems Critical Design Review was completed 18 Oct 86, in lieu of Nov 86.

c. Current Change Explanations -- None.

d. References --

Development Estimate: FY 1987 President's Budget, dated February, 1986.

Approved Program: Same as Development Estimate.

10. Technical/Operational Characteristics:

	Dev Estimate/ <u>Approved Program</u>	Demonstrated <u>Performance</u>	Current <u>Estimate</u>
a. Technical --			
Systems Reliability (%)	98/98	N/A	98
Solid Rocket Motors:			
Length (ft)	112.2/112.2	N/A	112.2
Diameter (ft)	10.2/10.2	N/A	10.2
Thrust (M/lbs)	1.6/1.6	N/A	1.6
Core Vehicle:			
Stage One			
Length (ft)	86.5/86.5	N/A	86.5
Diameter (ft)	10.0/10.0	N/A	10.0
Engine Thrust (k-lbs)	546/546	N/A	546
Stage Two			
Length (ft)	32.6/32.6	N/A	32.6
Diameter (ft)	10.0/10.0	N/A	10.0
Engine Thrust (k-lbs)	104/104	N/A	104
Payload Fairing:			
Diameter (ft)	16.7/16.7	N/A	16.7
Length (ft)	86/86	N/A	86
b. Operational --			
Payload to			
geosynchronous (k-lbs)	10/10	N/A	10

10. Technical/Operational Characteristics (Cont'd):

c. Previous Change Explanations -- None.

d. Current Change Explanation -- None.

e. References--

Development Estimate: FY 1987 President's Budget, dated February, 1986.Approved Program: Same as Development Estimate.11. Program Acquisition Cost (Current Estimate in Millions of Dollars):

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	\$ 579.7	+147.2	\$ 726.9
Program Development	(488.7)	(+138.4)	(627.1)
RDT&E Funded Centaurs	(91.0)	(+8.8)	(99.8)
Procurement	1570.8	+1245.5	2816.3
Total Flyaway	(1106.6)	(+1602.5)	(2709.1)
Other Weapon Systems Costs	(464.2)	(-357.0)	(107.2)
Construction (MILCON)	0.0	+177.4	177.4
Total FY 85 Base-Year \$	2150.5	+1570.1	3720.6
Escalation	378.7	+235.3	614.0
Development (RDT&E)	(61.4)	(+11.0)	(72.4)
Procurement	(317.3)	(+181.7)	(499.0)
Construction (MILCON)	(0.0)	(+42.6)	(42.6)
Total Then-Year \$	\$ 2529.2	+1805.4	\$ 4334.6
b. Quantities --			
Development (RDT&E)	-	-	-
Procurement	10	+13	23
Total	10	+13	23
c. Unit Cost --			
Procurement:			
FY 85 Base-Year \$	\$ 157.080	-32.632	\$ 122.448
Then-Year \$	188.810	-44.667	144.143
Program:			
FY 85 Base-Year \$	215.050	-53.285	161.765
Then-Year \$	\$ 252.920	-64.459	\$ 188.461
d. Approved Design to Cost Goal -- N/A			
e. Foreign Military Sales -- None			
f. Nuclear Costs -- None			

12. Program Acquisition/Current Procurement Unit Cost Summary:
 (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current</u> <u>Estimate</u> (Dec 86 SAR)	<u>UCR Baseline</u> <u>Estimate</u> (Dec 85 SAR)	<u>UCR Baseline</u> <u>Estimate</u> (Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	\$4334.6	\$2529.2	\$4334.6
(2) Quantity	23	10	23
(3) Unit Cost	\$ 188.461	\$ 252.920	\$ 188.461
b. Current Procurement -- (FY 1987)		(FY 1987) 1/	(FY 1988)
(1) Cost	\$ 658.3	\$ 658.3	\$ 654.7
Less CY Adv Proc	-319.9	-319.9	-168.0
Plus PY Adv Proc	+35.0	+35.0	+163.0
Net Total	373.4	373.4	649.7
(2) Quantity	2	2	6
(3) Unit Cost	186.700	186.700	108.283

1/ Differs from Dec 85 SAR because of 1987 Appropriations Act.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	
Development Estimate	641.1	1888.1	0.0	2529.2
Previous Changes:				
Economic				
Quantity		+1793.2		+1793.2
Schedule		-36.2		-36.2
Engineering	+17.0	-438.1		-421.1
Estimating	+102.6	+739.9		+842.5
Other				
Support	+20.0	-446.4		-426.4
Subtotal	+139.6	+1612.4	0.0	+1752.0
Current Changes:				
Economic	-5.3	-51.5		-56.8
Quantity				
Schedule				
Engineering	+40.0			+40.0
Estimating	-16.1	-97.6	+220.0	+106.3
Other				
Support		-36.1		-36.1
Subtotal	+18.6	-185.2	+220.0	+53.4
Total Changes	+158.2	+1427.2	+220.0	+1805.4
Current Estimate	799.3	3315.3	220.0	4334.6

13. Cost Variance Analysis Cont'd):
 FY 1985 Constant (Base-Year) Dollars in Millions (Cont'd):

	RDT&E	PROC	MILCON	
Development Estimate	579.7	1570.8	0.0	2150.5
Previous Changes:				
Quantity		+1466.4		+1466.4
Schedule				-345.8
Engineering	+15.5	-361.3		-345.8
Estimating	+90.3	+580.5		+670.8
Other				
Support	+19.3	-325.2		-305.9
Subtotal	+125.1	+1360.4	0.0	+1485.5
Current Changes: None.				
Quantity				
Schedule				
Engineering	+35.0			+35.0
Estimating	-12.9	-83.1	+177.4	+81.4
Other				
Support		-31.8		-31.8
Subtotal	+22.1	-114.9	+177.4	+84.6
Total Changes	+147.2	+1245.5	+177.4	+1570.1
Current Estimate	726.9	2816.3	177.4	3720.6

b. Previous Change Explanations --

RDT&E

Engineering: Design effort for satellite dual compatibility.

Estimating: Recurring payload integration for additional payloads; lifting of Centaur stop-work order; acceleration and compression of non-recurring payload integration; additional engineering support; transfer to procurement of funds for previously designated Shuttle missions; transfer of outyear funds from procurement; Gramm/Hollings/Rudman reductions; and reductions from budget cycle reviews.

Support: Additional support equipment for accelerated activation at the launch site.

Procurement

Quantity: Hardware costs for an additional 13 vehicles.

Schedule: Accelerated buy of original 10 vehicles.

Engineering: Additional hardware to accommodate satellite dual compatibility.

13. Cost Variance Analysis (Cont'd):

b. Previous Change Explanations (Cont'd) --

Estimating: Recategorization of Flyaway/Support costs reported in the Dec 85 SAR; procurement of additional tooling; transfer from RDT&E of funds for previously designated Shuttle missions; transfer of outyear funds to RDT&E; outyear Centaur procurement due to STS/Centaur cancellation; deletion of classified user operations and maintenance funds; Gramm/Hollings/Rudman reductions; outyear funding reductions due to budget cycle reviews; provisions for engineering change orders; contractor launch incentives and propellant requirements for increased launch schedule; and unit price benefits of increase quantity buy.

Support: Accelerated procurement of support equipment at the launch site and recategorized Flyaway/Support costs reported in the Dec 85 SAR.

d. Current Change Explanations --

(1) <u>RDT&E</u>	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised economic inflation indices. (Economic)	N/A	-5.3
Initial design engineering effort for a new Titan IV launch pad at Vandenberg AFB, CA. (Engineering)	+35.0	+40.0
Adjustment for current and prior year escalation change. (Estimating)	+2.6	+2.8
Transfer of funds from procurement to complete Centaurs currently funded in RDT&E. (Estimating)	+53.4	+60.0
Directed budget reductions which may result in a delay in the Titan IV/Centaur launch capability. (Estimating)	-53.0	-61.6
Congressional directed budget reductions which may result in a delay in Titan IV/Centaur launch capability. (Estimating)	-15.9	-17.3
(2) <u>Procurement</u>		
Revised economic inflation indices. (Economic)	N/A	-51.5
Adjustment for current and prior year escalation change. (Estimating)	+16.5	+18.3
Congressional directed budget reductions which no longer allows for the guaranteed delivery of the first vehicle. (Estimating)	-6.2	-6.9

13. Cost Variance Analysis (Cont'd):

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Engineering change order reserves reduced to reflect historical requirements. (Estimating)	-41.9	-49.0
Transfer of funds to RDT&E to complete Centaurs currently funded in procurement. (Estimating)	-51.5	-60.0
Adjustment for current and prior year escalation change. (Support).	+2.3	+2.6
Congressional directed budget reductions. (Support)	-34.1	-38.7

(3) MILCON

Funds added to program to construct a new Titan IV launch pad at Vandenberg AFB, CA. (Estimating) +177.4 +220.0

e. References -- Development Estimate: FY87 President's Budget, dated February 1986.

14. Program Acquisition Unit Cost (PAUC) History (Millions of Then-Year Dollars):

Initial SAR/Development Estimate to Current Estimate --

PAUC (Initial SAR/Dev Estimate)	Changes								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
252.920	-2.470	-64.988	-1.574	-16.570	+41.252	-	-20.109	-64.459	188.461

15. Contract Information: (Then-Year Dollars in Millions)

RDT&E/Procurement --

Titan IV:

Martin Marietta Corp., Denver, CO

F04701-85-C-0019, FPIF

Award: February 28, 1985

Definitized: March 1, 1985

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$2095.8	\$2287.8	10

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$2124.2	\$2318.5	23

Estimated Price At Completion

<u>Contractor</u>	<u>Program Manager</u>
\$2289.8	\$2289.8

Previous Cumulative Variances
Cumulative Variances To Date (23 Nov 86)
Net Change

<u>Cost Variance</u>	<u>Schedule Variance</u>
\$ +3.4	\$ -22.1
\$ -4.8	\$ -29.9
\$ -8.2	\$ -7.8

15. Contract Information (Cont'd):

Explanation of Change: The unfavorable Cost Variance is due to solid rocket motor fabrication problems, schedule recovery efforts at McDonnell Douglas (payload fairing), and product performance improvement actions on the core vehicle. The negative schedule variance, based on a 100 day margin, worsened since the last report due to manufacturing and fabrication problems at McDonnell Douglas and Chemical Systems Division (solid rocket motors). Due to the 100 day margin, no impacts are predicted to the ILC (Initial Launch Capability) date.

+ = favorable - = unfavorable

16. Program Funding Summary : (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Complete: 33.3% (3 yrs/9 yrs)

(2) Percent Program Cost Appropriated: 37.2% (\$1614.4/\$4334.6)

b. Appropriation Summary (Then-Year Dollars in Millions) --

<u>Appropriation</u>	<u>Current & Prior Yrs</u> (FY85-87)	<u>Budget Year</u> (FY88)	<u>Balance FYDP</u> (FY89-92)	<u>To Complete Beyond FYDP</u> (FY93)	<u>Total</u>
RDT&E	476.6	216.2	86.5	20.0	799.3
MILCON			220.0		220.0
Procurement	1137.8	654.7	1453.8	69.0	3315.3
Total	1614.4	870.9	1760.3	89.0	4334.6

c. Annual Summary 1/ --

Fiscal Year	Qty	FY 85 Base-Year Dollars			Then-Year Dollars		Total	Escl Rate (%)
		Flyaway		Total	Advance Proc			
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1985				37.5			38.2	3.4
1986				244.6			257.3	2.9
1987				166.6			181.1	3.1
1988				192.4			216.2	3.5
1989				0.0			0.0	3.5
1990				22.6			27.1	3.3
1991				22.3			27.4	2.9
1992				25.4			32.0	2.4
1993				15.5			20.0	2.4
Subtotal			2/	726.9			799.3	-

1/ FYs 86, 87, and 88 amounts include the purchase of two RDT&E funded Centaurs originally designated for Shuttle RDT&E missions. The missions have been redesignated on the Titan IV.

2/ Not available.

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary —

Fiscal Year	Qty	FY 85 Base-Year Dollars			Then-Year Dollars			Esol Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: Procurement								
1985				42.7			45.0	3.4
1986				398.6	302.5		434.5	2.9
1987	2	45.0	129.2	584.1	319.9	35.0	658.3	3.1
1988	6	152.0	435.3	562.5	168.0	163.0	654.7	3.5
1989	5	162.6	465.3	396.0	103.0	279.9	478.4	3.5
1990	5	162.6	465.3	336.3	42.0	301.0	413.7	3.3
1991	5	179.1	512.7	230.4		156.5	290.3	2.9
1992				213.5			275.4	2.4
1993				52.2			69.0	2.4
Subtotal	23	701.3	2007.8	2816.3	935.4	935.4	3315.3	
Appropriation: MILCON								
1989				25.1			30.0	3.5
1990				48.9			60.0	3.3
1991				103.4			130.0	2.9
Subtotal				177.4			220.0	
Total	23	701.3	2007.8	3720.6	935.4	935.4	4334.6	

d. Obligations and Expenditures --

(Reflects Program Office records as of 31 Dec 86)

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1985	38.2	38.2	28.4
1986	257.3	242.5	130.7
1987	181.1	54.2	-
To Complete	322.7	-	-
Total	799.3	334.9	159.1
Appropriation: Procurement 1/			
1985	45.0	45.0	0.0
1986	434.5	312.5	2.5
1987	658.3	139.9	-
To Complete	2177.5	-	-
Total	3315.3	497.4	2.5

1/ The FY85 funding was provided via reprogramming action in FY86, and has not yet accumulated expenditures.

17. Production Rate Data:

No report. Production rate less than six per year.

18. Operating and Support Costs:

a. Assumptions and Ground Rules -- Launch and Range Support costs are based on historical data from Titan 34D launches adjusted for any Titan IV peculiar launch requirements.

b. Costs --

(FY 85 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost
	Per Titan IV Launch
Launch Support	34.0
Range Support	4.2
Total	38.2

The average annual cost per launch is based on the cost to launch seventeen vehicles at a rate of four per year out of Cape Canaveral AFS (CCAFS). The costs include contractor launch support at CCAFS and the indirect support required at the Martin Marietta and subcontractor plants.

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Program: Joint STARS

AS OF DATE: 31 December 1986

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AS AMENDED

FEB 10 1987 18

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (DASI - DFI)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): Joint Surveillance Target Attack Radar System (Joint STARS)
2. DoD Component: U.S. Air Force, U.S. Army
3. Responsible Office and Telephone Number:

Joint STARS Program Office
Electronic Systems Division
Hanscom AFB, MA 01731-5000

PM: Col John J. Colligan
Assigned: 7 Jul 1986
AUTOVON 478-5724
Commercial: (617)-377-5724

4. Program Elements/ Procurement Line Items:

RDT&E: 63770F
64770A
64770D
64770F
64616F

PROCUREMENT: APPN 3010 ICN JSTARS
APPN 2035A ICN 7310 BA1080
MILCON: 64770F

SAF/PAS

87-0048-T

5. Related Programs: Global Positioning System(GPS), Joint Tactical Information Distribution System(JTIDS), Single Channel Ground Air Radar System(SINGARS), Inertial Navigation Unit(INU), E-8 (formerly C-18), HAVE QUICK

87 0294

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JOINT STARS
27 JUL 1987
GAGE

6. Mission and Description: The Joint Surveillance Target Attack Radar System (Joint STARS) is a Joint Army and Air Force Program, with the Air Force as lead Service. Joint STARS will fill a critical need for an effective capability to delay, disrupt, and destroy first and second echelon Warsaw Pact mobile targets and to hamper attempts to break through Allied positions. Joint STARS is unique because it is a closed-loop system for real time detection, tracking, and attack of enemy ground moving targets. Using moving target indicator and synthetic aperture radar techniques, Joint STARS can detect and track enemy forces. Joint STARS integrates the accurate attack of those forces by providing position updates and exact enemy locations in real time to direct attack aircraft, friendly artillery, and standoff missiles. The Army Corps commander requires wide area surveillance information to understand enemy force buildups and scheme-of-maneuver, in order to apply effective and timely maneuver of forces, battlefield management, and targeting of existing artillery and rockets. There is no other system planned to provide real time wide area surveillance of the Corps battlefield, closed-loop target detection and tracking and real time attack targeting against first and second echelon armor. Joint STARS provides a 2-5 day advance look at enemy second echelon force buildups, force movements, and the enemy's scheme of maneuver on the battlefield. This early information on the enemy's battle plan will allow the Corps Commander to react, before the enemy plan is executed, and maneuver with economy of force to engage the enemy at a time and place of the Corps Commander's own choosing. Additionally, Joint STARS closed-loop moving target detection, tracking, and real time targeting permit the direction of direct attack aircraft, artillery, and standoff missiles against moving ground targets in real time, compared with current interdiction missions which are performed on a pre-planned basis.

7. Program Highlights:

a. Significant Historical Developments -- On May 1982, an OSD/USRDE memorandum directed that a Joint Air Force/Army Program Management Office be established under Air Force lead to develop a single multi-mode target acquisition and weapon guidance system. The Joint STARS program resulted from this directive and was organized from JAWP and SOTAS program offices. Based on the May 84 agreement by Air Force and Army Chiefs of Staff, the joint program began development of the airborne segment using the F-15A (a Boeing 707-320 class aircraft converted to military use). The Army Ground Station Module (GSM) Full Scale Engineering Development (FSED) contract was awarded to Motorola Corporation in August 1984. Following the meeting of the Defense Systems Acquisition Review Council in August 1985 (Milestone IIA), a Secretary of Defense Decision Memorandum directed initiation of Full Scale Development (FSD) of the airborne segment. On 27 September 1985 the FSD contract for the airborne segment of Joint STARS was awarded to Grumman Aerospace Corporation. OSD supports an initial force structure of 10 platforms (8 production and 2 refurbished FSD aircraft).

b. Significant Developments Since Last Report -- Boeing Military Aircraft Company, a subcontractor to Grumman Melbourne System Division, began the refurbishment and modification of the two aircraft which will be used for the Joint STARS FSD program. The refurbishment of the used Boeing 707-320 aircraft is approaching completion. Following modifications, air worthiness flight tests will begin in late 1987. A series of hardware and software design reviews were held as planned with no significant problem areas. The radar design is progressing satisfactorily with brass-board and breadboard testing of selected critical LRU's meeting design expectations. Milestone IIB has been delayed from March 1987 to June 1987 to more fully develop the Operational Utility Evaluation models and analyses. Due to the complexity of the Joint STARS software design task, the software development schedule has

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Joint STARS, December 31, 1986

(U)been re-structured into four incremental builds with emphasis on Wide Area Surveillance. The software preliminary design review process began in September 1986 and is scheduled to be complete by March 1987. Similarly, the critical design review is scheduled to start in April 1987 and end in August 1987. The Army Downsized Ground Station Module (DGSM) FSED contract was awarded to Motorola Corporation in March 1986. On 18 Dec 86, the Army directed the Limited Procurement Urgent acquisition of nine Ground Station Modules. The basing of all Joint STARS testing was consolidated to the contractor's facility in Melbourne, Florida, for test efficiency, although numerous military test ranges will still be used. DT&E is scheduled to start in November 1988. A field test demonstration which tests the airborne and ground system in the NATO field environment is scheduled for FY 1990. The Joint STARS program is expected to satisfy its mission requirements.

c.(U)Changes Since "As of" Date -- None

8.(U)Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP dated 27 August 1985 or SDDM dated 26 September 1985 breaches.

~~9.(U)~~ Schedule:

a.(U)Milestones --

Planning Estimate/
Approved Program

Current
Estimate

(U)Ground Station FSD Award	Aug 84/Aug 84	Aug 84
(U)Milestone IIA	Apr 85/Apr 85	Sep 85
(U)Radar/Aircraft FSD Award	May 85/May 85	Sep 85
(U)PDR Hardware	Jan 86/Jan 86	May 86
(U)Software	- /Sep 86	Mar 87 (Ch-1)
(U)CDR Hardware	Aug 86/Aug 86	Dec 86 (Ch-2)
(U)Software	- /Apr 87	Aug 87 (Ch-1)
(U)Milestone IIL	- /Mar 87	Jun 87 (Ch-3)
(U)DT&E Start	Nov 88/Nov 88	Nov 88 (Ch-4)
(U)Ground Station Production Award	- /Jun 87	Jun 89 (Ch-5)
(U)First Delivery	- /Oct 88	Oct 90 (Ch-5)

(b)(1)

(U)Last Delivery	- /Nov 92	Nov 94 (Ch-5)
(U)Radar/Aircraft Production Award	- /Aug 90	Aug 90
(U)First Delivery	- /Aug 91	Aug 91
(U)IOC	TBD /TBD	TBD
(U)Last Delivery	- /Sep 94	Sep 94

b.(U)Previous Change Explanations -- Milestone IIA decision was delayed due to affordability considerations and examination of alternatives. Also milestones were added and/or dates were established as a result of the Milestone IIA SDDM.

c.(U)Current Change Explanations --

(U)(Ch-1) Software development reviews have been extended to implement the four incremental builds. Review start dates remain unchanged.

(U)(Ch-2) Hardware CDR slipped one month due to software development review replan and subcontractor design delays.

(U)(Ch-3) Milestone IIB has been delayed from March 1987 to June 1987 to complete phase 1 of the Operational Utility Evaluation.

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Joint STARS, December 31, 1986

9.(U)Schedule (Cont'd):

(U)(Ch-4) DT&E start changed from Dec 88 to Nov 88 as a result of a Single Test Site ACSN, which transferred testing from WPAFB to the contractor's facility.

(b)(1)

d.(U)References --

Planning Estimate: Army and Air Force R&D Descriptive Summaries. Joint STARS Program Management Directive, 21 Sep 1984.

Approved Program: SDDM dated 26 September 1985, subject Joint STARS Full-Scale Development Approval.

10.(U)Technical/Operational Characteristics:

<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
--	-------------------------------------	-----------------------------

(b)(1)

c.(U)Previous Change Explanations -- Added Characteristic.

d.(U)Current Change Explanations --

(U)(CH-1) Completed Hardware PDR permits inclusion of current estimate

e.(U)References --

Planning Estimate: Draft Joint STARS JSOR dated 26 September 1984. Joint STARS System Specification dated 24 September 1984, revised 17 October 1984.

Approved Program: DCP dated 26 August 1985. PE is in terms of goals, Approved Program is in terms of thresholds.

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11. Program Acquisition Cost (Current Estimate in Millions of Dollars)
Production costs based on directed production profiles.

		<u>Air Force and Army</u>		<u>Current Estimate</u>
		<u>Planning Estimate</u>	<u>Changes</u>	
a. Cost --				
Development (RDT&E)	1185.3	+ 203.3	1,388.6	
Procurement	TBD	+1,510.6	1,510.6	
Flyaway		(+1,058.4)	(1,058.4)	
Other Wpn Sys Cost		(+ 323.1)	(323.1)	
Initial Spares		(+ 129.1)	(129.1)	
Construction (MILCON)	TBD	+ 36.1	36.1	
Total: Constant FY 1983 \$	1185.3	+1,750.0	2,935.3	
Escalation	202.9	+ 716.7	919.6	
Development (RDT&E)	(202.9)	(+ 44.2)	(247.1)	
Procurement	(TBD)	(+ 660.5)	(660.5)	
Construction (MILCON)	(TBD)	(+ 12.0)	(12.0)	
Total Program Cost (Then-Year)	1388.2	+2,466.7	3,854.9	
b. Quantities --				
Development (RDT&E)		(See individual Air Force		
Procurement		and Army Sections)		
Total				
c. Unit Cost --				
Procurement:				
FY 83 base-Year \$				
Then-Year \$		(See individual Air Force		
Program:		and Army Sections)		
FY 83 base-Year \$				
Then-Year \$				
d. Approved Design to Cost Goal --	See individual sections.			
e. Foreign Military Sales --	none			
f. Nuclear Costs --	none			

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Joint STARS, December 31, 1986

Air Force Only

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)
Production costs based on directed production profile of 10 units
 (2 refurbished FSD and 8 production).

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	963.3	+ 198.2	1,161.5
Procurement	TBD	+1,207.1	1,207.1
Flyaway		(+837.2)	(837.2)
Other Wpn Sys Cost		(+277.7)	(277.7)
Initial Spares		(+ 92.2)	(92.2)
Construction (MILCON)	TBD	+ 36.1	36.1
Total FY 83 Base-Year \$	963.3	+1,441.4	2,404.7
Escalation	179.5	+ 615.9	795.4
Development (RDT&E)	(179.5)	(+ 40.6)	(220.1)
Procurement	(TBD)	(+563.3)	(563.3)
Construction (MILCON)	(TBD)	(+ 12.0)	(12.0)
Total Then-Year \$	1,142.8	2,057.3	3,200.1
b. Quantities --			
Development	TBD		(2)#
Procurement	TBD		10
Total	TBD		10#
#The 2 Development units will be refurbished.			
c. Unit Cost --			
Procurement:			
FY 83 Base-Year \$	N/A	+ 120.710	+ 120.710
Then-Year \$		+ 177.040	+ 177.040
Program:			
FY 83 Base-Year \$		+ 240.470	+ 240.470
Then-Year \$		+ 320.010	+ 320.010

- d. Approved Design to Cost Goal -- TBD JRM3 11 B - Jun 1987
 e. Foreign Military Sales -- none
 f. Nuclear Costs -- none

Army Only11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	222.0	+ 5.1	227.1
Procurement	TBD	+ 303.5	303.5
Flyaway		(+221.2)	(221.2)
Other Wpn Sys Cost		(+ 45.4)	(45.4)
Initial Spares		(+ 36.9)	(36.9)
Total FY 83 Base-Year \$	<u>222.0</u>	<u>+ 308.6</u>	<u>530.6</u>
Escalation	23.4	+ 100.8	124.2
Development (RDT&E)	(23.4)	(+ 3.6)	(27.0)
Procurement	(TBD)	(+ 97.2)	(97.2)
Total Then-Year \$	245.4	+409.4	654.8
b. Quantities --			
Development (RDT&E)	8	-	8
Procurement	<u>TBD</u>	<u>+ 95</u>	<u>95</u>
Total	<u>TBD</u>		<u>103</u>
c. Unit Cost --			
Procurement:			
FY 83 Base-Year \$	TBD	+ 3.195	3.195
Then-Year \$	TBD	+ 4.218	4.218
Program:			
FY 83 Base-Year \$	TBD	+ 3.248	5.151
Then-Year \$	TBD	+ 4.309	6.357
d. Approved Design to Cost Goal -- TBD JRM&B IIB-June 1987			
e. Foreign Military Sales -- none			
f. Nuclear Costs -- none			

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

Air Force only

	Current Year SAR Current Estimate	UCR Baseline Estimate	Budget Year UCR Baseline Estimate
a. Program Acquisition --	(Dec 86 SAR)	(Dec 85 SAR)	(Dec 86 SAR)
(1) Cost	3,200.1	2,989.3	3,200.1
(2) Quantity	10	10	10
(3) Unit Cost	320.010	298.930	320.010

b. Current Procurement -- No Quantities in Current or Budget Year.

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

Army only

	Current Year SAR Current Estimate	UCR Baseline Estimate	Budget Year UCR Baseline Estimate
a. Program Acquisition --	(Dec 86 SAR)	(Dec 85 SAR)	(Dec 86 SAR)
(1) Cost	654.8	808.9	654.8
(2) Quantity	103	103	103
(3) Unit Cost	6.357	7.853	6.357
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	23.7	23.7	44.8
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	23.7	23.7	44.8
(2) Quantity	3	3	6
(3) Unit Cost	7.900	7.900	7.467

13. Cost Variance Analysis: Air Force and Army

a. Summary -- (Current (Then-Year) Dollars in Millions)

	KDIA&E	PROC	MILCON	TOTAL
Planning Estimate	1,388.2	-	-	1,388.2
Previous Changes:				
Economic	-19.2	-	-	-19.2
Quantity	-	+1,425.1	+ 53.2	+1,478.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+295.6	-	-	+ 295.6
Other	-	-	-	-
Support	-	+ 655.3	-	+ 655.3
Subtotal	+276.4	+2,080.4	+ 53.2	+2,410.0
Current Changes:				
Economic	- 18.9	- 30.5	-0.6	- 50.0
Quantity	-	-	-	-
Schedule	-	+ 47.6	+1.4	+ 49.0
Engineering	-	-	-	-
Estimating	- 10.0	+ 69.5	-5.9	+ 53.6
Other	-	-	-	-
Support	-	+ 4.1	-	+ 4.1
Subtotal	- 28.9	+ 90.7	-5.1	+ 56.7
Total Changes	+247.5	+2,171.1	+48.1	+2,466.7
Current Estimate	1,635.7	2,171.1	48.1	3,854.9

13. Cost Variance Analysis (Cont'd):
 (FY 83 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1,185.3	-	-	1,185.3
Previous Changes:				
Quantity	-	+1,011.7	+40.6	+1,052.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+218.2	-	-	+218.2
Other	-	-	-	-
Support	-	+459.8	-	+459.8
Subtotal	+218.2	+1,471.5	+40.6	+1,730.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	- 14.9	+ 46.7	-4.5	+ 27.3
Other	-	-	-	-
Support	-	- 7.6	-	- 7.6
Subtotal	- 14.9	+ 39.1	-4.5	+ 19.7
Total Changes	+ 203.3	+1,510.6	+36.1	+1,750.0
Current Estimate	1,388.6	1,510.6	36.1	2,935.3

b. Previous Change Explanations -- See individual Air Force and Army sections.

c. Current Change Explanations -- See individual Air Force and Army sections.

d. References --

Planning Estimate: FY 1980 President's Budget.

Air Force only

13. Cost Variance Analysis:

a. Summary --(Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1,142.8	-	-	1,142.8
Previous Changes:				
Economic	-12.0	-	-	-12.0
Quantity	-	+1,000.0	+53.2	+1,053.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+291.7	-	-	+291.7
Other	-	-	-	-
Support	-	+513.6	-	+513.6
Subtotal	+279.7	+1,513.6	+53.2	+1,846.5
Current Changes:				
Economic	-14.2	-28.4	-0.6	-43.2
Quantity	-	-	-	-
Schedule	-	+24.8	+1.4	+26.2
Engineering	-	-	-	-
Estimating	-26.7	+223.0	-5.9	+190.4
Other	-	-	-	-
Support	-	+37.4	-	+37.4
Subtotal	-40.9	+256.8	-5.1	+210.8
Total Changes	+238.8	+1,770.4	+48.1	+2,057.3
Current Estimate	1,381.6	1,770.4	48.1	3,200.1

13. Cost Variance Analysis (Cont'd):
 (FY 83 Constant (Base-Year) Dollars in Millions)

Air Force Only

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	963.3	-	-	963.3
Previous Changes:				
Quantity	-	+684.8	+40.6	+725.4
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+225.0	-	-	+225.0
Other	-	-	-	-
Support	-	+351.0	-	+351.0
Subtotal	+225.0	+1,035.8	+40.6	+1,301.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-26.8	+152.4	-4.5	+121.1
Other	-	-	-	-
Support	-	+18.9	-	+18.9
Subtotal	-26.8	+171.3	-4.5	+140.0
Total Changes	+198.2	+1,207.1	+36.1	+1,441.4
Current Estimate	1,161.5	1,207.1	36.1	2,404.7

b. Previous Change Explanations --

RDT&E

Economic: Revised economic escalation indices

Estimating: Refinement and rephasing of program estimate

PROCUREMENT

Quantity: Addition of Procurement costs for 10 aircraft

Support: Addition of Procurement Support costs associated with 10 aircraft

MILCON

Quantity: Addition of MILCON cost associated with procurement program

c. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) RDT&E

Revised economic escalation indices (Economic)	N/A	-14.2
Adjustment for current and prior year escalation change (Estimating)	+ 5.1	+ 5.8
Scope of work addition (Self Defense Suite) (Estimating)	+26.6	+33.0
Congressional Reduction in Scope (3rd Aircraft & ADA Implementation) (Estimating)	-47.8	-55.7
Reprogramming of Funds (FY85) for deferred development (Estimating)	+ 0.9	+ 1.0
Congressional Reductions for general inflation, consultants fees, profit policy, and Gramm-Rudman-Hollings cuts resulting in deferred development (Estimating)	-21.4	-24.6

13. Cost Variance Analysis (Cont'd):

Partial restoration of deferred development costs as a result of prior year Congressional reductions (Estimating)	+ 9.8	+13.8
---	-------	-------

(2) PROCUREMENT

Revised economic escalation indices (Economic)	-	-28.4
Increased cost due to AF Board decision to defer production start one year	-	+35.3
Increase in flyaway costs due to schedule slip (Schedule)	-	(+23.3)
Increase in support costs due to schedule slip (Support)	-	(+12.0)
Increased cost due to AF Board decision to rephase buy schedule	-	+ 2.2
Increase in flyaway costs due to rephased buy schedule (Schedule)	-	(+ 1.5)
Increase in support cost due to rephased buy schedule (Support)	-	(+ 0.7)
Refinement of procurement costs based on grass roots estimate	+171.3	+247.7
Increase in flyaway costs due to grass roots estimate (Estimating)	(+152.4)	(+223.0)
Increase in initial spares and other weapon system costs due to grass roots estimate (Support)	(+18.9)	(+24.7)

(3) MILCON

Revised economic escalation indices (Economic)	-	-0.6
Increased costs as a result of a MILCON deferral of one year (Schedule)	-	+1.4
Decreased costs for deletion of FY88 MILCON project (Estimating)	-4.5	-5.9

13. Cost Variance Analysis:
a. Summary -- (Current (Then-Year) Dollars in Millions) Army Only

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	245.4	-	N/A	245.4
Previous Changes:	-	-	-	-
Economic	-7.2	-	-	-7.2
Quantity	-	+425.1	-	+425.1
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+3.9	-	-	+3.9
Other	-	-	-	-
Support	-	+141.7	-	+141.7
Subtotal	-3.3	+566.8	N/A	+563.5
Current Changes:	-	-	-	-
Economic	-4.7	- 2.1	-	- 6.8
Quantity	-	-	-	-
Schedule	-	+ 22.8	-	+ 22.8
Engineering	-	-	-	-
Estimating	+16.7	-153.5	-	-136.8
Other	-	-	-	-
Support	-	- 33.3	-	- 33.3
Subtotal	+12.0	- 166.1	N/A	-154.1
Total Changes	+ 8.7	+ 400.7	N/A	+409.4
Current Estimate	254.1	400.7	N/A	654.8

(FY83 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	222.0	-	N/A	222.0
Previous Changes:	-	-	-	-
Quantity	-	+326.9	-	+326.9
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-6.8	-	-	-6.8
Other	-	-	-	-
Support	-	+108.8	-	+108.8
Subtotal	-6.8	+435.7	N/A	+428.9
Current Changes:	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+ 11.9	- 105.7	-	- 93.8
Other	-	-	-	-
Support	-	- 26.5	-	- 26.5
Subtotal	+ 11.9	- 132.2	N/A	-120.3
Total Changes	+ 5.1	+ 303.5	N/A	+308.6
Current Estimate	227.1	303.5	N/A	530.6

b. Previous Change Explanations

RDT&E

Economic: Revised economic escalation indices

Estimating: Refinement and rephasing of program estimate

PROCUREMENT

Quantity: Addition of procurement flyaway costs for 95 ground stations
 Support: Addition of procurement support costs associated with 95 ground stations

c. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then year</u>
(1) <u>RDT&E</u>		
Revised economic inflation indices (Economic)	N/A	- 4.7
Adjustment for current and prior year escalation change (Estimating)	+ 3.8	+ 4.3
Increased cost due to addition of one year to RDT&E schedule (Estimating)	+ 3.9	+ 5.0
Decreased cost for development due to reprogramming of FY85 funds (Estimating)	-17.7	-19.7
Congressional reductions for general inflation and Gramm-Rudman-Hollings cuts resulting in deferred development (Estimating)	- 2.7	- 3.1
Partial restoration of deferred development costs as a result of prior year Congressional reductions (Estimating)	+24.6	+30.2
(2) <u>PROCUREMENT</u>		
Revised economic escalation indices (Economic)	N/A	- 2.1
3 year procurement delay due to unavailability of data link. FY87/88 procurement is Limited Procurement Urgent due to Department of Army urgency	N/A	+29.8
Increased flyaway costs due to schedule delay (Schedule)	(N/A)	(+22.8)
Increased support costs due to schedule delay (Support)	(N/A)	(+ 7.0)
Refinement of procurement estimate based on prototype actuals	-132.2	-193.8
Decreased flyaway costs due to refined estimate (Estimating)	(-105.7)	(-153.5)
Decreased support costs due to refined estimate (Support)	(- 26.5)	(- 40.3)

UNCLASSIFIED

Joint STARS, December 31, 1986

14. Program Acquisition Unit Costs (PAUC) History: Millions of Then-Year Dollars)

a. Initial SAR Estimate to Current Baseline Estimate -- Air Force Only

*PAUC Initial SAR Est)	Changes								PAUC (Planning Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Tot	
571.400	-5.520	-351.800	+2.620	-	+48.210	-	+55.100	-251.390	320.010

* This is not a true PAUC -- this number was derived by dividing RDT&E costs in the initial SAR by the 2 FSD units.

14. Program Acquisition Unit Costs (PAUC) History: Millions of Then-Year Dollars)

a. Initial SAR Estimate to Current Baseline Estimate -- Army Only

*PAUC Initial SAR Est)	Changes								PAUC (Planning Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Tot	
30.675	-0.136	-24.165	+0.221	-	-1.290	-	+1.052	-24.318	6.357

*This is not a true PAUC -- this number was derived by dividing RDT&E costs in the initial SAR by the 8 FSED units.

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E

Initial Contract Price

Radar/Aircraft Platform

Grumman Aerospace Corp., Bethpage, NY

F1962b-85-C-0053 FPIF

Award: 27 September 1985

Definitized: 27 September 1985

Target Ceiling Qty

657.0 657.0 2

Current Contract Price

Target Ceiling Qty

656.3 656.3 2

Estimate Price at Completion

Contractor Program Manager

656.3 (1000) 1,000.0

*This includes typical ECO historical levels and options that have not yet been exercised.

	Cost Variance	Schedule Var
Previous Cumulative Variances	0.0	0.0
Cumulative Variances to Date (11/30/86)	-20.2	-34.5
Net Change	-20.2	-34.5

UNCLASSIFIED

15. Contract Information (Cont'd):

Schedule variance is due to manpower shortages in the Engineering disciplines. Higher than planned labor rates and lower engineering labor performance, primarily in Software and Test Operations, caused the cost variance. Impact will be in the deferral of lower priority studies and Engineering Change Orders.

<u>GSM FSED Contract</u>			<u>Initial Contract Price</u>		
<u>Motorola Inc, Tempe AZ</u>	<u>Target</u>		<u>Ceiling</u>	<u>Qty</u>	
DAAK-20-84-C-0879 FPIF	31.5		35.4	6	
Award: 10 August 1984					
Definitized: 10 August 1984					
<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
66.1	73.0	8	66.6	73.0	
<u>Previous Cumulative Variances</u>			<u>Cost Variance</u>	<u>Schedule Variance</u>	
			-2.288	-2.937	
<u>Cumulative Variances to Date (11/22/86)</u>			-4.897	-3.624	
<u>Net Change</u>			-2.609	-0.687	

The cost variance is due to a) problems during assembly field testing and system level testing, b) more difficult than planned development of hardware (fixtures and special test equipment), c) a large number of minor parts and design changes required to insure specification compliance, d) more expensive material acquisition costs than planned, and e) significantly increased overhead costs. The schedule variance is due to a) delays in the design, fabrication, and test of the militarized AN/UPD-7 interface equipment, b) longer than planned mechanical design, c) unanticipated complexity of the DRAP* software causing delays in the test and evaluation effort, d) part number errors (in the database) causing price part procurement delay, e) unanticipated delays in the fabrication and assembly of the maintenance trainer, and f) more complicated software BIT design effort than was planned.

*DRAP is Data Reduction and Processing.

Design, Develop & Deploy 1 GSM
 Motorola Inc, Tempe AZ
 DAAK-20-83-C-0880 CPIF
 Award: August 1984
 Definitized: August 1984

Contract below reporting threshold, last submission.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)
 a. Program Status --

(1) Percent Program Completed: 50.0%(6/12)

(2) Percent Program Cost Appropriated: 21.8% (840.9/3,854.9)

16. Program Funding Summary (Cont'd):b. Appropriation Summary -- (Then-Year Dollars in Millions)

	Current & Prior Yrs (82-87)	Budget Year (88)	Balance to Complete FYDP (89-92)	Beyond FYDP (93)	Total
Appropriation					
RDT&E	817.2	364.1	384.3	70.1	1,635.7
Procurement	23.7	44.8	673.9	1,428.7	2,171.1
MILCON	0.0	0.0	48.1	0.0	48.1
Total	840.9	408.9	1,106.3	1,498.8	3,854.9

c. Annual Summary --Air Force and Army

Fiscal Year	Qty	FY 83 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1982	-	-	-	37.7	-	-	36.7	9.2/
1983	-	-	-	66.2	-	-	67.8	4.9
1984	-	-	-	101.8	-	-	108.8	3.8
1985	-	-	-	70.1	-	-	77.3	3.4
1986	-	-	-	175.6	-	-	198.7	2.9
1987	-	-	-	281.0	-	-	327.9	3.1
1988	-	-	-	301.5	-	-	364.1	3.5
1989	-	-	-	203.7	-	-	254.1	3.5
1990	-	-	-	60.8	-	-	78.1	3.3
1991	-	-	-	36.5	-	-	48.1	2.9
1992	-	-	-	3.0	-	-	4.0	2.4
1993	-	-	-	50.7	-	-	70.1	2.4
Sub Tot	-	-	-	1,388.6	-	-	1,635.7	-

Appropriation: Procurement

(2010 is Air Force Procurement, 2035 is Army Procurement --
see individual Air Force and Army sections for funding profiles)

Appropriation: MILCON

1990	-	-	-	19.4	-	-	25.6	3.3
1991	-	-	-	16.7	-	-	22.5	2.9
Sub Tot	-	-	-	36.1	-	-	48.1	-
Total	N/A	31.4	1,027.4	2,935.3	85.3	85.3	3,854.9	-

16. Program Funding Summary (Cont'd):

c. Annual Summary --

Air Force only

Fiscal Year	Qty	FY 83 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1982	-	-	-	33.5	-	-	32.6	9.2
1983	-	-	-	30.7	-	-	31.3	4.9
1984	-	-	-	38.7	-	-	41.0	3.8
1985	-	-	-	44.4	-	-	48.6	3.4
1986	-	-	-	138.7	-	-	156.6	2.9
1987	-	-	-	257.3	-	-	300.0	3.1
1988	-	-	-	280.0	-	-	337.9	3.5
1989	-	-	-	191.1	-	-	238.3	3.5
1990	-	-	-	56.9	-	-	73.1	3.3
1991	-	-	-	36.5	-	-	48.1	2.9
1992	-	-	-	3.0	-	-	4.0	2.4
1993	-	-	-	50.7	-	-	70.1	2.4
Sub Tot (2)	-	-	-	1,161.5	-	-	1,381.6	-

Appropriation: Procurement

1990	-	5.0	29.5	56.2	40.9	-	77.4	3.3
1991	1	15.3	35.6	82.8	26.4	22.9	116.8	2.9
1992	1	4.5	59.1	102.1	18.0	38.4	147.5	2.4
1993	8	3.4	684.8	966.0	-	24.0	1,428.7	2.4
Sub Tot	10#	28.2	809.0	1,207.1	85.3	85.3	1,770.4	-

Appropriation: MILCON

1990	-	-	-	19.4	-	-	25.6	3.3
1991	-	-	-	16.7	-	-	22.5	2.9
Sub Tot	-	-	-	36.1	-	-	48.1	-
Total	10#	28.2	809.0	2,404.7	85.3	85.3	3,200.1	-

The 2 FSD units will be refurbished and used as Production Units.

c. Annual Summary --

Army only

Fiscal Year	Qty	FY 83 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1982	-	-	-	4.2	-	-	4.1	7.6
1983	-	-	-	35.5	-	-	36.5	4.9
1984	-	-	-	63.1	-	-	67.8	3.8
1985	-	-	-	25.7	-	-	28.7	3.4
1986	-	-	-	36.9	-	-	42.1	2.9
1987	-	-	-	23.7	-	-	27.9	3.1
1988	-	-	-	21.5	-	-	26.2	3.5
1989	-	-	-	12.6	-	-	15.8	3.5
1990	-	-	-	3.9	-	-	5.0	3.3
Sub Tot	8	-	-	227.1	-	-	254.1	-

207.1

16. Program Funding Summary (Cont'd):

c. Annual Summary --

Appropriation: Procurement

1987	3	0.2	11.3	19.5	-	-	23.7	3.1
1988	6	0.3	24.0	35.7	-	-	44.8	3.5
1989	14	0.7	51.3	71.6	-	-	92.7	3.5
1990	17	0.8	53.4	75.1	-	-	99.8	3.3
1991	14	0.6	39.9	55.0	-	-	74.9	2.9
1992	11	0.6	38.1	46.6	-	-	64.8	2.4
1993	12	0.0	0.0	TBD	-	-	TBD	2.4
1994	18	TBD	TBD	TBD	-	-	TBD	2.4
Sub Tot	95	3.2	218.0	303.5	-	-	400.7	
TOTAL	103	3.2	218.0	530.6	-	-	654.8	

Air Force and Army

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1982	36.7	31.1	30.7
1983	67.8	67.6	65.3
1984	108.8	103.7	69.5
1985	77.3	76.3	28.3
1986	198.7	196.4	8.9
1987	327.9	72.0	1.3
To Complete	818.5	-	-
Total	1,635.7	547.1	204.0

Air Force only

1982	32.6	27.1	26.7
1983	31.3	31.1	28.8
1984	41.0	41.0	13.5
1985	48.6	48.6	20.0
1986	156.6	154.4	2.6
1987	300.0	66.8	1.0
To Complete	771.5	-	-
Total	1,381.6	369.0	92.6

Army only

1982	4.1	4.0	4.0
1983	36.5	36.5	36.5
1984	67.8	62.7	56.0
1985	28.7	27.7	8.3
1986	42.1	42.0	6.3
1987	27.9	5.2	0.3
To Complete	47.0	-	-
Total	254.1	178.1	111.4

16. Program Funding Summary (Cont'd):

d. Obligations and Expenditures --

Appropriation: Procurement

Army Only

1987	23.7	0.0	0.0
To Complete	377.0	-	-
Total	400.7	0.0	0.0

17. Production Rate Data:

Deliveries (Plan/Actual) --

Air Force OnlyTo Date

RDT&E 0/0
 Procurement 0/0

Deliveries (Plan/Actual) --

Army OnlyTo Date

RDT&E 3/3
 Procurement 0/0

18. Operating and Support Costs: N/A

AF-29 SFW

SAR-86-092

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

PROGRAM: Sensor Fuzed Weapon

AS OF DATE: December 31, 1986

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FEB 13 1987 18

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): CBU-97/B, Sensor Fuzed Weapon (SFW)

2. DoD Component: U.S. Air Force

3. Responsible Office and Telephone Number:

Sensor Fuzed Weapon Program Office
Armament Division
Eglin AFB, FL 32542

PM: Col Marty T. Runkle
Assigned: February 4, 1985
AV 872-5382; COMH (904)882-5382

4. Program Elements/Procurement Line Items:

RDT&E: PE 64607F
PE 64604F Project 643086 (Shared Funding)
PE 64602F Project 643244 (Shared Funding)

PROCUREMENT: PE 28030F APPN 3080 ICN 813520 (Shared Funding)

5. Related Programs: SUU-64/B Tactical Munitions Dispenser
CNU-411 Container
FZU-39 Proximity Sensor

SAF/PAS

87-0044-T

6. Mission and Description: The objective of the Sensor Fuzed Weapon (SFW) program is to develop and produce a conventional munition capable of multiple vehicle kills per pass against operating armored vehicles, air defense units, and other support vehicles. The SFW (CBU-97/B) consists of ten BLU-108/B submunitions packaged within the Tactical Munitions Dispenser (TMD). Within each BLU-108/B submunition are four self forging fragment warheads, commonly called "skeets". Each of the 40 warheads within the SFW is independently targeted by a dual channel infrared sensor. The SFW does not replace any existing system but will enhance capabilities.

7. Program Highlights:

a. Significant Historical Developments -- During formulation of the FY85 Program Objective Memorandum, the Air Force separated the development of conventional submunitions from the development and integration of these submunitions into a weapon system (i.e., CBU). This decision was made to preclude termination of promising submunition designs when the carrier vehicles were terminated. Hence, the BLU-108/B submunition development is funded by program element 64604F while program element 64607F funds development of the SFW system. The Army/DARPA Assault Breaker and the Air Force Extended Range Antiarmor Munition (ERAM) Programs provided technology used in the Sensor Fuzed Weapon (SFW) design. The development of the SFW was divided into two phases--Risk Reduction and Full Scale Development. The Risk Reduction Phase testing was successfully completed in September 1985, during which four warheads were simultaneously released from a single BLU-108/B submunition and each warhead hit a different tank target resulting in significant target damage. The Preliminary Design Review (PDR) was successfully conducted in October 1985, completing the 15 month Risk Reduction Phase. On 25 November 1985, SAF/AL authorized the SFW program to proceed into the Full Scale Development phase. The FSD contract option was signed on 29 November 1985. A second SFW live submunition drop was successfully completed 5 June 1986. The drop consisted of four warheads each hitting a different tank target in a 14 target array.

b. Significant Developments Since Last Report --

During the week of 15 Dec 86, program office successfully demonstrated the maximum parachute design requirement of 650 Knots Calibrated Air Speed (KCAS). The FY87 Appropriations Bill contained an additional \$10M above the FY87 President's Budget to "accelerate the SFW program development". The program office has identified and developed alternatives to insure compliance with congressional direction. To encourage second source production, a pre-draft request for production proposal meeting was held with industry. Representatives from 35 companies were in attendance. Beginning in FY87, both the submunition and the integration of the submunition into the carrier vehicle are funded in program element 64607F. This SAR implements the new Development Estimate baseline that was transitioned in the 30 June 1986 SAR.

The SFW system is expected to satisfy the mission requirement.

SFW, December 31, 1986

c. Changes since "As of Date" -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: No DCP.

9. Schedule:

a. Milestones --

	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
Contract Start	Jul 84/Jul 84	Jul 84
Preliminary Design Review (Risk Reduction Phase Completion)	Oct 85/Oct 85	Oct 85
SAF/AL Approval for FSD	Nov 85/Nov 85	Nov 85
Critical Design Review	Jul 87/Oct 87 (Ch-1)	Oct 87 (Ch-1)
Complete DT&E/IOT&E	Jun 89/Jun 89	Jun 89
Production Decision	Nov 88/Nov 88	Nov 88
Production Contract Award	Dec 88/Dec 88	Dec 88
IOC (First Delivery to Inventory)	Jul 90/Jul 90	Jul 90

b. Previous Change Explanations -- None. Program was rebaselined in the 30 June 1986 SAR.

c. Current Change Explanations --

(Ch-1) The Critical Design Review date was moved from July 1987 to October 1987 based on contractor hardware procurement and test delays.

d. References --

Development Estimate: OSD/CAIG Briefing, May 1986 (Approved by OSD)

Approved Program: Draft FY 1987 PMD 4064(4)/64607F/64604F

10. Technical/Operational Characteristics:

a. Technical --	Development Estimate/ Approved Program	Demonstrated Performance	Current Estimate
Submunition Capacity: (Number of Submunitions/Number of Integrated Warheads or Sensors per Submunition)	(10/4)/(10/4)		10/4
Aircraft Compatibility: ¹			
Shelf Life out of Container: (Yrs)	1/1		1
Storage Life in Container: (Yrs)	10/10		10
Maintenance Concept: ²			

b. Operational --

Kills per pass: ³	Multiple/Multiple	Multiple
Delivery Envelope: ³		

c. Previous Change Explanations -- None

d. Current Change Explanations -- None

e. References --

Development Estimate: OSD/CAIG Briefing, May 1986 (Approved by OSD)

Approved Program: Draft FY 1987 PMD 4064(4)/64607F/64604F

¹ Compatible with A-7, A-10, F-4, F-15, F-16, F-111, and a future potential compatibility with B-52 and NATO aircraft (by analysis). This applies to Development Estimate, Approved Program, and Current Estimate.

² No scheduled testing, calibration, or maintenance. This applies to Development Estimate, Approved Program, and Current Estimate.

³ Within the ground attack envelope of modern fighter aircraft and a future potential compatibility with B-52 and NATO aircraft (by analysis). This applies to Development Estimate, Approved Program, and Current Estimate.

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Changes	Current Estimate
Development (RDT&E)	80.0	+5.4	85.4
Procurement	1139.8	+344.3	1484.1
Total Flyaway	(1127.7)	(+340.6)	(1468.3)
Other Weapon System Cost	(12.1)	(+3.7)	(15.8)
Initial Spares	(0.0)	(0.0)	(0.0)
Construction (MILCON)	0.0	0.0	0.0
TOTAL FY 79 BASE-YEARS	<u>1219.8</u>	<u>+349.7</u>	<u>1569.5</u>
Escalation	1186.0	+408.4	1594.4
Development (RDT&E)	(47.7)	(+2.6)	(50.3)
Procurement	(1138.3)	(+405.8)	(1544.1)
Construction (MILCON)	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
TOTAL THEN-YEAR \$	<u>2405.8</u>	<u>+758.1</u>	<u>3163.9</u>
b. Quantities --			
Development (RDT&E)	84	+5	89
Procurement	<u>14000</u>	<u>+5803</u>	<u>19803</u>
Total	<u>14084</u>	<u>+5808</u>	<u>19892</u>
c. Unit Cost --			
Procurement:			
FY79 Base-Year\$	0.081	-0.006	0.075
Then-Year\$	0.163	-0.010	0.153
Program:			
FY79 Base-Year\$	0.087	-0.008	0.079
Then-Year\$	0.171	-0.012	0.159
d. Approved Design to Cost Goal -- N/A			
e. Foreign Military Sales -- None.			
f. Nuclear Costs -- None.			

12. Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Estimate</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition --			
(1) Cost	3163.9	2334.5	3163.9
(2) Quantity	19892	14084	19892
(3) Unit Cost	0.159	0.166	0.159
b. Current Procurement -	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	N/A	N/A	N/A
Less CY Adv Proc	N/A	N/A	N/A
Plus PY Adv Proc	N/A	N/A	N/A
Net Total	N/A	N/A	N/A
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

13. Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Development Estimate	127.7	2278.1	--	2405.8
Previous Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Current Changes:				
Economic	-0.7	-12.5	--	-13.2
Quantity	+2.3	+763.4	--	+765.7
Schedule	--	-9.0	--	-9.0
Engineering	--	--	--	--
Estimating	+6.4	--	--	+6.4
Other	--	--	--	--
Support	--	+8.2	--	+8.2
Subtotal	+8.0	+750.1	--	+758.1
Total Changes	+8.0	+750.1	--	+758.1
Current Estimate	135.7	3028.2	--	3163.9

13. Cost Variance Analysis (Cont'd):

(FY 1979 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	80.0	1139.8	--	1219.8
Previous Changes:				
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Current Changes:				
Quantity	+1.4	+340.6	--	+342.0
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+4.0	--	--	+4.0
Other	--	--	--	--
Support	--	+3.7	--	+3.7
Subtotal	+5.4	+344.3	--	+349.7
Total Changes	+5.4	+344.3	--	+349.7
Current Estimate	85.4	1484.1	--	1569.5

b. Previous Change Explanations -- None. Program was rebaselined in the 30 June 1986 SAR.

c. Current Change Explanations --

(Dollars in Millions)
Base-Year \$ Then-Year \$

(1) RDT&E

Revised economic escalation indices (Economic)

-- -0.7

Increased RDT&E units by 5 for Life Cycle Surveillance Testing using funds already appropriated (Quantity)

+1.4 +2.3

Offset of quantity increase. Reduced management flexibility in executing the program. (Estimating)

-1.4 -2.3

Adjusted for prior year escalation (Estimating)

+0.3 +0.4

Addition of funds in FY87 Appropriations Bill to accelerate SFW program development (Estimating)

+6.1 +10.0

Revised funding profile adjusted for Air Force assessments. Reduced scope of effort to accelerate SFW development. (Estimating)

-1.0 -1.7

(Dollars in Millions)	
<u>Base-Year \$</u>	<u>Then-Year \$</u>
1978	1978
1979	1979
1980	1980
1981	1981
1982	1982
1983	1983
1984	1984
1985	1985
1986	1986
1987	1987
1988	1988
1989	1989
1990	1990
1991	1991
1992	1992
1993	1993
1994	1994
1995	1995
1996	1996
1997	1997
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2015	2015
2016	2016
2017	2017
2018	2018
2019	2019
2020	2020
2021	2021
2022	2022
2023	2023
2024	2024
2025	2025
2026	2026
2027	2027
2028	2028
2029	2029
2030	2030
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2094	2094
2095	2095
2096	2096
2097	2097
2098	2098
2099	2099
2100	2100

Revised economic escalation
indices (Economic)

-- -12.5

Increase in production quantity of 5,803 SFW's in accordance with the revised Program Management Directive to incorporate the latest assessment of procurement objective requirements as reflected in the FY 88-92 Air Force Nonnuclear Consumables Annual Analysis (NCAA) Report

+344.3	+771.6
--------	--------

- Increase in flyaway costs associated with the additional 5,803 SFW's (Quantity)

(+340.6) (+763.4)

- Increase in data costs associated with the additional 5,803 SFW's (Support)

(+3.7) (+8.2)

Revised schedule in accordance with revised Program Management Directive to incorporate the latest assessment of procurement objective requirements as reflected in the FY 88-92 Air Force Nonnuclear Consumables Annual Analysis (NCAA) Report (Schedule)

-- -9.0

Development Estimate: OSD/CAIG Briefing, May 1986 (Approved by OSD)

a. Initial SAR/Planning Estimate (PE) to Development Estimate --

PAUC (Initial SAR/PE)	Changes							PAUC (Dev Estimate)	
	Econ	Qty	Sch	Eng	Est	Other	Spt		Total
-	-	+0.163	-	-	+0.006	-	+0.002	+0.171	0.171

PAUC (Dev Est)	Changes							PAUC (Curr Est)	
	Econ	Qty	Sch	Eng	Est	Other	Spt		Total
0.171	-0.001	-0.011	-	-	-	-	-	-0.012	0.159

SFW, December 31, 1986

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

<u>Sensor Fuzed Weapon</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Avco Corp. Wilmington, MA F08635-84-C-0182, FPIF Award: July 9, 1984 Definitized: July 9, 1984	\$25.6	\$27.6	-0-

<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$85.7	\$92.2	89	\$92.2	\$92.2

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	-8.5	-1.2
Cumulative Variances To Date (31 Oct 86)	-13.6	-3.8
Net Change	-5.1	-2.6

Explanation of Change: Avco's unfavorable cost variance has increased since the last report due to continued work on perfecting the tactical design specifically in the structure and submunition ejection system areas. Delays in the procurement of purchased parts continue to increase the unfavorable schedule variance and are beginning to affect the cost variance. Government liability is limited to ceiling to which the program office has budgeted. No impact on contract or program completion schedule.

b. Procurement -- None

c. MILCON -- None

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 31.3% (5 yrs/16 yrs)
(Years Funds Appropriated/Total Program Years)
- (2) Percent Program Cost Appropriated: 3.3% (\$104.8/\$3163.9)
(Funds Appropriated To Date in Millions/Total Program Funding in Millions)

SFW, December 31, 1986

16. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY83-87)	Budget Year (FY88)	Balance to Complete FYDP (FY89-92)	Beyond FYDP (FY93-98)	Total
RDT&E	104.8	17.6	13.3	-0-	135.7
Procurement	-0-	-0-	825.8	2202.4	3028.2
MILCON	-0-	-0-	-0-	-0-	-0-
Total	104.8	17.6	839.1	2202.4	3163.9

c. Annual Summary --

Fiscal Year	Qty	Base-Year Dollars			Then-Year Dollars			Esc1 Rate %
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1983				2.9			4.2	4.9
1984				11.3			16.7	3.8
1985				23.1			35.4	3.4
1986				15.5			24.6	2.9
1987				14.6			23.9	3.1
1988				10.4			17.6	3.5
1989				7.6			13.3	3.5
Subtotal	89	*	*	85.4	--	--	135.7	N/A

Appropriation: Procurement

1989	370	12.6	48.7	61.9			111.2	3.5
1990	795	2.0	96.1	99.1			183.0	3.3
1991	975	19.8	98.7	119.7			226.5	2.9
1992	1350	19.8	136.3	157.5			305.1	2.4
1993	2000	0.0	158.3	160.0			317.5	2.4
1994	2880	0.0	186.6	188.8			383.4	2.4
1995	2880	0.0	179.6	181.7			377.8	2.4
1996	2880	0.0	175.2	177.1			377.3	2.4
1997	2880	0.0	171.2	173.1			377.5	2.4
1998	2793	0.0	163.4	165.2			368.9	2.4
Subtotal	19803	54.2	1414.1	1484.1	--	--	3028.2	N/A

61.33 98.05 118.53
 1535 1.072 1.161
 61.865 99.122 119.691

SFW, December 31, 1986

16. Program Funding Summary (Cont'd):

c. Annual Summary --

Appropriation: MILCON

Subtotal	--	--	--	--	--	--	--	--
Total	19892	54.2	1414.1	1569.5	--	--	3163.9	N/A

*Information not available

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1983	4.2	4.2	4.2
1984	16.7	16.7	16.6
1985	35.4	35.4	33.3
1986	24.6	24.6	2.1
1987	23.9	10.6	0.1
To Complete	30.9	N/A	N/A
TOTAL	135.7	91.5	56.3

17. Production Rate Data:

a. Annual Production Rates -- (NOTES: The Current Estimate differs from the Development Estimate due to the revised production planning in accordance with the updated Program Management Directive. The funded delivery period is 12 months.)

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1989	400	N/A	370	N/A
1990	745	N/A	795	N/A
1991	1275	N/A	975	N/A
1992	1500	N/A	1350	N/A
1993	2000	N/A	2000	N/A
1994	2500	N/A	2880	N/A
1995	2700	N/A	2880	N/A
1996	2880	N/A	2880	N/A
1997		N/A	2880	N/A
1998		N/A	2793	N/A

SFW, December 31, 1986

17. Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY\$)	N/A	N/A	1569.5	N/A	N/A
(TY\$)	N/A	N/A	3163.9	N/A	N/A
PAUC (BY\$)	N/A	N/A	.079	N/A	N/A
(TY\$)	N/A	N/A	0.159	N/A	N/A

c. Schedule Variance --

	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum Economic
Start Date (Mo/Yr)*	N/A	N/A	12/88	N/A	N/A
Duration (in Months)	N/A	N/A	139	N/A	N/A
End Date (Mo/Yr)**	N/A	N/A	7/00	N/A	N/A

* Projected date of Contract Award

** Projected date of last delivery

d. Deliveries (Plan/Actual) --

RDT&E
Procurement

To Date
3/3
0/0

18. Operating and Support Costs: N/A

SELECTED ACQUISITION REPORT (RCS: DD-COMP (O&A) 823)

PROGRAM: JOINT TACTICAL COMMUNICATIONS (TRI-TAC) PROGRAM

AS OF DATE: 31 December 1986

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1. Designation/Nomenclature/(Popular Name): CNCE (AN/TSQ-111), TROPO (AN/TRC-170), and Others/Joint Tactical Communications (TRI-TAC) Program.

2. DoD Component: U.S. Air Force

3. Responsible Office and Telephone Number:

CTC Systems Program Office
Electronic Systems Division
Hanscom AFB, MA 01731-5000

PM: Col Robert J. Hovde
Assigned: Sept 15 1986
AV 478-5980, Ext 186-3138
COMM (617) 271-3138

4. Program Elements/Procurement Line Items:

RDT&E: PE 28010F

PROCUREMENT: APPN 3080 ICN 835100

MILCON: N/A

5. Related Program: N/A

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DEPARTMENT OF DEFENSE

SAF/PAS

87-0043-T

87-T-0152

6. MISSION and DESCRIPTION

The TRI-TAC Program is a multi-service DoD directed effort to develop and acquire joint communications equipment for the tactical forces. Within the TRI-TAC effort, USAF is the executive agent for the development and production of two large programs, the Communications Nodal Control Element (CNCE) and the Troposcatter Radio Terminal (TROPO). TRI-TAC is a continuing program.

a. CNCE (AN/TSQ-111). The CNCE is an automated technical control facility which provides centralized management and control for a tactical communications node. It provides the interface among analog and digital nodal switches, common-user and dedicated interfaces and the internodal radio and cable transmission networks. The CNCE is a single S-280 shelter configuration. It will eventually replace the AN/TSC-62 Communications Van.

b. TROPO (AN/TRC-170). The TROPO is a family of three tactical, digital, troposcatter radio assemblages designed to provide a capability for transmission and reception of digital voice and data group rates up to 2048 Kb/s. Each assemblage is capable of operating in either line-of-sight or troposcatter mode of propagation in the 4.4-5.0 GHz frequency band. Set V-2 is the middle size family member and provides secure communications at nominal ranges up to 150 miles. Set V-3, the smallest member of the family, provides secure communications at nominal ranges of up to 100 miles. The TROPO will eventually replace the AN/TRC-97 radio.

In addition to the two large programs for which it is the executive agent, USAF is the executive for one small program, the TA-954 Digital Non-Secure Voice Terminal (DNVT). USAF is also responsible for procuring TRI-TAC equipment developed by other services including switches (AN/TTC-39, AN/TTC-39, AN/TTC-42, and SB-3865), Tactical Digital Facsimiles, terminals (AN/UGC-137 and CV-3591), Modular Tactical Communications Centers (MTCC), and various Digital Group Multiplexers (DGM). COMSEC for TRI-TAC equipment is developed and produced by the National Security Agency (NSA).

7. PROGRAM HIGHLIGHTS:

a. Significant Historical Developments --

TRI-TAC was established by the Director, Telecommunications and Command and Control Systems (DTACCS), under DoD Directive No. 5148.7, dated 27 May 1971, Subject: Charter for the Joint Tactical Communications (TRI-TAC) Program (later revised as of 16 February 1976 and 20 January 1978). Under this charter, DTACCS issued Memoranda of Task Assignment and instruction to a particular military Service or the National Security Agency which then became the executive agent for the development of specific equipment. The assigned Service would later provide production acquisition and initial logistics support for all Services. The Memoranda of Task Assignment and Instruction for programs on which USAF is the executive agent were issued as follows: CNCE on 23 September 1972, TROPO on 15 September 1972, and DNVT on 16 July 1974. On 28 December 1983, USD (R&E) directed the Air Force to assume responsibility for the Tactical Digital Facsimile (TDF), which had been developed by the Navy.

7. PROGRAM HIGHLIGHTS (Cont'd)

CNCE. In May 1975, a contract was awarded to Martin Marietta Corporation for the development of four CNCEs. Government test of the CNCE at Ft. Huachuca, AZ, was completed in October 1981. During October 1982 - May 1983, the Army studied a less capable, lower cost alternative to the CNCE. In June 1983, DUSD (C3I) directed the Air Force to explore a descoped alternative to the CNCE which would satisfy minimum Army and Air Force requirements. This resulted in a modular CNCE. An agreement was reached to allow the Army to meet its near-term requirements by modifying the AN/TTC-39 while retaining the option to procure CNCE production units in later years.

A production contract for 58 CNCEs was awarded on 31 August 1984. The contract is firm fixed price with a basic buy of seven CNCEs, with options for 20, 17, and 14 respectively. Option 1 was exercised on November 1984 and Option 2 was exercised on 1 November 1985. Production has continued on schedule with the design, fabrication, and validation of production tools and special test equipment. Development of the initial cadre to support Follow-on Test and Evaluation commenced November 1986.

TROPO. In June 1976, a contract was awarded to Raytheon Company for the development of three sets of TROPOs. Each version has successfully completed joint DT&E/IOT&E at Ft Huachuca, AZ.

In April 1982, a 3-year multi-year, firm fixed price contract was awarded to Raytheon for 105 Air Force and 5 REDCOM radio terminals. An option for Army requirements (51 units) was awarded in April 1983. First production delivery was 3 months early in October 1984 and deliveries continue on or ahead of schedule. A follow-on contract was awarded to Raytheon on 10 September 1985 for 57 additional Army units. Efforts to initiate competition for FY86-88 units was initiated and the RFP was released in June 1986.

b. Significant Developments Since Last Report--

CNCE. On 1 November 1986, option 4 for 14 units was exercised. Follow-on Test & Evaluation is scheduled for February 1987. Initial deliveries were made on schedule in August 1986. Deliveries have continued at a rate of three per month. T.O. verification was completed at Ft Huachuca AZ in November 1986. Final Configuration Audit/Physical Configuration Audit was completed in August 1986. Proposals for 20 additional CNCEs were received and are under evaluation. The system is expected to satisfy its current mission requirements and comply with all performance requirements.

TROPO. In October 1986 a contract was awarded to Raytheon for the procurement of 41 radios for the Army and eight sets of materials (4 each V2 and V3) for the Air Force which will be used to develop the second source. In addition, Special Factory Test Equipment was procured in August 1986. The RFP for the FY86-FY88 units was released in June 1986. The system is expected to satisfy its mission requirements and comply with all performance requirements.

c. Changes Since December 31, 1986--None

TRI-TAC, 31 December 1986

8. Decision Coordinating Paper (DCP) Threshold Breaches: N/A

9. <u>Schedule</u>	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
(1) CNCE		
a. Milestones		
Contract Award	May 75/May 75	May 75
Preliminary Design Review - Hardware	Dec 75/Dec 75	Dec 75
Preliminary Design Review - Software	Aug 76/Aug 76	Aug 76
Critical Design Review - Hardware	Apr 77/Apr 77	Apr 77
Critical Design Review - Software Part I	Aug 77/Aug 77	Aug 77
Critical Design Review - Software Part II	Jan 78/Jan 78	Jan 78
Contractor Development Testing Completed	Dec 78/Dec 78	Dec 78
Software Delivery	Jun 80/Jun 80	Jun 80
Service Testing Begins	Aug 80/Aug 80	Aug 80
Service Testing Completed	Oct 81/Oct 81	Oct 81
Variant Development Completed	Dec 83/Dec 83	Dec 83
Production Begins	Jul 84/Jul 84	Aug 84
Initial Operational Capability <u>1/</u>	N/A	N/A
First Delivery	Aug 86/Aug 86	Aug 86
Last Delivery	Mar 88/Oct 88	Oct 88 (Ch-1)

b. Previous Change Explanations -- CNCE production award slipped one month from Jul 84 to Aug 84 due to difficult negotiations. Last delivery changed from March 88 to June 88 due to the addition of 12 CNCEs.

c. Current Change Explanations -- (Ch-1) Last delivery has changed from Jun 88 to Oct 88. Reflects revised delivery schedule due to the inclusion of US CENTCOM requirements.

d. References --

Production Estimate: FY 85 President's Budget, January 1984.

Approved Program: FY 88 President's Budget, January 1987.

1/ There is no directed or defined IOC for CNCE.

	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
(2) TROPO		
a. Milestones		
Production Begins	Apr 82/Apr 82	Apr 82

TRI-TAC, 31 December 1986

9. Schedule (Cont'd)

Initial Operational Capability <u>1/</u>	N/A	N/A
First Delivery	Dec 84/Dec 84	Oct 84
Last Delivery <u>2/</u>	Dec 86/Dec 86	Dec 86
Follow-on Production	Mar 85/Mar 85	Sep 85

b. Previous Change Explanations -- TROPO first delivery was three months early in Oct 84 vice Dec 84 due to aggressive management. TROPO Follow-on production award slipped six months from Mar 85 to Sep 85 due to unplanned competition and the time required to obtain reprocurment data.

c. Current Change Explanations -- No Changes

d. References --

Production Estimate: FY 85 President's Budget, January 1984.

Approved Program: FY 88 President's Budget, January 1987.

1/ There is no directed or defined IOC for TROPO.

2/ Last delivery date is the last delivery for USAF units on initial production contract.

10. Technical/Operational Characteristics:

a. Technical	Prod Estimate/ Appr Program	Demonstrated Performance	Current Estimate
(1) CNCE			
Capacity			
(Digital Channels)	756/756	N/A	756
(Analog Channels)	390/390	N/A	390
Weight (lbs)	10,000/10,000	N/A	10,000
Mean Time Between Incidents (MTBI) (Hrs)	50/50	N/A	94
Mean Corrective Time (MCT) (MINS)	15/15	N/A	9.4
(2) TROPO			
Capacity (Digital Channels)	60/60	60	60
Range (Miles)			
V-2	150/150	150	150
V-3	100/100	100	100

TRI-TAC, 31 December 1986

10. Technical/Operational Characteristics (Cont'd)

	<u>Prod Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Weight (lbs)			
V-2	9,300/9,300	9,016	9,016
V-3	6,200/6,200	6,077	6,077
Mean Time Between Failures (MTBF) (Hrs)			
V-2	308/308	N/A	520
V-3	472/472	N/A	800
Mean Time to Repair (MTTR) (Mins)	15-45/15-45	N/A	15-30
b. Operational			
(2) CNCE			
Footprint (No. of Shelters)	1/1	N/A	1
Maximum Set Up/Tear Down Times (Min)	45/45	N/A	45
(2) TROPO			
Footprint			
V-2 (No. of Shelters)	1	1	1
(No. of Antennas)	2	2	2
V-3 (No. of Shelters)	1	1	1
(No. of Antennas)	1	1	1
Maximum Set Up/Tear Down			
Times (Hrs)			
V-2	2/5	4/4	4/4
V-3	1/2	1/1	1/1

c. Previous Change Explanations -- TROPO's Maximum Set Up/Tear Down Time, Range, and Weight were demonstrated during Acceptance Testing at Ft. Huachuca, AZ. TROPO's MTBF current estimate changed as a result of on-going field tests.

d. Current Change Explanations -- None

e. References --

Production Estimate: FY 85 President's Budget, January 1984

Approved Program: FY 88 President's Budget, January 1987

TRI-TAC, 31 December 1986

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)
System: TRI-TAC (CNCE)

a. Cost --	Production Estimate	Changes	Current Estimate
Development	112.8	-	112.8
Procurement	-	+149.2	149.2
Total Flyaway	-	(+136.0)	(136.0)
Peculiar Spt Eqp	-	(+ 9.3)	(9.3)
Other Wpn Sys Cost	-	(+ 3.9)	(3.9)
Initial Spares	-	-	-
Construction	-	-	-
Total FY 76 Base-Year \$	112.8	+149.2	262.0
Escalation	36.9	+145.4	182.3
Development	(36.9)	(- 0.2)	(36.7)
Procurement	-	(+145.6)	(145.6)
Construction	-	-	-
Total Then-Year \$	149.7	+294.6	444.3
b. Quantities --			
Development	4	-	4
Procurement	-	+68	68
Total	4	+68	72
c. Unit Cost --			
Procurement:			
FY 76 Base-Year \$	-	+ 2.194	2.194
Then-Year \$	-	+ 4.335	4.335
Program:			
FY 76 Base-Year \$	28.200	-24.561	3.639
Then-Year \$	37.425	-31.254	6.171
d. Approved Design to Cost Goal -- None			

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)
System: TRI-TAC (TROPO)

a. Cost	Production Estimate	Changes	Current Estimate
Development	37.3	+ 7.8	45.1
Procurement	306.4	+ 36.8	343.2
Total Flyaway	(285.1)	(+ 24.3)	(309.4)
Peculiar Spt Eqp	(17.1)	(+ 3.3)	(20.4)
Other Wpn Costs	(4.2)	(+ 9.2)	(13.4)
Initial Spares	-	-	-
Construction	-	-	-
Total FY 76 Base-Year \$	343.7	+ 44.6	388.3
Escalation	353.6	+ 47.3	400.9
Development	(11.2)	(+ 8.5)	(19.7)
Procurement	(342.4)	(+ 38.8)	(381.2)
Construction	-	-	-
Total Then-Year \$	697.3	+ 91.9	789.2

11. Program Acquisition Cost (Cont'd) (Current Estimate in Millions of Dollars)
System: TRI-TAC (TROPO)

	<u>Production Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
b. Quantities --			
Development	9	-	9
Procurement	350	+ 90	440
Total	359	+ 90	449
c. Unit Cost --			
Procurement:			
FY 76 Base-Year \$	0.875	- 0.095	0.780
Then-Year \$	1.854	- 0.208	1.646
Program:			
FY 76 Base-Year \$	0.957	- 0.092	0.865
Then-Year \$	1.942	- 0.184	1.758

d. Approved Design to Cost Goal -- None

11. Program Acquisition Cost (Cont'd) (Current Estimate in Millions of Dollars)
System: TRI-TAC (Support/Systems Integration/Other)

	<u>Production Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost			
Development	80.7	+ 1.4	82.1
Procurement	589.8	-150.8	439.0
Total Flyaway	-	-	-
Peculiar Spt Eqp	-	-	-
Other Wpn Costs	(478.0)	(-125.9)	(352.1)
Initial Spares	(111.8)	(- 24.9)	(86.9)
Construction	-	-	-
Total FY 76 Base-Year \$	670.5	-149.4	521.1
Escalation	707.7	-170.7	537.0
Development	(35.8)	(+ 2.8)	(38.6)
Procurement	(671.9)	(-173.5)	(498.4)
Construction	-	-	-
Total Then-Year \$	1378.2	-320.1	1058.1

b. Quantities -- N/A

c. Unit Cost -- N/A

d. Approved Design to Cost Goal -- None

TRI-TAC, 31 December 1986

12. Program Acquisition/Current Procurement Unit Cost Summary:

(Current (Then-Year) Dollars in Millions)

System: TRI-TAC (CNCE)

	Current Year Current Est (Dec 86)	UCR Baseline (Dec 85)	Budget Year UCR Baseline (Dec 86)
a. Program Acquisition --			
(1) Cost	444.3	449.8	444.3
(2) Quantity	72	72	72
(3) Unit Cost	6.171	6.247	6.171
b. Current Procurement --			
	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	84.3	84.3	0
Less CY Adv Proc	0	0	0
Plus PY Adv Proc	0	0	0
Net Total	84.3	84.3	0
(2) Quantity	26	26	0
(3) Unit Cost	3.242	3.242	0

12. Program Acquisition/Current Procurement Unit Cost Summary:

(Current (Then-Year) Dollars in Millions)

System: TRI-TAC (TROPO)

	(FY 1987)	(FY 1987)*	(FY 1988)
a. Program Acquisition --			
(1) Cost	789.2	819.6	789.2
(2) Quantity	449	431	449
(3) Unit Cost	1.758	1.902	1.758
b. Current Procurement --			
	(FY 1987)	(FY 1987)*	(FY 1988)
(1) Cost	14.0	14.0	68.3
Less CY Adv Proc	0	0	0
Plus PY Adv Proc	0	0	0
Net Total	14.0	14.0	68.3
(2) Quantity	10	10	45
(3) Unit Cost	1.400	1.400	1.518

* Differs from December 1985 SAR based on FY87 Appropriations Act.

13. Cost Variance Analysis

System: Joint Tactical Communications (TRI-TAC) Program

a. Summary - Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	314.7	1910.5	-	2225.2
Previous Changes				
Economic	-1.6	-79.4	-	- 81.0
Quantity	-	+267.9	-	+267.9
Schedule	-	+ 9.9	-	+ 9.9
Engineering	+15.7	+ 4.2	-	+ 19.9
Estimating	+ 1.7	- 7.7	-	- 6.0
Other	-	-	-	-
Support	+ 0.4	+ 29.7	-	+ 30.1
Subtotal	+16.2	+224.6	-	+240.8
Current Changes				
Economic	- 1.2	- 23.5	-	- 24.7
Quantity	-	+ 28.3	-	+ 28.3
Schedule	-	+ 9.2	-	+ 9.2
Engineering	-	-	-	-
Estimating	+10.9	-140.8	-	-129.9
Other	-	-	-	-
Support	- 5.6	- 51.7	-	- 57.3
Subtotal	+ 4.1	-178.5	-	-174.4
Total Changes	+20.3	+ 46.1	-	+ 66.4
Current Estimate	335.0	1956.6	-	2291.6

(FY 1976 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
PRODUCTION ESTIMATE	230.8	896.2	-	1127.0
Previous Changes				
Quantity	-	+ 106.6	-	+106.6
Schedule	-	-	-	-
Engineering	+ 7.2	+ 2.0	-	+ 9.2
Estimating	+ 0.8	- 3.5	-	- 2.7
Other	-	-	-	-
Support	- 0.9	+ 8.4	-	+ 7.5
Subtotal	+ 7.1	+113.5	-	+120.6
Current Changes				
Quantity	-	+ 11.5	-	+ 11.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+ 4.9	- 65.4	-	- 60.5
Other	-	-	-	-
Support	- 2.8	- 24.4	-	- 27.2
Subtotal	+ 2.1	- 78.3	-	- 76.2
Total Changes	+ 9.2	+ 35.2	-	+ 44.4
Current Estimate	+240.0	931.4	-	1171.4

13. Cost Variance Analysis
System: TRI-TAC (CNCE)

a. Summary: - (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	149.7	-	-	149.7
Previous Changes				
Economic	- 0.3	- 7.3	-	- 7.6
Quantity	-	+278.8	-	+278.8
Schedule	-	-	-	-
Engineering	-	+ 4.2	-	+ 4.2
Estimating	+ 0.2	- 8.7	-	- 8.5
Other	-	-	-	-
Support	+ 3.7	+ 29.5	-	+ 33.2
Subtotal	+ 3.6	+296.5	-	+300.1
Current Changes				
Economic	- 0.2	- 3.7	-	- 3.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+ 0.2	+ 3.7	-	+ 3.9
Other	-	-	-	-
Support	- 3.8	- 1.7	-	- 5.5
Subtotal	- 3.8	- 1.7	-	- 5.5
Total Changes	- 0.2	+294.8	-	+294.6
Current Estimate	149.5	294.8	-	444.3

(FY 1976 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	112.8	-	-	112.8
Previous Changes				
Quantity	-	+135.3	-	+135.3
Schedule	-	-	-	-
Engineering	-	+ 2.0	-	+ 2.0
Estimating	+ 0.1	- 4.1	-	- 4.0
Other	-	-	-	-
Support	+ 1.7	+ 14.9	-	+ 16.6
Subtotal	+ 1.8	+148.1	-	+149.9
Current Changes				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+ 0.1	+ 1.9	-	+ 2.0
Other	-	-	-	-
Support	- 1.9	- 0.8	-	- 2.7
Subtotal	- 1.8	+ 1.1	-	- 0.7
Total Changes	0.0	+149.2	-	+149.2
Current Estimate	112.8	+149.2	-	262.0

13. Cost Variance Analysis (cont'd)

System: TRI-TAC (CNCE)

b. Previous Change Explanations

RD&E

Economic: Revised economic escalation indices

Estimating: Adjustment for prior year escalation.

Support: Training simulator requirements reduced;
revised estimate for Peculiar Support Equipment based on
Contractor's cost proposal.Procurement

Economic: Revised economic escalation indices.

Quantity: Addition of 68 CNCEs

Engineering: CNCE configuration change

Estimating: Revised contractual costs based on
negotiated amounts; adjustment for prior year
economic escalationSupport: Refined hardware Peculiar Support Equipment requirements;
increased support costs associated with production
of 68 units.

c. Current Change Explanations - -

(Dollars in Millions)
Base-Year Then-Year(1) RD&ERevised economic escalation indices.
(Economic)

N/A -0.2

Adjustment for current and prior year
escalation. (Estimating)

+0.1 +0.2

Revised estimate for Peculiar Support
Equipment based on maintenance concept
(Support)

-1.9 -3.8

(2) ProcurementRevised economic escalation indices.
(Economic)

N/A -3.7

Adjustment for prior year economic
escalation impact. (Estimating)

+1.9 +3.7

Refined hardware peculiar support
equipment requirements.(Support)

-0.8 -1.7

d. References --

Production Estimate: FY 85 President's Budget, January 1984.

13. Cost Variance Analysis
System: TRI-TAC (TROPO)

a. Summary - Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	48.5	648.8	-	697.3
Previous Changes				
Economic	- 0.4	- 28.0	-	- 28.4
Quantity	-	+111.5	-	+111.5
Schedule	-	+ 9.9	-	+ 9.9
Engineering	+15.7	-	-	+ 15.7
Estimating	+ 1.1	- 2.6	-	- 1.5
Other	-	-	-	-
Support	- 1.1	+ 16.2	-	+ 15.1
Subtotal	+15.3	+107.0	-	+122.3
Current Changes				
Economic	- 0.8	- 7.3	-	- 8.1
Quantity	-	+ 28.3	-	+ 28.3
Schedule	-	+ 9.2	-	+ 9.2
Engineering	-	-	-	-
Estimating	+ 1.8	- 64.6	-	- 62.8
Other	-	-	-	-
Support	-	+ 3.0	-	+ 3.0
Subtotal	+ 1.0	- 31.4	-	- 30.4
Total Changes	16.3	+ 75.6	-	+ 91.9
Current Estimate	64.8	724.4	-	789.2

(FY 1976 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
PRODUCTION ESTIMATE	37.3	306.4	-	343.7
Previous Changes:				
Quantity	-	+ 46.6	-	+ 46.6
Schedule	-	-	-	-
Engineering	+ 7.2	-	-	+ 7.2
Estimating	+ 0.5	- 1.3	-	- 0.8
Other	-	-	-	-
Support	- 0.7	+ 6.6	-	+ 5.9
Subtotal	+ 7.0	+ 51.9	-	+ 58.9
Current Changes				
Quantity	-	+ 11.5	-	+ 11.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+ 0.8	- 27.9	-	- 27.1
Other	-	-	-	-
Support	-	+ 1.3	-	+ 1.3
Subtotal	+ 0.8	- 15.1	-	- 14.3
Total Changes	+ 7.8	+ 36.8	-	+ 44.6
Current Estimate	45.1	343.2	-	388.3

13. Cost Variance Analysis (Cont'd):System: TRI-TAC (TAC)

b. Previous Change Explanations --

RDT&E

Economic: Revised economic escalation indices

Engineering: Development of Electronic Counter-Counter Measure (ECCM) Capability.

Estimating: Far term ECCM requirements more than originally stated.

Adjustment for prior economic escalation.

Support: Peculiar Support Equipment costs refined to reflect actual experience.

Procurement

Economic: Revised economic escalation indices

Quantity: Addition of 72 units with added production in FY 91.

Schedule: Rephasing of schedule due to quantity deletions.

Estimating: Refined estimate for other programmatic costs associated with TROP0 production. Adjustment for Prior Year economic escalation.

Support: Increased support costs associated with a net increase of 72 units (FY 88-91). ECCM retrofit associated with quantity decrease.

c. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year(1) RDT&ERevised economic escalation indices
(Economic)

N/A - 0.8

Development of Electronic Counter Counter
Measure (ECCM) Capability. (Estimating)

+0.7 + 1.4

Adjustment for current and prior year
economic escalation impact. (Estimating)

+0.1 + 0.4

(2) ProcurementRevised economic escalation indices
(Economic)

N/A - 7.3

Increased quantity of TROP0s from 422 to
440 with added production in FY 1992.

+12.8 +31.3

Flyaway costs associated with quantity
increase of 18 units (Quantity)

(+11.5) (+28.3)

Support costs associated with quantity
increase. (Support)

(+ 1.3) (+ 3.0)

Extension and rephasing of production schedule
due to Congressional inflation reduction.
(Schedule)

N/A + 9.2

13. Cost Variance Analysis (Cont'd)

c. Current Change Explanations -- (Cont'd)

(Dollars in Millions)
Base-Year Then-YearProcurement (Cont'd)Congressional reduction for general
inflation resulting in delay of a por-
tion of the FY 87 buy. (Estimating)

-22.2 -50.8

Refinement of current production esti-
mate based upon actual experience with
production units and a change in the
quantity mix being procured.
(Estimating)

-6.9 -16.2

Adjustment for current and prior year
economic escalation. (Estimating)

+1.2 +2.4

d. References-

Production Estimate: FY 85 President's Budget, January 1984.

13. Cost Variance Analysis

System: TRI-TAC (Support/Systems Integration/Other)

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Production Estimate	116.5	1261.7	-	1378.2
Previous Changes				
Economic	- 0.9	- 44.1	-	- 45.0
Quantity	-	-122.4	-	-122.4
Engineering	-	-	-	-
Estimating	+ 0.4	+ 3.6	-	+ 4.0
Support	- 2.2	- 16.0	-	- 18.2
Subtotal	- 2.7	-178.9	-	-181.6
Current Changes:				
Economic	- 0.2	- 12.5	-	- 12.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+ 8.9	- 79.9	-	- 71.0
Other	-	-	-	-
Support	- 1.8	- 53.0	-	- 54.8
Subtotal	+ 6.9	-145.4	-	-138.5
Total Changes	+ 4.2	-324.3	-	-320.1
Current Estimate	120.7	937.4	-	1058.1

(FY 1976 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Production Estimate	80.7	589.8	-	670.5
Previous Changes:				
Quantity	-	- 75.3	-	- 75.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+ 0.2	+ 1.9	-	+ 2.1
Other	-	-	-	-
Support	- 1.9	- 13.1	-	- 15.0
Subtotal	- 1.7	- 86.5	-	- 88.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+ 4.0	- 39.4	-	- 35.4
Other	-	-	-	-
Support	- 0.9	- 24.9	-	- 25.8
Sub total	+ 3.1	- 64.3	-	- 61.2
Total Changes	+ 1.4	-150.8	-	-149.4
Current Estimate	82.1	439.0	-	521.1

13. Cost Variance Analysis (Cont'd):

System: TRI-TAC (Support/Systems Integration/Other)

b. Previous Change Explanations --

ROT&E

Economic: Revised economic escalation indices.

Estimating: Adjustment for prior escalation.

Support: DoD transferred management responsibility of JTE to the army.
Refined estimate for AFOTEC support based on actual costs
and extension of the integration, planning and interface
equipment development schedule.

Procurement

Economic: Revised economic escalation indices.

Quantity: Decreased various items of TRI-TAC equipment produced
by the other Services.

Estimating: Adjustment to prior year escalation.

Support: Refined estimate for spares.

c. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>ROT&E</u>		
	Revised economic escalation indices. (Economic)	N/A	- 0.2
	Adjustment for current and prior year escalation (Estimating)	+ 0.1	+ 0.2
	Development of Tactical Generic Replacement Cable and the integration planning and interface equipment development schedule extended through FY 1992. (Estimating)	+ 3.9	+ 8.7
	Refined estimate for AFOTEC support and the development of unique PSE based on actual costs. (Support)	- 0.9	- 1.8
(2)	<u>Procurement</u>		
	Revised economic escalation indices. (Economic)	N/A	-12.5
	Decreased various items of TRI-TAC equipment produced by the other services. (Estimating)	-41.1	-84.3

13. Cost Variance Analysis (Cont'd):

System: TRI-TAC (Support/Systems Integration/Other)

c. Current Change Explanations--(Cont'd)

Adjustment for current and prior year economic escalation impact. (Estimating)	+ 1.7	+ 4.4
Adjustment in spares to support Prime Mission Equipment. (Support)	-24.9	-53.0
Adjustment for correction of category in in previous December 1985 SAR.	0.0	0.0
Quantity	(+20.5)	(+41.8)
Estimating	(-20.5)	(-41.8)

d. References --

Production Estimate: FY 1985 President's Budget, January 1984

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

a. Initial SAR/Production Estimate (PdE) to Current Estimate (CE) --

(1) CNCE

PAUC (Initial SAR/PdE)	CHANGES								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
37.425*	-0.160	-31.473	-	+0.058	-0.064	-	+0.385	-31.254	6.171

* Based on RDT&E Units Only

Initial SAR/Production Estimate (PdE) to Current Estimate (CE) --

(2) TROP0

PAUC (Initial SAR/PdE)	CHANGES								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1.942	-0.081	-0.078	+0.043	+0.035	-0.143	-	+0.040	-0.184	1.758

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E -- No Active Contracts

b. Procurement

1. CNCE Production Phase II

Martin Marietta, Orlando, FL
F19628-83-C-0051, FFP
Award: August 31, 1984
Definitized: August 31, 1984

Current Contract Price			
<u>Target</u>	<u>Ceiling</u>		<u>Qty</u>
409.4	1/	N/A	58
Variances:		N/A	

2. TROPO

Raytheon Corp, Marlborough, MA
F19628-82-C-0009, FFP
Award: April 9, 1982
Definitized: April 9, 1982

Current Contract Price			
<u>Target</u>	<u>Ceiling</u>		<u>Qty</u>
251.6	2/	N/A	161
Variances:		N/A	

3. TROPO (FOLLOW-ON)

Raytheon Corp, Marlboro, MA
F19628-85-C-0070, FFP
Award: September 10, 1985
Definitized: September 10, 1985

Current Contract Price			
<u>Target</u>	<u>Ceiling</u>		<u>Qty</u>
106.0	3/	N/A	90
Variances:		N/A	

4. DNVT *

General Atronics Corp, Phil. PA
F19628-83-C-0023, FFP
Award: December 30 1982
Definitized: December 30 1982

Current Contact Price			
<u>Target</u>	<u>Ceiling</u>		<u>Qty</u>
12.2	4/	N/A	18350
Variances:		N/A	

5. TDF *

Litton, Amecon, College Park, MD
F19628-84-C-0151, FFP
Award: September 12, 1984
Definitized: September 12, 1985

Current Contract Price			
<u>Target</u>	<u>Ceiling</u>		<u>QTY</u>
32.7	5/	N/A	173

Variances: N/A

* Will no longer be reported in subsequent SARs due to \$40M reporting threshold.

15. Contract Information (Cont'd): (Then-Year Dollars in Millions)

- 1/ Price includes \$93.0M Army funds and \$13.0M REDCOM funds.
- 2/ Price includes \$69.0M Army funds.
- 3/ Price includes \$93.1 Army funds.
- 4/ Price includes \$7.6M Army funds.
- 5/ Price includes \$8.0M Navy funds, \$12.5M Army Funds, and \$1.3M Marine Corps funds.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)
System: Joint Tactical Communications (TRI-TAC) Program

a. Program Status --

- (1) Percent Program Completed: 75.0% (15/20 yrs)
- (2) Percent Program Cost Appropriated: 50.1% (\$1,149.2M/\$2,291.6M)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

	<u>Current & Prior Year</u>	<u>Budget Year</u>	<u>Balance to Complete FYDP</u>	<u>Beyond FYDP</u>	<u>Total</u>
	(FY 73-87)	(FY 88)	(FY 89-92)		
RD&E	295.8	15.9	23.3	-	335.0
Procurement	853.4	199.3	903.9	-	1956.6
MILCON	-	-	-	-	-
Total	1149.2	215.2	927.2	-	2291.6

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)
System: Joint Tactical Communications (TRI-TAC) Program

c. Annual Summary --

FISCAL YEAR	QTY	FY 76 BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			Escal Rate
		FLYAWAY		Total	ADVANCE PROC		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1973				2.3			1.8	4.4
1974				4.7			4.0	7.9
1975				9.9			9.3	10.8
1976				22.3			22.3	7.0
1977				5.9			6.0	3.2
1977				35.1			37.6	3.8
1978				28.2			32.0	6.2
1979				21.5			27.5	8.4
1980				18.6			26.4	9.7
1981				11.7			18.5	11.9
1982				15.0			25.3	9.2
1983				24.7			43.7	4.9
1984				11.1			20.3	3.8
1985				5.1			9.7	3.4
1986				2.3			4.4	2.9
1987				3.5			7.0	3.1
1988				7.6			15.9	3.5
1989				3.8			8.1	3.5
1990				2.5			5.6	3.3
1991				2.1			4.7	2.9
1992				2.1			4.9	2.4
Subtotal				240.0			335.0	

Appropriation: Procurement

1980				8.0			12.8	9.7
1981		9.7	8.9	23.0			39.3	11.9
1982		5.2	25.5	64.3	7.7		113.5	9.2
1983			50.4	72.0	8.5	3.8	131.9	4.9
1984			39.0	57.7		12.4	109.1	3.8
1985		1.1	39.0	59.8			116.8	3.4
1986		3.6	33.0	79.2			159.7	2.9
1987		1.7	39.3	81.7			170.3	3.1
1988			28.5	92.5			199.3	3.5
1989			38.1	104.8			232.6	3.5
1990			41.8	125.7			286.4	3.3
1991			40.7	78.3			183.1	2.9
1992			39.9	84.4			201.8	2.4
Subtotal		21.3	424.1	931.4	16.2	16.2	1956.6	
Total		21.3	424.1	1171.4	16.2	16.2	2291.6	

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16. Program Funding Summary (Cont'd) (Current Estimate in Millions of Dollars)
System: Joint Tactical Communications (TRI-TAC Program)

d. Obligations and Expenditures --

FISCAL YEAR	Then-Year Dollars (Current Estimate in Millions)		
	TOTAL	OBLIGATED <u>1/</u>	EXPENDED <u>1/</u>

Appropriation: RDT&E

1973	1.8	1.8	1.8
1974	4.0	4.0	4.0
1975	9.3	9.3	9.3
1976	22.3	22.3	22.3
1977	6.0	6.0	6.0
1977	37.6	37.6	37.6
1978	32.0	32.0	32.0
1979	27.5	27.5	27.5
1980	26.4	26.4	26.4
1981	18.5	18.5	18.5
1982	25.3	25.3	25.3
1983	43.7	43.7	43.7
1984	20.3	20.3	14.8
1985	9.7	9.7	6.9
1986	4.4	4.4	2.9
1987	7.0	0.2	0.2
To Complete	39.2		
Total	335.0	289.0	279.2

Appropriation: Procurement

1980	12.8	12.8	12.8
1981	39.3	39.3	39.3
1982	113.5	113.5	113.4
1983	131.9	131.9	126.4
1984	109.1	109.1	83.1
1985	116.8	101.0	78.2
1986	159.7	117.9	29.4
1987	170.3	58.5	-
To Complete	1,103.2	-	-
Total	1,956.6	684.0	482.6

1/ Reflects Program Office records as of 31 December 1986.

16. Program Funding Summary (Current Estimate in Millions of Dollars)
System: TRI-TAC (CNCE)

a. Program Status --

- (1) Percent Program Completed: 92.8% (13/14 yrs)
- (2) Percent Program Cost Appropriated: 99.7% (\$443.1M/\$444.3M)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

	<u>Current & Prior Yrs</u>	<u>Budget Year</u>	<u>Balance to Complete FYDP</u>	<u>Beyond FYDP</u>	<u>Total</u>
	(FY75-87)	(FY-88)	(FY89-92)		
RDT&E	148.3	1.2	-	-	149.5
Procurement	294.8	-	-	-	294.8
MILCON	-	-	-	-	-
Total	443.1	1.2	-	-	444.3

c. Annual Summary

FISCAL YEAR	QTY	FY 76 BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			Esc1 Rate (%)
		FLYAWAY		Total	ADVANCE PROC		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1975				1.9			1.8	10.8
1976				18.4			18.4	7.0
1977				3.7			3.8	3.2
1977				20.4			21.9	3.8
1978				12.9			14.7	6.2
1979				11.6			14.8	8.4
1980				8.5			12.1	9.7
1981				5.9			9.3	11.9
1982				8.1			13.7	9.2
1983				10.7			18.9	4.9
1984				5.5			10.0	3.8
1985				2.6			5.0	3.4
1986				1.4			2.7	2.9
1987				.6			1.2	3.1
1988				.6			1.2	3.5
Subtotal	4			112.8			149.5	

16. Program Funding Summary (Cont'd) (Current Estimate in Millions of Dollars)
System: TRI-TAC (CNCE)

c. Annual Summary (Cont'd) --

FISCAL YEAR	QTY	FY 76 BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			Esc1 Rate (%)
		FLYAWAY		Total	ADVANCE PROC		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement

1983	3		20.5	20.7			37.9	4.9
1984	3		14.4	16.0			30.3	3.8
1985	19	1.1	39.0	43.5			84.9	3.4
1986	17	0.3	25.7	28.5			57.4	2.9
1987	26	0.3	34.7	40.5			84.3	3.1
Subtotal	68	1.7	134.3	149.2			294.8	
Total	72	1.7	134.3	262.0			444.3	

d. Obligations and Expenditures --

FISCAL YEAR	Then-Year Dollars (Current Estimate in Millions)		
	TOTAL	OBLIGATED <u>1</u> /	EXPENDED <u>1</u> /

Appropriation: RDT&E

1975	1.8	1.8	1.8
1976	18.4	18.4	18.4
1977	3.8	3.8	3.8
1977	21.9	21.9	21.9
1978	14.7	14.7	14.7
1979	14.8	14.8	14.8
1980	12.1	12.1	12.1
1981	9.3	9.3	9.3
1982	13.7	13.7	13.7
1983	18.9	18.9	18.9
1984	10.0	10.0	10.0
1985	5.0	5.0	4.8
1986	2.7	2.7	2.2
1987	1.2	0	0
To Complete	1.2	-	-
Total	149.5	147.1	146.4

TRI-TAC, 31 December 1986

16. Program Funding Summary (Cont'd) (Current Estimate in Millions of Dollars)
System: TRI-TAC (CNCE)

d. Obligations and Expenditures (Cont'd) --

FISCAL YEAR	Then-Year Dollars (Current Estimate in Millions)		
	TOTAL	OBLIGATED <u>1/</u>	EXPENDED <u>1/</u>

Appropriation: Procurement

1983	37.9	37.9	37.9
1984	30.3	30.3	27.2
1985	84.9	75.7	71.3
1986	57.4	55.0	17.5
1987	84.3	57.2	0
To Complete	-	-	-
Total	294.8	256.1	153.9

1/ Reflects Program Office records as of 31 December 1986.

16. Program Funding Summary (Current Estimate in Millions of Dollars)
System: TRI-TAC (TROPO)

a. Program Status --

- (1) Percent Program Completed: 72.2% (13/18 yrs)
- (2) Percent Program Cost Appropriated: 37.3% (\$294.0M/\$789.2M)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

	<u>Current & Prior Yrs</u>	<u>Budget Year</u>	<u>Balance to Complete FYDP</u>	<u>Beyond FYDP</u>	<u>Total</u>
	(FY75-87)	(FY-88)	(FY89-92)		
RD&E	49.2	9.8	5.8		64.8
Procurement	244.8	68.3	411.3		724.4
MILCON	-	-	-		-
Total	294.0	78.1	417.1		789.2

c. Annual Summary

FISCAL YEAR	QTY	FY 76 BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			Esc1 Rate (%)
		FLYAWAY		Total	ADVANCE PROC		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RD&E

1975				0.1			0.1	10.8
1976				-			-	-
1977				1.0			1.0	3.2
1977				10.0			10.7	3.8
1978				9.1			10.3	6.2
1979				6.5			8.3	8.4
1980				3.6			5.1	9.7
1981				1.1			1.8	11.9
1982				0.4			0.7	9.2
1983				1.1			2.0	4.9
1984				1.5			2.7	3.8
1985				0.5			1.0	3.4
1986				0.4			0.7	2.9
1987				2.4			4.8	3.1
1988				4.7			9.8	3.5
1989				1.8			3.8	3.5
1990				0.9			2.0	3.3
Subtotal	9			45.1			64.8	

TRI-TAC, 31 December 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)
System: TRI-TAC (TROPO)

c. Annual Summary (Cont'd) --

FISCAL YEAR	QTY	FY 76 BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			Esc1 Rate
		FLYAWAY		Total	ADVANCE PROC		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement

1981	3	9.7	8.9	21.8			37.2	11.9
1982	36	5.2	25.5	31.5	7.7		55.7	9.2
1983	34		29.9	35.0	8.5	3.8	64.2	4.9
1984	32		24.6	26.5		12.4	50.0	3.8
1985	-		-	-			-	-
1986	8	3.3	7.3	11.8			23.7	2.9
1987	10	1.4	4.6	6.7			14.0	3.1
1988	45		28.5	31.7			68.3	3.5
1989	62		38.1	42.3			93.9	3.5
1990	70		41.8	46.4			105.7	3.3
1991	70		40.7	45.2			105.7	2.9
1992	70		39.9	44.3			106.0	2.4
Subtotal	440	19.6	289.8	343.2	16.2	16.2	724.4	
Total	449	19.6	289.8	388.3	16.2	16.2	789.2	

d. Obligations and Expenditures --

FISCAL YEAR	Then-Year Dollars (Current Estimate in Millions)		
	TOTAL	OBLIGATED <u>1/</u>	EXPENDED <u>1/</u>

Appropriation: RDT&E

1975	0.1	0.1	0.1
1976	-	-	-
1977	1.0	1.0	1.0
1977	10.7	10.7	10.7
1978	10.3	10.3	10.3
1979	8.3	8.3	8.3
1980	5.1	5.1	5.1
1981	1.8	1.8	1.8
1982	0.7	0.7	0.7
1983	2.0	2.0	2.0
1984	2.7	2.7	2.5
1985	1.0	1.0	1.0
1986	0.7	0.7	0.1
1987	4.8	0	0
To Complete	15.6		
Total	64.8	44.4	43.6

16. Program Funding Summary (Cont'd) (Current Estimate in Millions of Dollars)
System: TRI-TAC (TROPO)

d. Obligations and Expenditures (Cont'd) --

FISCAL YEAR	Then-Year Dollars (Current Estimate in Millions)		
	TOTAL	OBLIGATED <u>1/</u>	EXPENDED <u>1/</u>

Appropriation: Procurement

1981	37.2	37.2	37.2
1982	55.7	55.7	55.6
1983	64.2	64.2	63.6
1984	50.0	50.0	36.6
1985	-	-	-
1986	23.7	12.6	0.4
1987	14.0	0	0
To Complete	479.6	-	-
Total	724.4	219.7	193.4

1/ Reflects Program Office records as of 31 December 1986.

16. Program Funding Summary (Current Estimate in Millions of Dollars)
 System: TRI-TAC (Support/Systems Integration/Other)

a. Program Status --

- (1) Percent Program Completed: 75% (15/20 yrs)
 (2) Percent Program Cost Appropriated: 38.9% (\$412.1M/\$1,058.1M)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

	Current & Prior Yrs (FY75-87)	Budget Year (FY-88)	Balance to Complete FYDP (FY89-92)	Beyond FYDP	Total
RDT&E	98.3	4.9	17.5	-	120.7
Procurement	313.8	131.0	492.6	-	937.4
MILCON	-	-	-	-	-
Total	412.1	135.9	510.1		1,058.1

c. Annual Summary

FISCAL YEAR	QTY	FY 76 BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			Esc1 Rate (%)
		FLYAWAY		Total	ADVANCE PROC		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1973				2.3			1.8	4.4
1974				4.7			4.0	7.9
1975				7.9			7.4	10.8
1976				3.9			3.9	7.0
1977				1.2			1.2	3.2
1977				4.7			5.0	3.8
1978				6.2			7.0	6.2
1979				3.4			4.4	8.4
1980				6.5			9.2	9.7
1981				4.7			7.4	11.9
1982				6.5			10.9	9.2
1983				12.9			22.8	4.9
1984				4.1			7.6	3.8
1985				2.0			3.7	3.4
1986				0.5			1.0	2.9
1987				0.5			1.0	3.1
1988				2.3			4.9	3.5
1989				2.0			4.3	3.5
1990				1.6			3.6	3.3
1991				2.1			4.7	2.9
1992				2.1			4.9	2.4
Subtotal				82.1			120.7	

16. Program Funding Summary (Cont'd) (Current Estimate in Millions of Dollars)
System: TRI-TAC (Support/Systems Integration/Other)

c. Annual Summary

FISCAL YEAR	QTY	FY 76 BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			Esc1 Rate (%)
		FLYAWAY		Total	ADVANCE PROC		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement

1980				8.0			12.8	9.7
1981				1.2			2.1	11.9
1982				32.7			57.8	9.2
1983				16.3			29.8	4.9
1984				15.2			28.8	3.8
1985				16.3			31.9	3.4
1986				39.0			78.6	2.9
1987				34.5			72.0	3.1
1988				60.8			131.0	3.5
1989				62.5			138.7	3.5
1990				79.3			180.7	3.3
1991				33.1			77.4	2.9
1992				40.1			95.8	2.4
Subtotal				439.0			937.4	
Total				521.1			1,058.1	

d. Obligations and Expenditures --

FISCAL YEAR	Then-Year Dollars (Current Estimate in Millions)		
	TOTAL	OBLIGATED <u>1/</u>	EXPENDED <u>1/</u>

Appropriation: RDT&E

1973	1.8	1.8	1.8
1974	4.0	4.0	4.0
1975	7.4	7.4	7.4
1976	3.9	3.9	3.9
1977	1.2	1.2	1.2
1977	5.0	5.0	5.0
1978	7.0	7.0	7.0
1979	4.4	4.4	4.4
1980	9.2	9.2	9.2
1981	7.4	7.4	7.4
1982	10.9	10.9	10.9
1983	22.8	22.8	22.8
1984	7.6	7.6	7.2
1985	3.7	3.7	1.1
1986	1.0	1.0	0.6
1987	1.0	0.2	0.2
To Complete	22.4		
Total	120.7	97.5	94.1

TRI-TAC, 31 December 1986

16. Program Funding Summary (Cont'd) (Current Estimate in Millions of Dollars)
System: TRI-TAC (Support/Systems Integration/Other)

d. Obligations and Expenditures (Cont'd) --

FISCAL YEAR	Then-Year Dollars (Current Estimate in Millions)		
	TOTAL	OBLIGATED <u>1/</u>	EXPENDED <u>1/</u>

Appropriation: Procurement

1980	12.8	12.8	12.8
1981	2.1	2.1	2.1
1982	57.8	57.8	57.8
1983	29.8	29.8	24.9
1984	28.8	28.8	19.3
1985	31.9	25.3	6.9
1986	78.6	50.3	11.5
1987	72.0	1.3	0
To Complete	623.6		
Total	937.4	208.2	135.3

1/ Reflects Program Office records as of 31 December 1986.

17. Production Rate Data

(1) CNCE

a. Annual Production Rates --

Fiscal Year	Production Rate (Quantity Year)			
	Development Estimate	Production Estimate	Current Estimate	1/ Maximum Economic
1983/1984	11.0	11.0	11.0	11.0
1985	20.6	20.6	20.6	20.6
1986	30.0	30.0	30.0	30.0
1987	30.0	30.0	30.0	30.0

b. Cost Variance -- Dollars in Millions (Note: Subject to limitations on production rates above).

Item	Production Estimate	Variance (CE Less PdE)	Current Estimate	Variance (CE Less Max)	Maximum Economic
Prog Acq Cost (BY \$)	262.7	-0.7	262.0	-0.7	262.7
(TY \$)	449.8	-5.5	444.3	-5.5	449.8
PAUC (BY \$)	3.649	-0.010	3.639	-0.010	3.649
(TY \$)	6.247	-0.076	6.171	-0.076	6.247

c. Schedule Variance -- (Note: Subject to limitations on production rates above).

	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum Economic
Start Date (Mo/Yr)	8/86	-	8/86	-	8/86
Duration (in Months)	23	+ 4 mos	27	-	27
End Date (Mo/Yr)	6/88	+ 4 mos	10/88	-	10/88

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	4/4
Procurement	15/15

1/ Maximum economic rate assumes AFLC spares will be procured on the same production line.

17. Production Rate Data

(1) TROPO

a. Annual Production Rates -- (Note: Annual production rates differ from annual funded quantities because the funded delivery period per option varies with the average approximating 15 months).

Fiscal Year	Production Rate (Quantity Year) <u>1/</u>			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1981/1982	21.2	21.2	21.2	21.2
1983	50.3	50.3	50.3	50.3
1984	54.0	54.0	54.0	54.0
1985				
1986	33.3	33.3	9.6	72.0
1987	55.7	55.7	14.6	72.0
1988	50.7	50.7	46.8	72.0
1989	57.1	57.1	55.2	120.0
1990			44.4	120.0
1991			51.6	132.0
1992			58.8	144.0

b. Cost Variance -- Dollars in Millions (Note: Subject to limitations on production rates above).

Item	Production Estimate	Variance (CE Less PdE)	Current Estimate	Variance (CE Less Max)	Maximum Economic
Prog Acq Cost (BY \$)	343.7	+44.6	388.3	-179.1	567.4
(TY \$)	697.3	+91.9	789.2	-368.8	1158.0
PAUC (BY \$)	0.957	-0.092	0.865	+0.090	0.775
(TY \$)	1.942	-0.184	1.758	+0.176	1.582

c. Schedule Variance -- (Note: Subject to limitations on production rates above).

	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum Economic
Start Date (Mo/Yr)	10/84	-	10/84	-	10/84
Duration (in Months)	102	+26 mos	128	-	128
End Date (Mo/Yr)	4/93	+26 mos	7/95	-	7/95

d. Deliveries (Plan/Actual) -- To Date
 RDT&E 9/9
 Procurement V2 79/79
 V3 22/22

1/ Maximum economic rate assumes Army quantities will be procured on the same production line.

18. Operating and Support Costs: N/A

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: WWMCCS INFORMATION SYSTEM (WIS)

AS OF DATE: December 31, 1986

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1. Designation/Nomenclature (Popular Name): Worldwide Military Command and Control System (WWMCCS) Information System (WIS)

2. DoD Component: U.S. Air Force

3. Responsible Office and Telephone Number:

WWMCCS Information System (WIS)
Joint Program Management Office (JPMD)

JPM: Brig Gen Carl G. O'Berry
Assigned: June 1, 1986
AUTOVON 356-5053
Area Code 703/285-5053

4. Program Elements/Procurement Line Items:

RDT&E: 33152A/W/F/K, 33154F, 63735F
PROCUREMENT: 11310F, 12322F, 27414F, 27415F, 27416F, 33151F,
33152A/W/F/H/K, 33154F, 41840F, 92498M, 21131F
APPN 3080 ICN 834040 (Air Force)
APPN 2035 ICN BE4100 (Army)
APPN 1810 ICN 8210 (Navy and Marine Corps)
APPN 0300 ICN Unknown (DCA/DNA)
OPERATION AND MAINTENANCE: ~~C2EXRE~~ 33152F/H

FOR OPEN PUBLICATION

5. Related Programs: None. JAN 29 1987 18

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

SAF/PAS

87-0028-T

87-0131

6. Mission and Description: The Worldwide Military Command and Control System (WMCCS) Information System (WIS) is the modernization program to provide a worldwide data collection and information processing system which allows rapid and reliable exchanges of information to support the employment of forces. Its primary mission is to support the National Command Authorities, the Joint Chiefs of Staff, and unified and specified commanders by providing command and control capabilities for use in national security decision making, force preparation and planning, and execution of operations plans; its secondary mission is that of supporting command and control systems of the unified and specified commands, Services, and other DoD components. WIS will interface with the Nuclear Planning and Execution System, and the Tactical Warning/Space Defense Systems. This program will modernize and replace the existing standard WMCCS ADP System.

7. Program Highlights:

a. **Significant Historical Developments** -- On 5 November 1982, the Deputy Secretary of Defense established the WIS Joint Program Manager (WIS JPM) for the WMCCS ADP modernization program. The Chief of Staff, Air Force was designated as Executive Agent. The WIS Joint Mission Element Needs Statement, February 1982, provided the basis for the July 1982 Report to Congress which defined the WIS architecture and development program. The Joint Chiefs of Staff approved the WIS Operational and Information Requirements on 3 July 1985. On 16 May 1984, the Defense Acquisition Executive held a program review and directed the WIS to be developed and deployed in the three increments (Blocks). A Secretary of Defense Decision Memorandum, 11 September 1985, approved Block A full scale development, procurement and installation of not more than 15 sites, capped the joint RDT&E program at \$835.8M (\$663.8M in base year FY82 dollars) and affirmed tri-Service funding. Increment IV of the Integration Contract was awarded to GTE with an effective date of 4 June 1986. This increment requires GTE to: design, acquire, and fabricate a local area network (LAN); integrate the local area network with Common User (CU) equipment and with existing WMCCS equipment; perform site engineering at 12 sites; install four (4) operational test sites; perform development test and evaluation (DT&E) and support operational test and evaluation (OT&E); support Block B development by performing analysis and prototyping. A revised WIS Program Block A Schedule was published in July 1986. The schedule is based on anticipated approval by the Joint Requirements and Management Board (JRMB) for installation of a transition device at all WMCCS Intercomputer Network host sites prior to cutover (to GCOS-8 with DOD protocols) and change in Block A operational test and evaluation to December 1988. Upon OSD approval, the Transition Component will be established as the mechanism to cutover to the DoD communications protocols in conjunction with the WIS LAN and gateway to the Defense Data Network (DDN). An Ada interface to the American National Standard (ANS) Graphical Kernel System (GKS) was developed and submitted to the American National Standards Institute (ANSI) for adoption as the standard Ada/GKS Binding. A production quality implementation of this Ada/GKS interface was completed in July 1986. An Ada interface to the draft ANS SQL database language was developed and submitted to the appropriate ANS committee. Two prototype implementations of this Ada/SQL interface are underway. Ada development began on a set of Software Development and Maintenance Environment (SDME) modules for fielding to the WIS community.

The SDME, developed in Ada, will provide portable, integrated Ada software development tools, with access to a validated Ada compiler, and a software configuration management system. Several demonstrations were conducted, leading to the development of a Beta Test system, which will be tested within the next six months. The follow-on phase Statement of Work is under review. This phase will complete the full development effort. An improved IBM VIP 7705 Terminal Emulation Software Package was developed during the reporting period and fielded in Sep 86. GTE conducted the Block A Design Review 23-25 Sep 86. The review demonstrated that the statement of work requirements are being met.

b. Significant Developments Since Last Report -- Under the Increment IV Contract with GTE, the Local Area Network (LAN) Final Design Review (FDR) and LAN Critical Design Review (CDR) were successfully conducted. GTE delivered to the government their WIS products list (WPL) proposal. Fact-finding is in progress. The WPL is the mechanism by which sites may order LAN components (gateways, interface units, bridges, etc.). Each site will be a unique configuration of components from the GTE WPL and from the common user products list as determined by the site. Preliminary site visits (PSV) and final site design reviews (FSDR) have been conducted by GTE at the operational test sites (PACOM, TAC, and FORSCOM). PSV's were also completed at two operational sites (WIS SSFN and SAC).

IBM Critical Design Review (CDR) -- IBM is conducting a series of Critical Design Reviews for the Release 1 Automated Message Handling System from Aug 86 - Feb 87.

The WMCCS Information System is expected to satisfy the mission requirements.

c. Changes Since December 31, 1986 -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: The OT&E completion date of FY88 established by the 2 July 1985 Block A Defense Systems Acquisition Review Council (and SEC DEF Decision Memorandum September 11, 1986) has slipped to FY89. Notification of this breach is currently in coordination within HQ USAF. The selection of DoD protocols and centralized security caused tighter integration with the modernization of the existing system to assure compatibility and interoperability. In addition, contractual negotiations with the integrating contractor were longer than expected.

9. Schedule:

a. Milestones --

<u>Block A</u>	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
Integration Contract Award	Oct 83/Oct 83	Oct 83
Common User Contract Award	Oct 83/Oct 84	Oct 84
System Support Contract Award	Jul 85/Jul 85	Jul 85
JRMB 1/II	Jul 85/Jul 85	Jul 85
Start DT&E (Phase I System)	May 87/May 87	Oct 87
Start OT&E	Oct 87/Oct 87	Oct 88
Start Low Rate Deployment (up to site #15)	Nov 87/Nov 87	Oct 88
Initial Operational Capability	Nov 87/Nov 87	Jan 89
Deployment Approval (sites #16 and on)	Nov 87/Nov 87	Feb 89 (Ch-1)

WMCCS Information System, December 31, 1986

A program review by the JRMB principals will be the approval mechanism to proceed with full deployment of Block A capabilities. Until that approval is granted, the Block A implementation is restricted to a low rate of procurement and installation (not more than 15 sites).

<u>Blocks B and C *</u>	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>
JRMB II (Block B)	N/A / N/A	Mar 88 (Ch-2)
Joint Mission Processing Environment Contract Award	Jun 86/ N/A	Jun 88 (Ch-3)
Start OT&E	N/A	**TBD
Start Deployment	N/A	**TBD
Initial Operational Capability	N/A	**TBD
JRMB II (Block C)	N/A	**TBD

*On previous SAR the awards for Block A were also erroneously included in Blocks B&C.

**TBD Current Estimate for Blocks B and C will be established 180 days prior to their respective JRMB review.

b. Previous Change Explanations --

Block A

Common User Contract Award slipped from Jun 84 to Oct 84 due to late receipt of user requirement comments for inclusion in the Request for Proposal (RFP), which caused a corresponding extension of the RFP period to allow adequate time for vendor preparation of their proposals.

Systems Support Contract Award slipped initially from Jul 84 to Jan 85 due to change in procurement strategy which redefined this effort as a Small Business Program Set-Aside (B-A); the second slip, from Jan 85 to Feb 85, was due to administrative contractual delays associated with BA processing; the last slip, from Feb 85 to Jul 85, was due to funding constraints which resulted in "descopeing" this effort and reaccomplishing the Statement of Work.

JRMB I/II slipped from May 85 to July 85; this one month slip was due to scheduling difficulties involved in presenting numerous pre-briefs and working around the schedules of senior OSD, OJCS, and military department officials.

Start of System Development Test and Evaluation slipped from May 87 to Oct 87 due to the delay in the GTE Increment IV contract negotiations and subsequent contract award and the delay in the start of Common User Contract DT&E caused by the implementation of network authenticated security (WISNAS).

The start of Operational Test and Evaluation slipped from Oct 87 to Oct 88 due to the delay in awarding the Increment IV contract, additional test requirements for DT&E/OT&E, and the requirement for interoperability test between WIS and SCOS B Operating System with DoD protocols.

9. Schedule (Cont'd)

Start Low Rate Deployment is delayed from Nov 87 to Oct 88 as a result of the slippage occurring in the DT&E and OT&E schedules.

Initial Operational Capability is delayed from Nov 87 to Jan 89 as a result of the slippage in the DT&E and OT&E schedules.

Deployment Approval is delayed from Nov 87 to Dec 88 as a result of the slippage in the OT&E schedule.

Blocks B and C

Joint Mission Processing Environment Contract Award was adjusted from Jun 86 to Dec 86; this six month slip was necessary to effect alignment with design schedule requirements of joint mission application and support software; the three month slip, from Dec 86 to Mar 87, was a function of FY85 deficit funding through the third fiscal quarter which delayed several activities.

Slip in JRMB from Jan 87 to May 87 is due to reduction of RDT&E funding in the FY87 President's Budget for support of Block B development effort.

Joint Mission Processing Environment Contract Award date (rescheduled from Mar 87 to Jun 87) is driven by the Block B JRMB date, and is expected to be awarded within the same fiscal quarter.

The Joint Program Manager has appointed a special task force to re-evaluate Block B schedule milestones. Recommended changes, if implemented, will be reported in the next SAR.

c. Current Change Explanations —

Block A

(Ch-1) The Block A Deployment Decision slipped from Dec 88 to Feb 89 to allow for sufficient time for test report generation and review.

Blocks B and C

(Ch-2) Block B JRMB II was moved to Mar 88 due to Deputy Secretary of Defense direction to delay deployment and acquisition by one year due to fiscal constraints.

(Ch-3) The Joint Mission Processing Environment Contract Award date is driven by the Block B JRMB date, funding cuts, and lack of a readily available common off-the-shelf (COTS) processors capable of controlled mode security.

9. Schedule (Cont'd)

d. References —

Block A

Development Estimate/Approved Program: SDDM, dated September 11, 1985, subject "Decision Memorandum on the World-Wide Military Command and Control System (WMCCS) Information System (WIS), Block A."

Blocks B and C

Planning Estimate: FY85 RDT&E Descriptive Summary.

Approved Program: FY85 RDT&E Descriptive Summary and FY87 RDT&E Descriptive Summary.

10. Technical/Operational Characteristics:

a. Technical — Block A	Dev Estimate/ Appr Program	Demonstrated Performance	Current Estimate
Availability 1/			
Routine Operational Availability	95%/95%	N/A	95%
Crisis Operational Availability	98%/98%	N/A	98%
MTBF (Workstation/Printer)	1500 Hrs/1500 Hrs	N/A	1500 Hrs
Diagnostics Automated Message Handling (AMH) Processor 2/	90% Fault Det/Rate/90%FDR	N/A	90% Fault Detection Rate
Response Time			
Simple (Priority)	8-10 Sec/8-10 Sec	N/A	8-10 Sec
Complex (Priority)	2-4 Min/2-4 Min	N/A	2-4 Min

1/ Availability is defined as the percentage of time WIS is ready for use. WIS reliability and redundancy requirements will be incorporated into its design so that critical command and control activities will be available as specified in JCS Pub 19 and the JOPEB RDC.

2/ The probability of correctly determining the replacement unit on the first attempt is 90% for the AMH processor.

a. Technical— Blocks B and C	Plan Estimate/ Appr Program	Demonstrated Performance	Current Estimate
Availability 1/			
Routine Operational Availability	98%/98%	N/A	98%
Crisis Operational Availability	99.8%/99.8%	N/A	99.8%
MTBF (Workstation/Printer)	2000 Hrs/2000 Hrs	N/A	2000 Hrs
MTBF (WIS System)	160 Hrs/ 160 Hrs	N/A	160 Hrs
Diagnostics Automated Message Handling (AMH) Processor 2/	95% Fault Det/Rate 95%FDR	N/A	95% Fault Detection/Rate
Response Time			
Simple (Priority)	2-5 Sec/2-5 Sec	N/A	2-5 Sec
Complex (Priority)	1-3 Min/1-3 Min	N/A	1-3 Min

10. Technical/Operational Characteristics (Cont'd):

- 1/ Availability is defined as the percentage of time WIS is ready for use. WIS reliability and redundancy requirements will be incorporated into its design so that critical command and control activities will be available as specified in JCS Pub 19 and the JOPES ROC.
- 2/ The probability of correctly determining the replacement unit on the first attempt is 95% for the AMH processor.

b. Operational --	Dev Estimate/ Appr Program	Demonstrated Performance	Current Estimate
<u>Block A</u>			
<u>Security 3/</u>	System High/ System High	N/A	System High
<u>Useability 4/</u>	20 Hrs Training/ 20 Hrs Training	N/A	20 Hrs Training
Automated Message Handling (AMH)			
Peak Msg Rec/Day 5/	2000/2000	N/A	2000
Automated Message Handling (AMH)			
Peak Msg Rec/Hour	300/300	N/A	300
Automated Message Handling (AMH)			
Peak Msg Trans/Hour	100/100	N/A	100
3/ WIS will be secure from unauthorized access, data manipulation, or retrieval. The system hardware will be TEMPEST certified as required. For Block A, the system will operate in a for BLOCK A system high mode.			
4/ Useability is defined as the time it will take to learn how to log-on through a WIS workstation to the system and access available WIS applications. For Block A threshold, 20 hours of training for an experienced workstation user, consisting of on-the-job-training (OJT), classroom, and computer-aided instructor courses, are anticipated to use basic automated message handling capabilities.			
5/ This goal is a measure of AMH capability in a priority operation; it is defined as the maximum number of messages processed for the time period. All AMH goals assume an average message length of 1500 characters and a maximum length of 30,000 characters.			

b. Operational --	Plan Estimate/ Appr Program	Demonstrated Performance	Current Estimate
<u>Blocks B and C</u>			
<u>Security 3/</u>	Controlled Mode/ Controlled Mode	N/A	Controlled Mode
<u>Useability 4/</u>	8 Hrs Training/ 8 Hrs Training	N/A	8 Hrs Training
Automated Message Handling (AMH)	3500/3500	N/A	3500
Peak Msg Rec/Day 5/			
Automated Message Handling (AMH)	500/500	N/A	500
Peak Msg Rec/Hour			
Automated Message Handling (AMH)	150/150	N/A	150
Peak Msg Trans/Hour			

10. Technical/Operational Characteristics (Cont'd):

- 3/ WIS will be secure from unauthorized access, data manipulation, or retrieval. The system hardware will be TEMPEST certified as required. For Blocks B and C the system will operate in a ~~TOP SECRET~~-controlled mode.
- 4/ Useability is defined as the time it will take to learn how to log-on through a WIS workstation to the system and access available WIS applications. For Blocks B and C, the useability goal will be 8 hours workstation OJT with the availability of a full help command function.
- 5/ This goal is a measure of AMH capability in a priority operation; it is defined as the maximum number of messages processed for the time period. All AMH goals assume an average message length of 1500 characters and a maximum length of 30,000 characters.

c. Previous Change Explanations —

Blocks A, B and C None.

d. References —

Block A

Development Estimate/Approved Program: SDDM, dated September 11, 1985, subject "Decision Memorandum on the World-Wide Military Command and Control System (WMCCS) Information System (WIS), Block A."

Blocks B and C

Planning Estimate/Approved Program: Decision Coordinating Paper for Block A of the WIS, dated September 20, 1985.

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost —	Planning/Dev Estimate	Changes	Current Estimate
Development	\$ 545.3	+\$352.3	\$ 897.6
*Procurement	642.3	+103.3	745.6
MILCON	1.9	- 1.9	0
Operation and Maintenance (O&M)	237.5	-134.0	103.5
Total FY 82 Base-Year \$	1,427.0	+319.7	1,746.7
Escalation			
Development (RDT&E)	132.3	+122.6	254.8
Procurement	223.8	+49.5	273.3
MILCON	.5	- .5	0
Operation and Maintenance (O&M)	73.4	-42.2	31.2
Total Then - Year \$	\$1,857.0	+\$449.0	\$2,306.0
b. Quantities —			
Development (RDT&E)	1	-	1
Procurement	34	-	34
Total	35	-	35

11. Program Acquisition Cost (Current Estimate in Millions of Dollars) (Cont'd):

c. Unit Cost --

Procurement: N/A

Program:

FY 82 Base-Year \$	40.771	+9.135	49.906
Then-Year \$	53.057	+12.829	65.886

d. Approved Design to Cost Goal -- Office of the Assistant Secretary of Defense for Acquisition and Logistics approved a request for waiver from Design to Cost by memorandum dated 12 Nov 1985. The waiver was granted because the program intends to purchase off-the-shelf commercial equipment in lieu of Design for Production equipment.

e. Foreign Military Sales -- A letter of Offer & Acceptance was signed with SHAPE for \$837K for common user equipment. Since common user equipment contract is fixed price, this sale did not affect the price of equipment to U.S. Government users.

f. Nuclear Costs -- None

* Stratification of procurement dollars will be made in future SAR submissions.

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est	UCR Baseline	UCR Baseline
	(Dec 86 SAR)	(Dec 85 SAR)	(Dec 86 SAR)
a. Program Acquisition --			
(1) Cost	2,306.0	2,152.5	2,306.0
(2) Quantity	35	35	35
(3) Unit Cost 1/	65.886	61.500	65.886
b. Current Procurement -- 2/ (FY 1987)		(FY 1987)	(FY 1988)
N/A			

1/ Identification of Level I host sites, as a unit of measure for Unit Cost Reporting carries with it the recognition that the total program costs divided by these sites will not yield a stable baseline since this program does not lend itself to the establishment of a true unit cost. Additionally, the number and the configuration of sites will vary with each Service and Agency acquisition strategy/funding policy.

2/ The WIS unit will be incrementally fielded over several years (consistent with Block schedule/capability approved through the DSARC process); however, the ultimate operational performance expected by the thirty-four Level I host sites will be the results of the aggregate capabilities achieved during development of all Blocks -- it is for this reason that quantity data is reported in total rather than incrementally phased by fiscal year. A Current Procurement Unit Cost (CPUC) is therefore determined not appropriate.

13. Cost Variance Analysis: WIS Total Program

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDTE	PROC	MILCON	O&M	TOTAL
Planning/Dev Estimate	677.6	866.1	2.4	310.9	1857.0
Previous Changes:					
Economic	-20.5	-36.2	-	-10.9	-67.6
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	+30.9	-	-	-	+30.9
Estimating	+392.2	-26.0	-	-156.9	+209.3
Other	-	-	-	-	-
Support	-	-	-2.4	-	-2.4
Subtotal	+402.6	-62.2	-2.4	-167.8	+170.2
Current Changes:					
Economic	-133.2	-6.6	-	-7.4	-147.2
Quantity	-	-	-	-	-
Schedule	+22.4	-	-	-	+22.4
Engineering	-	-	-	-	-
Estimating	+183.0	+221.6	-	-7.0	+397.6
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+72.2	+215.0	0	-8.4	+278.8
Total Changes	+474.8	+152.8	-2.4	-176.2	+449.0
Current Estimate	1152.4	1018.9	0	134.7	2306.0

13. Cost Variance Analysis: WIS Total Program (Cont'd)
(FY 82 Constant (Base Year) Dollars in Millions)

	RDT&E	PRDC	MILCON	O&M	TOTAL
Planning/Dev Estimate	545.3	642.3	1.9	237.5	1427.0
Previous Changes:					
Economic	-	-	-	-	-
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	+25.7	-	-	-	+25.7
Estimating	+282.9	-50.1	-	-128.2	+104.6
Other	-	-	-	-	-
Support	-	-	-1.9	-	-1.9
Subtotal	+308.6	-50.1	-1.9	-128.2	+128.4
Current Changes:					
Economic	-	-	-	-	-
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+43.7	+153.4	-	-5.8	+191.3
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+43.7	+153.4	-	-5.8	+191.3
Total Changes	+352.3	+103.3	-1.9	-134.0	+319.7
Current Estimate	897.6	745.6	0	103.5	1746.7

13. Cost Variance Analysis: MIS Total Program (Cont'd)

b. Previous Change Explanations --

RD&E

Economic: Revised OSD inflation indices
Engineering: Support of Ada foundation effort, and product improvement into applications software
Estimating: Reclassification/Transfer of funds from Operation and Maintenance, and Other Procurement; additional year of cost added to the 5-year FYDP period; increased programmed dollars for Joint Operations Planning and Execution System (JOPEs), National Military Command System Information System (NIS), Automated Message Handling (AMH); Required Operational Capabilities (RDCs) due to finalization of requirements; reprogramming of additional dollars to support planning start up of AFMIS program office; initial identification of "Balance to Complete" funding requirement; adjustment for difference between FY86 President's Budget and required funding; prorata shared Tri-service RD&E Funding directed by Sep 85 SDDM; and additional funding in support of command unique requirements. Gramm-Rudman and other miscellaneous across-the-board reductions.

PROCUREMENT

Economic: Revised OSD inflation indices
Estimating: Appropriation transfer of funds to RD&E; additional year of cost added to the 5 year FYDP period; initial identification of "Balance to Complete" fund requirement; adjustment for difference between FY86 President's Budget and required funding; and reduction due to a smaller complement of equipment at WIS Sites in order to meet affordability constraints. Deletion of Worldwide Technology Communications Improvement Program costs inadvertently included in WIS reporting Gramm-Rudman and other miscellaneous across-the-board reductions.

D & M

Economic: Revised OSD inflation indices
Estimating: Appropriation transfer of funds to RD&E; additional year of cost added to the 5-year FYDP period; adjustment for difference between FY86 President's Budget and required funding; and refinement and rephrasing of estimate to align program with FY87 President's Budget. Deletion of maintenance costs contained in PE33151F and deletion of Air Force Command Unique software modernization costs (separate from WIS) found in PE's 11310F, 27414F, 27415F and 27416F.

MILCON

Support: Funding deleted due to reduced support requirements.

(Dollars in Millions)
Base-Year\$ Then-Year\$

(1) <u>RDT&E</u>		
Revised OSD inflation indices (Economic)	-	-133.2
Deputy Secretary of Defense decision to delay deployment and acquisition by one year slip in the schedule due to current funding constraints. (Schedule)	-	+22.4
Previous funding cuts added to outyears to meet requirements (Estimating)	+43.7	+183.0
(2) <u>PROCUREMENT</u>		
Revised OSD inflation indices (Economic)	-	-6.6
Previous funding cuts added to outyears to meet requirements (Estimating)	+153.4	+221.6
(3) <u>OPERATIONAL and MAINTENANCE</u>		
Revised OSD inflation indices (Economic)	-	-1.4
Miscellaneous across-the-board reductions (Estimating)	-5.8	-7.0

Planning/Development Estimate: Fiscal Year 1985 President's Budget;
and SDDM, dated September 11, 1985, subject "Decision Memorandum on the
World-Wide Military Command and Control System (WMCCS) Information System
(WIS), Block A."

13. Cost Variance Analysis: Block A

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RD&E	PROC	MILCON	O&M	TOTAL
Development Estimate	309.2	457.4	0	0	766.6
Previous Changes:					
Economic	-2.6	-11.3	-	-	-13.9
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-14.9	-128.0	-	-	-142.9
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	-17.5	-139.3	0	0	-156.8
Current Changes:					
Economic	-2.9	-4.6	-	-	-7.5
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+3.5	+129.1	-	-	+129.6
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	-2.4	+124.5	0	0	+122.1
Total Changes	-19.9	-14.8	0	0	- 34.7
Current Estimate:	289.3	442.6	0	0	731.9

13. Cost Variance Analysis: Block A (Cont'd)
 (FY B2 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	254.3	334.7	0	0	589.0
Previous Changes:					
Economic	-	-	-	-	-
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-14.6	-95.3	-	-	-109.9
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	-14.6	-95.3	0	0	-109.9
Current Changes:					
Economic	-	-	-	-	-
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-	+92.6	-	-	+92.6
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	0	+92.6	0	0	+92.6
Total Changes	-14.6	-2.7	0	0	-17.3
Current Estimate	239.7	332.0	0	0	571.7

13. Cost Variance Analysis: Block A (Cont'd)

b. Previous Change Explanations —

RD&E

Economic: Revised economic escalation indices.

Estimating: Program related inflationary change (PRC) resulting from rephasing of approved funding. Reclassification of \$15.0M (14.6M BY) of program Pre-FSED costs inadvertently included as Block A costs.

PROCUREMENT

Economic: Revised economic escalation indices.

Estimating: Adjustment of cost estimate based upon better requirement definition, and Program Element Code realignment. Reclassification of prior year Block A costs to reflect actual use.

c. Current Change Explanations —

(Dollars in Millions)
Base Year \$ Then Year \$

(1) RD&E

Revised DSD inflation indices (Economic) - -2.9

Previous funding cuts added to outyears
to meet requirements (Estimating) - +.5

(2) PROCUREMENT

Revised DSD inflation indices (Economic) - -4.5

Previous funding cuts added to outyears
to meet requirements (Estimating) +92.5 +129.1

WMCCS Information System, December 31, 1986

13. Cost Variance Analysis: Blocks B and C (Cont'd)
(Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Planning Estimate	368.4	408.7	2.4	310.9	1090.4
Previous Changes:					
Economic	-17.9	-24.9	-	-10.9	-53.7
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	+30.9	-	-	-	+30.9
Estimating	+407.1	+102.0	-	-156.9	+352.2
Other	-	-	-	-	-
Support	-	-	-2.4	-	-2.4
Subtotal	+420.1	+77.1	-2.4	-167.8	+327.0
Current Changes:					
Economic	-130.3	-2.0	-	-1.4	-133.7
Quantity	-	-	-	-	-
Schedule	+22.4	-	-	-	+22.4
Engineering	-	-	-	-	-
Estimating	+182.5	+92.5	-	-7.0	+268.0
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+74.6	+90.5	0	-8.4	+156.9
Total Changes	+494.7	+167.6	-2.4	-176.2	+483.7
Current Estimate	863.1	576.3	0	134.7	1574.1

13. Cost Variance Analysis: Blocks B and C (Cont'd)
(FY 82 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Planning Estimate	291.0	307.6	1.9	237.5	838.0
Previous Changes:					
Economic	-	-	-	-	-
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	+25.7	-	-	-	+25.7
Estimating	+297.5	+ 45.2	-	-128.2	+214.5
Other	-	-	-	-	-
Support	-	-	-1.9	-	-1.9
Subtotal	+323.2	+45.2	-1.9	-128.2	+238.3
Current Changes:					
Economic	-	-	-	-	-
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+43.7	+60.8	-	-5.8	+98.7
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+43.7	+60.8	0	-5.8	+98.7
Total Changes	+366.9	+106.0	-1.9	-134.0	+337.0
Current Estimate	657.9	413.6	0	103.5	1175.0

b. Previous Change Explanations ---

RDTE

Economic: Revised OSD inflation indices
Engineering: Support of Ada foundation effort, and product improvement into applications software
Estimating: Reclassification/Transfer of funds from Operation and Maintenance, and Other Procurement; additional year of cost added to the 5-year FYDP period; increased programmed dollars for Joint Operations Planning and Execution System (JOPEX), National Military Command System Information System (NIS), Automated Message Handling (AMH); Required Operational Capabilities (ROCs) due to finalization of requirements; reprogramming of additional dollars to support planning start up of AFMIS program office; initial identification of "Balance to Complete" funding requirement; adjustment for difference between FY86 President's Budget and required funding; Prorata shared Tri-service RDTE funding directed by Sep 85 SDDM; additional funding in support of command unique requirements, Gramm-Rudman and other miscellaneous across-the-board reductions. Reclassification of \$15.0M (14.6M) of Program FSED costs inadvertently included as Block A costs.

PROCUREMENT

Economic: Revised OSD inflation indices
Estimating: Appropriation transfer of funds to RDTE; additional year of cost added to the 5 year FYDP period; initial identification of "Balance to Complete" fund requirement; adjustment for difference between FY86 President's Budget and required funding; Reduction due to a smaller complement of equipment at MIS Sites in order to meet affordability constraints. Deletion of Worldwide Technology Communications Improvement Program costs inadvertently included in MIS reporting. Gramm-Rudman and other across-the-board reductions and reclassification of prior year Block A costs to reflect actual use.

O & M

Economic: Revised OSD inflation indices
Estimating: Appropriation transfer of funds to RDTE; additional year of cost added to the 5-year FYDP period; adjustment for difference between FY86 President's Budget and required funding; Refinement and rephasing of estimate to align program with FY87 President's Budget. Deletion of maintenance costs contained in PE 33151F and deletion of Air Force Command unique software modernization costs (separate from MIS) found in PE's 11310F, 27414F, 27415 and 27416F.

MILCON

Support: Funding deleted owing to reduced support requirements.

19. Cost Variance Analysis: Blocks B and C (Cont'd)

c. Current Change Explanations --

		(Dollars in Millions)	
		Base Year \$	Then Year \$
(1) <u>RD&E</u>			
Revised OSD inflation indices (Economic)		-	-130.3
Deputy Secretary of Defense decision to delay deployment and acquisition by one year slip in the schedule due to current funding constraints. (Schedule)		-	+22.4
Previous funding cuts added to outyears to meet requirements (Estimating)		+43.7	+182.5

(2) PROCUREMENT

Revised OSD inflation indices (Economic)		-	-2.0
Previous funding cuts added to outyears to meet requirements (Estimating)		+50.8	+92.5

(3) OPERATIONAL and MAINTENANCE

Revised OSD inflation indices (Economic)		-	-1.4
Miscellaneous across-the-board reductions (Estimating)		-5.8	-7.0

- d. References -- Planning Estimate: Fiscal Year 1985 President's Budget; and SDDM, dated September 11, 1985 subject "Decision Memorandum on the World-Wide Military Command and Control System (WMCCS) Information System (WIS), Block A."

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

a. Initial SAR Planning Estimate (PE) to the Planning/Development Estimate

PAUC (Initial SAR Est) 31 Dec 83	Changes (Then-Year Dollars in Millions)								PAUC (Plan/Dev Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
N/A 1/	--	--	--	--	--	--	--	--	53.057

b. Planning/Development Estimate (PE/DE) to the Current Estimate (CE)

PAUC (Plan/Dev Estimate)	Changes (Then-Year Dollars in Millions)								PAUC (Current Estimate)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
53.057	-5.965	--	+0.640	+883	+17.340	-.069	--	+12.829	65.886

1/ The appropriateness of defining a WIS unit was undetermined as of the 31 December 1983 SAR submission. The Program Acquisition Unit Cost (PAUC) baseline was established by the 30 Sep 85 SAR submission.

15. Contract Information: (Then-Year Dollars in Millions) *

a. RDT&E —

<u>System Integration</u>	<u>Initial Contract Price</u>	<u>Target Price</u>	<u>Ceiling</u>	<u>Qty</u>
General Telephone & Electronics Corp (GTE)	\$104.4	\$118.6	N/A	
Strategic Systems Division				
Billerica, MA				
F19628-86-C-0053, FPIF				
Award: July 30, 1986				
Definitized: July 30, 1986				

<u>Current Contract Price</u>	<u>Estimated Price At Completion</u>
<u>Target</u> <u>Ceiling</u> <u>Qty</u>	<u>Contractor</u> <u>Program Manager</u>
\$104.4 \$118.6 N/A	\$104.4 \$117.0
	<u>Cost Variance</u> <u>Schedule</u>
<u>Variance</u>	
Initial Variances (10/31/86)	\$+0.4 \$-1.0

Explanation of Variance: GTE's unfavorable schedule variance was due to delays in the integration and test portion of the LAN Implementation, availability of Tempest Units for evaluation and prototype software for testing. The favorable cost variance because the Program Manager had a year-to-date adjustment of the computer charge out rate.

b. Procurement —

<u>System Integration</u>	<u>Initial Contract Price</u>		
	<u>Target Price</u>	<u>Ceiling</u>	<u>Qty</u>
International Business Machines Corp (IBM) Federal Systems Division F1928-B4-C-0159, FFP Award: October 5, 1984 Definitized: October 5, 1984	N/A	N/A	1/
	<u>Current Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	
	N/A	N/A	1/
	<u>Estimated Price At Completion</u>		
	<u>Contractor</u>	<u>Program Manager</u>	
	N/A	N/A	

1/ This is a firm-fixed price contract with provisions for indefinite quantity and schedule - no cost/schedule performance reporting required.

* Previously reported contracts no longer meet the minimum \$40 million requirement to be identified as a major contract.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status —

- (1) Percent Program Completed: 50% (6 years/12 years)
- (2) Percent Program Cost Appropriated: 23.2% (\$536.1/\$2307.2)

b. Appropriation Summary — (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Budget</u>		<u>Balance To Complete</u>		<u>Total</u>
	<u>Prior Yrs</u>	<u>Year</u>	<u>FYDP</u>	<u>Beyond FYDP</u>	
	<u>(FY82-87)</u>	<u>(FY88)</u>	<u>(FY89-92)</u>	<u>(FY93)</u>	
RDT&E	392.5	127.3	580.4	52.2	1152.4
Procurement	117.7	107.6	768.0	25.6	1018.9
O&M	25.8	20.8	88.1	-	134.7
Total	536.0	255.7	1437.5	78.8	2306.0

16. Program Funding Summary (Cont'd) : (Current Estimate in Millions of Dollars)

c. Annual Summary --
PROGRAM: WIS TOTAL PROGRAM

AS OF DATE: December 31, 1986
BASE-YEAR: FY 1982

FISCAL YEAR	BASE-YEAR DOLLARS				THEN-YEAR DOLLARS			ESCALATION RATE (%)
	QTY	FLYAWAY		TOTAL	ADV PROCUREMENT		TOTAL	
		NONREC	REC		DEBIT	CREDIT		

APPROPRIATION: RDT&E

1982	-	-	-	13.7	-	-	14.0	9.2
1983	-	-	-	16.6	-	-	17.8	4.9
1984	-	-	-	41.8	-	-	46.5	3.8
1985	-	-	-	61.3	-	-	70.4	3.4
1986	-	-	-	85.0	-	-	100.6	2.9
1987	-	-	-	117.1	-	-	143.2	3.1
1988	-	-	-	100.6	-	-	127.3	3.5
1989	-	-	-	101.8	-	-	133.1	3.5
1990	-	-	-	112.0	-	-	151.0	3.3
1991	-	-	-	109.7	-	-	151.9	2.9
1992	-	-	-	102.0	-	-	144.4	2.4
1993	-	-	-	36.0	-	-	52.2	2.4
SUBTOTAL	1	0	0	897.6	0	0	1152.4	-

APPROPRIATION: PROCUREMENT

1983	-	-	-	.4	-	-	.5	4.9
1984	-	-	-	.1	-	-	.1	3.8
1985	-	-	-	16.5	-	-	18.4	3.4
1986	-	-	-	22.3	-	-	27.2	2.9
1987	-	-	-	56.8	-	-	71.5	3.1
1988	-	-	-	82.7	-	-	107.6	3.5
1989	-	-	-	109.8	-	-	147.2	3.5
1990	-	-	-	137.5	-	-	189.4	3.3
1991	-	-	-	150.3	-	-	212.0	2.9
1992	-	-	-	151.8	-	-	219.4	2.4
1993	-	-	-	17.4	-	-	25.6	2.4
SUBTOTAL	34	0	0	745.6	0	0	1018.9	-

APPROPRIATION: O&M

1986	-	-	-	8.3	-	-	9.8	2.9
1987	-	-	-	13.2	-	-	16.0	3.1
1988	-	-	-	16.5	-	-	20.8	3.5
1989	-	-	-	21.0	-	-	27.3	3.5
1990	-	-	-	14.0	-	-	18.7	3.3
1991	-	-	-	27.3	-	-	37.5	2.9
1992	-	-	-	3.2	-	-	4.6	2.4
1993	-	-	-	-	-	-	-	2.4
SUBTOTAL	0	0	0	103.5	0	0	134.7	-
TOTAL	35	0	0	1746.7	0	0	2306.0	-

16. Program Funding Summary (Cont'd) : (Current Estimate in Millions of Dollars)

c. Annual Summary --
BLOCK A

AS OF DATE: December 31, 1986
BASE-YEAR: FY 1982

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESCALATION RATE (%)
		FLYAWAY		TOTAL	ADV PROCUREMENT		TOTAL	
		NONREC	REC		DEBIT	CREDIT		

APPROPRIATION: RDT&E

1984	-	-	-	7.2	-	-	8.0	3.8
1985	-	-	-	37.7	-	-	43.3	3.4
1986	-	-	-	66.7	-	-	79.0	2.9
1987	-	-	-	81.5	-	-	99.7	3.1
1988	-	-	-	36.7	-	-	46.4	3.5
1989	-	-	-	9.9	-	-	12.9	3.5
1990	-	-	-	-	-	-	-	3.3
1991	-	-	-	-	-	-	-	2.9
1992	-	-	-	-	-	-	-	2.4
1993	-	-	-	-	-	-	-	2.4
SUBTOTAL	1	0	0	239.7	0	0	289.3	-

APPROPRIATION: PROCUREMENT

1985	-	-	-	.4	-	-	.4	3.4
1986	-	-	-	20.9	-	-	25.5	2.9
1987	-	-	-	44.2	-	-	55.6	3.1
1988	-	-	-	79.9	-	-	104.0	3.5
1989	-	-	-	80.4	-	-	107.8	3.5
1990	-	-	-	45.3	-	-	62.4	3.3
1991	-	-	-	33.8	-	-	47.7	2.9
1992	-	-	-	27.1	-	-	39.2	2.4
1993	-	-	-	-	-	-	-	2.4
SUBTOTAL	34	0	0	332.0	0	0	442.6	-
TOTAL	35	0	0	571.7	0	0	731.9	-

16. Program Funding Summary (Cont'd) : (Current Estimate in Millions of Dollars)c. Annual Summary --
BLOCKS B & CAS OF DATE: December 31, 1986
BASE-YEAR: FY 1982

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESCALATION RATE (%)
		FLYAWAY		TOTAL	ADV PROCUREMENT		TOTAL	
		NONREC	REC		DEBIT	CREDIT		

APPROPRIATION: RDT&E

1982	-	-	-	13.7	-	-	14.0	9.2
1983	-	-	-	16.6	-	-	17.8	4.9
1984	-	-	-	34.6	-	-	38.5	3.8
1985	-	-	-	23.6	-	-	27.1	3.4
1986	-	-	-	18.3	-	-	21.6	2.9
1987	-	-	-	35.6	-	-	43.5	3.1
1988	-	-	-	63.9	-	-	80.9	3.5
1989	-	-	-	91.9	-	-	120.2	3.5
1990	-	-	-	112.0	-	-	151.0	3.3
1991	-	-	-	109.7	-	-	151.9	2.9
1992	-	-	-	102.0	-	-	144.4	2.4
1993	-	-	-	36.0	-	-	52.2	2.4
SUBTOTAL	1	0	0	657.9	0	0	863.1	-

APPROPRIATION: PROCUREMENT

1983	-	-	-	.4	-	-	.5	4.9
1984	-	-	-	.1	-	-	.1	3.8
1985	-	-	-	16.1	-	-	18.0	3.4
1986	-	-	-	1.4	-	-	1.7	2.9
1987	-	-	-	12.6	-	-	15.9	3.1
1988	-	-	-	2.8	-	-	3.6	3.5
1989	-	-	-	29.5	-	-	39.4	3.5
1990	-	-	-	92.2	-	-	127.0	3.3
1991	-	-	-	116.5	-	-	164.3	2.9
1992	-	-	-	124.7	-	-	180.2	2.4
1993	-	-	-	17.4	-	-	25.6	2.4
SUBTOTAL	34	0	0	413.6	0	0	576.3	-

APPROPRIATION: O&M

1986	-	-	-	8.3	-	-	9.8	2.9
1987	-	-	-	13.2	-	-	16.0	3.1
1988	-	-	-	16.5	-	-	20.8	3.5
1989	-	-	-	21.0	-	-	27.3	3.5
1990	-	-	-	14.0	-	-	18.7	3.3
1991	-	-	-	27.3	-	-	37.5	2.9
1992	-	-	-	3.2	-	-	4.6	2.4
1993	-	-	-	-	-	-	-	2.4
SUBTOTAL	0	0	0	103.5	0	0	134.7	-
TOTAL	35	0	0	1175.0	0	0	1574.1	-

16. Program Funding Summary (Cont'd) : (Current Estimate in Millions of Dollars)

c. Annual Summary --
PROGRAM: WIS - ARMY

AS OF DATE: December 31, 1985
BASE-YEAR: FY 1982

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESCALATION RATE (%)
		FLYAWAY		TOTAL	ADV PROCUREMENT			
		NONREC	REC		DEBIT	CREDIT	TOTAL	

APPROPRIATION: RDT&E

1984	-	-	-	11.9	-	-	13.2	3.8
1985	-	-	-	18.6	-	-	21.3	3.4
1986	-	-	-	21.8	-	-	25.8	2.9
1987	-	-	-	23.3	-	-	28.5	3.1
1988	-	-	-	25.2	-	-	31.9	3.5
1989	-	-	-	23.5	-	-	30.7	3.5
1990	-	-	-	33.8	-	-	45.5	3.3
1991	-	-	-	32.3	-	-	44.7	2.9
1992	-	-	-	27.9	-	-	39.5	2.4
1993	-	-	-	17.2	-	-	25.0	2.4
SUBTOTAL	0	0	0	235.5	0	0	306.1	-

APPROPRIATION: PROCUREMENT

1983	-	-	-	.4	-	-	.5	4.9
1984	-	-	-	.1	-	-	.1	3.8
1985	-	-	-	12.7	-	-	14.2	3.4
1986	-	-	-	5.6	-	-	6.8	2.9
1987	-	-	-	27.9	-	-	35.1	3.1
1988	-	-	-	17.9	-	-	23.3	3.5
1989	-	-	-	32.6	-	-	43.7	3.5
1990	-	-	-	47.2	-	-	65.0	3.3
1991	-	-	-	48.6	-	-	68.6	2.9
1992	-	-	-	69.6	-	-	100.5	2.4
1993	-	-	-	16.9	-	-	25.0	2.4
SUBTOTAL	8	0	0	279.5	0	0	382.8	-
TOTAL	8	0	0	515.0	0	0	688.9	-

16. Program Funding Summary (Cont'd) : (Current Estimate in Millions of Dollars)

c. Annual Summary —

PROGRAM: MIS - NAVY *

AS OF DATE: December 31, 1986

BASE-YEAR: FY 1982

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESCALATION RATE (%)
		FLYAWAY		TOTAL	ADV PROCUREMENT		TOTAL	
		NONREC	REC		DEBIT	CREDIT		

APPROPRIATION: RDT&E

1984	-	-	-	7.4	-	-	8.3	3.8
1985	-	-	-	12.2	-	-	14.0	3.4
1986	-	-	-	11.9	-	-	14.1	2.9
1987	-	-	-	10.0	-	-	12.2	3.1
1988	-	-	-	6.8	-	-	8.6	3.5
1989	-	-	-	4.4	-	-	5.8	3.5
1990	-	-	-	5.7	-	-	7.7	3.3
1991	-	-	-	4.8	-	-	6.6	2.9
1992	-	-	-	4.7	-	-	6.6	2.4
1993	-	-	-	-	-	-	-	2.4
SUBTOTAL	0	0	0	67.9	0	0	83.9	-

APPROPRIATION: PROCUREMENT

1987	-	-	-	3.1	-	-	3.9	3.1
1988	-	-	-	13.0	-	-	16.9	3.5
1989	-	-	-	20.1	-	-	27.0	3.5
1990	-	-	-	22.6	-	-	31.1	3.3
1991	-	-	-	28.4	-	-	40.1	2.9
1992	-	-	-	24.7	-	-	35.6	2.4
1993	-	-	-	-	-	-	-	2.4
SUBTOTAL	8	0	0	111.9	0	0	154.6	-
TOTAL	8	0	0	179.8	0	0	238.5	-

*The Navy has other programs to complete the cost of modernizing the functions currently on WMCCS ADP; these costs are excluded.

16. Program Funding Summary (Cont'd) : (Current Estimate in Millions of Dollars)

c. Annual Summary --

PROGRAM: WIS - AIR FORCE *

AS OF DATE: December 31, 1986

BASE-YEAR: FY 1982

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESCALATION RATE (%)
		FLYAWAY		TOTAL	ADV PROCUREMENT		TOTAL	
		NONREC	REC		DEBIT	CREDIT		

APPROPRIATION: RDT&E

1983	-	-	-	4.6	-	-	5.0	4.9
1984	-	-	-	22.5	-	-	25.0	3.8
1985	-	-	-	30.5	-	-	35.1	3.4
1986	-	-	-	51.3	-	-	60.7	2.9
1987	-	-	-	83.8	-	-	102.5	3.1
1988	-	-	-	68.6	-	-	86.8	3.5
1989	-	-	-	73.9	-	-	96.6	3.5
1990	-	-	-	72.7	-	-	97.8	3.3
1991	-	-	-	72.6	-	-	100.6	2.9
1992	-	-	-	69.4	-	-	98.3	2.4
1993	-	-	-	18.8	-	-	27.2	2.4
SUBTOTAL	1	0	0	568.6	0	0	735.6	-

APPROPRIATION: PROCUREMENT

1985	-	-	-	2.2	-	-	2.5	3.4
1986	-	-	-	9.2	-	-	11.2	2.9
1987	-	-	-	24.5	-	-	30.8	3.1
1988	-	-	-	34.6	-	-	45.0	3.5
1989	-	-	-	41.7	-	-	55.9	3.5
1990	-	-	-	52.4	-	-	72.1	3.3
1991	-	-	-	55.6	-	-	78.4	2.9
1992	-	-	-	53.7	-	-	77.6	2.4
1993	-	-	-	-	-	-	-	2.4
SUBTOTAL	14	0	0	273.8	0	0	373.5	-

APPROPRIATION: O&M

1986	-	-	-	8.3	-	-	9.8	2.9
1987	-	-	-	12.8	-	-	15.6	3.1
1988	-	-	-	15.6	-	-	19.6	3.5
1989	-	-	-	19.5	-	-	25.3	3.5
1990	-	-	-	13.3	-	-	17.8	3.3
1991	-	-	-	26.4	-	-	36.3	2.9
1992	-	-	-	2.3	-	-	3.2	2.4
1993	-	-	-	-	-	-	-	2.4
SUBTOTAL	0	0	0	98.2	0	0	127.6	-
TOTAL	15	0	0	940.6	0	0	1236.7	-

* The Air Force has other programs to complete the cost of modernizing the functions currently on WMCCS ADP; these costs are excluded.

16. Program Funding Summary (Cont'd) : (Current Estimate in Millions of Dollars)

c. Annual Summary --

PROGRAM: WIS - MARINE CORPS

AS OF DATE: December 31, 1986

BASE-YEAR: FY 1982

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESCALATION RATE (%)
		FLYAWAY		TOTAL	ADV PROCUREMENT		TOTAL	
		NONREC	REC		DEBIT	CREDIT		
APPROPRIATION: PROCUREMENT								
1985	-	-	-	.3	-	-	.3	3.4
1986	-	-	-	.2	-	-	.2	2.9
1987	-	-	-	.2	-	-	.2	3.1
1988	-	-	-	.2	-	-	.2	3.5
1989	-	-	-	.1	-	-	.2	3.5
1990	-	-	-	.1	-	-	.2	3.3
1991	-	-	-	.1	-	-	.2	2.9
1992	-	-	-	.1	-	-	.2	2.4
1993	-	-	-	.4	-	-	.6	2.4
TOTAL	0	0	0	1.7	0	0	2.3	-

16. Program Funding Summary (Cont'd) : (Current Estimate in Millions of Dollars)
c. Annual Summary --
PROGRAM: MIS - DCA
AS OF DATE: December 31, 1986
BASE-YEAR: FY 1982

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESCALATION RATE (%)
		FLYAWAY		TOTAL	ADV PROCUREMENT		TOTAL	
		NONREC	REC		DEBIT	CREDIT		

APPROPRIATION: RDT&E

1982	-	-	-	13.7	-	-	14.0	9.2
1983	-	-	-	12.0	-	-	12.8	4.9
SUBTOTAL	0	0	0	25.7	0	0	26.8	-

APPROPRIATION: PROCUREMENT

1985	-	-	-	1.3	-	-	1.4	3.4
1986	-	-	-	6.2	-	-	7.6	2.9
1987	-	-	-	1.0	-	-	1.3	3.1
1988	-	-	-	15.6	-	-	20.3	3.5
1989	-	-	-	14.1	-	-	18.9	3.5
1990	-	-	-	15.3	-	-	21.0	3.3
1991	-	-	-	12.7	-	-	17.9	2.9
1992	-	-	-	1.8	-	-	2.6	2.4
1993	-	-	-	-	-	-	-	2.4
SUBTOTAL	3	0	0	68.0	0	0	91.0	-
TOTAL	3	0	0	93.7	0	0	117.8	-

16. Program Funding Summary (Cont'd) : (Current Estimate in Millions of Dollars)

c. Annual Summary —

PROGRAM: WTS - DNA

AS OF DATE: December 31, 1986

BASE-YEAR: FY 1982

FISCAL YEAR	QTY	BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESCALATION RATE (%)
		FLYAWAY		TOTAL	ADV PROCUREMENT		TOTAL	
		NONREC	REC		DEBIT	CREDIT		

APPROPRIATION: PROCUREMENT

1986	-	-	-	1.1	-	-	1.4	2.9
1987	-	-	-	.2	-	-	.3	3.1
1988	-	-	-	1.5	-	-	1.9	3.5
1989	-	-	-	1.1	-	-	1.5	3.5
1990	-	-	-	-	-	-	-	3.3
1991	-	-	-	4.8	-	-	6.8	2.9
1992	-	-	-	2.0	-	-	2.8	2.4
1993	-	-	-	-	-	-	-	2.4
SUBTOTAL	1	0	0	10.7	0	0	14.7	-

APPROPRIATION: O&M

1987	-	-	-	.3	-	-	.4	3.1
1988	-	-	-	1.0	-	-	1.2	3.5
1989	-	-	-	1.5	-	-	2.0	3.5
1990	-	-	-	.7	-	-	.9	3.3
1991	-	-	-	.9	-	-	1.2	2.9
1992	-	-	-	1.0	-	-	1.4	2.4
1993	-	-	-	-	-	-	-	2.4
SUBTOTAL	0	0	0	5.4	0	0	7.1	-
TOTAL	1	0	0	16.1	0	0	21.8	-

16. Program Funding Summary (Cont'd)

d. Obligations and Expenditures --

AS OF DATE: December 31, 1986
BASE YEAR: FY 1982

FISCAL YEAR	THEN-YEAR DOLLARS (CURRENT ESTIMATE IN MILLIONS)		
	TOTAL	OBLIGATED	EXPENDED

APPROPRIATION: RD&E

1982	14.0	14.0	14.0
1983	17.8	17.8	16.7
1984	46.5	46.5	45.9
1985	70.4	70.3	45.5
1986	100.6	96.0	54.2
1987	143.2	6.8	1.3
To Complete	760.1	N/A	N/A
Total	1152.6	251.4	177.6

APPROPRIATION: PROCUREMENT

1983	.5	.5	.5
1984	.1	.1	.1
1985	18.4	7.5	2.8
1986	27.2	18.2	13.9
1987	71.6	2.6	0
To Complete	902.1	N/A	N/A
Total	1019.9	28.9	17.3

APPROPRIATION: O&M

1986	9.8	9.8	9.8
1987	16.0	0	0
To Complete	108.9	N/A	N/A
Total	134.7	9.8	9.8

17. Production Rate Data: N/A

18. Operating and Support Costs: N/A

~~CONFIDENTIAL~~SELECTED ACQUISITION REPORT (ECS: DD-COMP(Q&A)823)

PROGRAM: PHALANX CIWS

AS OF DATE: December 31, 1986

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CLEARED
FOR OPEN PUBLICATION
MAR 03 1987
AS AMENDED 22
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): MK 15/Close-In Weapon System (PHALANX CIWS)

2. DoD Component: Department of the Navy

3. Responsible Office and Telephone Number:

PHALANX Close-In Weapon System
Program Office (PMS 413)
Naval Sea Systems Command

PM: CAPT Paul Sovey, USN
ASSIGNED: February 14, 1984
AUTOVON: 222-7142

4. Program Elements/Procurement Line Items:

RDT&E: PE 64358N

WPN: 24229 Subhead 84E2

APPN 1507

ICN 4110

SCN: Ship Class: BB

PE: 24220N

APPN 1611

LSD/LHD

24411N

FFG

24224N

CG's & DDG's

24292N

CVN/CV SLEP

24112N

5. Related Programs: FFG-7, CG 47, LSD-41, LHD, DDG 51, CVN-70, and BB-61 Classes are SAR reportable related programs. CV-62, AE, AO, AO JUMBO, LPDX/LKDX, LPD SLEP, AOE-6, and 989 are related programs not included in other SARs.

Classified by OMAINST 35513.3
Declassify on: 31 December 1993

This Page is Unclassified

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PHALANX CIWS, December 31, 1986

6. Mission and Description: CIWS is designed as a fast reaction terminal defense against low-flying high speed anti-ship missiles penetrating outer Fleet defenses. CIWS is an automatic self-contained unit consisting of search and track radars, digitalized fire control system and a 20 MM M61A1 gun all mounted in a single above deck structure requiring minimum interface with other ship systems. CIWS automatically detects, evaluates, tracks, and engages threats and then returns to search mode ready to another target. Its operations sequence is as follows: the search radar detects and evaluates a potential target by comparing measured target parameters (speed and angle of approach) with data stored in the fire control computer. After the target is declared a threat, it is handed over to the track radar. The system begins firing a stream of projectiles timed so that the projectiles arrive in the vicinity of the target when the target reaches an optimum engagement range. Thereafter, the fire control radar compares the incoming target position with the centroid of the stream of projectiles and makes any corrections required to bring it onto the target. This system does not replace an existing major weapon system, but provides a close range self defense capability that is otherwise unavailable to the fleet.

7. Program Highlights:

a. Significant Historical Developments -- Five Expanded PHALANX Introduction Commitment (EPIC) flag level review panels have convened to improve introduction of PHALANX to the fleet. SECNAV directed acceleration of PHALANX installation in deploying ships was successfully conducted and continues. Spares support was smoothly transitioned to SPCC and ACIM sparing is being implemented. Comprehensive successful testing against real world ASM threats was conducted and results incorporated into the design. Present Configuration (Block 0) was not designed to meet high speed diving threats, and introduction of Block I configuration is necessary to meet these threats. CTE of PHALANX Block I was conducted during the final quarter of 1984. NTE and a comprehensive DT/OT were accomplished in the spring and summer of 1985. ALP for Block I production under the FY 1986 and FY 1987 Production contracts has been approved. There was a two month contract suspension of General Dynamics from 3 December 1985 to 2 February 1986. The CIWS Second Source study has been completed.

b. Significant Developments Since Last Report -- Authorization for Limited Production (ALP) has been granted for FY 1986 and FY 1987 contracts for 157 systems.

Second Source RFP was evaluated 15 September 1986 through 14 November 1986.

c. Changes Since "As Of" Date --

Best and Final evaluation to be conducted during 5 January through 30 January 1987 time frame, contract award expected in February 1987.

8. Decision Coordinating Paper (DCP) Threshold Breaches: None. DCP #88 Revision 1, approved 17 November 1977.

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PHALANX CIWS, December 31, 1986

9. Schedule:

a. Milestones --	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
Start Engineering Dev	Dec 70/Dec 70	Dec 70
Complete At-Sea Test #1 Prototype	Mar 74/Mar 74	Mar 74
Complete At-Sea Operational Test and Evaluation	Jul 77/Jul 77	Jul 77
DSARC III	Sep 77/Sep 77	Sep 77
Production Contract Award	Dec 77/Dec 77	Dec 77
Initial Operational Capability on CV-66 First Production Run	Feb 80/Feb 80	Feb 80
Block I Testing Began	Jun 80/Jun 80	Jun 80
Block I Approval for Limited Production	Jan 84/Dec 85	Dec 85

(b)(1)

b. Previous Change Explanations --

ALP Schedule slipped from Jan 1984 to Dec 1985 due to problems development including excessive TMI's, and TMCU loss of "Standby go" indication. Corrective action confirmed and tested.

c. Current Change Explanations --

(b)(1)

d. References --

Production Estimate: DCP #88, Rev 1, dated 17 Nov 1977.

Approved Program: PHALANX CIWS Acquisition Plan No. 31-87 dated 10 Nov 1986, approved 10 Nov 1986.

FY 1988 President's Budget.

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PHALANX CIWS, December 31, 1986

10. Technical/Operational Characteristics:

a. Technical --	<u>Prod Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(1)(U) Weight (lbs)	12,000/12,600	10,750	12,600
(2)(U) Deck Space (Including space required for operation)	224 sq ft/ 224 sq ft	224 sq ft	224 sq ft

b. Operational --

(b)(1)

(4)(U) Reliability (MTBF)			
High stress profile	60 hrs/40 hrs	71 hrs (188 hrs) ^{4/}	60 hrs
Low stress profile	120 hrs/not stated	not tested	120 hrs
(5)(U) Maintainability (MTTR)	2.2 hrs/3 hrs	2.73 hrs	2.2 hrs
(6)(U) Availability (inherent)			
High stress profile	.96/.93	.96 (.99) ^{5/}	.96
Low stress profile	.98/not stated	not tested	.98

(b)(1)

c. Previous Change Explanations --

(b)(1)

d. Current Change Explanations -- None.

(b)(1)

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e. References --

Production Estimate: DCP #88, Rev 1, dated 17 November 1977.

Approved Program: Test and Evaluation Master Plan No. 142 Rev 2 (Block 0)
dated 6 March 1980.

FY 1988 President's Budget

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost --	Production Estimate	Changes	Current Estimate
Development	\$ 154.8	\$ 105.6	\$ 260.4
Procurement	2021.4	417.4	2438.8
M61A1 Gun/Barrel	(22.5)	(- 0.6)	(21.9)
Weapons Group	(1518.0)	(43.9)	(1561.9)
Other (Proc Support)	(212.8)	(336.0)	(548.8)
TOTAL SAILAWAY	(1753.3)	(379.3)	(2132.6)
Peculiar Support	(45.3)	(2.8)	(48.1)
Initial Spares	(222.8)	(35.3)	(258.1)
Construction	-	-	-
Total: (Constant FY 84\$)	\$ 2176.2	\$ 523.0	\$ 2699.2
Escalation	305.5	-341.8	- 36.3
Development	(3.2)	(- 52.7)	(- 49.5)
Procurement	(302.3)	(-289.1)	(13.2)
Construction	-	-	-
Total Then-Year \$	\$ 2481.7	\$ 181.2	\$ 2662.9
b. Quantities --			
Development (RDT&E)	3	0	3
Procurement	617	+18	635
Total	620	18	638
c. Unit Cost --			
Procurement:			
FY 84 Base-Year \$	3.276	+0.565	3.841
Then-Year \$	3.766	+0.095	3.861
Program:			
FY 84 Base-Year \$	3.510	+0.721	4.231
Then-Year \$	4.003	+0.171	4.174

d. Approved Design to Cost Goal -- No design-to-cost goals apply to the CIWS program, as this program was initiated in 1966, prior to design-to-cost implementation.

e. Foreign Military Sales --

Australia:	6
Israel:	14
Japan:	29
Pakistan:	7
Taiwan:	7
United Kingdom:	17

f. Nuclear Costs -- None.

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PHALANX CIWS, December 31, 1986

12. Program Acquisition/Current Procurement Unit Cost Summary:
 (Current (Then-Year) Dollars in Millions)

	Current Year		Budget Year
	Current Estimate Dec 86 SAR	UCR Baseline Dec 85 SAR	UCR Baseline Dec 86 SAR
a. Program Acquisition --			
(1) Cost	2662.9	2496.1	2662.9
(2) Quantity	638	618	638
(3) Unit Cost	4.174	4.039	4.174
b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	161.2	161.2	115.5
Less CY Adv Proc	-	-	-
Plus PY Adv Proc	-	-	-
Net Total	161.2	161.2	115.5
(2) Quantity	36	36	23
(3) Unit Cost	4.478	4.478	5.022

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	158.0	2323.7	-	2481.7
Previous Changes:				
Economic	- 43.3	- 256.5	-	- 299.8
Quantity	-	- 12.3	-	- 12.3
Schedule	-	+ 15.5	-	+ 15.5
Engineering	-	+ 186.4	-	+ 186.4
Estimating	+ 83.7	+ 12.0	-	+ 95.7
Other	-	-	-	-
Support	-	+ 28.9	-	+ 28.9
Subtotal	+ 40.4	- 26.0	-	+ 14.4
Current Changes:				
Economic	- 0.6	- 42.5	-	- 43.1
Quantity	-	+ 71.6	-	+ 71.6
Schedule	-	+ 11.4	-	+ 11.4
Engineering	-	0.0	-	0.0
Estimating	+ 13.1	+ 86.3	-	+ 99.4
Other	-	-	-	-
Support	-	27.5	-	+ 27.5
Subtotal	12.5	154.3	-	166.8
Total Changes	52.9	128.3	-	181.2
Current Estimate	210.9	2452.0	-	2662.9

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13. Cost Variance Analysis:

(FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Baseline Estimate (PdE)	154.8	2021.4	-	2176.2
Previous Changes:				
Economic	-	-	-	-
Quantity	-	- 8.2	-	- 8.2
Schedule	-	-	-	-
Engineering	-	+ 147.3	-	+ 147.3
Estimating	+ 96.1	+ 112.0	-	+ 208.1
Other	-	-	-	-
Support	-	+ 15.7	-	+ 15.7
Subtotal	+ 96.1	+ 266.8	-	+ 362.9
Current Changes:				
Economic	-	-	-	-
Quantity	-	+ 53.2	-	+ 53.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+ 9.5	+ 75.6	-	+ 85.1
Other	-	-	-	-
Support	-	+ 21.8	-	+ 21.8
Subtotal	+ 9.5	+ 150.6	-	+ 160.1
Total Changes	+ 105.6	+ 417.4	-	+ 523.0
Current Estimate	+ 260.4	+2438.8	-	+2699.2

b. Previous Change Explanations --

RDT&E

Additional requirements to support OPEVAL, lethality enhancement, investigate advanced high velocity applications, improve ECM capability, and coordinate multi-mount and combat systems interfaces

Economic: Revised escalation rates
 Estimating: Revised cost estimates to improve capability to counter lower altitude, high velocity targets with smaller cross sections

PROCUREMENT

Economic: Revised escalation rates
 Quantity: Requirements for 8 additional WPN systems and reduce SCN units for net reduction of 1 unit
 Reduction of 2 units by NAVCOMPT FY 85- FY 87
 Schedule: SCN program stretchout due to planned addition of program years
 Addition of program year and production stretch out

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PHALANX CIWS, December 31, 1986

Engineering: Application of Block I upgrade consisting primarily of high search elevation angle radar and increased magazine capacity to fiscal year 1986 procurement

Estimating: Budget reductions require out-year hardware costs to be reduced
Additional requirements in configuration management and quality assurance

Support: Reduced support costs as result of lower procurement quantity requirements
Increased requirements in logistic support products

c. Current Change Explanations --

(1) <u>RD&E</u>	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised escalation rates (Economic)	N/A	- 0.6
Revised cost estimated to improve capability to counter lower altitude, high velocity targets with smaller cross sections (Estimating)	+ 9.5	+ 13.1
(2) <u>PROCUREMENT</u>		
Revised 1/87 escalation rates (Economic)	N/A	- 42.5
WPN increase of 3 systems and SCN increase of 17 systems for net increase of 20 (Quantity)	+ 53.2	+ 71.6
Schedule shift of WPN systems from FY 85-88 to FY 89-92 and SCN systems from FY 85 & 89 to FY 88, 90-92 (Schedule)	-	+ 11.4
Current hardware contracts have allowed revised out year hardware estimates. (Estimating)	+ 75.6	+ 86.3
Increase in support costs due to associated increase in quantity (Support)	+ 21.8	+ 27.5

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14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate -- N/A

b. Current Baseline Estimate to Current Estimate --

PAUC (Prod Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
4.003	-0.650	0.097	0.038	0.292	0.306	0.088	0.000	0.171	4.174

15. Contract Information: (Then-Year Dollars in Millions)a. PROCUREMENT --

FY 84 Production

General Dynamics

Pomona, California

N00024-84-C-7000, FPI

Awarded: 1 February 1985

Definitized: 1 February 1985

Initial Contract Price

Target	Ceiling	Qty
\$178.6	\$193.8	84

Current Contract Price

Target	Ceiling	Qty
\$214.0	\$244.5	84

Estimated Price At Completion

Contractor	Program Manager
\$214.0	\$214.0

Cost Variance

Schedule Variance

Previous Cumulative Variances:

0.0

0.0

Cumulative Variances To Date:

- .5
 -0.5

3.3
 3.3

Explanation of Change: Variance due to additional miscellaneous work added to contract.

Reference: CPR dated April 1986.

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PHALANX CIWS, December 31, 1986

FY 85 Production
 General Dynamics
 Pomona, California
 N00024-85-C-7002, FFP
 Awarded: 4 September 1985
 Definitized: 9 October 1985

<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$117.5	N/A	69

<u>Current Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$206.0	N/A	69

<u>Estimated Price At Completion</u>	
<u>Contractor</u>	<u>Program Manager</u>
\$206.0	\$206.0

Previous Cumulative Variances:
 Cumulative Variances To Date:

<u>Cost Variance</u>	<u>Schedule Variance</u>
0.0	0.0
+4.1	-5.5
+4.1	-5.5

Explanation of Change: Variance centered in weapon group and hardware fabrication support.

Reference: N/A

FY 86 Production
 General Dynamics
 Pomona, California
 N00024-86-C-5412, FFP
 Awarded: 7 August 1986
 Definitized: Expected Feb 87

<u>Initial Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N/A	\$200.5	57

<u>Current Contract Price</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N/A	\$200.5	57

<u>Estimated Price At Completion</u>	
<u>Contractor</u>	<u>Program Manager</u>
\$200.5	\$200.5

Previous Cumulative Variances: None.
 Cumulative Variances To Date: None.

<u>Cost Variance</u>	<u>Schedule Variance</u>
----------------------	--------------------------

Explanation of Change: None.

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16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 73.3% or 11 of 15 years

(2) Percent Program Cost Appropriated: 76.3% or \$2031.8/\$2,662.9

b. Appropriation Summary --

Appropriation	Current & Prior Yrs (FY7T-87)	(Then-Year Dollars in Millions)			Total
		Budget Year (FY88)	Balance FYDP (FY89-92)	To Complete Beyond FYDP (FY93)	
RDT&E	148.7	7.6	54.6	-	210.9
WPN	1290.8	29.6	111.3	-	1431.7
SCN	592.3	85.9	342.1	-	1020.3
Total	2031.8	123.1	508.0	-	2662.9

c. Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1978	3			183.7			123.4	6.8
1979				5.3			3.9	8.4
1980				2.6			2.1	10.5
1981				2.3			2.1	10.6
1982				1.5			1.4	7.6
1983				1.3			1.3	4.9
1984				1.2			1.2	3.8
1985				3.5			3.7	3.4
1986				4.0			4.3	2.9
1987				4.7			5.3	3.1
1988				6.6			7.6	3.5
1989				9.5			11.4	3.5
1990				11.5			14.2	3.3
1991				15.0			19.0	2.9
1992				7.7			10.0	2.4
Subtotal	3			260.4			210.9	

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PHALANX CIWS, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: WPN								
7T			48.9	48.9			26.8	3.6
1977			43.0	43.0			25.0	3.8
1978	21		106.1	119.2			77.4	6.8
1979	19		70.6	88.6			63.4	8.7
1980	51		146.1	165.8			130.7	11.8
1981	52		155.2	177.4			156.0	11.6
1982	49		142.7	174.1			166.3	14.3
1983	37		104.9	120.9			122.1	9.0
1984	40		115.5	123.0			129.9	8.0
1985	34		142.6	147.4			159.9	3.40
1986	38		111.4	115.5			129.4	2.9
1987	24		86.6	89.7			103.9	3.1
1988	5		23.4	24.7			29.6	3.5
1989	5		15.6	16.5			20.4	3.5
1990	10		30.2	30.4			38.5	3.3
1991	9		24.4	24.6			31.9	2.9
1992	6		15.3	15.4			20.5	2.4
Subtotal	400		1382.4	1525.0			1431.7	

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PHALANX CIWS, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

Fiscal Year	Qty	FY 84 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: SCN								
1978	10		42.6	52.3			45.2	8.2
1979	8		26.3	32.4			28.6	9.6
1980	15		35.1	42.8			40.9	9.8
1981	15		41.2	50.1			49.8	9.6
1982	15		53.6	65.1			66.3	7.5
1983	22		73.4	88.8			92.0	3.8
1984	16		45.3	55.0			58.9	3.0
1985	15		56.9	69.5			75.8	2.1
1986	17		56.8	68.9			77.5	2.1
1987	12		40.4	49.4			57.3	3.1
1988	18		59.1	71.8			85.9	3.5
1989	15		48.2	58.7			72.1	3.5
1990	17		51.8	63.2			79.7	3.3
1991	20		61.3	74.6			96.4	2.9
1992	20		58.0	71.0			93.8	2.4
Subtotal	235		750.2	913.8			1020.3	
Total	638		2132.6	2699.2			2662.9	

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PHALANX CIWS, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1978 and Prior	123.4	121.0	121.0
1979	3.9	3.9	3.9
1980	2.1	2.1	2.1
1981	2.1	2.1	2.1
1982	1.4	1.4	1.4
1983	1.3	1.3	1.3
1984	1.2	1.2	1.2
1985	3.7	3.7	3.6
1986	4.3	4.2	1.7
1987	5.3	4.4	2.1
To Complete	62.2		
Total	210.9	138.2	136.4
Appropriation: WPN			
1977	26.8	26.8	26.8
1977	25.0	25.0	25.0
1978	77.4	77.4	75.9
1979	63.4	63.4	61.0
1980	130.7	130.7	118.8
1981	156.0	156.0	146.4
1982	166.3	166.2	160.2
1983	122.1	123.9	120.5
1984	129.9	129.8	115.1
1985	159.9	132.1	70.4
1986	129.4	49.3	7.5
1987	103.9	.2	0
To Complete	140.9		
Total	1431.7		

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PHALANX CIWS, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: SCN			
1977			
1978	45.2	18.7	18.7
1979	28.6	53.5	52.9
1980	40.9	62.3	61.6
1981	49.8	34.7	31.2
1982	66.3	47.8	39.8
1983	92.0	37.4	39.1
1984	58.9	43.3	39.1
1985	75.8	49.9	28.7
1986	77.5	17.8	8.1
1987	57.3	-	-
To Complete	326.5	-	-
Total	1020.3	365.4	319.2

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PHALANX CIWS, December 31, 1986

17. Production Rate Data:

a. Annual Production Rates -- (Note: The attainment of the maximum production rate may be limited by expected participation of FMS customers.)

Fiscal Year	Production Rates (Quantity/Year)		
	Production Estimate	Current Estimate ^{1/}	Maximum Economic
1978	22	34	
1979	64	27	
1980	72	66	84
1981	73	67	84
1982	90	64	84
1983	112	59	84
1984		56	84
1985		49	84
1986		55	84
1987		36	84
1988		23	96
1989		20	96
1990		27	96
1991		29	96
1992		26	96

b. Cost Variance --

Item	Production Estimate	Variance (CE less PDE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	2176.2	+523.0	2699.2	0.000	2699.2
(TY \$)	2481.7	+181.2	2662.9	0.000	2662.9
PAUC (BY \$)	3.510	+0.721	4.231	0.000	4.231
(TY \$)	4.003	+0.171	4.174	0.000	4.174

^{1/}Delivery period is 12 months from 1st delivery to last. Quantity shown is budget quantity, figures do not include lead time.

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PHALANX CIWS, December 31, 1986

17. Production Rate Data (Cont'd):

c. Schedule Variance --

Item	Production Estimate	Variance (CE less PDE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (Mo/Yr)	7/78	N/A	7/78	N/A	7/78
Duration (in Months)	86	-96	194	0	194
End Date (Mo/Yr)	9/85	N/A	9/94	N/A	9/94

d. Deliverables (Plan/Actual) --

	<u>To Date</u>
RDT&E	3/ 3
SCN	347/230
WPN	352/232

18. Operating and Support Costs: N/A

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

PROGRAM: P-3C ORION

AS OF DATE: DECEMBER 31, 1986 *

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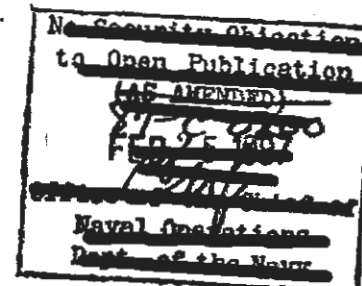
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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)

1. Designation/Nomenclature (Popular Name): P-3C Patrol Aircraft
ASW (ORION)
2. DoD Component: U.S. Navy
3. Responsible Office and Telephone Number:
P-3 PROGRAM OFFICE CAPT. W.L. VINCENT
Naval Air Systems Command Assigned: January 2, 1986
Washington, D.C. 20361 AUTOVON 222-3354
4. Program Elements/Procurement Line Items:
RDY&E: 25605N, 63254N, 64221N, 64201N
PROCUREMENT: 24251N, 24262N ICN 0185,0188 appn: 1506
MILCON: 24613N
5. Related Programs: Harpoon, Proteus

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6. Mission and Description: The P-3C is a patrol type ASW land-based aircraft with equipment to permit detection, identification, tracking accurate location and destruction of all type of enemy submarines. P-3C's are being procured in time-phased versions which incorporate advances in capability, maintainability and reliability resulting from an ongoing Product Improvement Program. UPDATE I aircraft included increased data processing capacity, OMEGA, and additional tactical display and improved DIFAR. UPDATE II aircraft incorporated Infrared Detection System (IRDS), a Sonobuoy Reference System (SRS), HARPOON missile capability and an improved wide band acoustic tape recorder. UPDATE III production includes the Proteus Advance Signal Processor (ASP), the Advanced Sonobuoy Communications Link (ASCL), the Integrated Acoustic Communications System (IACS), and a new software program to fully exploit the increased acoustic sensor capability. UPDATE IV aircraft will incorporate the UYS-2 Enhanced Modular Signal Processor (EMSP), imaging radar, and improved communications, all connected through a Navy standard data bus to improved displays, controls and distributed data processing.

7. Program Highlights:

a. Significant Historical Developments -- The P-3C aircraft is a direct follow-on of the P-3A and P-3B aircraft. The P-3C has been continuously produced since 1969. It is currently planned to shutdown the P-3C line after the FY87 procurement.

b. Significant Developments Since Last Report -- The fleet has reported a P-3C Mission Capability of 85.50% for operational squadrons for the period extending from Oct 85 thru Sep 86. This value exceeds the latest CNO standards.

Excluded in the Selected Acquisition Reports requirement are the 237 P-3C aircraft procured in FY83 & prior & \$4,282.6M - FY83 & prior funding, and \$5,947.5M for the 125 P-3C aircraft - FY90 thru FY95, which is part of the FY88/89 Presidents Budget.

The P-3C program was approved as a FY88 new start on August 22, 1986 as part of the Program Decision Memorandum for the Department of the Navy.

The P-3C aircraft has a demonstrated performance of successfully completing its current assigned missions.

8. Decision Coordinating Paper (DCP) Threshold Breaches:

Not Applicable since DCP thresholds were not established for this program.

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9. Schedule

a. Milestones

Approved Prgm/
Production

Estimate

Current

Estimate

Program Initiated	Sep 65	Sep 65
First Prod Contract	Sep 67	Sep 67
Navy Prelim. Eval.	NA	NA
First Prod Flight	Mar 69	Mar 69
Accept First Prod A/C	Feb 69	Feb 69
Begin BIS	Oct 69	Oct 69
End BIS	Jul 70	Jul 70
Fleet Introduction	Sep 69	Sep 69
Navy Support Date	Apr 70	Apr 70
Fleet operational	Jul 70	Jul 70
Update III-IOT&E	Jan 82	Jan 82
Update III Prov. ASU	Mar 82	Mar 82
Update III Fleet Oper.	May 84	May 84
Update IV Fleet Oper.	Aug 91	Aug 91

b. Previous Change Explanations: None

c. Current Change Explanations: None

d. References--

Production Estimate - Master Milestones List dated 23 April 1978
Approved Program - FY88 Congressional Data Sheet dtd Jan 1987

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10. Technical/Operational Characteristics:

a. Technical	Approved Prgm/ Production Estimate	Demonstrated Performance	Current Estimate
Weight (lbs)			
(1) Empty	66,726	66,726	66,726
(2) Normal T.O.	135,000	135,000	135,000
(3) Max. T.O.	139,760	139,760	139,760
w/Ext. Stores	142,000	142,000	142,000
Dimensions			
(1) Lgth/Wing Span	116'10"/99'8"	116'10"/99'8"	116'10"/99'8"
(2) Ht/Ht folded	33'9"/No Fold	33'9"/No Fold	33'9"/No Fold
b. Operational			
Speed-Combat Wt.			
(1) Cruise (Max. Rnge)	324Kn TAS	324Kn TAS	324Kn TAS
(2) Maximum (Mil. Pwr)	392	392	392
Radius (NM) Full Fuel ASW loading			
(1) Max (no loiter)	2003NM/25000	2003NM/25000	2003NM/25000
(2) Norm (loiter 1/2 flt time 6hr loiter)	875	875	875
Ceill/Alt.			
(1) Serv. Ceil (Cmbt Wt)	30,000	30,000	30,000
(2) Cruise Alt. (low)	1,500	1,500	1,500
(high)	25,000	25,000	25,000
(3) loit Alt (low/high)	1,500	1,500	1,500
Reliability (probab. no fail 12hr mission that will reduce system effectiveness >90% of full effectiveness.)			
90% goal	95.59%	90%	
Maintainability			
(1) SDLM Cycle	60/50/40 mo	60/50/40 mo	60/50/40 mo
(2) MMH flt hr	16.0 hrs.	14.3 hrs	16.0 hrs

c. Previous Change Explanations: None

d. Current Change Explanations: None

e. References--

Production Estimate: No DCP planning document available
 Approved Program - FY88 - FY89 Presidents Budget

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11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost	(1) Production Estimate (FY83-FY92)	(2) Changes	(3) Current Estimate (FY83-FY89)
Development	280.1	+ 89.5	369.6
Procurement	3453.2	-2050.4	1402.8
Flyaway:			
Airframe & Changes	(1477.7)	(- 906.7)	(571.0)
Engine & Accessories	(253.6)	(- 167.9)	(85.7)
Electronics & Comm	(881.6)	(- 584.0)	(297.6)
Armament & Other GFE	(20.9)	(- 14.1)	(6.8)
TOTAL FLYAWAY	(2633.8)	(-1672.7)	(961.1)
Ground Support Equip.	(185.7)	(- 86.7)	(99.0)
Training Equip. & Other	(570.1)	(- 250.5)	(319.6)
TOTAL SUPPORT	(755.8)	(- 337.2)	(418.6)
Initial Spares	(63.6)	(- 40.5)	(23.1)
MILCON	2.6	+ 8.6	11.2
TOTAL FY84 Base-Year \$	3735.9	-1952.3	1783.6
Escalation	1287.7	-1064.7	223.0
Development	(51.5)	(+ 8.2)	(59.7)
Procurement	(1236.0)	(-1074.5)	(161.5)
MILCON	(.2)	(+ 1.6)	(1.8)
TOTAL THEN-YEAR \$	5023.6	-3017.0	2006.6
b. Quantities --			
Development	0	-	0
Production	80	-48	32
TOTAL	80	-48	32
c. Unit Cost --			
Procurement:			
FY84 Base-Year \$	43.2	\$ + .6	\$ 43.8
Then-Year \$	58.6	\$ -9.7	\$ 48.9
Program			
FY84 Base-Year \$	46.7	\$+ 9.0	\$ 55.7
Then-Year \$	62.8	\$- .1	\$ 62.7

d. Approved Design to Cost Goal -- Not Applicable

e.. Foreign Military Sales: Sales to date total \$701.4M. \$195.3M for 10 P-3C's for Australia; \$366.2M for 13 P-3C's for Netherlands; and \$139.9M for 3 P-3C's and 5 knock-down P-3C's for Japan. The direct buys will aid in leveling the growth in P-3C airframe contracts; however, no cost savings are predicted at this time.

f.. Nuclear Costs: None

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12. Program Acquisition/Current Procurement Unit Cost Summary: (Current (Then Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Estimate</u> <u>DEC 86 SAR</u>	<u>Estimate</u> <u>DEC 86 SAR</u>	<u>Estimate</u> <u>DEC 86 SAR</u>
A. Program Acquisition---			
(1) Cost	2006.6	4608.1	2006.6
(2) Quantity	32	80	32
(3) Unit Cost	62.706	57.601	62.706
B. Current Procurement---	(FY 1987)	(FY 1987)	(FY 1987)
(1) Cost	399.5	399.5	.1
Less CY Adv Proc	- 0.0	- 0.0	- .0
Plus FY Adv Proc	+ 80.8	+ 80.8	+ .0
Net Total	480.3	480.3	.1
(2) Quantity	9	9	0
(3) Unit Cost	53.367	53.367	.0

13. Cost Variance Analysis:

A. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Baseline Estimate	331.6	4689.2	2.8	5023.6
Previous Changes	-	-	-	-
Economic	- 14.5	-323.3	-	-337.8
Schedule	+101.2	+212.0	-	+313.2
Estimating	+ 89.2	-686.9	-	-597.7
Support	-	+206.8	-	+206.8
Subtotal	+175.9	-591.4	-	-415.5
Current Changes:				
Economic	- 6.5	- 91.1	-	- 97.6
Schedule	3.1	-	-	+ 3.1
Quantity	-	-1897.2	-	-1897.2
Estimating	-74.8	-	-	- 74.8
Support	-	- 545.2	+ 10.2	- 535.0
Subtotal	- 78.2	-2533.5	+ 10.2	-2601.5
TOTAL CHANGES	+ 97.7	-3124.9	+ 10.2	-3017.0
Current Estimate	429.3	1564.3	13.0	2006.6

13. Cost Variance Analysis (Cont'd):
 (FY 1984 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
Baseline Estimate	280.1	3453.2	2.6	3735.9
Previous Changes	-	-	-	-
Schedule	+ 79.0	+161.2		+240.2
Estimating	+ 67.9	-504.2		-436.3
Support		+195.7		+195.7
Subtotal	+146.9	-147.3	-	- .4
Current Changes:				
Quantity		-1506.0		-1506.0
Schedule	+ 2.1			+ 2.1
Estimating	- 59.5			- 59.5
Support		- 397.1	+ 8.6	- 388.5
Subtotal	- 57.4	-1903.1	+ 8.6	-1951.9
Total Changes	+ 89.5	-2050.4	+ 8.6	-1952.3
Current Estimate	369.6	1402.8	11.2	1783.6

b. Previous Change Explanations

RDT&E

ECONOMIC -- Revised economic escalation indices

SCHEDULE -- Inclusion of FY90 funding

ESTIMATING Update IV reprogramming, FY91 funds inclusion, Cancellation of Avionics Improvement Program & Congressional Reductions

PROCUREMENT

ECONOMIC -- Revised economic escalation indices

SCHEDULE -- Stretch-out of program by one year

ESTIMATING- Reprice of FY87-FY90 as Multi-year Program, cancellation of Multi-year Program, straight lining airframe/cfe costs FY86-93), & Congressional Reductions

SUPPORT -- Stretch-out of Support/Spares Requirements & increase in support/spares requirements.

MILCON: None

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13. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

	(Dollars in Millions)	
	Base Year \$	Then Year \$
(1) RDT&E		
Revised Jan 87 economic escalation rates(ECON)	N/A	- 6.5
Inclusion of FY92 RDT&E funding (SCH)	+ 2.1	+ 3.1
Congressional Reductions (EST)	- 59.5	- 74.8

(2) PROCUREMENT		
Revised Jan 87 economic escalation rates(ECON)	N/A	- 91.1
Congressional Reductions; shutdown of P-3C program after FY87 procurement & shutdown costs (QTY)	-1506.0	-1897.2
Decreased support/Spares Requirements-P-3C (SPT)	(-397.1)	(- 545.2)

(3) MILCON		
Construction of A/C Parking Apron --NAS Jacksonville (2.9)		
Construction of A/C Engine Maint. Shop &Add - NAS Jax (4.6)		
Construction of Operational Training Bldg. - NAS Moffett (2.7)		
TOTAL SUPT	+ 8.6	+ 10.2

d. References --

Production Estimate: FY 1987 Congressional Data Sheets dated Jan 1986

Current Estimate: FY 1988 Congressional Data Sheets dated Jan 1987.

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14. Program Acquisition Unit Cost (PAUC) History:

A. Initial SAR Estimate to Current Baseline Estimate

PAUC (Initial SAR Est.)	ECON	QTY	Changes (Then Year Dollars in Millions)						PAUC (Baseline Estimate)
			SCH	ENG	EST	SPT	Other	Total	
62.8	-	-	-	-	-	-	-	-	62.8

B. Current Baseline Estimate to Current Estimate:

PAUC (Baseline Estimate)	ECON	QTY	Changes (Then Year Dollars in Millions)						PAUC (Current Estimate)
			SCH	ENG	EST	SPT	Other	Total	
62.8	-13.6	+34.9	+9.9	-	-21.0	-10.3	- -	-1	62.706

15. Contract Information: (Then Year Dollars in Millions)

A. RDT&E: None

B. PROCUREMENT

AIRFRAME
Lockheed California Co.
N0001985-C-0016 FFP,
AWARD: JUN 1986
Definitized: Aug 1986

Initial Contract Price
Target Ceiling Qty

163.2 N/A 9

Current Contract Price
Target Ceiling Qty
163.2 N/A 9

Estimated Price at Completion
Contractor Program Manager
163.2 163.2

. Variance Analysis: FFP Contract

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15. Contract Information (Cont'd) (Then-Year Dollars in Millions)

B. PROCUREMENT (cont'd)

	Initial Contract Price		
	Target	Ceiling	Qty
<u>AIRFRAME</u> Lockheed California Co. N0001984-C-0008 FFP, AWARD: DEC 1984 Definitized: FEB 1986	164.4	N/A	9

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
164.4	N/A	9	164.4	164.4

Variance Analysis: FFP Contract

	ENGINE		
General Motors Corp. Allison Div. N0001984-C-2243 FFP, AWARD: MAR 1985 Definitized: FEB 1986	18.9	N/A	36

Current Contract Price			Estimated Price at Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
18.9	N/A	36	18.9	18.9

2. Variance Analysis: FFP Contract

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 71.4% (5/7)
- (2) Percent Program Cost Appropriated: 82.28% (\$1651.0/2006.6)

b. Appropriation Summary --

<u>Appropriation</u>	<u>Current & Prior Yrs.</u> (FY83-87)	<u>Budget Year</u> (FY88)	<u>Balance FYDP</u> (FY89-92)	<u>To Complete Beyond FYDP</u> (FY93-95)	<u>Total</u>
RDT&E	117.8	113.1	198.4	-	429.3
PROCUREMENT	1,527.5	3.6	33.2	-	1564.3
MILCON	5.7	4.6	2.7	-	13.0
TOTAL	1,651.0	121.3	234.3	-	2,006.6

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16. Program Funding Summary: (Current Estimate in Millions of Dollars)

Fiscal Year	Qty	FY84 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		FLYAWAY		Total	Advance Proc		Total	
		Non-Rec	Rec		Debit	Credit		

Appropriation: RDT&E

1984	-	-	-	8.7	-	-	8.9	4.3
1985	-	-	-	23.7	-	-	24.9	3.4
1986	-	-	-	27.2	-	-	29.5	2.9
1987	-	-	-	48.6	-	-	54.5	3.1
1988	-	-	-	97.6	-	-	113.1	3.5
1989	-	-	-	95.0	-	-	113.6	3.5
1990	-	-	-	64.8	-	-	79.7	3.3
1991	-	-	-	1.6	-	-	2.0	2.9
1992	-	-	-	2.4	-	-	3.1	2.4
Subtotal	-	-	-	369.6	-	-	429.3	

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions)

Fiscal Year	Qty	FY84 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		FLYAWAY		Total	Advance Proc		Total	
		Non-Rec	Rec		Debit	Credit		
Appropriation: Procurement								
1983	-	-	-	46.2	48.8	-	48.8	4.6
1984	5	-	145.5	273.9	74.3	48.8	291.4	5.6
1985	9	-	268.0	373.0	83.6	74.3	409.3	3.4
1986	9	7.9	256.2	334.4	80.8	83.6	378.6	2.9
1987	9	4.8	254.2	345.2	0.0	80.8	399.5	3.1
1988	0	.1	0.0	3.0	0.0	0.0	3.6	3.5
1989	0	24.4*	0.0	27.1	0.0	0.0	33.1	3.5
Subtotal	32	37.2	923.9	1402.8	287.5	287.5	1564.3	

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions)

Fiscal Year	Qty	FY84 Base-Year Dollars			Then-Year Dollars			Escl Rate %
		FLYAWAY		Total	Advance Proc		Total	
		Non-Rec	Rec		Debit	Credit		

Appropriation: Milcon

1984	-	-	-	1.3	-	-	1.4	4.3
1985	-	-	-	1.3	-	-	1.4	3.4
1987	-	-	-	2.5	-	-	2.9	3.1
1988	-	-	-	3.9	-	-	4.6	3.5
1989	-	-	-	2.2	-	-	2.7	3.5
Subtotal	-	-	-	11.2	-	-	13.0	
Total	32			1783.6	-	-	2006.6	

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16. Program Funding Summary (Cont'd)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1984	8.9	8.9	8.4
1985	24.9	24.9	19.4
1986	29.5	29.5	16.2
1987	54.4	6.7	.4
To Complete	311.6	N/A	N/A
Total	429.3	70.0	44.4

Appropriation: Procurement

1983	48.8	48.8	48.8
1984	291.5	291.5	239.0
1985	409.3	372.8	282.8
1986	378.6	284.6	74.6
1987	399.5	30.9	0.0
To Complete	36.6	N/A	N/A
Total	1564.3	1029.6	645.1

Appropriation: MILCON

1984	1.4	1.4	1.4
1985	1.4	1.4	1.4
1987	2.9	0.0	0.0
TO COMPLETE	7.3	N/A	N/A
Total	13.0	2.8	2.8

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17. Production Rate Data:

FISCAL YEAR	DEVELOPMENT ESTIMATE	PRODUCTION ESTIMATE	CURRENT ESTIMATE	MAXIMUM ECOMIMIC
1984	-	5	5	24
1985	-	9	9	24
1986	-	9	9	24
1987	-	9	9	24
1988	-	0	0	24
1989	-	0	0	24
1990	-	0	0	24
1991	-	0	0	24
1992	-	0	0	24
1993	-	0	0	24
1994	-	0	0	24
1995	-	0	0	24

b. Cost Variance -- Dollars in Millions

ITEM	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max.)	Maximum
Prog Acq Cost (BY\$) 3735.9		-1952.3	1783.6	N/A	N/A
(TY\$) 5023.6		-3017.0	2006.6	N/A	N/A
PAUC (BY\$) 46.699		+ 9.035	55.734	N/A	N/A
(TY\$) 62.795		- .089	62.706	N/A	N/A

c. Schedule Variance --

Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Start Date (Mo/Yr) 10/82	-	10/82	N/A	N/A
Duration (in Months) 144	-	32	N/A	N/A
End Date (Mo/Yr) 9/94	-	5/89	N/A	N/A

d. Deliveries (Plan/Actual) --

RDT&E
PROCUREMENT
18. Operating & Support Costs: N/A

To Date
0/0
11/11

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Selected Acquisition Report (RCS: DD-COMP(Q&A)823)

Program: I-S/A AMPE

As of Date: December 31, 1986

I N D E X

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Program Acquisition Unit Cost History	9
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Operating and Support Costs	19
1. <u>Designation/Nomenclature (Popular Name)</u>	
I-S/A AMPE/Inter-Service/Agency Automated Message Processing Exchange (I-S/A AMPE)	
2. <u>DOB Component:</u> U. S. Air Force	
3. <u>Responsible Office and Telephone Number</u>	
I-S/A AMPE Program Management Office PM: Colonel John J. Ritenour, Jr. Standard Systems Center: Assigned Jul 85 Air Force Communications Command AUTOVON: 446-4337 (ATCC) Gunter AFS AL 36114-6343 Comm: (205) 279-4337	

4. Program Element/Procurement Line Items:

RDT&E: PE 331281

O&M: PE 331281
 PE 33111A (Shared funding)
 PE 331281
 PE 35123F (Shared funding)
 PE 33128G
 PE 33128S

SAF/PAS

87-0064-T

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I-S/A AMPE, December 31, 1986

Procurement: APPN 3080

PE 33401F (Shared funding)	PE 33128F
PE 33401A (Shared funding)	PE 33111A
PE 33401N (Shared funding)	PE 37128N
PE 33401G (Shared funding)	PE 37128G
PE 33401S (Shared funding)	PE 37128S

MILCON: PE 33128F
PE 33111A (Shared funding)
PE 33128N
PE 33128G
PE 33128S

5. Related Programs: None

6. Mission and Description: Inter-Service/Agency Automated Message Processing Exchange (I-S/A AMPE) Program will provide a standard telecommunication system to replace the existing Services and Agencies systems, and meet new requirements as directed by Congress and the DOD. It will also provide a replacement for the AUTODIN Switching Centers (ASCs). The Defense Communications Agency manages the 15 operational ASCs, all of which will be replaced by I-S/A AMPE. In addition, the I-S/A AMPE will provide an interface for AUTODIN terminals to the Defense Communications Systems (DCS) packet switching network, and will provide a consolidation of the DSSCS and GENSER services.

7. Program Highlights:

a. Significant Historical Developments -- The Defense Communications Agency (DCA) developed an approach called the Integrated AUTODIN Systems Architecture (IASA) that provides increased message processing standardization of the Defense Communications System (DCS) and the Services' and Agencies' AMPE systems. The I-S/A AMPE Program is an element of the IASA designed to replace the Services' and Agencies' AMPEs, functionally replace the AUTODIN Switching Centers (ASCs), and provide connection to the Defense Data Network (DDN). The I-S/A AMPE Program is a joint Service and Agency program with the Air Force as the Lead Military Department (LMD). The other Services and Agencies involved are Army, Navy, National Security Agency (NSA), Defense Intelligence Agency (DIA), Defense Communications Agency (DCA), and Defense Logistics Agency (DLA). The Air Force is responsible for funding the design of the system as well as Air Force production units. Army, Navy, NSA and DLA are responsible for funding their respective systems. DCA is responsible for the overall AUTODIN system architecture, of which I-S/A AMPE is a part. NSA and DIA provide security and policy guidance and certify and accredit the I-S/A AMPE system. USAF Program Management Directive (PMD) 3056(1) was signed on 10 Mar 83 directing the Air Force to implement the I-S/A AMPE Program. A Draft Request for Proposal (RFP) package was completed and released to industry for comment in Dec 83. The Program Office has considered industry comments for inclusion, as appropriate, in the RFP. A contract was awarded in Sep 84 to conduct Independent Verification and Validation (IV&V) of specified tasks in the areas of I-S/A AMPE contractor proposal evaluation, system design, specification development, testing, and implementation. Source selection for the I-S/A AMPE began in Oct 84.

I-S/A AMPE, December 31, 1986

Contractor proposals were received and the initial evaluation was completed. The Best and Final Offers (BAFOs) for the I-S/A AMPE contract were received from the offerors in May 85. The DSARC met on 20 Jun 85 and JRMB II approval was granted. The Source Selection Advisory Council was briefed on 9-11 Jul 85, and the Source Selection Authority was briefed on 18 Jul 85. The Secretary of Defense Decision Memorandum (SDDM) approving JRMB II was signed on 24 Jul 85. On 13 Aug 85, the I-S/A AMPE Design Period contract was awarded to TRW. The Source Selection Authority elected to award a single contract in lieu of using two prime contractors as originally planned. Briefings to the two unsuccessful offerors on the program were completed on 12 Sep 85. The Systems Requirements Review (SRR) was accomplished 7-11 Oct 85. The first modification to the contract was released 4 Nov 85. The System Specification was delivered in Nov and Dec 85. The Government rejected the initial submissions because the data item descriptions were not complied with by the contractor. The System Design Review (SDR) was completed May 86. This accomplishment was completed later than originally scheduled (by four months), but will have no impact on the overall program.

b. Significant Developments Since Last Report -- The Program Office and TRW reached agreement on an initial functional baseline (i.e., System Specification/A-Specification) on 6 Nov 86. The first of three preliminary design reviews was completed on 18 Dec 86. The I-S/A AMPE system is expected to satisfy the mission requirements. The PMD was updated and reissued as PMD 3056(2), 8 December 86.

c. Changes Since "As Of" Date -- None

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP (dated 13 Jun 85) threshold breaches. An updated DCP Annex B was completed on 25 Feb 86.

9. Schedule:

a. Milestones --	<u>Development Estimate/ Approved Program</u>	<u>Current Estimate</u>
Justification for Major		
System New Start	Mar 83/Mar 83	Mar 83
JRMB I Decision (AFSARC)	Jan 84/Jan 84	Jan 84
JRMB II Decision	Jun 85/Jun 85	Jul 85
Contract Award (Design Phase)	Jul 85/Jul 85	Aug 85
System Design Phase Start	Aug 85/Aug 85	Aug 85
Subsystem Design Phase Start	May 87/May 87	Aug 85
Prototype & Test Phase Start	Apr 88/Apr 88	Apr 88
Initial Operational Test and Evaluation Start	Oct 88/Oct 88	Oct 88
JRMB III Decision	Apr 89/Apr 89	Apr 89
Production Buy Decision	Apr 89/Apr 89	May 89
Initial Operational Capability IOC 1/	Sep 89/Sep 89	Nov 89

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1/ The system will achieve IOC when I-S/A AMPE has been evaluated, accepted, certified, accredited, and a minimum of two operational facilities, including necessary trained personnel and logistics support, has been certified to interface with the Defense Data Network (Integrated AUTODIN System (IAS)) and cutover to mission traffic.

b. Previous Change Explanation --

The Secretary of Defense Decision Memorandum (SDDM) for the Milestone II Decision was received in Jul 85 instead of Jun 85. The Source Selection Authority was not available for the briefing on the scheduled date, resulting in a delay in the contract award of one month. Because funds were available, the Subsystem Design Phase was ordered ahead of schedule (Aug 85 in lieu of May 87). Due to the delay in Contract Award, the Production Buy Decision will be delayed one month (from Apr to May 89). The 30 Sep 85 SAR Production Buy Decision schedule date of May 89 was returned to its originally-scheduled date of Apr 89. The 30 Sep 85 SAR IOC date of Sep 89 should reflect Oct 89. The Production Buy Decision was delayed one month from Apr 89 to May 89 to reflect the time consumed in the DSARC III decision process. Due to the delay in the Production Buy Decision, there will be a one month delay in IOC from Oct 89 to Nov 89.

c. Current Change Explanations -- None

d. References --

Development Estimate: Decision Coordinating Paper (DCP) dated June 13, 1985.

Approved Program: FY 1988 President's Budget.*

10. Technical/Operational Characteristics:

	<u>Dev Estimate/ Appr Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. Technical --			
Performance Throughput Readiness/Supportability (Hardware & Software Systems)	40-120 Line Blocks per second	N/A	40-120 Line Blocks per second
(1) Reliability, Availability, and Maintainability (RAM) (%)	99.95	N/A	99.95
(2) Logistics Support Base	CLS	N/A	CLS
(3) Certification and Accreditation	A1	N/A	A1

*Air Force, Army and Navy funding reflects FY88 President's Budget, the NSA and DLA funding position reflects the FY88 BES position.

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b. Operational --

Operational Availability (%)	99.95	N/A	99.95
Manning			
(1) Operational Systems	3960	N/A	3960
(2) Systems Support Facility	73	N/A	73

c. Change Explanations -- None.

d. Current Change Explanations -- None.

e. References --

Development Estimate: Decision Coordinating Paper (DCP) dated June 13, 1985.

Approved Program: FY 1988 President's Budget.

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate*</u>
a. Cost --			
O&M	285.7	-235.4	50.3
Development (RDT&E)	0.0	+84.1	84.1
Procurement	291.1	-55.6	235.5
Prime Mission Equip	(182.0)	(-38.1)	(143.9)
Govt Furnished Equip	(7.1)	(-1.4)	(5.7)
System/Project Mgt	(27.3)	(-5.3)	(22.0)
System T&E	(17.7)	(-3.4)	(14.3)
Total Flyaway	(234.1)	(-48.2)	(185.9)
Other System Cost	(57.0)	(-7.4)	(49.6)
Construction (MILCON)	114.4	-19.7	94.7
Total FY85 Base-Year \$	691.2	-226.6	464.6
Escalation	138.3	-47.7	90.6
O&M	(25.0)	(-23.0)	(2.0)
Development (RDT&E)	(0.0)	(+7.3)	(7.3)
Procurement	(85.3)	(-25.6)	(59.7)
Construction (MILCON)	(28.0)	(-6.4)	(21.6)
Total Then-Year \$	829.5	-274.3	555.2

*Air Force, Army and Navy funding reflects FY88 President's Budget, the NSA and DLA funding position reflects the FY88 BES position.

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	<u>Development Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
b. Quantities --			
Development (RDT&E)	0	0	0
Procurement*	<u>94</u>	<u>-1</u>	<u>93</u>
Total	94	-1	93
c. Unit Cost --			
Procurement:			
FY85 Base-Year \$	3.097	-0.565	2.532
Then-Year \$	4.004	-0.830	3.174
Program:			
FY85 Base-Year \$	7.353	-2.357	4.996
Then-Year \$	8.824	-2.854	5.970
d. Approved Design to Cost Goal -- Not applicable; waived.			
e. Foreign Military Sales -- None.			
f. Nuclear Costs -- None.			

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u>	<u>UCR Baseline</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 85 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition --			
(1) Cost	555.2	611.6	555.2
(2) Quantity	93	94	93
(3) Unit Cost	5.970	6.506	5.970
b. Current Procurement -- (FY 1987)		(FY 1987)	(FY 1988)
(1) Cost	N/A	N/A	N/A
Less CY Adv Proc	N/A	N/A	N/A
Plus PY Adv Proc	N/A	N/A	N/A
Net Total	N/A	N/A	N/A
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

No procurement quantities in the Current Year or Budget Year.

*Decreased quantities to reflect funding constraints.

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13. Cost Variance Analysis:

a. Summary - (Current (Then-Year) Dollars in Millions)

	O&M	RDT&E	PROC	MILCON	TOTAL
Development Estimate	310.7	0	376.4	142.4	829.5
Previous Changes:					
Economic	-1.3	+7	-11.6	-3.2	-15.4
Quantity	--	--	--	--	--
Schedule	+1.2	--	+4.5	--	+5.7
Engineering	--	--	--	--	--
Estimating	-256.7	+97.8	-46.8	-25.4	-231.1
Other	--	--	--	--	--
Support	+0.6	--	-8.7	--	-8.1
Subtotal	-256.2	+98.5	-62.6	-28.6	-248.9
Current Changes:					
Economic	-.2	-0.3	-0.1	-0.1	-0.7
Quantity	--	--	-2.2	--	-2.2
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	-2.0	-6.8	-15.7	+2.6	-21.9
Other	--	--	--	--	--
Support	--	--	-0.6	--	-0.6
Subtotal	-2.2	-7.1	-18.6	+2.5	-25.4
Total Changes	-258.4	+91.4	-81.2	-26.1	-274.3
Current Estimate	52.3	91.4	295.2	116.3	555.2
(FY 1985 Constant (Base-Year) Dollars in Millions)					
	O&M	RDT&E	PROC	MILCON	TOTAL
Development Estimate	285.7	0	291.1	114.4	691.2
Previous Changes:					
Quantity	--	--	--	--	--
Schedule	+0.8	--	--	--	+0.8
Engineering	--	--	--	--	--
Estimating	-234.9	+90.2	-30.7	-21.8	-197.2
Other	--	--	--	--	--
Support	+0.5	--	-6.9	--	-6.4
Subtotal	-233.6	+90.2	-37.6	-21.8	-202.8
Current Changes:					
Quantity	--	--	-2.1	--	-2.1
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	-1.8	-6.1	-15.4	+2.1	-21.2
Other	--	--	--	--	--
Support	--	--	-0.5	--	-0.5
Subtotal	-1.8	-6.1	-18.0	+2.1	-23.8
Total Changes	-235.4	+84.1	-55.6	-19.7	-226.6
Current Estimate	50.3	84.1	235.5	94.7	464.6

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b. Previous Change Explanations --

O&M

Economic: Revised economic escalation indices.
Schedule: Increase due to change from 32 to 44 month Design Period associated with Independent Validation and Verification contractor.
Estimating: Decrease due to Source Selection Authority's decision to award a single contract in lieu of two contracts for the Design Period. In addition, there was a congressionally directed (FY86 Defense Appropriations Act) reprogramming of funds and corresponding requirements between Appropriations for O&M to RDT&E. Refinement of costs to reflect only acquisition activities.
Support: Refinement of facility modification costs based on site surveys.

RDT&E

Economic: Escalation increased due to shift from O&M to RDT&E.
Estimating: Congressional Directed (FY86 Defense Appropriations Act) reprogramming of funds and corresponding requirements between Appropriations from O&M to RDT&E. Cost reflects Gramm-Rudman (FY86) cuts. No impact on program.

Procurement

Economic: Revised economic escalation indices.
Schedule: Increase due to revised schedule slipping procurement approximately one year. Rephasing of schedule based on Required Operational Dates (RODs) in lieu of Installation Dates.
Estimating: Overall reduction due to actual Design Phase Contract Award experience. Revised evaluation of costs based upon actual contractor experience. Alignment of approved program contract.
Support: Revised evaluation of costs based upon actual contractor experience. Redefine costs between flyaway and nonflyaway and correct the mix of support/flyaway changes.

MILCON

Economic: Revised economic escalation indices.
Estimating: Decrease due to revised estimate of construction costs based on site surveys. Revised estimate based upon revised site surveys. Cost aligned to approved program content significant delay in deployment of systems if additional funds are not provided.

c. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then Year</u>
(1) O&M		
Revised economic escalation indices (Economic)	0.0	-0.2
Cost aligned to approved program funding. Impact currently being assessed. (Estimating)	-1.8	-2.0

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(2) RD&E

Revised economic escalation indices. (Economic)	0.0	-0.3
Cost reflects across-the-board Air Force cuts. Impact currently being assessed. (Estimating)	-6.1	-6.8

(3) Procurement

Revised economic escalation indices. (Economic)	0.0	-0.1
Additional reduction due to failure to approve program funding for scheduled I-S/A AMPE systems. (Quantity)	-2.1	-2.2
To redefine costs between flyaway and non-flyaway and to adjust support funding due to unfunded systems.	-15.9	-16.3
--Estimating	(-15.4)	(-15.7)
--Support	(-0.5)	(-0.6)

(4) MILCON

Revised economic escalation indices. (Economic)	0.0	-0.1
Adjustment of funding to cover MILCON requirements. (Estimating)	+2.1	+2.6

d. References --

Development Estimate: Decision Coordinating Paper (DCP) dated June 13, 1985.

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

a. Initial SAR/Planning Estimate (PE) to Development Estimate

PAUC (Initial SAR/PE)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
10.738	-0.220	-0.190	-0.156	--	+1.583	--	-2.931	-1.914	8.824

b. Development Estimate to Current Estimate

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
8.824	-0.173	+0.072	+0.061	--	-2.720	--	-0.094	-2.854	5.970

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15. Contract Information: (Then-Year Dollars in Millions)

a. O&M and RDT&E -- <u>Software Design Effort:</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
TRW, Inc., Torrance, CA FO1630-85-D-0003, FPIF/FFP Award: August 13, 1985 Definitized: August 13, 1985	\$83.2	\$104.2	0

<u>Current Contract Price</u>			<u>Estimate Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$83.8	\$104.9	0	\$110.2M(CH-1)	\$104.2

Explanation of Change:

(CH-1) The contractor has reassessed contract completion cost to reflect present and future cost and schedule variances.

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	-4.3	-1.8
Cumulative Variances to Date (11/28/86)	-11.2	-4.6
Net Change	-6.9	-2.8

Major schedule variances exist in the Application System Software, Test Facilities, and System Engineering area, due to lack of cleared personnel and time spent on SDR action items. Major cost variances exist in Project Management and System Engineering areas due to additional manpower costs and reworking of the A Specifications and B1 Specifications. If TRW's performance continues at present rate, the contract ceiling price will be exceeded. When this occurs, TRW will absorb any costs incurred above the contract ceiling price.

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16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 45.5% (5 yrs/11 yrs)
(2) Percent Program Cost Appropriated: 21.9% (121.8/555.2)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY83-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance FYDP (FY89-92)</u>	<u>To Complete Beyond FYDP (FY93-94)</u>	<u>Total</u>
O&M	43.7	1.0	7.3	0.3	52.3
RDT&E	76.9	1.3	13.2	0.0	91.4
Procurement	1.2	0.2	266.0	27.8	295.2
MILCON	<u>0.0</u>	<u>14.0</u>	<u>99.3</u>	<u>3.0</u>	<u>116.3</u>
Total	121.8	16.5	385.8	31.1	555.2

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary -- Total Program

Fiscal Year	Qty	FY85 Base-Year Dollars			Then-Year Dollars		Escl Rate (%)
		Flyaway	Total		Advance Proc	Total	
		Nonrec	Rec		Debit	Credit	

Appropriation: O&M

1983				0.4			0.4	4.9
1984				1.6			1.6	3.8
1985				41.1			41.7	3.6
1986				0.0			0.0	N/A
1987				0.0			0.0	N/A
1988				0.9			1.0	3.5
1989				3.1			3.6	3.5
1990				1.0			1.2	3.3
1991				1.1			1.4	2.9
1992				0.9			1.1	2.4
1993				0.2			0.3	2.4
Subtotal				50.3			52.3	

Appropriation: RDT&E

1983				0.0			0.0	N/A
1984				0.0			0.0	N/A
1985				0.0			0.0	N/A
1986				23.3			24.5	2.9
1987				48.2			52.4	3.1
1988				1.2			1.3	3.5
1989				11.4			13.2	3.5
Subtotal				84.1			91.4	

Appropriation: Procurement

1986		1.1		1.1			1.2	2.9
1987		0.0		0.0			0.0	N/A
1988		0.0		0.2			0.2	3.5
1989	12	3.1	10.5	20.2			24.1	3.5
1990	19	7.7	33.5	51.5			62.9	3.3
1991	28	10.6	45.8	70.4			88.1	2.9
1992	26	10.5	46.1	70.9			90.9	2.4
1993	8	3.2	13.8	21.2			27.8	2.4
Subtotal	93	36.2	149.7	235.5			295.2	

Appropriation: MILCON

1988				12.0			14.0	3.5
1989				10.4			12.5	3.5
1990				18.0			21.8	3.3
1991				39.5			49.2	2.9
1992				12.5			15.8	2.9
1993				2.3			3.0	2.4
Subtotal				94.7			116.3	
Total	93			464.6			555.2	

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary — Air Force

(b)(4)



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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary — Army

(b)(4)



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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary -- Navy

		FY85 Base-Year Dollars			Then-Year Dollars			Escl
Fiscal Year	Qty	Flyaway		Total	Advance Proc		Total	Rate (%)
		Nonrec	Rec		Debit	Credit		

Appropriation: O&M

1983				0.0			0.0	N/A
1984				0.0			0.0	N/A
1985				0.0			0.0	N/A
1986				0.0			0.0	N/A
1987				0.0			0.0	N/A
1988				0.0			0.0	N/A
1989				0.0			0.0	N/A
1990				0.0			0.0	N/A
1991				0.0			0.0	N/A
1992				0.0			0.0	N/A
Subtotal				0.0			0.0	

Appropriation: Procurement

1986				0.0			0.0	N/A
1987				0.0			0.0	N/A
1988				0.2			0.2	3.5
1989	1	0.4	1.8	2.8			3.3	3.5
1990	1	0.5	2.0	3.0			3.6	3.3
1991	5	1.8	7.6	11.7			14.6	2.9
1992	8	3.0	13.2	20.3			26.0	2.4
Subtotal	15	5.7	24.6	38.0			47.7	

Appropriation: MILCON

1988				0.0			0.0	N/A
1989				0.0			0.0	N/A
1990				8.6			10.2	3.3
1991				14.5			17.8	2.9
1992				9.4			11.8	2.9
Subtotal				32.5			39.8	2.4
Total				70.5			87.5	

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary -- NSA

Fiscal Year	Qty	FY85 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: O&M

1983				0.0			0.0	N/A
1984				0.0			0.0	N/A
1985				0.0			0.0	N/A
1986				0.0			0.0	N/A
1987				0.0			0.0	N/A
1988				0.0			0.0	N/A
1989				0.0			0.0	N/A
1990				0.0			0.0	N/A
1991				0.0			0.0	N/A
1992				0.0			0.0	N/A
Subtotal				0.0			0.0	

Appropriation: Procurement

1986				0.0			0.0	N/A
1987				0.0			0.0	N/A
1988				0.0			0.0	N/A
1989	2	0.8	3.3	5.0			6.0	3.5
1990	2	0.7	3.2	4.9			6.0	3.3
1991	4	0.4	1.6	2.4			3.0	2.9
1992	0	0.0	0.0	0.0			0.0	N/A
Subtotal	8	1.9	8.1	12.3			15.0	

Appropriation: MILCON

1988				0.7			0.8	3.5
1989				0.8			1.0	3.5
1990				0.0			0.0	N/A
1991				0.0			0.0	N/A
Subtotal				1.5			1.8	2.4
Total				13.8			16.8	

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary — DLA

(b)(4)



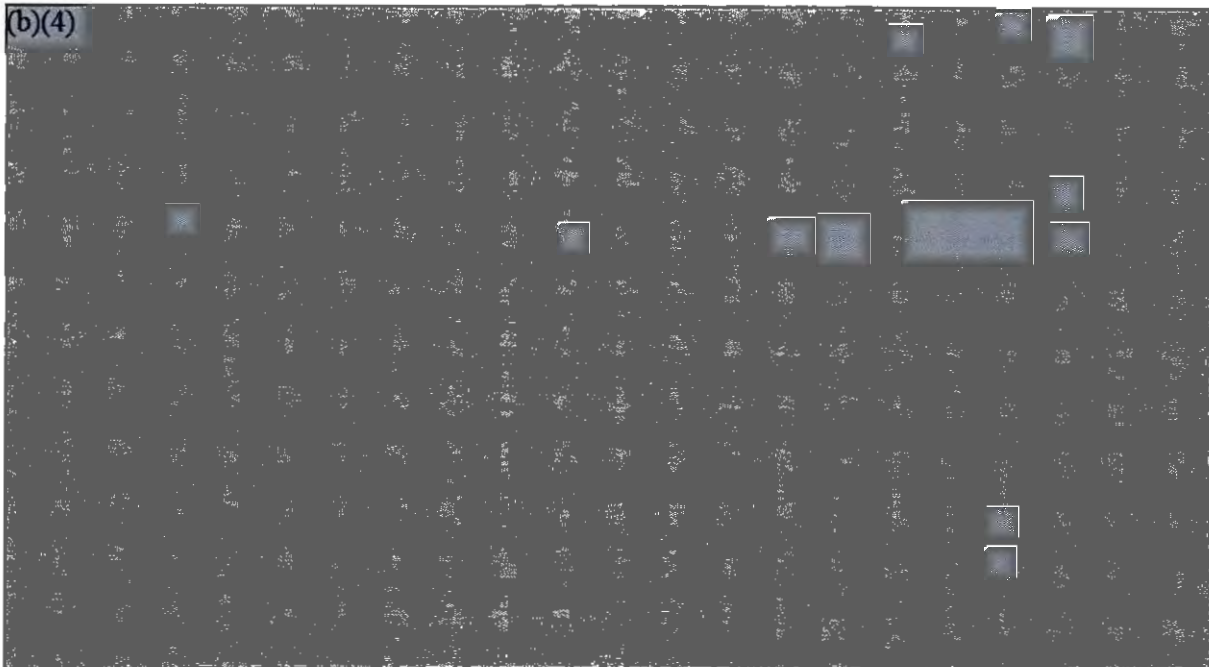
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16. Program Funding Summary (Cont'd):

d. Obligations and Expenditures —

(b)(4)



17. Production Rate Data:

a. Annual Production Rates -- (NOTE: Program is designed to employ off-the-shelf components.)

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum
1986	0	N/A	0	N/A
1987	0	N/A	0	N/A
1988	0	N/A	0	N/A
1989	14	N/A	10	N/A
1990	36	N/A	19	N/A
1991	36	N/A	28	N/A
1992	8	N/A	26	N/A
1993			8	

1/ Reflects Program Office records as of 31 Dec 86.

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17. Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum
Prog Acq Cost (BYS)	N/A	N/A	464.6	N/A	N/A
(TYS)	N/A	N/A	555.2	N/A	N/A
PAUC (BYS)	N/A	N/A	4.996	N/A	N/A
(TYS)	N/A	N/A	5.970	N/A	N/A

c. Schedule Variance --

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE vs Max)	Maximum
Start Date (Mo/Yr)	N/A	N/A	4/89	N/A	N/A
Duration (in Months)	N/A	N/A	37	N/A	N/A
End Date (Mo/Yr)	N/A	N/A	4/92	N/A	N/A

d. Deliveries (Plan/Actual) -- Not Applicable

18. Operating and Support Costs: Not Applicable

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: E-2C

AS OF DATE: December 31, 1986

INDEXSUBJECT

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DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (DASD-PA)
 DEPARTMENT OF DEFENSE

1. (U) Designation/Nomenclature (Popular Name): E-2C/Carrier Based All
 Weather Airborne Early Warning Command and Control System (Hawkeye)

2. (U) DOD Component: Department of the Navy.

3. (U) Responsible Office and Telephone Number:

E-2/C-2 and ATDS Program Office
 Naval Air Systems Command
 Washington, DC 20361

PM: CAPT H.E. Seligson
 Assigned: June 15, 1984
 AUTOVON 222-3251, (202)692-3251

4. (U) Program Elements:

RDT&E: PE 24152N
 PROCUREMENT: APPN 1506 ICN 0195 PE 24152N, 24156N
 MILCON: PE 24611N

CLASSIFIED BY: 33NAVTST 33513.2-18
 DECLASSIFY ON: 11 FEBRUARY 1980

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5. (U) Related Programs: C-2A Greyhound
Improved Engine (PE 64252N)

6. (U) Mission and Description: The Grumman built E-2C "Hawkeye" is a twin engine, carrier based Combat Information Center Aircraft which extends task force defense perimeters by providing early warning of approaching enemy air and surface units and vectoring interceptors to the attack. Carrying a crew of five the E-2C also provides area surveillance, search and rescue, communication relay, and strike and traffic control. Principal subsystems include APS-125/138 radar and ALR-73 Passive Detection Systems which allow E-2C to detect targets during periods of radar silence. E-2C replaces E-1B and E-2B Airborne Early Warning (AEW) aircraft.

7. (U) Program Highlights:

a. Significant Historical Development -- The E-2C was introduced to the fleet in 1974. The automatic overland radar target tracking and Electronic Counter Counter-Measure (ECCM) features were introduced to the fleet in 1977 with the new AN/APS-125 Advanced Radar Processing System (ARPS). The designation of the AN/APS-125 radar was changed to the AN/APS-138 in FY 1983 with the production incorporation and delivery of the Total Radiation Aperture Control Antenna (TRAC-A) and other radar changes. E-2C satisfies the mission needs.

b. Significant Developments Since Last Report -- Update Development Program (UDP) Group II completed DT-IIA/OT-IIA with favorable results although OPTEVFOR reports are not yet available.

c. Changes Since "As Of" Date -- None

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no DCP threshold breaches.

9. (U) Schedule:

a. <u>Milestone:</u>	<u>Production Estimate/ Approved Programs</u>	<u>Current Estimate</u>
Project Initiated (Letter Contract)	Jun 1968/Jun 1968	Jun 1968
Definitized Contract Executed (R&D)	May 1969/May 1969	Sep 1970
Production Contract Award	Oct 1970/Oct 1971	Sep 1971
Navy Preliminary Evaluation I (Commenced)	Jan 1972/Jan 1972	Feb 1972
First Flight of Production Airplane	May 1972/May 1972	Sep 1972

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9. (U) Schedule (Cont'd):

Navy Preliminary Evaluation II (Commenced)	Oct 1972/Oct 1972	Oct 1972
First Production Airplane Accepted	Oct 1972/Oct 1972	Jan 1973
Board of Inspection and Survey (Commenced)	Feb 1973/Feb 1973	Apr 1973
Fleet Introduction	Apr 1973/Apr 1973	May 1973
Board of Inspection and Survey (Completed)	Mar 1973/Mar 1973	Nov 1973
Initial Operational Capability	Nov 1973/Nov 1973	Feb 1974
Navy Support Date	Nov 1974/Nov 1974	Dec 1975
First Production AN/APS-125 ARPS	Dec 1976/Dec 1976	Nov 1976
AN/APS-125 Fleet Operational	May 1978/May 1978	May 1978
APS-138 Radar/TRAC-A Antenna (Prod. Delivery)	Dec 1982/Dec 1982	Jun 1983
High Speed Processor (Prod. Delivery)	Apr 1987/Apr 1987	Apr 1987
APS-139 Radar (Prod. Delivery)	Feb 1988/Feb 1988	Feb 1988

b. Previous Change Explanations -- None

c. Current Change Explanations -- None

d. (U) References --

Production Estimate: DCP No. 26 Rev 1 dated 24 June 1971, subject "Development Concept Paper Carrier Based, Airborne Early Warning/Command and Control System (E-2C)" NDCP W0463 dated 28 September 1984, subject "Navy Decision Coordinating Paper for Carrier Based Early Warning Command and Control System (E-2C)"

Approved Program: FY 1988 President's Budget

10. (U) Technical/Operational Characteristics:

a. (U) <u>Technical</u>	<u>Production Estimate/ Approved Programs</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Take off weight	51,535/51,535	51,878	51,878
Length/Span	56'4"-80'7"/56'4"-80'7"	57'6"-80'7"	57'6"-80'7"
Engine Number/Type	2-T56-A-8A/2-T56-A-8A	2-T56-A-425	2-T56-A-425
Crew	5/5	5	5
b. (U) <u>Operational</u>			
(U) Speed (KIAS)			
(1) Max Speed	315/315	N.A.	315
@ 13,500'			
(KIAS)			

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10. (U) Technical/Operational Characteristics (Cont'd):

(2) Cruise Speed @ 24,450'	270/270	N.A.	270
(U) Time on Station @ 200 NM (Hrs)	4.0/4.0	3.5	3.5
(U) Service Ceiling (Ft)	28,100/28,100	N.A.	30,800
(U) Radar Detection Range (AN/APS-120)			

(b)(1)

(U) Passive Detection System

(b)(1)

(U) (2) azimuth	360 deg/360 deg	360 deg	360 deg
(U) Radar detection range (AN/APS-138 with TRAC-A antenna)			

(b)(1)

(U) Systems Accuracy (CEP to Target at 200 NM range) (NM)	1.5/1.5	1.5	1.5
---	---------	-----	-----

Note: All detection parameters based on 50% probability of detection point.

c. Previous Changes Explanations -- None

d. Current Changes Explanations -- None

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10. (U) Technical/Operational Characteristics (Cont'd):

e. References --

Production Estimate: DCP No. 26 Rev 1 dated
24 June 1971, subject "Development Concept
Paper Carrier Based, Airborne Early
Warning/Command and Control System (E-2C)" NDCP
W0463 dated 28 September 1984, subject
"Navy Decision Coordinating Paper for Carrier
Based Early Warning Command and Control System
(E-2C)"

Approved Program: FY 1988 President's Budget

11. (U) Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost --	Production Estimate	Changes	Current Estimate
Development (RDT&E)	\$ 655.7	\$ + 95.9	\$ 751.6
Procurement	4739.2	+803.8	5543.0
Airframe & Changes	(2967.3)	(+627.2)	(3594.5)
Engine & Accessories	(142.0)	(+ 60.0)	(202.0)
Electronics	(110.0)	(+ 17.6)	(127.6)
Armament & Other GFE	(13.7)	(+ 0.7)	(14.4)
Total Flyaway	(3233.0)	(+705.5)	(3938.5)
Other Wpn Sys Cost	(1183.4)	(+116.3)	(1299.7)
Initial Spares	(322.8)	(- 18.0)	(304.8)
Construction (MILCON)	3.1	-0.7	2.4
Total FY 85 Base-Year \$	5398.0	+899.0	6297.0
Escalation	523.5	+ 5.4	528.9
Development (RDT&E)	(50.3)	(+ 19.4)	(69.7)
Procurement	(473.1)	(- 13.9)	(459.2)
Construction (MILCON)	(0.1)	(- 0.1)	0.0
Total Then-Year \$	\$ 5921.5	\$ +904.4	\$ 6825.9
b. Quantities --			
Development (RDT&E)	2	-	2
Procurement	125	+ 16	141
Total	127	+ 16	143
c. Unit Cost --			
Procurement:			
FY 85 Base-Year \$	\$ 37.9	\$ + 1.4	\$ 39.3
Then-Year \$	41.7	+ .8	42.5
Program:			
FY 85 Base-Year \$	42.5	+ 1.5	44.0
Then-Year \$	\$ 46.6	\$ + 1.1	\$ 47.7

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11. (U) Program Acquisition Cost (Cont'd) (Current Estimated in Millions of Dollars)

- d. Approved Design to Cost Goal -- Not applicable
- e. Foreign Military Sales -- Sales to date are 4 for Israel for a total of \$157.8M; 8 for Japan for a total of \$380.9M; 5 for Egypt for a total of \$570.3M; and 4 for Singapore for a total of \$364.5M.
- f. Nuclear Costs -- None

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>SAR Current</u> <u>Estimate</u> <u>Dec 1986</u>	<u>UCR Baseline</u> <u>Estimate</u> <u>Dec 1985</u>	<u>UCR Baseline</u> <u>Estimate</u> <u>Dec 1986</u>
a. Program Acquisition --			
(1) Cost	6825.9	6050.2	6825.9
(2) Quantity	143	133	143
(3) Unit Cost	47.7	45.5	47.7

FY 1987 Appropriation Act

b. Current Procurement --	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	455.3	455.3	427.3
Less CY Adv Proc	24.1	24.1	30.1
Plus FY Adv Proc	26.5	26.5	24.1
Net Total	<u>457.7</u>	<u>457.7</u>	<u>421.3</u>
(2) Quantity	10	10	6
(3) Unit Cost	45.770	45.770	70.217

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13. (U) Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	706.0	5212.3	3.2	5921.5
Previous Changes:				
Economic	+3.3	- 77.6		-74.3
Quantity	--	+232.2	--	+232.2
Schedule	--	--	--	--
Engineering	+24.6	--	--	+24.6
Estimating	--	+ 67.2	--	+67.2
Other	--	--	--	--
Support	--	-121.0	--	-121.0
Subtotal	+27.9	+ 100.8	--	+128.7
Current Changes:				
Economic	- 11.9	- 44.1	--	- 56.0
Quantity	--	+ 390.5	--	+390.5
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+ 99.3	+ 118.7	--	+218.0
Other	--	--	--	--
Support	--	+ 224.0	-.8	+223.2
Subtotal	+ 87.4	+ 689.1	- .8	+775.7
Total Changes	+ 115.3	+ 789.9	- .8	+904.4
Current Estimate	821.3	6002.2	2.4	6825.9

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13. (U) Cost Variance Analysis(Cont'd):
 (FY 1985 Constant Dollars (Base Year) in Millions)

	<u>RDT&E</u>	<u>PROC</u>	<u>MILCON</u>	<u>TOTAL</u>
Production Estimate	655.7	4739.2	3.1	5398.0
Previous Changes:				
Economic	--	--	--	--
Quantity	--	+182.4	--	+ 182.4
Schedule	--	--	--	--
Engineering	+ 49.8	--	--	+ 49.8
Estimating	--	+ 64.0	--	+ 64.0
Other	--	--	--	--
Support	--	- 93.3	+ 0.1	- 93.2
Subtotal	+ 49.8	+153.1	+ 0.1	+ 203.0
Current Changes:				
Economic	--	--	--	--
Quantity	--	+351.9	--	+ 351.9
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+ 46.1	+107.2	--	+ 153.3
Other	--	--	--	- .8
Support	--	191.6	-.8	+ 190.8
Subtotal	+ 46.1	+650.7	- .8	+ 696.0
Total Changes	+ 95.9	+803.8	- .7	+ 899.0
Current Estimate	751.6	5543.0	2.4	6297.0

b. Previous Change Explanations -- Change due to quantity, engineering, estimating and support costs.

c. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base Year</u>	<u>Then Year</u>
1. <u>RDT&E</u>			
Estimating		+46.1	+ 99.3
Correction of error on previous SAR (Economics)			- 8.0
Current (Economics)			- 3.9
Change due to different indices from last year.			

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13. (U) Cost Variance Analysis (Cont'd):
(FY 1985 Constant Dollars (Base Year) in Millions)

		(Dollars in Millions)	
		<u>Base Year</u>	<u>Then Year</u>
2.	<u>Procurement</u>		
	Revised escalation (Economic)	N/A	-44.1
	Addition of 10 aircraft (Quantity)	+ 351.9	+ 390.5
	Revised estimate of support costs (Support)	+ 191.6	+ 224.0
	Repricing of A/C and GFE requirements (Estimating)	+ 107.2	+ 118.7
3.	<u>MILCON</u>		
	Repair of training facility at Norfolk (Support)	- .8	- .8

- d. References --

Production Estimate: DCP No. 26 Rev 1 dated 24 June 1971, subject "Development Concept Paper Carrier Based, Airborne Early Warning/Command and Control System (E-2C)"
NDCP W0463 dated 28 September 1984, subject "Navy Decision Coordinating Paper for Carrier Based Early Warning Command and Control System (E-2C)"

Approved Program: FY 1988 President's Budget

14. (U) Program Acquisition Unit Cost (PAUC) History:

- a. Initial SAR Estimate to Current Baseline Estimate

(1) Same as Current Baseline Estimate

- b. Current Baseline Estimate to Current Estimate --

PAUC (PdE)	Changes (Then Year Dollars in Millions)								PAUC (CE)
	ECON	QTY	SCH	ENG	EST	SUP	OTHER	TOTAL	
46.6	-.9	-.9	--	+.2	+2.0	+.7	--	+1.1	47.7

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15. (U) Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

Radar
Grumman Aerospace Corporation
N00019-83-C-0304 FPI
29 June 1984

Initial Contract Price		
Target	Ceiling	Qty
\$91.3	101.4	--

Current Contract Price		
Target	Ceiling	Qty
\$95.5	101.4	--

Estimate Price At Completion	
Contractor	Program Manager
\$ 95.5	\$ 95.5

Previous Cumulative Variances
Cumulative Variances to Date
Net Change

Cost Variance	Schedule Variance
\$ 2.0	\$ 1.1
\$ - 0.2	\$ -3.4
\$ + 1.8	\$ -2.3

Explanation of Change: This contract is considered on schedule at cost. The schedule of the UDP was slipped 9 months to maintain concurrency with the JTIDS program, resulting in a cost impact to be negotiated. Now, due to SECNAV direction to drop Navy JTIDS and incorporate Air Force JTIDS the schedule of JTIDS will slip several more years. Therefore concurrency with the UDP can no longer be maintained. There will be a delta cost to the UDP due to this loss of concurrency.

b. Procurement --

Airframe
Grumman Aerospace Corporation
N00019-84-C-0046 FFP
13 March 1984

Initial Contract Price		
Target	Ceiling	Qty
\$256.0	N/A	6

Current Contract Price		
Target	Ceiling	Qty
\$265.2	N/A	6

Estimate Price At Completion	
Contractor	Program Manager
\$265.2	\$265.2

Previous Cumulative Variances
Cumulative Variances to Date
Net Change

Cost Variance	Schedule Variance
-0-	-0-
-0-	-0-
-0-	-0-

Airframe
Grumman Aerospace Corporation
N00019-83-C-0007 FFP
18 March 1983

Initial Contract Price		
Target	Ceiling	Qty
\$218.4	N/A	6

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15. (U) Contract Information (Cont'd): (Dollars in Millions)

Current Contract Price			Estimate Price At Completion		
Target	Ceiling	Qty	Contractor	Program Manager	
\$219.4	N/A	6	\$219.4	\$219.4	
Previous Cumulative Variances			Cost Variance	Schedule Variance	
Cumulative Variances to Date			-0-	-0-	
Net Change			-0-	-0-	
Airframe			Initial Contract Price		
Grumman Aerospace Corporation			Target	Ceiling	Qty
N00019-82-C-0047 FFP			\$245.5	N/A	6
26 March 1982					

Current Contract Price			Estimate Price At Completion		
Target	Ceiling	Qty	Contractor	Program Manager	
\$248.9	N/A	6	\$248.9	\$248.9	
Previous Cumulative Variances			Cost Variance	Schedule Variance	
Cumulative Variances to Date			\$ -0-	\$ -0-	
Net Change			\$ -0-	\$ -0-	

Explanation of Changes: Not reported on FFP contracts.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

- a. Program Status --
 (1) Percent Program Completed: 80.0% (20 yrs/25 yrs)
 (2) Percent Program Cost Appropriated: 63.9% (\$4383.0/\$6860.0)
- b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Budget		Balance FYDP (FY89-92)	To Complete Beyond FYDP (FY93)	Total
	Prior Yrs (FY82-87)	Year (FY88)			
RDT&E	431.7	33.4	356.2	-	821.3
Procurement	3948.9	427.3	1626.0	-	6002.2
MILCON	2.4	0	-	-	2.4
Total	4383.0	460.7	1982.2	-	6825.9

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 85 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1970	2	--	--	161.0	--	--	161.0	5.5
1972	--	--	--	30.8	--	--	30.8	4.6
1973	--	--	--	15.9	--	--	15.9	4.4
1974	--	--	--	0.1	--	--	0.1	8.0
1975	--	--	--	0.0	--	--	0.0	10.9
1976	--	--	--	0.0	--	--	0.0	6.6
1977	--	--	--	0.0	--	--	0.0	2.9
1977	--	--	--	0.0	--	--	0.0	2.6
1978	--	--	--	0.0	--	--	0.0	6.8
1979	--	--	--	5.5	--	--	5.5	8.4
1980	--	--	--	11.1	--	--	11.1	10.5
1981	--	--	--	19.0	--	--	19.0	10.6
1982	--	--	--	17.7	--	--	17.7	7.6
1983	--	--	--	40.5	--	--	40.5	4.9
1984	--	--	--	40.6	--	--	40.6	3.8
1985	--	--	--	33.8	--	--	34.4	3.4
1986	--	--	--	21.1	--	--	22.1	2.9
1987	--	--	--	30.5	--	--	33.0	3.1
1988	--	--	--	29.8	--	--	33.4	3.5
1989	--	--	--	21.5	--	--	24.9	3.5
1990	--	--	--	83.4	--	--	99.5	3.3
1991	--	--	--	89.6	--	--	109.7	2.9
1992	--	--	--	99.7	--	--	122.1	2.9
TOTAL	2	--	--	751.6	--	--	821.3	

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16. (U) Program Funding Summary (Cont'd): (Current Estimated in Millions of Dollars)

c. Annual Summary —

Fiscal Year	Qty	FY 85 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: Procurement								
1970	11	--	--	48.8	43.7	--	48.8	3.9
1972	9	--	190.7	275.0	16.5	43.7	275.0	3.8
1973	--	--	104.7	157.6	18.2	16.5	157.6	4.2
1974	8	--	127.3	161.4	1.5	18.2	161.4	5.8
1975	6	--	102.5	129.2	7.7	1.5	129.2	8.8
1976	6	1.0	100.1	160.9	8.4	7.7	160.9	6.6
1977	1	--	16.8	23.0	6.9	3.7	23.0	3.6
1977	6	--	107.9	156.5	10.6	11.6	156.5	3.8
1978	6	--	132.4	193.7	10.6	10.6	193.7	6.8
1979	6	9.4	140.6	207.3	16.3	10.6	207.3	8.7
1980	6	--	159.6	199.2	17.6	16.3	199.2	11.8
1981	6	21.6	152.0	235.1	20.1	17.6	235.1	11.6
1982	6	1.2	192.5	254.7	21.2	20.1	254.7	14.3
1983	6	0.0	187.7	293.5	25.3	21.2	293.5	9.0
1984	6	0.0	202.1	320.1	25.1	25.3	321.2	8.0
1985	6	30.2	186.7	314.9	28.4	25.1	330.9	3.4
1986	6	26.8	185.9	318.6	26.5	28.4	345.6	2.9
1987	10	22.3	341.0	406.0	24.1	26.5	455.3	3.1
1988	6	20.3	239.2	368.7	30.0	24.1	427.3	3.5
1989	6	--	234.5	296.0	30.7	30.0	354.3	3.5
1990	6	--	237.9	351.0	32.5	30.7	430.3	3.3
1991	6	1.9	233.1	333.1	33.3	32.5	417.3	2.9
1992	6	--	228.6	338.7	0	33.3	424.1	2.4
TOTAL	141	134.7	3803.8	5543.0	455.2	455.2	6002.2	

Appropriation: MILCON

85 & Prior	--	--	--	2.4	--	--	2.4	--
TOTAL				2.4			2.4	

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16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1982 & Prior	261.8	261.8	261.8
1983	40.5	40.4	40.2
1984	40.6	40.6	40.6
1985	33.7	33.7	33.7
1986	22.1	22.1	11.2
1987	33.0	10.7	0.1
To Complete	389.6	N/A	N/A
TOTAL	821.3	409.3	387.6

Appropriation: Procurement

1982 & Prior	2202.4	2202.4	2202.4
1983	293.5	282.5	273.2
1984	321.2	307.4	262.3
1985	330.9	308.6	247.9
1986	345.6	290.9	52.7
1987	455.3	44.1	12.2
To Complete	2053.3	N/A	N/A
TOTAL	6002.2	3435.9	3050.7

Appropriation: MILCON

1982 & Prior	2.4	2.4	2.4
1983	--	--	--
1984	--	--	--
1985	--	--	--
1986	--	--	--
1987	--	--	--
To Complete	--	N/A	N/A
TOTAL	2.4	2.4	2.4

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E-2C, December 31, 1986

17. (U) Production Rate Data:

a. Annual Production Rates -- Note: Since the E-2C has been in production for several years, the development estimate was not a factor considered for production rates in this SAR. Tooling presently at Grumman allows for production of six E-2C's, eight C-2A's, and four FMS customers.

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1987	N/A	10	10	18
1988	N/A	6	6	18
1989	N/A	6	6	18
1990	N/A	6	6	18
1991	N/A	6	6	18
1992	N/A	6	6	18

b. Cost Variance -- Dollars in Millions (Note: Subject to limitations on production rates above.)

Item	Production Estimate	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Prog Acq Cost (BY \$)	5398.0	+ 899.0	6297.0	--	6297.0
(TY \$)	5921.5	+ 904.4	6825.9	--	6825.9
PAUC (BY \$)	42.5	+ 1.5	44.0	--	44.0
(TY \$)	46.6	+ 1.1	47.7	--	47.7

c. Schedule Variance -- (Note: Subject to the limitations on production rates above.)

	Production Estimate	Variance (CE vs PdE)	Current Estimate	Variance (CE vs Max)	Maximum Economic
Start Date (Mo/Yr)	3/84	N/A	3/84	N/A	3/84
Duration (in Months)	35	N/A	35	N/A	35
End Date (Mo/Yr)	2/87	N/A	2/97	N/A	2/87

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	2/2
Procurement	94/94

18. (U) Operating and Support Costs: N/A

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(A)125B(7700))

PROGRAM: BATTLESHIP REACTIVATION

AS OF DATE: December 31, 1986

<u>SUBJECT</u>	<u>INDEX</u>	<u>PAGE</u>
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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name): IOWA-Class Battleship
Reactivation/Modernization (NEW JERSEY, IOWA, MISSOURI, WISCONSIN)

2. DoD Component: U.S. Navy

3. Responsible Office and Telephone Number:

Battleship Reactivation Program (SEA-913B1)
Naval Sea Systems Command
Washington, DC 20362

PM: CAPT Dennis Doyle
Assigned: Oct 15, 1985
(202)692-0554 AV: 222-0554

4. Program Elements/Procurement Line Items:

RDT&E: APPN 1319 ICN 64567N
APPN 1319 ICN 63564N

PROCUREMENT: APPN 1611 ICN 22420N

5. Related Programs:

TOMAHAWK
CIWS

6. Mission and Description: To conduct prompt and sustained combat operations
at sea, worldwide, in support of national interests. The battleship will operate

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as an element of a carrier battle group or amphibious group. In areas of lesser threat, the battleship will be capable of surface action group operations with appropriate ASW- and AAW-capable escorts. The battleship will not replace any existing DOD system.

7. Program Highlights:

a. Significant Historical Developments -- The USS NEW JERSEY was delivered on schedule and subsequently recommissioned on 28 December 1982. Due to operational requirements in Central America and Lebanon, she did not complete her Post Shakedown Availability until November 1984. Delivery of the USS IOWA was successfully accelerated in December 1983 to enable recommissioning on 28 April 1984. She completed her Post Shakedown Availability in July 1985. The USS MISSOURI was delivered on schedule in April and recommissioned in May 1986 and is scheduled for PSA from January to May 1987. The production contract for the WISCONSIN was awarded in June 1986 with the Reactivation/Modernization Option exercised in July 1986.

b. Significant Developments Since Last Report -- Wisconsin contract awarded June 1986. Missouri recommissioned May 1986.

c. Changes Since "As Of" Date -- None

8. Decision Coordinating Paper (DCP) Threshold Breaches: N/A

9. Schedule:

a. Milestones --	<u>Production Estimate/ Approved Program</u>	<u>Current Estimate</u>
Delivery of NEW JERSEY (BB-62)	Dec 82/Dec 82	Dec 82
Delivery of IOWA (BB-61)	Jan 85/Apr 84	Apr 84
Delivery of MISSOURI (BB-63)	Jul 86/Apr 86	Apr 86
Delivery of WISCONSIN (BB-64)	Jan 88/Oct 88	Aug 88(Ch-1)

b. Previous Change Explanations -- Reflects accelerated IOWA delivery; revised MISSOURI schedule; revised WISCONSIN schedule; and Corrected Production Estimate dates to reflect original schedule provided in Baseline Dec 82 SAR.

c. Current Change Explanations: Ch-1 - (Current schedule reflects actual WISCONSIN contract award)

d. References --

Production Estimate: CNM Memo Ser 00/0547 of 8 Jun 1981
COMNAVSEASYSKOM, "Reactivation of NEW JERSEY (BB62)"; COMNAVSEASYSKOM ltr Ser 1035 of 16 Jul 1981, "Reactivation of NEW JERSEY (BB62)"; COMNAVSEASYSKOM ltr Ser 209 of 31 Dec 1981, "Reactivation and Modernization of IOWA (BB61)"; CNO Memo Ser 00/C30022 of 13 Jan 1982 to SECNAV, "IOWA (BB61) Reactivation/Modernization"

Approved Program: FY 1988 President's Budget

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10. Technical/Operational Characteristics:

a. Technical	<u>Prod Estimate/ Appr Program*</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Overall Length, ft.	887	887	887
Beam, ft.	108	108	108
Navigational Draft, ft.	38	38	38
Full Load Displacement, tons	58,000	58,000	58,000
Propulsion			
Type	600# stm turb	600# stm turb	600# stm turb
HP (4 shafts)	212,000	212,000	212,000
Accommodations			
BB-62 Officers	62	128	128
Enlisted	1,500	1,655	1,655
BB-61 Officers	131	131	131
Enlisted	1,588	1,588	1,588
BB-63 Officers	78	78	78
Enlisted	1,676	1,676	1,676
BB-64 Officers	78	78	78
Enlisted	1,676	1,676	1,676
b. Operational			
Sustained Speed (@ 80%), kts.	30	30	30
Endurance (@ 20 kts.), nm.	14,800	14,800	14,800
Armament			
<u>Anti-Air Warfare</u>			
PHALANX (CIWS)	MK-15 MOD-4	MK-15 MOD-4	MK-15 MOD-4
Electronic Warfare System	AN/SLQ-32(V)3	AN/SLQ-32(V)3	AN/SLQ-32(V)3
5"/38 Gun Mounts	6 MK-28	6 MK-28	6 MK-28
SRBOC Launch System	MK-36 MOD-7	MK-36 MOD-7	MK-36 MOD-7
2D Air Search Radar	AN/SPS-49(V)1	AN/SPS-49(V)5**	AN/SPS-49(V)**
<u>Anti-Surface Warfare</u>			
Surface Search Radar***	AN/SPS-10B	AN/SPS-10B	AN/SPS-10B
Surface Search Radar****	AN/SPS-67(V)	AN/SPS-67(V)	AN/SPS-67(V)
TOMAHAWK Weapon System	EX-32 MOD-5	EX-32 MOD-5	EX-32 MOD-5
HARPOON Weapon System	AN/SWG-1(V)21	AN/SWG-1A(V)21**	AN/SWG-1A(V)21**
	3	3	3

NOTES

* Unless dual entries are provided, Approved Program values are the same as Production Estimate values.

** BB-64 Only

*** BB-62 Only

**** BB-61, BB-63, and BB-64

c. Previous Change Explanations — Revised accommodation estimates.

d. Current Change Explanations — None

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10. Technical/Operational Characteristics (Cont'd):

e. References --

Production Estimate: OPNAV INSTRUCTION C9010., Ser 03C/502 of 13 Jan 1982, "IOWA-Class (BB-61) Top Level Requirements (TLR): Promulgation of,"

Approved Program: FY 1988 President's Budget

11. Program Acquisition Cost: (In Millions of Dollars)

	Production Estimate (FY81-88)	Changes	Current Estimate (FY81-89)
a. Cost --			
Development	19.4	+2.1	21.5
Procurement	1,457.3	+92.4	1,549.7
Basic Ship	(696.4)	(+173.1)	(869.5)
GFE	(532.2)	(+18.5)	(550.7)
Other	(148.4)	(-130.4)	(18.0)
Subtotal Procurement	(1,377.0)	(+61.2)	(1,438.2)
Outfitting/Post Delivery	(80.3)	(+31.2)	(111.5)
Construction	—	—	—
Total FY82 Base-Year \$	1,476.7	+94.5	1,571.2
Escalation	399.9	-181.7	218.2
Development	(1.9)	(-.2)	(1.7)
Procurement	(398.0)	(-181.5)	(216.5)
Construction	—	—	—
Total Then-Year \$	1,876.6	-87.2	1,789.4
b. Quantities --			
Development	—	—	—
Procurement	4	—	4
Total	4	—	4
c. Unit Cost --			
Procurement:			
FY82 Base-Year \$	364.325	+23.100	387.425
Then-Year \$	463.825	-22.275	441.550
Program:			
FY82 Base-Year \$	369.175	+23.625	392.800
Then-Year \$	469.150	-21.800	447.350
d. Approved Design to Cost Goal -- N/A			
e. Foreign Military Sales -- None			
f. Nuclear Costs -- None			

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12. Program Acquisition/Current Procurement Unit Cost Summary:
 (Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est</u> <u>(Dec 86 SAR)</u>	<u>UCR Baseline</u> <u>(Dec 85 SAR)</u>	<u>UCR Baseline</u> <u>(Dec 86 SAR)</u>
a. Program Acquisition			
(1) Cost	1,789.4	1,815.6	1,789.4
(2) Quantity	4	4	4
(3) Unit Cost	447.350	453.900	447.350
b. Current Procurement			
(1) Cost	11.9	12.0	11.9
Less CY Adv Proc	-	-	-
Plus PY Adv Proc	+	-	-
Less OF/PD	-	11.9	12.0
Net Total	0	0	0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. Cost Variance Analysis:

a. Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	21.3	1,855.3	-	1,876.6
Previous Changes:				
Economic	-0.5	-136.0	-	-136.5
Quantity	-	-	-	-
Schedule	+4.3	+127.9	-	+132.2
Engineering	-	-	-	-
Estimating	-1.9	-54.8	-	-56.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1.9	-62.9	-	-61.0
Current Changes:				
Economic	-	-57.1	-	-57.1
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+30.9	-	+30.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	0	-26.2	-	-26.2
Total Changes	+1.9	-89.1	-	-87.2
Current Estimate	23.2	1,766.2	-	1,789.4

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13. Cost Variance Analysis (Cont'd):

(FY 1982 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	19.4	1,457.3	-	1,476.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	+3.5	+97.7	-	+101.2
Engineering	-	-	-	-
Estimating	-1.4	-31.4	-	-32.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+2.1	+66.3	-	+68.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+26.1	-	+26.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	0	+26.1	-	+26.1
Total Changes	+2.1	+92.4	-	+94.5
Current Estimate	21.5	1,549.7	-	1,571.2

b. Previous Change Explanations —

RDT&E

Economic: Revised escalation indices

Schedule: Accelerated IOWA delivery; reflects WISCONSIN authorization as a FY86 ship

Estimating: Updated program funding profile to reflect IOWA actuals and MISSOURI acceleration; updated program funding profile

Procurement

Economic: Revised escalation indices

Schedule: Accelerated IOWA delivery; reflects WISCONSIN authorization as a FY86 ship; transferred \$73.4 million FY85 FF to FY84 AP to facilitate advanced MISSOURI delivery

Estimating: Updated program funding profile to reflect NEW JERSEY & IOWA actuals and MISSOURI acceleration; updated program funding profile to reflect appropriation of entire WISCONSIN funding in FY86

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13. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

(Dollars in Millions)
Base-Year \$ Then-Year \$(1) RDT&E

- -

(2) ProcurementEconomic: Revised escalation indices
Estimating: Update of program funding
profile- -57.1
+26.1 +30.9

d. References --

Production Estimate: CNM Memo Ser 00/0547 of 8 Jun 1981,
COMNAVSEASYS COM, "Reactivation of NEW JERSEY (BB62)"14. Program Acquisition Unit Cost (PAUC) History:

a. Initial SAR Estimate is the same as Current Baseline Estimate (PdE).

b. Current Baseline Estimate to Current Estimate --

PAUC Baseline Estimate (PdE)	Changes (Then-Year Dollars in Millions)								PAUC Current Estimate
	Econ	Qty	Sched	Eng	Est	Support	Other	Total	
469.150	-48.400	-	+33.050	-	-6.450	-	-	-21.800	447.350

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E -- N/A

b. Procurement --

WISCONSIN:

Litton Systems Inc., Ingalls Shipbuilding Div.
N00024-86-C-2043, FPPI,
Award: July 1986*

Initial Contract Price		
Target	Ceiling	Qty
210.3	210.3	1

Current Contract Price		
Target	Ceiling	Qty
210.3	210.3	1

Estimated Price At Completion	
Contractor	Program Mgr
210.3	210.3

* 1.0M planning contract awarded in June 1986

15. Contract Information (Cont'd)

Previous Cumulative Variances	<u>Cost Var</u>	<u>Schedule Var</u>
Cumulative Variances To Date	-	-
Net Change	-	-

Explanation of Change: N/A

16. Program Funding Summary: (Current Estimate In Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 67% (6 of 9 years)
(Years Funds Appropriated/Total Program Years)
- (2) Percent Program Cost Appropriated: 98.3% (\$1,759.4/\$1,789.4)
(Funds Appropriated To Date in Millions/Total Program Funding in Millions)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY81-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance To Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93)</u>	<u>Total</u>
RDT&E	23.2	-	-	-	23.2
Procurement	1,736.2	26.7	3.3	-	1,766.2
Total	1,759.4	26.7	3.3	-	1,789.4

c. Annual Summary --

Fiscal Year	Qty	FY 82 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1981				3.2			3.1	10.61
1982				3.8			3.9	7.59
1983				5.3			5.7	4.90
1984				2.9			3.2	3.80
1985				4.3			4.9	3.40
1986				2.0			2.4	2.90
Subtotal				21.5			23.2	

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16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 82 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement-SCN

1981			83.4	83.4	88.1		88.1	9.60
1982	1		298.4	305.4	95.6	88.1	332.5	7.50
1983	1		273.1	307.4	38.0	87.9	340.5	3.80
1984	1		404.8	411.5	7.7		471.4	3.00
1985				12.3	14.3		14.3	2.10
1986	1		378.6	397.0	22.2		477.5	1.20
1987				9.6	11.9		11.9	3.10
1988				20.8	10.8		26.7	3.50
1989				2.5	19.2		3.3	3.50
1990								3.30
Subtotal	4		1,438.2	1,549.7	307.8	176.0	1,766.2	

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1981	3.1	3.1	3.0
1982	3.9	3.7	3.5
1983	5.7	5.6	5.4
1984	3.2	3.2	3.1
1985	4.9	4.9	3.1
1986	2.4	2.1	-
To Complete	-	N/A	N/A
Total	23.2	22.6	18.1

Appropriation: Procurement-SCN

1981	88.1	88.1	84.9
1982	332.5	320.7	309.2
1983	340.5	300.3	287.1
1984	471.4	435.3	395.4
1985	14.3	-	-
1986	477.5	304.6	34.3
To Complete	41.9	N/A	N/A
Total	1,766.2	1,449.0	1,110.9

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Battleship Reactivation, December 31, 1986

17. Production Rate Data: N/A

18. Operating and Support Costs: N/A

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N-14 F-14A

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SAR-86-106
~~CONFIDENTIAL~~

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: F-14A

AS OF DATE: December 31, 1986

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AS AMENDED

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation/Nomenclature (Popular Name): F-14A

2. DoD Component: U.S. Navy

3. Responsible Office and Telephone Number:

Naval Air Systems Command
PMA-241
Washington, D.C.

PM: CAPT W. C. Bowes
Assigned : December 16, 1983
COMM (202) 692-8284
AUTOVON 222-8284

4. Program Elements/Procurement Line Items:

RDT&E: PE 25667N
PROCUREMENT: PE 24144N APPN 1506 ICN 0140
ICN 0141
MILCON: PE 24144N

5. Related Programs: F-14D, A-6E, EA-6B, E-2C, C-2 (All Grumman Aero Corp produced aircraft) and AIM-54 A/C PHOENIX Missile.

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6. MISSION AND DESCRIPTION: The F-14A is an all-weather, carrier-based, airborne weapon system capable of performing fleet air defense and air-to-ground missions. Air-to-ground capability is secondary and has never been fully developed. The F-14A is a twin-engine, two-place, tandem seat, variable-sweep-wing, supersonic fighter capable of engaging multiple targets simultaneously at altitudes from sea level to over 80,000 feet. The major sub-systems of the F-14A aircraft are the TF30-P-414A engine and the AN/AWG-9 Weapons Control System. The F-14A is powered by two TF30-P-414A engines which are mounted in podded nacelles on either side and below the centerline of the fuselage. Each engine is rated (at sea level, static conditions) at 12,350 pounds thrust (military) and 20,900 pounds thrust (maximum afterburner). The engines also provide power to operate aircraft electrical, hydraulic and environmental control systems. The AN/AWG-9 is a pulse doppler radar which can detect fighter targets at over 115 nautical miles across a 150 nautical mile front. The AN/AWG-9 can simultaneously track 24 targets and attack six individual targets with PHOENIX missiles while continuing to scan the airspace. The AN/AWG-9 includes many features not presently available in any other aircraft. The AWG-9 PHOENIX missile combination gives the F-14 the unique ability to prosecute the long-range, multiple-target, outer Air Battle missions.

7. Program Highlights:

a. Significant Historical Developments -- The concept of the F-14 aircraft was initiated in 1967 to recognize the Navy requirement for a new fighter aircraft to replace the F-4. After competition, the engineering development contract was awarded to Grumman Aerospace corporation on 3 February 1969 for the development of 6 RDT&E aircraft and pre-established option prices for 463 production aircraft through Fiscal Year 1976. The first F-14A production model aircraft was accepted in May 1972. The first readiness training squadron was activated in October 1972 and the first squadron became fleet operational in December 1973. To date, 24 F-14A squadrons and 2 reserve are in an operational status operating on both the East and West Coasts of the U.S. On December 9, 1982, the Navy Defense Resource Board (DRB) determined an upgrade to the F-14A to be the most cost effective solution for the Navy's anti-air warfare operational requirement. The decision was confirmed by a SECNAV memorandum of July 6, 1983, which delineated required capabilities for the upgraded F-14. This program called for production to commence on a F110 engine F-14A configuration (designated the F-14A(PLUS)) in FY86, and for production to commence on the F-14D in FY88. A requirement for the early F-14A(PLUS) configuration was necessitated by the safety and operability problems associated with the present TF30 engine.

b. Significant Developments Since Last Report --

This is the final SAR. Deliveries of the F-14A and F-14A (Plus) total 93%, therefore this is the final SAR. The F-14D costs are now reported in a separate F-14D SAR.

The F-14A has met all its DCP mission requirements.

c. Changes Since "As Of" Date -- None

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are currently no (DCP) threshold breaches. Breach of thresholds in cost, schedule and technical performance as contained in current effective DCP 60, revision A, of 20 July 1970, was reported to DEPSECDEF in March 1971 during DSARC III.

9. Schedule

a. Milestones --

	Development Estimate/ Approved Program	Current Estimate
a. Release of RFP	Jun 68/Jun 68	Jun 68
b. Project Initiated	Jul 68/Jul 68	Jul 68
c. Award of Contract Definition Contracts	Jul 68/Jul 68	Jul 68
d. Award of Engineering Develop. Contract	Feb 69/Feb 69	Feb 69
e. Airframe Mockup	May 69/May 69	May 69
f. Completion of MQT for Eng w/new nozzle	Jan 71/Feb 71	Mar 71
g. Delivery of 1st Prod Engine	Jan 71/Feb 71	Mar 71
h. First Flight (RDT&E Model)	Jan 71/Dec 70	Dec 70
i. Navy Preliminary Evaluation		
Begin First	Apr 71/Apr 71	Nov 71
Begin Second	Oct 71/Oct 71	Jul 72
j. Delivery 1st Prod. Aircraft (No. 13)	Jan 72/Jan 72	May 72
k. Begin BIS trial	Jun 72/Jun 72	Nov 72
l. Complete Static Tests	Oct 72/Oct 72	Nov 73
m. Activate Readiness Trng Sqd (RTS)		
(Fleet Introduction)	Nov 72/Nov 72	Oct 72
n. Fleet Operational (1st Sqdrn)	Apr 73/Apr 73	Dec 73
o. Navy Support Date	Jan 74/Jan 74	Jan 74

b. Previous Change Explanations --

Milestone (f&g)- Completion of MQT for engine with new nozzle - slip caused by delay in signing the contract for development of engine nozzle. Milestone (h)- First F-14A flight (RDT&E model) - accomplished one month ahead of schedule. Milestone (i) - Navy preliminary evaluation seven months late due to loss of No. 1 F-14A on 30 Dec 1970 and delays in flight test program. Milestone (j)- Delivery of first production aircraft (No. 13) - slip contributed to by flight test program delays and production delays. Milestone (k)- Begin BIS trial - slip by seven months contributed to by loss of No. 1 F-14A on 30 Dec 1970 and delays in flight test program. Accomplished by initiation of Initial Trial Phase of BIS in Nov 1972. Milestone (l)- Complete static test - slip 13 months caused by test reruns and test transferred from static article No. 1, i.e. vertical fin failure test, inlet duct retest, structural and pylon test. Milestone (m)- Activate Readiness Training Sqd (RTS) (Fleet introduction) - accomplished a month ahead of schedule. Milestone (n)- Fleet operational (1st sqdrn) - slip 8 months caused by delays in flight test program and delivery of production aircraft.

c. Current change explanations --

None

d. References --

Development Estimate: DCP #60 dated January 13, 1969.
Approved Program: FY 1988 President's Budget.

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10. (U) Technical/Operational Characteristics:

(Configuration with 4 SPARROW missiles unless otherwise indicated)

(U) a. Technical	Dev Estimate/ Appr Program	Demonstrated Performance	Current Estimate A/
(U) Weight			
Empty no stores (1b)	35,979/35,514	40,422	40,422
Normal Take off (1b)	53,500/53,500	60,033(C/)	60,033 (C/)
Max T/O (6 PHX) (1b)	65,421/65,421	70,891	70,891
(U) Length/Height/Span (Ft.)	62/16/62.8/ 62/16/64.1	62/16/64.1	62/16/64.1
(U) Spotting Factor (A4C=1.0**	1.67/1.74	1.74	1.74
(U) Maintenance Manhours per Flight Hour	19.8/19.8	21.5	21.5 (E/)
(U) SDLM Cycle (mo.)	18/36	44	44

(U) b. Operational

(U) Speed

(U) At S/L Combat wt. (M)	1.15/1.15	1.20	1.20
---------------------------	-----------	------	------

(b)(1)			
(U) VPA* @ Max Ldg wt. (6 PHX) (Kts) (51800 Lb)	120/120	133	133
(U) Acceleration .8-1.8M (min)	2.04/2.04	2.19(C/)	2.19(C/)
(U) Rate of Climb at S/L single engine PA* configuration, max Ldg wt. (6 PHX) (Ft/Min)		575/575	480(D/)
(U) Min. Wind Over Deck Requirements (Kts)			
Catapult	-10/-10	+9(C/)	+ 9(C/)
Catapult, Max (6 PHX)	+13/+13	+30	+30
Landing Max (6 PHX)	+10/+10	+26	+26
(U) CAP Combat Time at 150 Miles			
Range (6 PHX) (hrs.)	2.0/2.0	1.58	1.58
(U) Combat Radius, Escort Miss.(NM)		500/500	478(C/)
(U) Combat Radius (4 SPARROW & 4 SIDEWINDER)	N/A/NA	387	387
(U) Ceiling			
Supersonic (Ft.)	58,100/58,100	55,900(C/)	55,900(C/)
Cruise (6 PHX) (Ft.)	38,000/38,000	37,000	37,000
(U) Sustained Load Factor	2.27/2.27	2.18(C/)	2.18 (C/)

*VPA=Velocity, Power Approach; PA = Power Approach

**Spotting Factor (A7=1.0 is estimated to be 1.52)

NOTES:

A/ (U) Today's performance is based on the operational F-14A which has undergone several changes since the completion of development

(b)(1)

C/ (U) Utilizing full internal fuel. (16,200) lbs)

D/ (U) 89 degree Tropical Day

E/ (U) Unscheduled maintenance actions.

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10. Technical/Operational Characteristics: (Cont'd)

- c. Previous Change Explanations --
F-14A current estimate updated to reflect current demonstrated performances.
- d. Current Change Explanations -- None
- e. References --
Development Estimate : DCP #60 dated January 30, 1969.
Approved Program: FY 1988 President's Budget.

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)

a. Cost --	Development		Current
	<u>Estimate</u>	<u>Changes</u>	<u>Estimate</u>
Development (RDT&E)	899.5	+480.2	1379.7
Procurement	4491.9	+2260.5	6752.4
Airframe	(1773.1)	(+1519.8)	(3292.9)
Engine	(572.9)	(+331.9)	(904.8)
Avionics	(941.5)	(-27.8)	(913.7)
Other Hardware	(35.9)	(+140.2)	(176.1)
Total Flyaway	(3323.4)	(+1964.1)	(5287.5)
Other Wpn Sys Cost	(471.1)	(+507.0)	(978.1)
Initial Spares	(697.4)	(-210.6)	(486.8)
Construction (MILCON)	-	+6.0	6.0
Total FY 69 Base-Year \$	5391.4	+2746.7	8138.1
Escalation	774.6	+6562.2	7336.8
Development (RDT&E)	(74.5)	(+188.4)	(262.9)
Procurement	(700.1)	(+6369.7)	(7069.8)
Construction (MILCON)	(-)	(+4.1)	(4.1)
Total Then-Year \$	6166.0	+9308.9	15474.9
b. Quantities --			
Development (RDT&E)	6	+6	12
Procurement	463	+120	583
Total	469	+126	595
c. Unit Cost --			
Procurement:			
FY 69 Base-Year \$	9.702	+1.880	11.582
Then-Year \$	11.214	+12.495	23.709
Program:			
FY 69 Base-Year \$	11.496	+2.181	13.677
Then-Year \$	13.147	+12.861	26.008

d. Approved Design to Cost Goal -- N/A

e. Foreign Military Sales -- Iranian sales have been cancelled. The Iranian Government originally contracted for 80 F-14 aircraft, of which 79 were delivered, a total cost of \$1919.2M.

f. Nuclear Costs -- None

12. Program Acquisition/Current Procurement Unit Cost Summary:
 (Current (Then Year) Dollars in Millions)

	Current Year		Budget Year
	Current Est	UCR Baseline	UCR Baseline
	Dec 86 Sar	Dec 85 SAR	Dec 86 SAR
a. Program Acquisition --			
(1) Cost	15474.9 1/	15539.9	N/A 2/
(2) Quantity	595	595	
(3) Unit Cost	26.0	26.0	
FY 1987 Appropriation Act			
b. Current Procurement -- (FY 1987)		(FY 1987)	
(1) Cost	547.1	547.1	
Less CY Adv Proc	44.4	44.4	
Plus PY Adv Proc	113.0	113.0	
Net Total	615.7	615.7	
(2) Quantity	15	15	
(3) Unit Cost	41.0	41.0	

13. Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	974.0	5192.0	-	6166.0
Previous Changes: 3/				
Economic	+197.1	-1979.1	+1.5	-1780.5
Quantity	+296.9	+7119.3	-	+7416.2
Schedule	+109.4	+2218.7	-	+2328.1
Engineering	+1679.1	+3722.9	+23.3	+5425.3
Estimating	-1,693.6	-4391.3	-23.8	-6108.7
Support	-	+2004.7	+9.1	+2013.8
Other	+79.7	-	-	+79.7
Subtotal	+668.6	8695.2	+10.1	+9373.9
Current Changes:				
Economic	-	-100.2	-	-100.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-5.2	-	-5.2
Support	-	+40.4	-	+40.4
Other	-	-	-	-
Subtotal	-	-65.0	-	-65.0
Total Changes	+668.6	+8630.2	+10.1	+9308.9
Current Estimate	1642.6	13822.2	10.1	15474.9

1/ Includes \$368.2 million for the F-14B follow-on engine R&D funding budgeted through 1974.

2/ Since this is the final SAR, the F-14A will no longer be tracked for unit cost reporting purposes.

3/ Previous changes are being revised to remove F-14D costs from the F-14A SAR. These F-14D costs are established as the baseline for the stand-alone F-14D SAR.

13. Cost Variance Analysis (Cont'd):
(FY 1969 Constant Dollars (Base Year) in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	899.5	4491.9	-	5391.4
Previous Changes: 1/				
Quantity	+287.5	+1757.9	-	+2045.4
Schedule	+97.2	+180.9	-	+278.1
Engineering	+593.5	+854.6	+5.7	+1453.8
Estimating	-571.8	-1134.5	-6.7	-1713.0
Support	-	+591.0	+7.0	+598.0
Other	+73.8	-	-	+73.8
Subtotal	+480.2	+2249.9	+6.0	+2736.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+ .8	-	+ .8
Support	-	+9.8	-	+9.8
Other	-	-	-	-
Subtotal	-	+10.6	-	+10.6
Total Changes	+480.2	+2260.5	+6.0	+2746.7
Current Estimate	1379.7	6752.4	6.0	8138.1

1/ Previous changes are being revised to remove F-14D costs from the F-14A SAR. The F-14D costs are established as the baseline for the stand-alone F-14D SAR.

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation rates.
Quantity: Change by Congress from PAMN to R&D funding for Lot II A/C; additional F-401 engines.
Schedule: Delays in F-14A and F14B R&D schedules.
Engineering: Advance Engine development; engine component improvement, Programmable Signal Processor/Target Identification System program, Radar/Avionics Upgrade with new F110 engine (F-14D).
Estimating: Revisions due to better definition of the development program changes and recoupments, reprogrammings, roundings and refinement in pricing.
Other: Funding Grumman to ceiling; cost overrun on F-401/F-14B program.

PROCUREMENT

Economic: Revised escalation rates.
Quantity: Increase from 307 to 899 aircraft.
Schedule: Fluctuation in production rates and extension of program.
Engineering: Various program and configuration changes.
Estimating: Revisions due to negotiation savings and refinements in pricing.
Support: Repricing, realignments, and spare adjustments; additional squadron and carrier outfitting and additional sites due to extension of program.

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13. Cost Variance Analysis (Cont'd)MILCON

Economic: Revised Escalation Indices.
 Quantity: N/A
 Schedule: N/A
 Estimating: Rounding adjustment. Adjustment to actual obligation.
 Engineering: F-14D Operations Training Bldg. and Applied Instructional requirement.
 Support: F-14A Operational Training NAS Oceana not included in development estimate.

c. Current Change Explanation --

(Dollars in Millions)
Base-Year Then Year

(1) RDT&E

No change.

(2) Procurement

Revised Jan 87 economic escalation rates. (Economic)

N/A -100.2

Revised estimate based on refined price estimate for the F-14A(PLUS) and F110-GE-400 engines. (Estimating)

+.8 -5.2

Increase in spares procurement. (Support)

+9.8 +40.4

(3) MILCON

No change.

d. References --Development Estimate: DCP #60 dated January 13, 1969Approved Program: FY 1988 President's Budget.14. Program Acquisition Unit Cost (PAUC) History: (Millions of then-year dollars)

a. Initial SAR Estimate to Current Baseline Estimate
 Same as current baseline estimate.

b. Current Baseline Estimate to Current Estimate

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Spt	Other	Total	
13.1	-3.2	+9.8	+3.9	+9.1	-10.3	+3.5	+0.1	+12.9	26.0

15. Contract Information: (Then-Year Dollars in Millions)

- a. RDT&E --N/A
b. Procurement

			<u>Initial Contract Price</u>	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
<u>FY-85 Production Airframe</u>				
Grumman Aerospace Corp				
Bethpage, NY N00019-84-C-0001, FFP	543.0	N/A	24	
Award: November 26, 1983				
Definitized: January 17, 1986				
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
N/A	543.0	24	543.0	543.0
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			N/A	N/A
Cumulative Variances to Date			N/A	N/A
Net Change			N/A	N/A

			<u>Initial Contract Price</u>	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
<u>FY-85 Production AWG-9</u>				
Hughes Aircraft Co.				
Los Angeles, CA N00019-84-C-0231/FFP	86.9	N/A	24	
Award: December 16, 1983				
Definitized: December 31 1984				
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
N/A	86.9	28	86.9	86.9
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			N/A	N/A
Cumulative Variances to Date			N/A	N/A
Net Change			N/A	N/A

			<u>Initial Contract Price</u>	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
<u>FY-86 Production Airframe</u>				
Grumman Aerospace Corp				
Bethpage, NY N00019-85-C-0004, AAC#	526.4 2/	N/A	18	
Award: December 21, 1984				
Definitized: 31 March 1987				
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
N/A	526.4	18	526.4 2/	1/
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			N/A	N/A
Cumulative Variances to Date			N/A	N/A
Net Change			N/A	N/A

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15. Contract Information: (Cont'd) (Then-Year Dollars in Millions)

<u>FY-86 Production AWG-9</u>			<u>Initial Contract Price</u>		
<u>Hughes Aircraft Co.</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Los Angeles, CA N00019-85-C-0219/AAC#			181.5	2/	N/A
Award: December 31, 1984					63
Definitized: 31 May 1987					
<u>Current Contract Price</u>			<u>Estimated Price at Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
N/A	181.5	63	181.5	2/	1/
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			N/A	N/A	
Cumulative Variances to Date			N/A	N/A	
Net Change			N/A	N/A	
 <u>FY-87 Production Airframe</u>			 <u>Initial Contract Price</u>		
<u>Grumman Aerospace Corporation</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Bethpage, NY N00019-85-C-0401/AAC#			NTE Value	N/A	15
Award: June 9, 1986					
Definitized: 31 May 1987					
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
N/A	420.0	15	420.0	3/	1/
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			N/A	N/A	
Cumulative Variances to Date			N/A	N/A	
Net Change			N/A	N/A	
 <u>FY-87 Production AWG-9</u>			 <u>Initial Contract Price</u>		
<u>Hughes Aircraft Company</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Los Angeles, Ca N0001984-C-0219/AAC#			49.5	N/A	15
Award: June 27, 1986					
Definitized: 31 May 1987					
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
N/A	49.5	15	49.5	3/	1/
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			N/A	N/A	
Cumulative Variances to Date			N/A	N/A	
Net Change			N/A	N/A	

15. Contract Information: (Cont'd): (Then-Year Dollars in Millions)

c. MILCON -- N/A

Advance Acquisition Contracts. (A fully structured contract initially containing advance procurement funds which is converted to an FFP contract in the full funding year.)

1/ Contract is currently in negotiations. It is inappropriate to disclose PMs estimate due to sensitivity of pricing. Expected definitization 31 May 1987

2/ Contractor's FY-86 proposal. Expected definitization 31 March 1987.

3/ Contractor's FY-87 proposal. Expected definitization 31 May 1987.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 90.5% (19 yrs/21 yrs)

(2) Percent Program Cost Appropriated: 98.1% (15215.2/15474.9)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY 69-87)</u>	<u>Budget Year (FY 88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Balance to Complete Beyond FYDP (FY 93)</u>	<u>Total</u>
RDT&E	1642.6	-	-	-	1642.6
Procurement	13562.5	242.6	17.1	-	13822.2
MILCON	10.1	-	-	-	10.1
Total	15215.2	242.6	17.1	-	15474.9

16. Program Funding Summary (Con't): (Current Estimate in Millions of Dollars)
 c. Annual Summary --

Fiscal Year	Qty	FY 69 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: RDT&E								
1969	12			167.5			172.5	4.71
1970	-			470.8			512.1	5.51
1971	-			300.6			342.1	5.14
1972	-			190.0			226.0	4.61
1973	-			127.4			160.4	4.35
1974	-			39.7			54.3	7.96
1975	-			9.3			13.9	10.90
1976	-			0.6			1.0	6.61
1977	-			1.0			1.6	2.88
1977	-			1.4			2.4	2.58
1978	-			20.2			36.6	6.80
1979	-			10.2			20.4	8.39
1980	-			11.8			26.1	10.50
1981	-			14.8			35.8	10.60
1982	-			7.8			19.8	7.59
1983	-			5.7			15.1	4.90
1984	-			0.9			2.5	3.80
Subtotal	12			1379.7			1642.6	

Appropriation: APN

1969	-	-	-	-	-	-	-	3.17
1970	-	-	-	7.9	9.1	-	9.1	3.93
1971	26	-	375.7	601.0	59.2	9.1	690.9	4.55
1972	48	7.7	417.7	649.9	84.3	59.2	787.5	3.83
1973	48	6.0	311.4	424.4	74.6	84.3	565.2	4.16
1974	50	-	389.7	491.9	56.6	74.6	685.1	5.77
1975	50	7.2	372.5	486.9	74.5	56.6	717.0	8.81
1976	36	8.4	280.0	392.7	94.5	74.5	618.0	6.59
1977	9	0.2	74.7	79.4	49.7	45.9	133.2	3.56
1977T	36	7.1	305.9	395.0	120.3	98.2	694.5	3.78
1978	44	0.8	361.7	425.5	132.0	120.3	821.7	6.80
1979	36	5.2	322.9	391.8	146.2	132.0	847.4	8.72
1980	30	0.5	271.6	317.3	130.9	146.2	765.0	11.80
1981	30	4.9	293.6	338.0	145.8	130.9	902.6	11.60
1982	30	2.9	309.9	402.9	178.8	145.8	1165.0	14.30
1983	24	10.0	242.3	311.0	200.1	178.8	956.7	9.00
1984	24	29.0	218.9	305.9	178.0	200.1	979.3	8.00
1985	24	21.0	214.4	289.3	192.5	178.0	952.9	3.40
1986	18	15.7	185.0	213.2	113.0	192.5	724.3	2.90
1987	15	4.9	146.3	156.4	44.4	113.0	547.1	3.10
1988	5	9.4	52.4	67.4	-	44.4	242.6	3.50
1989	-	-	-	4.6	-	-	17.1	3.50
Subtotal	583	140.9	5146.6	6752.4	2084.5	2084.4	13822.2	

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16. Program Funding Summary (Con't): (Current Estimate in Millions of Dollars)
 c. Annual Summary (con't) --

Fiscal Year	Qty	FY 69 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
Appropriation: MILCON								
1969				-			-	6.18
1970				-			-	7.84
1971				2.4			3.2	8.69
1972				-			-	5.94
1973				0.5			0.8	5.55
1974				1.7			3.0	11.76
1975				-			-	16.12
1976				0.5			1.0	3.02
1977				-			-	1.56
1977				-			-	2.80
1978				-			-	7.68
1979				0.9			2.1	9.31
Subtotal				6.0			10.1	
(RDT&E/APN/MILCON)								
Total		595 140.9	5146.6	8138.1	2084.5	2084.4	15474.9	

d. Obligations and Expenditures -

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	TOTAL	Obligated	Expended
Appropriation: RDT&E			
1969	172.5	172.5	172.4
1970	512.1	511.9	511.7
1971	342.1	342.1	341.0
1972	226.0	225.9	225.3
1973	160.4	159.9	159.2
1974	54.3	53.5	53.2
1975	13.9	13.9	13.5
1976	1.0	1.0	1.0
1977	1.6	1.6	1.6
1977	2.4	2.4	2.3
1978	36.6	36.6	36.4
1979	20.4	20.4	20.2
1980	26.1	26.1	26.0
1981	35.8	35.8	35.5
1982	19.8	19.5	18.9
1983	15.1	14.7	13.5
1984	2.5	2.5	2.3
To complete	-	N/A	N/A
Total	1642.6	-	-

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16. Program Funding Summary (Con't): (Current Estimate in Millions of Dollars)
 d. Obligations and Expenditures -

Fiscal Year	Then Year Dollars (Current Estimate in Millions)		
	TOTAL	Obligated	Expended

Appropriation: APN

1970	9.1	9.1	9.1
1971	690.9	690.9	689.1
1972	787.5	787.5	785.8
1973	565.2	565.2	564.4
1974	685.1	685.1	685.1
1975	717.0	717.0	711.1
1976	618.0	618.0	612.7
1977	133.2	131.4	130.8
1977	694.5	694.5	686.5
1978	821.7	821.0	821.0
1979	847.4	847.0	838.6
1980	765.0	765.0	736.0
1981	902.6	902.5	893.3
1982	1,165.0	1,157.0	1,156.0
1983	956.7	955.0	941.6
1984	979.3	980.1	868.1
1985	952.9	919.3	702.1
1986	724.3	587.3	126.9
1987	547.1	43.0	-
To complete	259.7	N/A	N/A
Total	13,822.2	12,875.9	11,958.2

Appropriation: MILCON

1971	3.2	3.1	3.1
1972	-	-	-
1973	.8	.8	.8
1974	3.0	3.0	3.0
1975	-	-	-
1976	1.0	1.0	1.0
1977	-	-	-
1977	-	-	-
1978	-	-	-
1979	2.1	2.1	2.1
To Complete	-	N/A	N/A
Total	10.1	10.0	10.0

17. Production Rate Data

a. Annual Production Rates -- N/A.

Deliveries (Plan/Actual) --

RDT&E To Date
 12/12
 PROCUREMENT 551/550

18. Operating and Support Costs: N/A - Reference DOD Instruction 7000.3, Para. 18.
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PROGRAM: FORWARD AREA AIR DEFENSE SYSTEM (FAADS)
 FORWARD AREA AIR DEFENSE COMMAND, CONTROL,
 AND INTELLIGENCE (FAAD C2I)

86-027

AS OF DATE: December 31, 1986

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- Designation and Nomenclature (Popular Name): Forward Area Air Defense System (FAADS) Forward Area Air Defense Command, Control, and Intelligence (FAAD C²I)
- DoD Component: Department of the Army
- Responsible Office and Telephone Number:

Project Manager COL Kenneth N. Brown
 Air Defense Command & Control Systems ASSIGNED: September 3, 1985
 Project Office AUTOVON: 742-3442
 Redstone Arsenal, AL 35898-5600 COMMERCIAL: (205) 895-3442
- Program Elements/Procurement Line Items:

RDT&E: PE 63740 Project 464 (Aerial Sensor)
 PE 63740 Project 593 (FAAD C²)
 PE 63706 Project 243 (Post Host ID) (Shared Funding)
 PE 64741 Project 126 (FAAD C² Ground Sen)
 PE 64741 Project 421 (Aerial Sensor)
 PE 64709 Project 355 (Pos Hostile) (Shared Funding)
 PE 64709 Project 530 (Coop IFF) (Shared Funding)

CONCUR IN CLASS. FULFILL
 AS MARKED

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 DEFENSE

NO SECURITY Objection
 TO PUBLIC RELEASE

SECURITY REVIEW, OACSI, HQ

Classified by FAAD Ground-Based Sensor SCG
 Declassify on OADR

530

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4. Program Elements/Procurement Line Items (Cont'd):

1/ PROCUREMENT: APPN 2035 SSN AD5050 (FAAD C²/GND)

MILCON: NA

5. Related Programs: Line of Sight-Forward-Heavy, Line of Sight-Rear, and Non-Line of Sight

6. Mission and Description: The Army has worked with the Office of the Secretary of Defense (OSD) to develop an effective and affordable program to fill the void in the forward area. In January 1986, OSD approved in principle an integrated program to meet the growing air threat to the forward area of the battlefield. The FAADS program integrates weapons, sensors, and command, control and intelligence (C²I) architecture to counter the entire spectrum of the air threat to the forward area through the 90's. The FAADS concept is designed to provide total coverage in the division area and permits the enemy no preferred attack option. The acquisition strategy relies heavily on non-developmental items (NDI) and preplanned product improvements (P³I) to rapidly overcome our current air defense deficiencies and keep pace with the advancing threat. A Cost and Operational Effectiveness Analysis (COEA) is being conducted to assure the optimum mix of weapon characteristics.

The FAADS concept consists of weapons delivery elements tied together by a C²I network which also integrates FAADS into the Army command and control system architecture. The C²I initiative incorporates a family of sensors and identification equipment (ground and aerial, active and passive) with improved data processing and distribution capability. The mission will be accomplished through digital processing of target information, improved dissemination of air threat warning and weapon control orders, and the introduction of essential equipment at all echelons to provide data processing and display capabilities with emphasis on the needs of the fire units.

The components of FAADS are not new to air defense. Planning for C²I along with requirements for combined arms initiatives and improved air defense weapons has existed for several years. The FAADS program, using a systems approach, will integrate these relatively independent systems together to defeat the future enemy threat in the forward area. The components will work together to maximize total force effectiveness.

7. Program Highlights:

a. Significant Historical Developments -- SHORAD C² program was presented to the Army Systems Acquisition Review Council (ASARC) (MDR11) on March 26, 1985. On September 3, 1985, the ASARC program was approved by the Vice Chief of Staff of the Army (VCSA). On January 3 and 4, 1986, an ASARC level review directed

1/FAAD C²/Grnd SSN includes initial spares

2
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FAADS, FAAD C²I, December 31, 1986

7. Program Highlights (Conc'd):

that SHORAD C² become a subsystem of the FAAD system and that SHORAD C² be redesignated FAAD C²I. On July 29, 1986, the JRMB approved the concept for execution of the overall FAAD program as a system of systems and approved the following segments of FAAD C²I:

(1) Full scale development (Build I - Air Defense Operations) of the FAAD C²I system software.

(2) A ground sensor NDI acquisition strategy to procure four test articles in FY 88 to support other FAAD developmental and operational testing, and 13 low rate initial production (LRIP) units in FY 88 and FY 89 to be used for operational test and evaluation, production verification, and initial training.

Aerial sensor decisions will be requested upon completion of the ongoing systems definition phase. Much of the data associated with the balance of the FAADS program remains to be determined (TBD).

The FAADS to include the FAAD C²I component is expected to satisfy mission requirements.

b. Changes Since "As Of" Date -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: There are no threshold breaches of the DCP dated July 15, 1986.

9. Schedule:

a. Milestones --

	<u>Planning Estimate/ Approved Program</u>	<u>Development Estimate/ Current Estimate</u>
(1) Test Bed		
Contract Award	2QFY84/2QFY84	2QFY84/2QFY84
Contractor Test Complete	4QFY85/4QFY85	4QFY85/4QFY85
Begin Field Test	1QFY86/1QFY86	1QFY86/1QFY86
(2) Full Scale Development -- SHORAD C ²		
Milestone II (ASARC)	3QFY84/NA	NA/NA
Milestone II (DSARC)	3QFY84/NA	NA/NA
Full Scale Engineering	3QFY84/NA	NA/NA
Development Contract Award		
Milestone III (LRIP)	TBD/NA	NA/NA
Milestone III (FSP)	TBD/NA	NA/NA
Contract Award (LRIP)	TBD/NA	NA/NA
Contract Award (FSP)	TBD/NA	NA/NA
Start DT/OT II	TBD/NA	NA/NA
Complete DT/OT II	TBD/NA	NA/NA
Initial Operational	4QFY89/NA	NA/NA

9. Schedule:

	<u>Planning Estimate/ Approved Program</u>	<u>Development Estimate Current Estimate</u>
(3) C ² Architecture and NDI Ground Base Sensor		
ASARC/JRMB (FSD C ² Build 1 & LRIP Sensor)	N/A/4QFY86	4QFY86/4QFY86
FSD C ² Build 1 Contract Award	N/A/4QFY86	4QFY86/4QFY86
FSD C ² Build 2 Contract Award	N/A/3QFY88	3QFY88/3QFY88
LRIP Sensor Contract Award	N/A/3QFY88	3QFY88/3QFY88
Start System Test/Demo Build 1	N/A/3QFY89	3QFY89/3QFY89
Complete System Test/Demo Build 1	N/A/3QFY90	3QFY90/3QFY90
Start System TT/IOTE	N/A/4QFY90	4QFY90/4QFY90
Complete System TT/IOTE	N/A/3QFY91	3QFY91/3QFY91
First Unit Equipped	N/A/3QFY91	3QFY91/3QFY91
	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>
(4) -- Aerial Sensor	TBD/TBD	TBD
(5) -- Positive Hostile ID	TBD/TBD	TBD
(6) -- ID Friend or Foe (MKXV)	TBD/TBD	TBD

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9. Schedule (Cont'd):

b. Previous Change Explanations --

Completion of ASARC/DSARC II and Full Scale Engineering Development contract award slipped from 3QFY84 to 3QFY85 per Congressional Data Sheet accompanying FY86 President's Budget.

Army Command and Control System (ACCS) Laydown decisions resulted in delay of ASARC II, subsequently causing delay of DSARC II and award of Full Scale Engineering Development contract.

Contractor Test completion slipped due to computer failure and software problems.

c. Current Change Explanations -- None

d. References --

FAAD C²

Planning Estimate: FY 1985 President's Budget.

Development Estimate: FY 1988-89 President's Budget.

Approved Program: FY 1988-89 President's Budget.

PHID/IFF/Aerial Sensors

Planning Estimate: FY 1988-89 President's Budget.

Approved Program: FY 1988-89 President's Budget.

10. Technical/Operational Characteristics:

	<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Development Estimate/ Current Estimate</u>
a. *Technical -2			
RAM--FAAD C ²			
Sensor MTBOMF	TBD/125 hrs	TBD	125 hrs/125 hrs
Generator MTBOMF	TBD/425 hrs	TBD	425 hrs/425 hrs
ABMOC or AME or C ²	TBD/184 hrs	TBD	184 hrs/184 hrs
subsystems MTBOMF			
System Requirements Ao	TBD/.84	TBD	.84 / .84
Manpower Threshold	TBD/626 max.	TBD	626 max/626 max
MITR (subsystem)	TBD/0.5 hrs	TBD	0.5 hrs/0.5 hrs
(sensor)	TBD/2.0 hrs	TBD	2.0 hrs/2.0 hrs
	<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
Aerial Sensor	TBD	TBD	TBD
Positive Hostile ID	TBD	TBD	TBD
ID Friend or Foe (MKXV)	TBD	TBD	TBD

*This information for Approved Program/Development Estimate and Current Estimate was taken from Draft ROC, October 27, 1986 and DCP, July 15, 1986.

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FAADS, FAAD C²I, December 31, 1986

10. Technical Operational Characteristics (Cont'd):

b. Operational --

FAAD C ² I	<u>Development Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(1) FAAD C ² /Ground Sensors ABMOC/C ² Node, 90% of the time, will be capable of: Target correlation reports true position	w/i 1km/w/i 1km	TBD	w/i 1km
Target information to fire after report entry	w/i 12 sec/w/i 12 sec	TBD	w/i 12 sec
Selection and simultaneous display of air track, ground situation, weapons status and special points of interest	90% / 90%	TBD	90%
(2) FAAD subsystems, 90% of the time will be capable of: Air Battle Management Order dissemination to fire unit of:			
Air Defense Warning	w/i 90 sec/w/i 90 sec	TBD	w/i 90 sec
Weapons Control	w/i 90 sec/w/i 90 sec	TBD	w/i 90 sec
State of Alert	w/i 90 sec/w/i 90 sec	TBD	w/i 90 sec
Manual acknowledgement of ABMO from time of receipt	w/i 30 sec/w/i 30 sec	TBD	w/i 30 sec

(b)(1)

	<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(4) Aerial Sensor	TBD/TBD	TBD	TBD
(5) Positive Hostile ID	TBD/TBD	TBD	TBD
(6) ID Friend or FOE (MKXV)	TBD/TBD	TBD	TBD

c. Previous Change Explanations -- N/A

d. Current Change Explanations -- N/A

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e. References --

FAADS C²:

Planning Estimate: FY 1985 President's Budget. Draft ROC, October 27, 1986 and DCP, July 15, 1986.

Development Estimate: FY 1988-89 President's Budget. Draft ROC, October 27, 1986 and DCP, July 15, 1986.

Approved Program: FY 1988-89 President's Budget. Draft ROC, October 27, 1986 and DCP, July 15, 1986.

PHID/IFF/Aerial Sensors:

Planning Estimate/Approved Program: TBD

11. Program Acquisition Cost: (Current Estimate in Millions of Dollars)

FAAD C ²	a. Cost --	Planning Estimate/	Changes	Development Estimate/
		Approved Program		Current Estimate
	Development (RDT&E)	\$ 360.3	\$+ 116.7	\$ 477.0
	Procurement	423.7	+314.7	738.4
	Construction (MILCON)	0	0	0
	Total FY 85 Base-Year \$	784.0	+431.4	1215.4
	Adjustment in FY 85 \$			
3/	to FY 87 \$		+74.1	74.1
	Total FY 87 Base-Year \$			1289.5
	Escalation	91.5	+ 81.1	172.6
	Development (RDT&E)	(14.6)	(+ 15.7)	(30.3)
	Procurement	(76.9)	(+ 65.4)	(142.3)
	Construction (MILCON)	0	0	0
	Total Then-Year \$	\$ 875.5	\$+ 586.6	\$1462.1
1/b.	Quantities --	TBD	N/A	TBD
c.	Unit Cost --			
	Procurement:	TBD	N/A	TBD
	FY 87 Base-Year \$			
	Then-Year \$			
	Program:	TBD	N/A	TBD
	FY 87 Base-Year \$			
	Then-Year \$			

2/d. Approved Design to Cost Goal -- N/A

e. Foreign Military Sales -- None

f. Nuclear Costs -- None

1/ Quantities remain to be determined

2/ Program is primarily off-the-shelf NDI. See DCP, July 15, 1986.

3/ The adjustment factors used to transition from FY85 \$ to FY87 \$ were taken from the 12 December 1986 inflation guidance and 12 December 1986 Base Year 86 Department of Defense Deflators. The adjustment factor for RDTE and Procurement is 1.061.

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FAADS, FAAD C²I, December 31, 1986

11. Program Acquisition Cost (Current Estimate in Millions of Dollars)
(Cont'd):

<u>PHID/IFF/Aerial Sensors</u>	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	\$ 227.3	0	\$ 227.3
Procurement	TBD	-	TBD
Construction(MILCON)	TBD	-	\$ TBD
Total FY 87 Base Year \$	\$ 227.3	0	\$ 227.3
 Escalation	\$18.1	0	\$18.1
Development (RDT&E)	(18.1)	0	(18.1)
Procurement	TBD	-	TBD
Construction(MILCON)	TBD	-	TBD
Total Then Year \$	\$ 245.4	0	\$ 245.4
 b. Quantities --	TBD	0	TBD
c. Unit Cost --	TBD		
d. Approved Design to Cost Goal --	N/A		
e. Foreign Military Sales --	N/A		
f. Nuclear Costs --	N/A		

12. Program Acquisition/Current Procurement Unit Cost Summary:
(Current (Then-Yr) Dollars in Millions).

<u>FAAD C²</u>	<u>Current Year</u>	<u>Budget Year</u>
	<u>SAR Current EST</u>	<u>UCR Baseline</u>
	<u>Dec 86 SAR</u>	<u>Dec 86 SAR</u>
a. Program Acquisition --		
(1) Cost	1462.1	1462.1
(2) Quantity	TBD	TBD
(3) Unit Cost	N/A	N/A
b. Current Procurement --	N/A --First year of procurement is in FY88.	

PHID/IFF/Aerial Sensors

NOTE: In accordance with the FY 1987 Authorization Act, unit cost reporting shall not apply to programs that are reporting on the development program only.

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13. Cost Variance Analysis:

FAAD C²

a. Summary - (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	TOTAL
Planning Estimate	374.9	500.6	875.5
Previous Changes			
Economic	-5.8	-15.6	-21.4
Quantity			
Schedule	+95	+23.1	+118.1
Engineering	-19.2	+254.9	+235.7
Estimating	-32.0		-32.0
Other			
Support			
Subtotal	+38.0	+262.4	+300.4
Current Changes:			
Economic	+3.9	+0.8	+4.7
Quantity			
Schedule	+127.5		+127.5
Engineering			
Estimating	-18.4	+83.6	+65.2
Other			
Support	+10.5	+78.3	+88.8
Subtotal	+123.5	+162.7	+286.2
Total Changes	+161.5	+425.1	+586.6
Development Estimate/ Current Estimate	536.4	925.7	1462.1

(FY 85 Constant (Base-Year) Dollars in Millions with adjustments to reflect a bottom line Current/Development estimate of FY 1987 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	TOTAL
Planning Estimate	360.3	423.7	784.0
Previous Changes:			
Quantity			
Scheduling	+67.5	-34.4	+33.1
Engineering	-14.4	+210.8	+196.4
Estimating	-30.9		-30.9
Other			
Support			
Subtotal	+22.2	+176.4	+198.6
Current Changes:			
Quantity			
Schedule	+106.6		+106.6
Engineering			
Estimating	-21.1	+71.8	+50.7
Other			
Support	+9.0	+66.5	+75.5
Subtotal	+94.5	+138.3	+232.8
Total Changes	+116.7	+314.7	+431.4
Current Estimate/ Development Estimate FY 85\$	477.0	738.4	1215.4
Adjustments-From FY 85\$ to FY 87\$	+29.1	+45.0	+74.1
Current Estimate Develop- ment Estimate FY 87\$	506.1	783.4	1289.5

13. Cost Variance Analysis (Cont'd):

b. Previous Change Explanations --

(1) RDT&E

Schedule: Program restructure to extend schedule and revise system configuration and result of FY84 HQDA guidance.

Engineering: The change in cost is due to decrease in RDT&E schedule, incorporation of Army Command & Control Systems (ACCS) common software and the addition of non-developmental item sensor.

Economic: Revised January 86 economic escalation rates.

Estimating: OSD returned these dollars to congress.

(2) Procurement

Economic: Revised January 1985 economic escalation rates.
Revised January 1986 economic escalation rates.

Schedule: Program restructure to extend schedule and revise system configuration as a result of FY84 HQDA guidance.

Engineering: The change in cost is due to a decrease in the number of FAAD C²I subsystem/Force Structure and addition of a non-development item sensor.

c. Current Change Explanations --

(1) RDT&E

(Dollars in Millions)

Base-YearThen-Year

Revised Dec 86 economic escalation rates. (Economic)

N/A

+3.9

Compression of Build I schedule, delay of Build II start, and extension of IOC per July 1986 ASARC II direction. (Schedule)

+106.6

+127.5

Addition of OTEA test support costs. (Support)

+9.0

+10.5

Reduced development costs reprogrammed for other priorities. (Estimating)

-21.1

-18.4

(2) Procurement

Revised Dec 86 economic escalation rates. (Economic)

N/A

+0.8

Addition of Air Space Management Element (AME) Subsystem per July 1986 ASARC II direction, addition of hardware for other subsystems. (Estimating)

+71.8

+83.6

Addition of initial spares not reported in prior SARs. (Support)

+66.5

+78.3

FAADS, FAAD C²I, December 31, 1986

13. Cost Variance Analysis (Cont'd):

PHID/IFF/Aerial Sensors

a. Summary (Current (Then-Year) Dollars in Millions) --

	RDT&E	PRCC	TOTAL
Planning Estimate	245.4	TBD	245.4
Previous Changes:			
Economic	--	--	--
Quantity	--	--	--
Schedule	--	--	--
Engineering	--	--	--
Estimating	--	--	--
Support	--	--	--
Subtotal	--	--	--
Current Changes:			
Economic	--	--	--
Quantity	--	--	--
Schedule	--	--	--
Engineering	--	--	--
Estimating	--	--	--
Support	--	--	--
Subtotal	--	--	--
Total Changes	--	--	--
Current Estimate	245.4	TBD	245.4

(FY 87 Constant Dollars in Millions)

	RDT&E	PRCC	TOTAL
Planning Estimate	227.3	TBD	227.3
Previous Changes:			
Economic	--	--	--
Quantity	--	--	--
Schedule	--	--	--
Engineering	--	--	--
Estimating	--	--	--
Support	--	--	--
Subtotal	--	--	--
Current Changes:			
Economic	--	--	--
Quantity	--	--	--
Schedule	--	--	--
Engineering	--	--	--
Estimating	--	--	--
Support	--	--	--
Subtotal	--	--	--
Total Changes	--	--	--
Current Estimate	227.3	TBD	227.3

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FAADS, FAAD C²I, December 31, 1986

13. Cost Variance Analysis (Cont'd):

- b. Previous Change Explanations -- NA - Initial SAR.
- c. Current Change Explanations -- NA - Initial SAR.
- d. References -- FAAD C²:
Development Estimate: SDDM, August 14, 1986; FY 88-89 President's Budget
Planning Estimate: FY 1985 President's Budget
 -- PHID/IFF/Aerial Sensors:
Planning Estimate: FY 1988-89 President's Budget

14. Program Acquisition Unit Cost (PAUC) History (Millions of Then-Year Dollars):

Current Baseline Estimate to Current Estimate --

PAUC (Plan Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
TBD	--	--	--	--	--	--	--	--	TBD

15. Contract Information (Then-Year Dollars in Millions):

a. RDT&E --

Initial Contract Price

Target Ceiling QTY

TRW Defense Systems Group

DAAH01-86-C-A065, CPIF

\$58.1

N/A

N/A

Award: September 29, 1986

Definitized: September 29, 1986

Current Contract Price

Estimated Price at Completion

Target Ceiling QTY

Contractor

Program Manager

\$58.1

N/A

N/A

\$58.1

\$58.1

Previous Cumulative Variances¹

Cost Variance

Schedule Variance

None

None

None

¹This is first submission of this contract in the SAR. October CPR data is not available.

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16. Program Funding Summary: (Current Estimate in Millions of Dollars)FAAD C²
a. Program Status --

- (1) Percent Program Completed: 57.1% (8 yrs/14 yrs)
 (2) Percent Program Cost Appropriated: 10.7% (\$136.1/\$1462.1)

PHID/IFF/Aerial Sensors

- (1) Percent Program Completed: 28.6% (2/7)
 (2) Percent Program Cost Appropriated: 11.7% (\$28.8/\$245.4)

b. Appropriation Summary --
(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Years (FY 80 - 87)</u>	<u>Budget Year (FY 88)</u>	<u>Balance FYDP (FY 89-92)</u>	<u>To Complete</u>	<u>Total</u>
<u>FAAD C²</u>					
RDT&E	136.1	108.0	292.3	-	536.4
Procurement	-	82.6	740.9	102.2	925.7
Total	136.1	190.6	1033.2	102.2	1462.1

PHID/IFF/Aerial Sensors

RDT&E	28.8	35.1	181.5	TBD	245.4
Procurement	TBD	TBD	TBD	TBD	TBD
Total	28.8	35.1	181.5	TBD	245.4

FAADS, FAAD C²I, December 31, 1986

c. Annual Summary --

FISCAL YEAR	QTY	FY 87 BASE-YEAR DOLLARS			THEN-YEAR DOLLARS			ESC RATE (%)
		FLYAWAY		TOTAL	ADVANCE PROC		TOTAL	
		NON-REC	REC		DEBIT	CREDIT		

FAAD C2

Appropriation: RDT&E

1980				4.0			3.0	5.9
1981				12.3			10.0	5.1
1982				15.2			13.2	7.6
1983				1.1			1.0	4.9
1984				33.2			31.2	3.8
1985				18.7			18.1	3.4
1986				20.2			20.1	2.9
1987				38.6			39.5	3.1
1988				101.9			108.0	3.5
1989				113.5			124.2	3.5
1990				88.1			99.4	3.3
1991				59.3			68.7	2.9
1992				-			-	-
SUBTOTAL	TBD			506.1			536.4	-

Appropriation: Procurement

1987								
1988				75.1			82.6	3.5
1989				61.9			70.1	3.5
1990				188.5			219.0	3.3
1991				241.2			287.1	2.9
1992				135.2			164.7	2.4
1993				81.5			102.2	2.4
SUBTOTAL	TBD			783.4			925.7	-
TOTAL				1289.5			1462.1	-

PHID/IFF/Aerial Sensors

Appropriation: RDT&E

1986 & Prior				13.9			10.1	N/A
1987	TBD			18.3			18.7	3.1
1988	TBD			33.2			35.1	3.5
1989	TBD			68.9			75.5	3.5
1990	TBD			63.8			72.0	3.3
1991	TBD			19.6			22.6	2.9
1992	TBD			9.6			11.4	2.4
ToCmpl	TBD			TBD			TBD	-
TOTAL	TBD			227.3			245.4	

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FAADS, FAAD C²I, December 31, 1986

d. Obligations and Expenditures --

Fiscal Year	THEN YEAR DOLLARS (Current Estimate in Millions)		
	Total	Obligated	Expended

FAAD C²

Appropriation: RDT&E

1980	3.0	2.9	2.9
1981	10.0	9.9	9.7
1982	13.2	13.1	12.8
1983	1.0	1.0	1.0
1984	31.2	32.8	30.6
1985	18.1	15.5	13.9
1986	20.1	19.9	9.3
1987	39.5	23.5	1.0
To complete	400.3	N/A	N/A
Total	536.4	118.6	81.2

PHID/IFF/Aerial Sensors

Appropriation: RDT&E

1986 & Prior	10.1	8.3	5.0
1987	18.7	6.2	0.5
To Complete	216.6	N/A	N/A
Total	245.4	14.5	5.5

17. Production Rate Data: TBD

18. Operating and Support Costs: N/A

A-9 FAADS LOS-F-H

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

PROGRAM: FORWARD AREA AIR DEFENSE SYSTEM (FAADS)
LINE OF SIGHT-FORWARD-HEAVY (LOS-F-H)

86-028

AS OF DATE: December 31, 1986

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1. Designation and Nomenclature (Popular Name): Forward Area Air Defense System (FAADS) Line of Sight-Forward-Heavy (LOS-F-H)

CLEARED
FOR OPEN PUBLICATION

2. DoD Component: Department of the Army

MAR 3 1987

3. Responsible Office and Telephone Number:

Project Manager
Line of Sight-Forward-Heavy
Redstone Arsenal, AL 35898-5750

COL John M. Gamino
ASSIGNED: December 15, 1986
AUTOVON: 746-7866
COMMERCIAL: (205) 876-7866

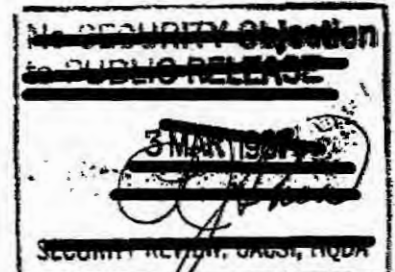
NO SECURITY OBJECTION
AND SECURITY REVIEW (DASD - PA)
DEPARTMENT OF DEFENSE

4. Program Elements/Procurement Line Items:

RDT&E PE 63757A Project 463 (LOS-F-H)
PE 23801A Project 683 (LOS-F-H)

PROCUREMENT: APPN 2032 SSN CC2200 (LOS-F-H)

MILCON: NA



5. Related Programs: Line of Sight-Rear; Non-Line of Sight; and Forward Area Air Defense Command, Control, and Intelligence

6. Mission and Description: The Army has worked with the Office of the Secretary of Defense (OSD) to develop an effective and affordable program to fill the void in the forward area. In January 1986, OSD approved in principle

6. Mission and Description (Cont'd):

an integrated air defense program to meet the growing air threat to the forward area of the battlefield. The FAADS program integrates weapons, sensors, and command, control and intelligence (C²I) architecture to counter the entire spectrum of the air threat to the forward area through the 90's. The FAADS concept is designed to provide total coverage in the division area and permits the enemy no preferred attack option. The acquisition strategy relies heavily on non-developmental items (NDI) and preplanned product improvements (P³I) to rapidly overcome our current air defense deficiencies and keep pace with the advancing threat. A Cost and Operational Effectiveness Analysis (COEA) is being conducted to assure the optimum mix of weapon characteristics.

The FAADS concept consists of weapons delivery elements tied together by a C²I network which also integrates FAADS into the Army command and control system. The C²I initiative incorporates a family of sensors and identification equipment (ground and aerial, active and passive) with improved data processing and distribution capability.

The Line of Sight-Forward-Heavy (LOS-F-H) component is conceived of as an NDI air defense system designed to provide direct fire coverage for maneuver elements. A draft Request for Proposal (RFP) was released to industry in December 1986 and the final RFP is scheduled for release in March 1987.

The components of FAADS are not new to air defense. Planning for C²I along with requirements for combined arms initiatives and improved air defense weapons has existed for several years. The FAADS program, using a systems approach, will integrate these relatively independent systems together to defeat the future enemy threat in the forward area. The components will work together to maximize total force effectiveness.

7. Program Highlights:

a. Significant Historical Developments -- On 29 July 1986, the JRMB approved the concept for execution of the overall FAAD program as a system of systems. An in-process review held in November 1986 reviewed the LOS-F-H program. At this review, OSD approved release of an RFP for the LOS-F-H system. The Army was directed to ensure that testing include provisions for comparing candidates of varying maturities, and that the program be moved forward as quickly as possible. The FAADS, to include the LOS-F-H, component is expected to satisfy mission requirements.

b. Changes Since "As Of" Date -- None. Specifics of the acquisition strategy are still being determined.

8. Decision Coordinating Paper (DCP) Threshold Breaches: There is no DCP for the LOS-F-H system.

9. Schedule:

	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>
a. Milestones --		
LOS-F-H		
Release Request for Proposals (RFPs)	TBD/TBD	TBD
Competitive Test	TBD/TBD	TBD
Contract Award	1Q88/1Q88	1Q88
Operational Test (OT)	TBD/TBD	TBD
First Unit Equipped (FUE)	TBD/TBD	TBD
b. Previous Change Explanations -- NA - Initial SAR.		
c. Current Change Explanations -- NA - Initial SAR.		
d. References --		

Planning Estimate: FY 1987 Appropriation Act

10. Technical/Operational Characteristics:

	<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. Technical --	TBD	TBD	TBD
b. Operational --	TBD	TBD	TBD
c. Previous Change Explanations -- Initial SAR.			
d. Current Change Explanations -- Initial SAR.			
e. References --			

Planning Estimate: TBD

11. Program Acquisition Cost (Current Estimate in Millions of Dollars): 1/

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E) FAAD System	\$ 95.6	--	\$ 95.6
Procurement	1358.0		1358.0
FAADS Weapon System Initial Spares		-- --	
Total Flyaway	TBD	--	TBD
Other Wpn Sys Cost	TBD	--	TBD
Construction (MILCON)	0	0	0
Total FY 87 Base Year \$	1453.6	--	1453.6
Escalation	239.7	--	239.7
Development (RDT&E)	(3.2)	--	(3.2)
Procurement	(236.5)	--	(236.5)
Construction (MILCON)	0		0
Total Then-Year \$	\$1693.3		\$1693.3
2/ b. Quantities --			
Development (RDT&E)	TBD	--	TBD
Procurement	TBD	--	TBD
Total	TBD	--	TBD
c. Unit Cost --			
Procurement:			
FY 87 Base-Year \$	TBD	--	TBD
Then-Year \$	TBD	--	TBD
Program:			
FY 87 Base-Year \$	TBD	--	TBD
Then-Year \$	TBD	--	TBD

1/ Note that costs presented in this report include only budget years through FY 92. Costs for FY 93 and beyond are TBD.

2/ Quantities remain to be determined. The quantity in the FYDP reflects missiles only. The LOS-F-H unit of measure will be fire units which are yet to be determined. Cost and Operational Effectiveness Analysis (now underway) results will be used to determine the optimum fielded mix of FAAD components. COEA will be presented to the JRMB scheduled for May 1987.

11. Program Acquisition Cost (Current Estimate in Millions of Dollars) (Cont'd):

d. Approved Design to Cost Goal -- LOS-F-H consists primarily of off-the-shelf, NDI. Therefore, Design to Cost goals will not apply.

e. Foreign Military Sales -- None planned at this time.

f. Nuclear Costs -- None.

12. Program Acquisition/Current Procurement Unit Cost Summary (Current Dollars in Millions):

		Current Year		Budget Year
		Current EST	UCR Baseline	UCR Baseline
		Dec 86 SAR	Dec 86 SAR	Dec 86 SAR
a. Program Acquisition --				
	(1) Cost	\$1693.3	\$1693.3	\$1693.3
<u>1/</u>	(2) Quantity	TBD	TBD	TBD
	(3) Unit Cost	TBD	TBD	TBD
b. Current Procurement --				
		(FY 87)	(FY 87)	(FY 88)
	(1) Cost			\$59.4
	Advanced Procurement -- N/A			
<u>1/</u>	(2) Quantity	TBD	TBD	TBD
	(3) Unit Cost	TBD	TBD	TBD

1/ Quantities remain to be determined. The quantity in the FYDP reflects missiles only. The LOS-F-H unit of measure will be fire units which are yet to be determined. Cost and Operational Effectiveness Analysis (now underway) results will be used to determine the optimum fielded mix of FAAD components. COEA will be presented to the JRMB scheduled for May 1987.

13. Cost Variance Analysis:

a. Summary (Current (Then-Year) Dollars in Millions) --

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	98.8	1594.5	TBD	1693.3
Previous Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Current Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Total Changes	--	--	--	--
Current Estimate	98.8	1594.5	TBD	1693.3

(FY 87 Constant Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	95.6	1358.0	TBD	1453.6
Previous Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Current Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Total Changes	--	--	--	--
Current Estimate	95.6	1358.0	TBD	1453.6

13. Cost Variance Analysis (Cont'd):

- b. Previous Change Explanations -- NA - Initial SAR.
- c. Current Change Explanations -- NA - Initial SAR.
- d. References --

Planning Estimate: FY 88-89 President's Budget

14. Program Acquisition Unit Cost (PAUC) History (Millions of Then-Year Dollars):

Current Baseline Estimate to Current Estimate -- N/A

PAUC (Plan Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
TBD	--	--	--	--	--	--	--	--	TBD

15. Contract Information (Then-Year Dollars in Millions): N/A
No contracts have been awarded at this time.16. Program Funding Summary (Current Estimate in Millions of Dollars):

a. Program Status --

- (1) Percent Program Completed: 28.6% (2/7)
- (2) Percent Program Cost Appropriated: 3.6% (\$61.4/\$1693.3)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY 87)</u>	<u>Budget Year (FY 88)</u>	<u>FYDP (FY 89-92)</u>	<u>Beyond FYDP (FY 93)</u>	<u>Total</u>
RDT&E	\$ 61.4	\$ 16.6	\$ 20.8	TBD	\$ 98.8
Procurement	0.0	\$ 59.4	\$ 1535.1	TBD	1594.5
MILCON	0.0	0.0	0.0	-	-
Total	\$ 61.4	\$ 76.0	\$ 1555.9	-	\$1693.3

16. Program Funding Summary (Current Estimate in Millions of Dollars) (Cont'd):

c. Annual Summary -- FAAD Line of Sight-Forward-Heavy

Fiscal Year	*Qty	FY 87 Base-Year Dollars			Then-Year Dollars			Escl
		Flyaway		Total	Advance Proc		Total	Rate
		Nonrec	Rec		Debit	Credit		(%)

Appropriation: RDT&E

1986 & Prior	TBD			41.9			41.6	N/A
1987	TBD			19.3			19.8	3.1
1988	TBD			15.7			16.6	3.5
1989	TBD			12.6			13.8	3.5
1990	TBD			2.7			3.0	3.3
1991	TBD			1.7			2.0	2.9
1992	TBD			1.7			2.0	2.4
To Compl	TBD							-
Subtotal	TBD			95.6			98.8	-

Appropriation: Procurement

1986 & Prior								
1987								
1988	245			54.1			59.4	3.5
1989	709			233.6			264.0	3.5
1990	1313			366.6			425.2	3.3
1991	1329			355.1			421.8	2.9
1992	1395			348.6			424.1	2.4
To Compl	TBD			TBD			TBD	-
Subtotal	4991			1358.0			1594.5	
TOTAL	4991			1453.6			1693.3	

*The quantity in the FYDP reflects missiles only. The LOS-F-H unit of measure will be fire units which are yet to be determined. Cost and Operational Effectiveness Analysis (now underway) results will be used to determine optimum fielded mix of FAADS components. The COEA will be presented to the JRMB scheduled for May 1987.

16. Program Funding Summary (Current Estimate in Millions of Dollars) (Cont'd):

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1986 & Prior	41.6	15.3	.4
1987	19.8	0	0
To Complete	37.4	0	0
Total	98.8	15.3	.4

17. Production Rate Data: N/A

18. Operating and Support Costs:

- a. Assumptions and Ground Rules -- TBD
- b. Costs -- TBD

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)
PROGRAM: FIXED DISTRIBUTED SYSTEM (FDS)

AS OF DATE: December 31, 1986

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AS AMENDED AS AMENDED
FEB 27 1987 225

DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW (CARD-PA)
 DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature: Fixed Distributed System (FDS)
2. (U) DOD Component: Department of the Navy
3. (U) Responsible Office and Telephone Number:

Integrated Undersea Surveillance System
 (IUSS) Program Office
 Space and Naval Warfare Systems Command
 Washington, D.C. 20363-5100

CAPT R. C. Witter, USN
 Assigned: January 23, 1986
 AV 222-1120;
 COMM (202) 692-1120

4. (U) Program Elements/Procurement Line Items:

RDTE&N: PE 63784N Project X1312
 PE 24311N Project X0766 (Shared funding; FY1986 & Prior)

5. (U) Related Programs: AN/UYS-2 Enhanced Modular Signal Processor (EMSP)
 and AN/UYK-43 Computer
6. (U) Mission and Description:

(b)(1)

CLASSIFIED BY: 22 MAY 1981 S5513.5
 DECLASSIFY ON: OADR

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FDS, December 31, 1986

6. (U) Mission and Description (Cont'd):

(b)(1)



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FDS, December 31, 1986

7. (U) Program Highlights (Cont'd):

(b)(1)

b. (U) Significant Developments Since Last Report-- None.

c. (U) Change Since "As Of Date"-- None.

8. (U) Navy Decision Coordinating Paper (NDCP) Threshold Breaches: NDCP was approved May 13, 1986.

9. (U) Schedule:

a. (U) Milestones--

DNARC I

Milestone II (JRMB II)

Planning Estimate/
Approved Program

MAY 86/MAY 86

MAR 89/JUN 89

Current
Estimate

MAY 86

JUN 89 (Ch 1)

(b)(1)

Milestone III (JRMB III)

NOV 95/MAY 96

MAY 96 (Ch 1)

b. (U) Previous Change Explanations -- N/A

c. (U) Changes Since Previous Report --

(b)(1)

Milestone

From

To

Difference

Milestone II (JRMB II)

MAR 89

JUN 89

+ 3 mos

(b)(1)

Milestone III (JRMB III)

NOV 95

MAY 96

+ 6 mos

d. (U) References --

Planning Estimate: NDCP dated 13 May 1986 and TEMP No. 1009 dated 13 May 1986.

Approved Program: FY 1988/1989 President's Budget.

(b)(1)

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FDS, December 31, 1986

10. (U) Technical/Operation Characteristics:

a. ~~(S)~~ Technical--

Plan Estimate/
Approved Program

Demonstrated Current
Performance Estimate

(b)(1)

b. ~~(S)~~ Operational--

(b)(1)

c. (U) Previous Change Explanations -- N/A

d. (U) Current Change Explanations -- N/A

e. (U) References --

Planning Estimate: NDCP dated 13 May 1986 and TEMP No. 1009 FDS dated 13 May 1986.

Approved Program: Same as Planning Estimate.

11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. (U) Cost			
Development (RDT&E,N)	674.7	-	674.7
Procurement (OPN)	TBD	N/A	TBD
Construction (MILCON)	TBD	N/A	TBD
Total FY86 Base-Year \$	<u>TBD</u>	<u>N/A</u>	<u>TBD</u>
Escalation	102.3	- 3.8	98.5
Development (RDT&E,N)	(102.3)	(- 3.8)	(98.5)
Procurement (OPN)	N/A	N/A	N/A
Construction (MILCON)	N/A	N/A	N/A
Total Then-Year \$	TBD	-	TBD
b. (U) Quantities			
Development (RDT&E,N)	1	N/A	1
Procurement (OPN)	<u>TBD</u>	N/A	<u>TBD</u>
Total	<u>1</u>	N/A	<u>1</u>

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FDS, December 31, 1986

11. (U) Program Acquisition Cost (Cont'd) (Current Estimate in Millions of Dollars)

c. (U) Unit Cost

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
Procurement:			
FY86 Base-Year \$	TBD	N/A	TBD
Then-Year \$	TBD	N/A	TBD
Program:			
FY86 Base-Year	TBD	N/A	TBD
Then-Year \$	TBD	N/A	TBD

d. (U) Approved Design to Cost Goal -- N/A

e. (U) Foreign Military Sales -- None

f. (U) Nuclear Costs -- N/A

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

(Current (Then-Year) Dollars in Millions)

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est (DEC 86 SAR)</u>	<u>UCR Baseline (SEP 86 SAR)</u>	<u>UCR Baseline (DEC 86 SAR)</u>
a. Program Acquisition			
(1) Cost	TBD	TBD	TBD
(2) Quantity	TBD	TBD	TBD
(3) Unit Cost	TBD	TBD	TBD
b. Current Procurement -- N/A			

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FDS, December 31, 1986

13. (U) Cost Variance Analysis:

a. (U) Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	Total
Planning Estimate	777.0	TBD	TBD	777.0
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-3.8	-	-	-3.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-3.8	-	-	-3.8
Total Changes	-3.8	-	-	-3.8
Current Estimate	773.2	TBD	TBD	773.2

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13. (U) Cost Variance Analysis (Cont'd)

(U) (FY86 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	Total
Planning Estimate	674.7	TBD	TBD	674.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-	-	-	-
Current Estimate	674.7	TBD	TBD	674.7

b. (U) Previous Change Explanations -- None

c. (U) Current Change Explanations --

RD&E	(Dollars in Millions)	
	FY86 Base-Year	Then-Year
Economic: Revised escalation rate.	N/A	-3.8

d. (U) References --

Approved Program: FY 1988 President's Budget.

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FDS, December 31, 1986

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial SAR Estimate to Current Estimate --

PAUC (Initial SAR Est)	Changes								PAUC (Cur Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
TBD	-3.8	-	-	-	-	-	-	-	TBD

15. (U) Contract Information: (Then-Year Dollars in Millions)

All contracts below \$40 million dollars threshold.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

(b)(1)

b. (U) Appropriation Summary -- (Then year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY84-87)</u>	<u>Budget year (FY88)</u>	<u>Balance to Complete FYDP (FY89-92)</u>	<u>Complete Beyond FYDP</u>	<u>Total</u>
RDT&E,N	86.7	76.0	585.0	25.5	773.2

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FDS, December 31, 1986

c. (U) Annual Summary --

Fiscal Year	Qty	FY86 Base-Year Dollars			Then-Year Dollars			Escal Rate %
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E,N

1984		14.6		14.6			14.0	3.8
1985		16.1		16.1			15.9	3.4
1986		23.1		23.1			23.5	2.9
1987		31.7		31.7			33.3	3.1
1988		69.8		69.8			76.0	3.5
1989	1	99.6		99.6			112.0	3.5
1990		168.8		168.8			195.7	3.3
1991		129.0		129.0			153.5	2.9
1992		101.6		101.6			123.8	2.4
1993		20.4		20.4			25.5	2.4
Subtotal	1	674.7		674.7			773.2	

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FDS, December 31, 1986

16. (U) Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. (U) Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E,N

1984	14.0	14.0	14.0
1985	15.9	15.9	15.9
1986	23.5	23.4	18.0
1987	33.3	20.5	1.0
To Complete	686.5	N/A	N/A
Total	773.2	73.8	48.9

17. (U) Production Rate Data: N/A*

18. (U) Operating and Support (O&S) Costs: N/A*

*Note: (U) The number and sequencing of production FDS systems have not been determined to date. Production systems requirements will have been determined when Milestone II approval is requested and production rate data and O&S Costs will be included in the Development Estimate (DE).

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SELECTED ACQUISITION REPORT (RCS DD-COMP (Q)B23 (7700)
 PROGRAM: FISCAL YEAR 1989 SUBMARINE COMBAT SYSTEM (FY89 SCS)
 AS OF DATE: December 31, 1986

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<p>1. (U) <u>Designation/Nomenclature (Popular Name)</u>: FY89 Submarine Combat System AN/BSY-() and Standalone Wide Aperture Array (SWAA) AN/BQG-()</p>	
<p>2. (U) <u>DoD Component</u>: U.S. Navy</p>	
<p>3. (U) <u>Responsible Office and Telephone Number</u>:</p>	
<p>New Attack Submarine System Program Management Office FY89 SCS Program Manager, PMS418 Naval Sea Systems Command Washington, D.C. 20362</p>	<p>PM: CAPT James R. Wilson, USN Assigned: December 29, 1985 Area Code 202/746-0056 AUTOVON 286-0056</p>
<p>4. (U) <u>Program Elements</u>:</p>	
<p><u>RDTE</u>:</p>	
<p>PE64524N - S1347 AN/BSY-1 (FY85 and prior) (shared funding)</p>	
<p>PE64524N - S1941 FY89 SCS (shared funding)</p>	
<p>PE64520N - S0198 Wide Aperture Array (FY86 and prior)</p>	
<p>PE63504N - S0222 Wide Aperture Array (FY87 and prior) (shared funding)</p>	
<p><u>OPN</u>:</p>	
<p>BA2 PE 24281N, Line Item 332217</p>	
<p>BA7 PE 84731N, Line Item 338026</p>	
<p>BA8 PE 84731N</p>	
<p><u>O&M,N</u>:</p>	
<p>BA8 PE 78017N, Line Item P2PU</p>	

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 REVIEW ON: ~~CONFIDENTIAL~~

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5. (U) Related Programs:

PE 64503N-S0219 Submarine Sonar Improvement Program
PE 64562N-S0236 Combat Control Submarine Improvement Program

6. (U) Mission and Description:

a. Mission. The FY89 Submarine Combat System supports the SSN mission to conduct prompt and sustained combat operations. The warfare tasks supporting this mission are: Anti-Submarine Warfare (ASW); Anti-Surface Warfare; Strike Warfare; Special Warfare; Ocean Surveillance; Intelligence/Reconnaissance; Command, Control, and Communication (C³); Electronic Warfare and Mine Warfare.

b. Description. The FY89 Submarine Combat System (AN/BSY-()) will improve upon existing combat systems to meet the expanded operational requirements of attack submarines in countering the 1990's threat. The FY89 Submarine Combat System will provide combat control and acoustic functions to support the ship characteristics of the SSN 21. In addition, Stand-Alone Wide Aperture Array (AN/BQG-()) capability will be provided for SSN 688 Class ships authorized in fiscal year 1989 and later. It shall meet the following needs:

(1) (U) Detect, classify, localize and track targets, platforms and weapons by means of onboard active and passive sensors and by target information from other platforms and external detection systems.

(2) (U) Direct and control placement of weapons on designated targets and deploy countermeasure devices.

(3) (U) Utilize own ship data through appropriate interfaces and data transmission networks to orient and direct sensors and weapons control systems.

(4) (U) Display tactical data and other information to the Commanding Officer and provide internal distribution to the combat control party.

(5) (U) Perform Command, Control, Communications and Intelligence-related (C³I) functions to facilitate the decision process.

7. (U) Program Highlights:

(U) The Joint Requirements and Management Board (JRMB) conducted a Milestone I review on 17 June 1986. The program was approved by Secretary of Defense Decision Memorandum of 9 October 1986. The FY89 Submarine Combat System is expected to meet mission objectives.

8. (U) Decision Coordinating Paper (DCP) Threshold Breaches:

(U) There are no breaches.

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9. (U) Schedule:

PLANNING ESTIMATE/ APPROVED PROGRAM

CURRENT ESTIMATE

a. (U) Milestones

(U) System Design Definition Contract Award

RCA Corporation
IBM Corporation

Jan 86/Jan 86
Mar 86/Mar 86

Jan 86
Mar 86

(U) Milestone I (JRMB)
(U) Milestone II (JRMB)
(U) FSD Contract Award
(U) Preliminary Design Review
(U) Program Review (MS II)
(U) Critical Design Review
(U) Program Review (MS II)
(U) AN/BQG-() Standalone WAA
Deliver to Shipyard
(U) AN/BSY-() FY89 SCS
Deliver to Shipyard
(U) Program Review (MS II)
(U) Complete TECHEVAL (DT II D)
(U) Complete OPEVAL (OT II B)
(U) Milestone III (JRMB)

Jun 86/Oct 86
Nov 87/Nov 87
Jan 88/Jan 88
Mar 89/Mar 89
Dec 89/Dec 89
Sep 90/Sep 90
Dec 91/Dec 91
Nov 92/Nov 92
Nov 93/Nov 93
Dec 93/Dec 93
Dec 94/Dec 94
Jun 95/Jun 95
Dec 95/Dec 95

Jun 86
Nov 87
Jan 88
Mar 89
Dec 89
Sep 90
Dec 91
Nov 92
Nov 93
Dec 93
Dec 94
Jun 95
Dec 95

b. (U) Previous Change Explanation:

None. This is the initial SAR.

c. (U) Current Change Explanation:

None

d. (U) References:

(U) Planning Estimate: SDDM dated October 9, 1986, subject "Fiscal Year 1989 Submarine Combat System Milestone I Decision Memorandum" (U)

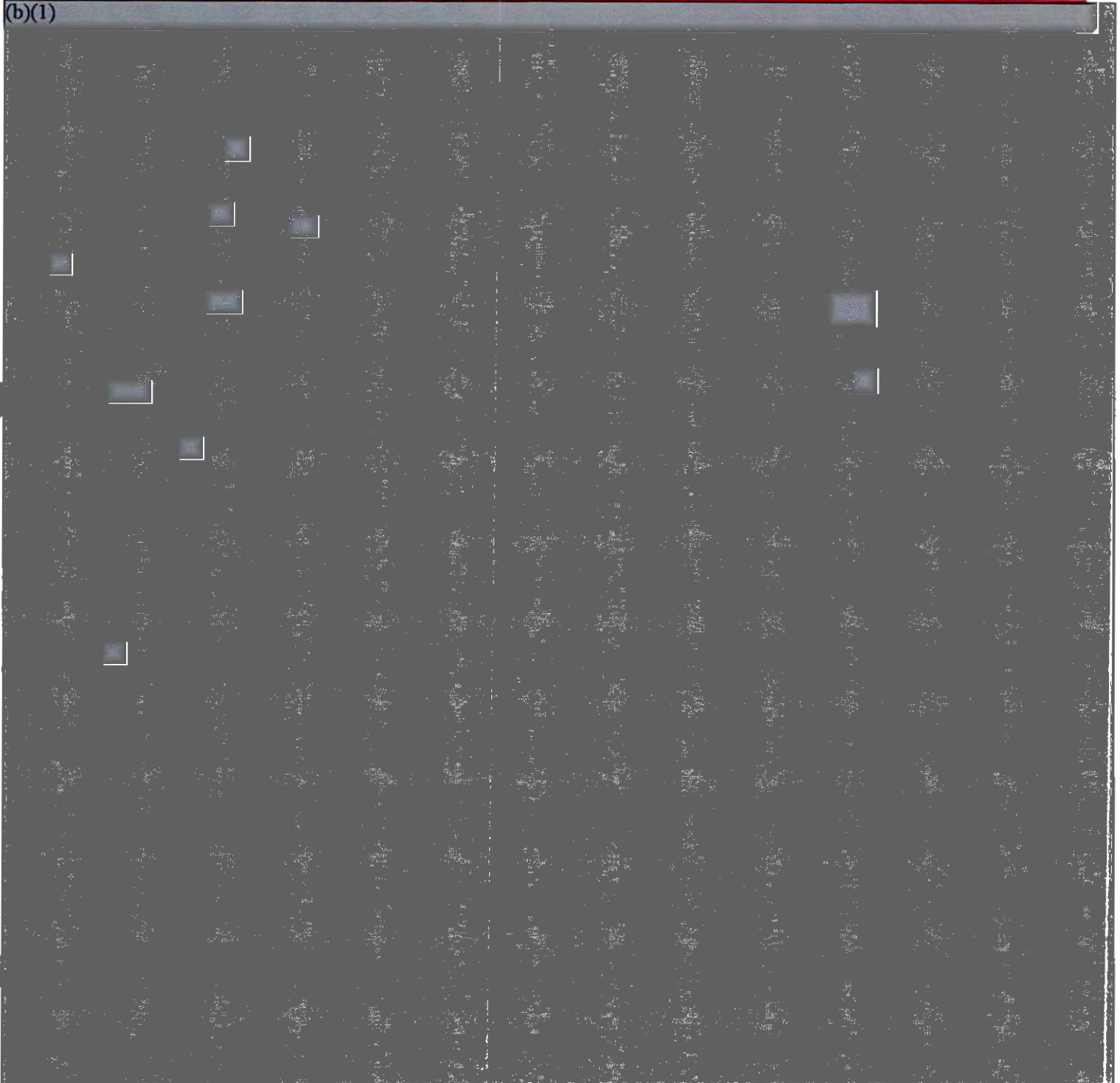
(U) Approved Program: Same as Planning Estimate.

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10. ~~(S)~~ Technical/Operational Characteristics:

	<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>	<u>Notes</u>
a. (S) <u>Technical Characteristics:</u>				

(b)(1)



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10. ~~(S)~~ Technical/Operational Characteristics: (Cont'd)

Planning
Estimate/
Approved
Program

Demonstrated
Performance

Current
Estimate

Notes

(b)(1)



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10. ~~(S)~~ Technical/Operational Characteristics: (Cont'd)

Planning
Estimate/
Approved
Program

Demonstrated
Performance

Current
Estimate

Notes

(b)(1)



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10. ~~(b)~~ Technical/Operational Characteristics: (Cont'd)

Planning
Estimate/
Approved
Program

Demonstrated
Performance

Current
Estimate

Notes

(b)(1)



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10. ~~(S)~~ Technical/Operational Characteristics: (Cont'd)

<u>Planning</u> <u>Estimate/</u> <u>Approved</u> <u>Program</u>	<u>Demonstrated</u> <u>Performance</u>	<u>Current</u> <u>Estimate</u>	<u>Notes</u>
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(b)(1)



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10. ☒ Technical/Operational Characteristics: (Cont'd)

<u>Planning</u> <u>Estimate/</u> <u>Approved</u> <u>Program</u>	<u>Demonstrated</u> <u>Performance</u>	<u>Current</u> <u>Estimate</u>	<u>Notes</u>
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(b)(1)



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(U) Notes for Technical Characteristics

- (U) Notes 1-30 refer to the OT&E Threshold notes which are provided in Notes for Operational Characteristics. References A and B are supplied with the notes to those characteristics.
- (U) All thresholds are calculated for the conditions stated in the notes. Variances between these stated conditions and the actual testing conditions will be factored into the comparison of the thresholds to measured results.
31. (U) The FOM is based on tracker acquisition.

(b)(1)

33. (U) The threshold is calculated using classification LOFAR gram.
34. (U) Tested at sea using a 10% modulated high signal level source.
35. (U) The array wander contribution to $\sigma_{\Delta r}$ is dominant over all mechanisms over all arrival paths except severe mountainous bottoms.

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10. ~~(S)~~ Technical/Operational Characteristics: (Cont'd)

Planning
Estimate/
Approved
Program

Demonstrated
Performance

Current
Estimate

Notes

b. ~~(S)~~ Operational
Characteristics:

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10. ~~(S)~~ Technical/Operational Characteristics: (Cont'd)

<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>	<u>Notes</u>
--	-------------------------------------	-----------------------------	--------------

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10. ~~(S)~~ Technical/Operational Characteristics: (Cont'd)

Planning
Estimate/
Approved
Program

Demonstrated
Performance

Current
Estimate

Notes

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10. ~~(b)~~ Technical/Operational Characteristics: (Cont'd)

Planning Estimate/ Approved Program	Demonstrated Performance	Current Estimate	Notes
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10. ~~(S)~~ Technical/Operational Characteristics: (Cont'd)

Planning
Estimate/
Approved
Program

Demonstrated
Performance

Current
Estimate

Notes

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(U) Notes for Operational Characteristics

(U) The following notes are based on environmental and threat parameters provided in the following:

Reference A The Attack Submarine Effectiveness Analysis Input Parameters Data Book, Volume B of 17 August 1984.

Reference B: Naval Intelligence Support Center (NISC) System Threat Assessment Report (STAR), Submarine Systems, Volume 1, NISC TA 006-85 with update NISC ltr Ser 21/51233 of 24 June 1985.

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(U) Notes for Operational Characteristics (Cont'd)

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(U) Notes for Operational Characteristics (Cont'd)

15. (U) TOMAHAWK TLAM-C and TLAM-N cannot be present concurrently.
16. (U) The actual system capacity is for 2000 tracks, however, only 500 tracks will be demonstrated.
17. (U) Mission Time Between Critical Failures (MTBCF) defines the system mission reliability in accordance with MIL-STD-721C. MTBCF is equal to Mission Time divided by the total number of critical and major failures which occur during series of specified missions. Critical, major and minor failures are defined as follows:
 - a. (U) A critical failure prevents the ship from performing its mission.
 - b. (U) A major failure causes the ship to lose some operational capability and degrade mission accomplishment. If detected before the mission it would probably be mission aborting.
 - c. (U) A minor failure affects performance but can be worked around to avoid mission impact.
18. (U) This threshold is based on the SSN 21, 90-day mission scenario, which is provided in the FY89 Submarine Combat System, AN/BSY-(), Top Level Requirements (TLR).
19. (U) MTBE is defined in terms of cold starts (down loading, and initialization of software programs and data without restoration of historical data) and warm starts (down loading and initialization of software programs and data including restoration of historical data). Historical data includes all data except that lost during the interval between the error and the completion of the recovery action. Mode remembered on checkpoint is also included in the historical data.
20. (U) Full capability and self protect are defined in the FY89 Submarine Combat System TLR.

Notes 21-30 are not used.

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11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)

AS OF DATE: DECEMBER 31, 1986

BASE YEAR: FY1986

a. <u>Cost</u>	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
Development (RDT&E)	\$ 1566.2	N/A	\$ 1566.2
Procurement			
Support System Costs (including LBES, Trainers, Trainer Unique Equipment, MS/RFs, IMAs, I&C Spares and MAMs)	956.5 (956.5)	N/A N/A	956.5 (956.5)
Construction (MILCON)	-		-
Total FY86 Base Year \$	2522.7	N/A	2522.7
Escalation	467.2	N/A	467.2
Development (RDT&E)	(211.5)	N/A	(211.5)
Procurement	(255.7)	N/A	(255.7)
Construction (MILCON)	-		-
Total Then Year \$	2989.9	N/A	2989.9
b. <u>Quantities</u>			
Procurement	N/A	N/A	N/A

Note: Production systems for new construction ships are procured under SCN appropriation. These SCN requirements are included as portions of the SSN 21 and SSN 688 ship construction budgets, and are not reported as part of Program Acquisition Costs in this SAR. The non-add SCN funding and system quantities are shown in Section 16c.

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11. (U) Program Acquisition Cost: (Current Estimate in Millions of Dollars)
(Cont'd)

c. <u>Unit Cost</u>	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
Procurement:			
FY86 Base Year \$	N/A	N/A	N/A
Then Year \$	N/A	N/A	N/A
Program:			
FY86 Base Year \$	N/A	N/A	N/A
Then Year \$	N/A	N/A	N/A

d. Approved Design to Cost Goal: N/A; Design to Cost Goals are established at Milestone II.

e. Foreign Military Sales: None

f. Nuclear Costs: None

12. (U) Program Acquisition/Current Procurement Unit Cost Summary: (Current
(Then Year) Dollars in Millions)

a. Program Acquisition	Current Year		Budget Year
	Current Est Dec 86 SAR	UCR Baseline Dec 86 SAR	UCR Baseline Dec 86 SAR
(1) Cost	2989.9	2989.9	2989.9
Quantity	N/A	N/A	N/A
Unit Cost	N/A	N/A	N/A
b. Current Procurement			
(1) Cost	N/A	N/A	N/A
Less CY Adv Proc	N/A	N/A	N/A
Plus FY Adv Proc	N/A	N/A	N/A
Net Total	N/A	N/A	N/A
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

N/A: Not Applicable. Production systems for new construction ships are procured under SCN appropriation and are reported in the SSN 21 and SSN 688 SARs.

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13. (U) Cost Variance Analysis:

a. Summary -- (Current (Then Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Baseline Estimate	1777.7	1212.2	-	2989.9
Previous Changes:				
Economic	-	-		-
Quantity	-	-		-
Schedule	-	-		-
Engineering	-	-		-
Estimating	-	-		-
Other	-	-		-
Support	-	-		-
Subtotal	-	-		-
Current Changes:				
Economic	-	-		-
Quantity	-	-		-
Schedule	-	-		-
Engineering	-	-		-
Estimating	-	-		-
Other	-	-		-
Support	-	-		-
Subtotal	-	-		-
Total Changes	-	-		-
Current Estimate	1777.7	1212.2	-	2989.9

(FY 1986 Constant Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Baseline Estimate	1566.2	956.5	-	2522.7
Previous Changes:				
Economic	-	-		-
Quantity	-	-		-
Schedule	-	-		-
Engineering	-	-		-
Estimating	-	-		-
Other	-	-		-
Support	-	-		-
Subtotal	-	-		-
Current Changes:				
Economic	-	-		-
Quantity	-	-		-
Schedule	-	-		-
Engineering	-	-		-
Estimating	-	-		-
Other	-	-		-
Support	-	-		-
Subtotal	-	-		-
Total Changes	-	-		-
Current Estimate	1566.2	956.5	-	2522.7

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13. (U) Cost Variance Analysis: (Cont'd)

- b. Previous Change Explanations: Not Applicable - initial SAR.
- c. Current Change Explanations: Not Applicable - initial SAR.
- d. References:

Planning Estimate: SDDM, dated 9 October 1986, subject "Fiscal Year 1989 Submarine Combat System" Milestone I Decision Memorandum

14. (U) Program Acquisition Unit Cost (PAUC) History:*

- a. Initial SAR Estimate to Current Baseline Estimate: N/A
- b. Current Baseline Estimate to Current Estimate: N/A

* Not Applicable. Production systems for new construction ships are procured under SCN appropriation and are reported in the SSN 21 and SSN 688 SARs.

15. (U) Contract Information: (Then Year Dollars in Millions)

There are no contracts which exceed \$40 million.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status:

- (1) Percent Program Completed:* 20.0% (2 yrs/10 yrs)
- (2) Percent Program Cost Appropriated: 7.5% (224.7/2989.9)

b. Appropriation Summary:

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current and Prior Yrs (FY81-87)</u>	<u>Budget Year (FY88)</u>	<u>Balance To Complete FYDP (FY89-92)</u>	<u>Beyond FYDP (FY93-99)</u>	<u>Total</u>
RDT&E	224.7	211.3	1184.5	157.2	1777.7
Procurement	-	-	458.6	753.6	1212.2
MILCON	-	-	-	-	-
Total	224.7	211.3	1643.1	910.8	2989.9

* FY86 was the first year in which the FY89 Submarine Combat System Program was funded. Funding for years prior to FY86 was for SUBACS A, SUBACS B, and Wide Aperture Array (WAA) programs.

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16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)
(Cont'd)

c. Annual Summary:

Fiscal Year	Qty	FY86 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
		Appropriation: RDT&E						
1981		19.8		19.8			15.2	-
1982		28.6		28.6			23.7	7.6
1983		27.1		27.1			24.1	4.9
1984		23.7		23.7			22.4	3.8
1985		26.8		26.8			26.5	3.4
1986		26.7		26.7			27.2	2.9
1987		81.4		81.4			85.6	3.1
1988		194.2		194.2			211.3	3.5
1989		270.3		270.3			304.0	3.5
1990		290.0		290.0			336.2	3.3
1991		279.6		279.6			332.8	2.9
1992		173.5		173.5			211.5	2.4
1993		78.4		78.4			97.8	2.4
1994		27.4		27.4			35.0	2.4
1995		18.7		18.7			24.4	2.4
Subtotal		1566.2		1566.2			1777.7	-

Fiscal Year	Qty	FY86 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)
		Sailaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		
			Appropriation: OPN					
1990			141.3	141.3			167.5	2.4
1991			183.1	183.1			222.1	2.3
1992			55.6	55.6			69.0	2.3
1993			128.3	128.3			162.9	2.3
1994			213.3	213.3			277.0	2.3
1995			203.1	203.1			269.8	2.3
1996			13.5	13.5			18.4	2.3
1997			17.5	17.5			24.3	2.3
1998			-	-			-	2.3
1999			0.8	0.8			1.2	2.3
Subtotal			956.5	956.5			1212.2	-

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16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)
(Cont'd)

c. Annual Summary: (Cont'd)

Fiscal Year	Qty	FY86 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)	
		Sailaway		Total	Advance Proc		Total		
		Nonrec	Rec		Debit	Credit			
			Appropriation: SCN for SSN 21*						
1988		-	-	-	-	20.0	20.0	3.5	
1989	1	20.7	142.8	176.2	20.0	-	184.7	3.5	
1990		-	-	-	-	26.0	26.0	3.3	
1991	2	18.0	264.9	303.9	26.0	40.0	385.4	2.9	
1992	2	2.6	263.3	285.7	40.0	58.9	376.5	2.4	
Subtotal		41.3	671.0	765.8	86.0	144.9	992.6		

Fiscal Year	Qty	FY86 Base-Year Dollars			Then-Year Dollars			Escl Rate (%)	
		Sailaway		Total	Advance Proc		Total		
		Nonrec	Rec		Debit	Credit			
			Appropriation: SCN for SSN 688*						
1988		-	-	-	-	40.0	40.0	3.5	
1989	2	6.8	64.0	74.6	40.0	38.7	85.4	3.5	
1990	2	2.2	64.3	70.3	38.7	36.1	81.3	3.3	
1991	2	-	59.9	63.6	36.1	19.4	61.0	2.9	
1992	1	-	31.6	33.6	19.4	19.2	41.9	2.4	
Subtotal		9.0	219.8	242.1	134.2	153.4	309.6		

d. Obligations and Expenditures:

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended
Appropriation: RDT&E			
1981	15.2	15.2	15.2
1982	23.7	23.7	23.7
1983	24.1	24.1	24.1
1984	22.4	22.4	22.4
1985	26.5	26.5	26.1
1986	27.2	26.3	22.6
1987	85.6	26.1	1.1
To Complete	1975.2	-	-
Total	2199.9	164.3	135.2

* These are Program Managers' estimates for the FY89 Submarine Combat System. They are included as portions of the SSN 21 and SSN 688 ship construction budgets, and are not reported as part of Program Acquisition Costs in this SAR.

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17. (U) Production Rate Data:

a. Annual Production Rate:

Fiscal Year	Production Rates (Quantity/Year)			
	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1988	N/A	N/A	N/A	N/A
1989	N/A	N/A	N/A	N/A
1990	N/A	N/A	N/A	N/A
1991	N/A	N/A	N/A	N/A
1992	N/A	N/A	N/A	N/A

b. Cost Variance: Not Applicable.

c. Schedule Variance: Not Applicable.

d. Planned Deliveries:

	<u>To Date</u>
RDTE	0/0
Procurement	0/0

18. (U) Operating and Support Costs: Not Applicable; Program is not yet in Full Scale Development.

19. (U) Cost-Quantity Information. Not Applicable. Production systems for new construction ships are procured under SCN appropriation and are reported in the SSN 21 and SSN 688 SARs.

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SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

Program: Peacekeeper Rail Garrison

AS OF DATE: December 31, 1986

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1. <u>Designation and Nomenclature (Popular Name):</u>	Peacekeeper Rail Garrison
2. <u>DoD Component:</u>	U.S. Air Force
3. <u>Responsible Office and Telephone Number:</u>	
Deputy Commander for Peacekeeper Rail Garrison	Col Glenn H. Vogel
Ballistic Missile Office	Assigned: 3 Nov 86
Norton AFB, CA 92409-6468	AV 876-5897; COMM (714) 382-5897
4. <u>Program Elements/Procurement Line Items:</u>	
RDT&E: PE 64312F (Shared Funding)	
PROCUREMENT: PE 11215F (Shared Funding)	
MILCON: PE 11215F (Shared Funding)	

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
U.S. DEPARTMENT OF DEFENSE

SAF/PAS

87-0546-T

Peacekeeper Rail Garrison, December 31, 1986

5. Related Programs: Peacekeeper, Small ICBM

6. Mission and Description: The mission of Peacekeeper Rail Garrison is to enhance the deterrent posture of the U.S. strategic forces by providing a highly survivable ICBM system. Survivability is achieved by dispersing the trains onto the nation's rail network, thus severely stressing the Soviet planner's ability to target this system along with all other U.S. strategic forces. Should deterrence fail, these Peacekeeper missiles will provide a highly accurate, prompt retaliatory capability against the full spectrum of designated targets, launchable from garrison or virtually any location along the rail network.

Rail Garrison will include 25 trains with two missiles per train parked in secure igloos at selected Air Force bases throughout the CONUS. The trains will be dispersed only by direction of national command authorities. Training trains will operate periodically on the nation's rail network. Peacekeeper Rail Garrison does not replace an existing system.

7. Program Highlights:

a. Significant Historical Developments - On 19 December 1986, the President selected Rail Garrison as the basing mode for the second 50 Peacekeeper missiles. A 7 Jan 87 message amendment to Program Management Directive 0075(17) (ICBM Modernization) directed Air Force Systems Command to begin development of the Rail Garrison basing mode for Peacekeeper.

In January 1987, the Ballistic Missile Office (BMO) began siting work at the 11 candidate bases. Final bases will be selected in December 1988, with the Main Operating Base directed to be at F.E. Warren AFB, WY. The site-specific Environmental Impact Statement (EIS) for the final garrison sites will be submitted in January 1988.

Rail Garrison development is divided into three major contracts: (1) Basing Test and System Support (BT&SS), (2) Missile Launch Car (MLC), and (3) Launch Control System (LCS). Contract award dates are scheduled for late Aug 87 for BT&SS, and Mar 88 for the MLC and LCS. This is Peacekeeper Rail Garrison's initial Selected Acquisition Report.

b. Significant developments since last report - N/A

The Rail Garrison is expected to satisfy its mission.

c. Changes since as of date - None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: None (DCP not available)

Peacekeeper Rail Garrison, December 31, 1986

9. Schedule:

a. Milestones —

	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>
Full-Scale Development (FSD)	Oct 87	Oct 87
System Design Review (SDR)	TBD	TBD
Critical Design Review (CDR)	TBD	TBD
Initial Operational Capability (IOC) ¹	Dec 91	Dec 91
Full Operational Capability (FOC) ²	Jun 93 ³	Dec 93

(1) IOC is defined as two missiles (one train) on alert and one spare train.

(2) Fifty missiles deployed.

(3) Not earlier than.

b. Previous Change Explanations — None. Initial report.

c. Current Change Explanations — None. Initial report.

d. References—Planning Estimate: Program Management Directive (PMD) amendment dated 7 Jan 87 amended by DEPSECDEF Memo dated 5 May 87.

Approved Program: Program Management Directive (PMD) amendment dated 7 Jan 87 amended by DEPSECDEF Memo dated 5 May 87.

10. Technical/Operational Characteristics: TBD

Peacekeeper Rail Garrison, December 31, 1986

11. Program Acquisition Cost (Current Estimate in Millions of Dollars): ^{1/}

a. Cost --	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
Development (RDT&E)	\$2487.5	—	\$2487.5 ^{3/}
Procurement	3253.2	—	3253.2
Other Weapon System Costs	(2834.5)	—	(2834.5)
Initial Spares	(418.7)	—	(418.7)
Construction (MILCON)	<u>587.8</u>	<u>—</u>	<u>587.8</u>
Total FY 82 Base-Year \$	6328.5		6328.5
Escalation	2778.3	—	2778.3
Development (RDT&E)	(797.7)	—	(797.7)
Procurement	(1743.0)	—	(1743.0)
Construction (MILCON)	<u>(237.6)</u>	<u>—</u>	<u>(237.6)</u>
Total Then-Year \$	9106.8	—	9106.8
b. Quantities — (Basing Units) ^{2/}			
Development (RDT&E)	0	—	0
Procurement	<u>50</u>	<u>—</u>	<u>50</u>
Total	<u>50</u>	<u>—</u>	<u>50</u>
c. Unit Cost --			
Procurement:			
FY 82 Base Year \$	65.064	—	65.064
Then-Year \$	99.924	—	99.924
Program:			
FY 82 Base Year \$	126.570	—	126.570
Then-Year \$	182.136	—	182.136

^{1/} Production missile costs for Rail Garrison program are excluded and are included in the Peacekeeper Selected Acquisition Report (SAR).

^{2/} One Rail Garrison basing unit is defined as one Peacekeeper rail launch car and all associated support equipment.

^{3/} RDT&E appropriation includes the cost of 5 missiles to support the Basing Verification Program.

Peacemaker Rail Garrison, December 31, 1986

11. Program Acquisition Cost (Cont'd)

- d. Approved Design to Cost Goal — None
- e. Foreign Military Sales — None
- f. Nuclear Costs — N/A

12. Program Acquisition/Current Procurement Unit Cost Summary): (Current [Then-Year]
Dollars in Millions.

	<u>Current Year</u>		<u>Budget Year</u>
	<u>Current Est (Dec 86 SAR)</u>	<u>UCR Baseline (Dec 86 SAR)</u>	<u>UCR Baseline (Dec 86 SAR)</u>
a. Program Acquisition —			
(1) Cost	9106.8	9106.8	9106.8
(2) Quantity	50	50	50
(3) Unit Cost	182.136	182.136	182.136
b. Current Procurement —	(FY 1987)	(FY 1987)	(FY 1988)
(1) Cost	N/A	N/A	N/A
Less CY Adv Proc	N/A	N/A	N/A
Plus FY Adv Proc	N/A	N/A	N/A
Net Total	N/A	N/A	N/A
(2) Quantity	N/A	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

Peacekeeper Rail Garrison, December 31, 1986

13. Cost Variance Analysis: ^{1/}

a. Summary -- (Current [Then-Year] Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	3285.2	4996.2	825.4	9106.8
Previous Changes:	None	Initial	Report	
Economic	—	—	—	—
Quantity	—	—	—	—
Schedule	—	—	—	—
Engineering	—	—	—	—
Estimating	—	—	—	—
Other	—	—	—	—
Support	—	—	—	—
Subtotal	—	—	—	—
Current Changes:				
Economic	—	—	—	—
Quantity	—	—	—	—
Schedule	—	—	—	—
Engineering	—	—	—	—
Estimating	—	—	—	—
Other	—	—	—	—
Support	—	—	—	—
Subtotal	—	—	—	—
Total Changes	—	—	—	—
Current Estimate	3285.2	4996.2	825.4	9106.8

(FY 1982 Constant [Base-Year] Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2487.5	3253.2	587.8	6328.5
Previous Changes:	None	Initial	Report	
Quantity	—	—	—	—
Schedule	—	—	—	—
Engineering	—	—	—	—
Estimating	—	—	—	—
Other	—	—	—	—
Support	—	—	—	—
Subtotal	—	—	—	—
Current Changes:				
Quantity	—	—	—	—
Schedule	—	—	—	—
Engineering	—	—	—	—
Estimating	—	—	—	—
Other	—	—	—	—
Support	—	—	—	—
Subtotal	—	—	—	—
Total Changes	—	—	—	—
Current Estimate	2487.5	3253.2	587.8	6328.5

^{1/} Production missile costs for Rail Garrison program are excluded and are included in the Peacekeeper Selected Acquisition Report (SAR).

Peacekeeper Rail Garrison, December 31, 1986

13. Cost Variance Analysis (Cont'd):

- b. Previous Change Explanations -- None. Initial report.
- c. Current Change Explanations -- None. Initial report.
- d. References -- FY 1988/89 President's Budget, January 1987

14. Program Acquisition Unit Cost (PAUC) History: (Millions of Then-Year Dollars)

a. Initial SAR Estimate to Current Baseline Estimate --

PAUC		Changes								PAUC	
(Initial										(Current	
SAR Est)		Econ	Qty	Sch	Eng	Est	Other	Spt	Total	Est)	
182.136		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	182.136	

15. Contract Information: (Then-Year Dollars in Millions)

None. No contracts awarded.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

- (1) Percent Program Completed: 12.5% (1/8 yrs)
- (2) Percent Program Cost Appropriated: 1.0% (90.0/9106.8)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY87)	Budget Year (FY88)	Balance to Complete		Total
			FYDP (FY89-92)	Beyond FYDP (FY93-94)	
RDT&E	90.0	591.0	2604.2	—	3285.2
Procurement	—	—	4996.2	—	4996.2
MILCON	—	—	800.2	25.2	825.4
Total	90.0	591.0	8400.6	25.2	9106.8

Peacekeeper Rail Garrison, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

c. Annual Summary --

Fiscal Year	Qty	FY 82 Base-Year Dollars			Then-Year Dollars			Rate
		Nonrec	Rec	Total	Debit	Credit	Total	

Appropriation: RDT&E (1)

1987	:	:	:	73.6	:	:	90.0	3.1
1988	:	:	:	466.8	:	:	591.0	3.5
1989	:	:	:	912.0	:	:	1192.9	3.5
1990	:	:	:	582.8	:	:	785.6	3.3
1991	:	:	:	446.0	:	:	616.8	2.9
1992	:	:	:	6.3	:	:	8.9	2.4
Subtotal	0	:	:	2487.5	:	:	3285.2	—

Appropriation: Procurement

1990	5	:	:	826.8	:	:	1237.7	3.3
1991	25	:	:	1443.1	:	:	2213.7	2.9
1992	20	:	:	983.3	:	:	1544.8	2.4
Subtotal	50	:	:	3253.2	:	:	4996.2	—

Appropriation: MILCON

1989	:	:	:	33.1	:	:	44.5	3.5
1990	:	:	:	254.6	:	:	351.9	3.3
1991	:	:	:	196.8	:	:	278.6	2.9
1992	:	:	:	86.3	:	:	125.2	2.4
1993	:	:	:	16.0	:	:	23.7	2.4
1994	:	:	:	1.0	:	:	1.5	2.4
Subtotal	0	:	:	587.8	:	:	825.4	—
Total	50	:	:	6328.5	:	:	9106.8	—

(1) RDT&E Appropriation includes the cost of 5 missiles (3 in FY88 and 2 in FY89) to support the Basing Verification Program.

Peacekeeper Rail Garrison, December 31, 1986

16. Program Funding Summary (Cont'd): (Current Estimate in Millions of Dollars)

d. Obligations and Expenditures —

: Then-Year Dollars (Current Estimate in Millions) :			
: Fiscal Year : Total : Obligated : Expended :			

Appropriation: RDT&E

: 1987 :	90.0 :	— :	— :
: To Complete :	3195.2 :	— :	— :
: Subtotal :	3285.2 :	— :	— :

Appropriation: Procurement

: 1987 :	— :	— :	— :
: To Complete :	4996.2 :	— :	— :
: Subtotal :	4996.2 :	— :	— :

Appropriation: MILCON

: 1987 :	— :	— :	— :
: To Complete :	825.4 :	— :	— :
: Subtotal :	825.4 :	— :	— :
: Total :	9106.8 :	— :	— :

17. Production Rate Data: TBD

18. Operating and Support Costs: TBD

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

PROGRAM: FORWARD AREA AIR DEFENSE SYSTEM (FAADS)
LINE OF SIGHT-REAR (LOS-R)

86-029

AS OF DATE: December 31, 1986

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1. Designation and Nomenclature (Popular Name): Forward Area Air Defense System (FAADS) Line of Sight-Rear (Pedestal Mounted STINGER) (PMS)

CLEARED
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2. DoD Component: Department of the Army

MAR 3 1987

3. Responsible Office and Telephone Number:

Project Manager
STINGER Project Office
Redstone Arsenal, AL 35898-5630

COL Robert A. Drolet
ASSIGNED: January 9, 1986
AUTOVON: 746-6191
COMMERCIAL: (205) 876-6191

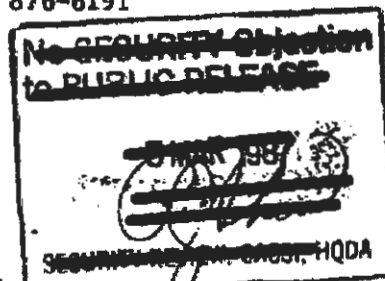
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AND SECURITY REVIEW (DASD -PA)
DEPARTMENT OF DEFENSE

4. Program Elements/Procurement Line Items:

RDT&E: PE 64306 Project 646 (LOS-R/PMS)

PROCUREMENT: APPN 2032 SSN CC9803 (LOS-R/PMS)

MILCON: TBD



5. Related Programs: Line of Sight-Forward-Heavy; Non-Line of Sight; and Forward Area Air Defense Command, Control, and Intelligence

6. Mission and Description: The Army has worked with the Office of the Secretary of Defense (OSD) to develop an effective and affordable program to fill the void in the forward area. In January 1986, OSD approved in principle an integrated air defense program to meet the growing air threat to the forward area of the battlefield. The FAADS program integrates weapons, sensors, and

6. Mission and Description (Cont'd):

command, control, and intelligence (C²I) architecture to counter the entire spectrum of the air threat to the forward area through the 90's. The FAADS concept is designed to provide total coverage in the division area and permits the enemy no preferred attack option. The acquisition strategy relies heavily on non-developmental items (NDI) and preplanned product improvements (P³I) to rapidly overcome our current air defense deficiencies and keep pace with the advancing threat. A Cost and Operational Effectiveness Analysis (COEA) is being conducted to assure the optimum mix of weapon characteristics.

The FAADS concept consists of weapons delivery elements tied together by a C²I network which also integrates FAADS into the Army command and control system. The C²I initiative incorporates a family of sensors and identification equipment (ground and aerial, active and passive) with improved data processing and distribution capability.

The Pedestal Mounted STINGER (PMS) solution to the Line of Sight-Rear (LOS-R) will consist of multiple STINGER missiles and an attrition weapon integrated on a High Mobility Multi-Purpose Wheeled Vehicle (HMMWV) to provide high firepower and mobile protection of the rear area assets of the divisions. The NDI Request for Proposals was released in July 1986 with the technical test/operational evaluation of candidates leading to an initial production contract. Fielding of this component will occur in FY 89.

The components of FAADS are not new to air defense. Planning for C²I along with requirements for combined arms initiatives and improved air defense weapons has existed for several years. The FAADS program, using a systems approach, will integrate these relatively independent systems together to defeat the future enemy threat in the forward area. The components will work together to maximize total force effectiveness.

7. Program Highlights:

a. On July 29, 1986, the JRMB approved the concept for execution of the overall FAAD program as a system of systems. An NDI program for LOS-R was approved. The concept was to conduct candidate evaluation, with evaluation based on current performance and growth capability. The Army was directed to move forward as rapidly as possible in this effort. FAADS, to include the LOS-R component, is expected to satisfy mission requirements.

b. Changes Since "As Of" Date -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: There is no DCP for the LOS-R system.

9. Schedule:

	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>
a. Milestones --		
LOS-R (PMS)		
Start Competitive Test	2QFY87/2QFY87	2QFY87
Contract Award	4QFY87/4QFY87	4QFY87
First Unit Equipped (FUE)	2QFY89/2QFY89	2QFY89
b. Previous Change Explanations -- NA - Initial SAR.		
c. Current Change Explanations -- NA - Initial SAR.		
d. References --		

Planning Estimate: FY 88-89 President's Budget PMS program plan

10. Technical/Operational Characteristics:

	<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. Technical --			
(1) Compatible with Man- pads STINGER, STINGER POST and STINGER RMP	WILL MEET/WILL MEET	TBD	WILL MEET
(2) Passive sensor for day/ night capability	WILL MEET/WILL MEET	TBD	WILL MEET
(3) Four ready to fire STINGER missiles (8 desired)	8/8	TBD	8
b. Operational --			
(1) Ready time from standby mode	10 SEC/10 SEC	TBD	10 SEC
(2) Remote operation	50 METERS/50 METERS	TBD	50 METERS

10. Technical/Operational Characteristics (Cont'd):

	<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
(3) Reload time	15 MIN/15 MIN	TBD	15 MIN
c. Previous Change Explanations -- Initial SAR.			
d. Current Change Explanations -- Initial SAR.			
e. References --			

Planning Estimate: Draft ROC, October 15, 1986; FY 88-89 President's Budget

11. Program Acquisition Cost (Current Estimate in Millions of Dollars):*

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)			
FAAD System	11.7	--	11.7
Procurement	1045.9		1045.9
FAADS LOS-R Weapon System	(928.2)	--	(928.2)
Initial Spares	(117.7)	--	(117.7)
Total Flyaway	TBD	--	TBD
Other Wpn Sys Cost	TBD	--	TBD
Construction (MILCON)	0	0	0
Total FY 87 Base Year \$	1057.6	--	1057.6
Escalation	200.0	--	200.0
Development (RDT&E)	(0.4)	--	(0.4)
Procurement	(199.6)	--	(199.6)
Construction (MILCON)	0.0		0.0
Total Then-Year \$	1257.6		1257.6

*Note that costs presented in this report are through FY 93. Costs for FY 94 and beyond are TBD.

11. Program Acquisition Cost (Current Estimate in Millions of Dollars) (Cont'd):

*b. Quantities --

Development (RDT&E)	TBD	--	TBD
Procurement	TBD	--	TBD
Total	TBD	--	TBD

c. Unit Cost --

Procurement:

FY 87 Base-Year \$	TBD	--	TBD
Then-Year \$	TBD	--	TBD

Program:

FY 87 Base-Year \$	TBD	--	TBD
Then-Year \$	TBD	--	TBD

d. Approved Design to Cost Goal -- LOS-R consists primarily of off-the-shelf, NDI. Therefore, Design to Cost goals will not apply.

e. Foreign Military Sales -- None planned at this time.

f. Nuclear Costs -- None.

12. Program Acquisition/Current Procurement Unit Cost Summary (Current Dollars in Millions):

	Current Year Current EST Dec 86 SAR	UCR Baseline Dec 86 SAR	Budget Year UCR Baseline Dec 86 SAR
a. Program Acquisition --			
(1) Cost	\$1257.6	\$1257.6	\$1257.6
(2) Quantity	TBD	TBD	TBD
(3) Unit Cost	TBD	TBD	TBD
b. Current Procurement --	(FY 87)	(FY 87)	(FY 88)
(1) Cost	\$40.6	\$40.6	\$66.1
Advance Procurement -- N/A			
* (2) Quantity	TBD	TBD	TBD

*Quantities are not included in the FYDP. Cost and Operational Effectiveness Analysis (now underway) results will be used to determine fielded mix of FAADS components. The COEA will be presented to the JRMB scheduled for May 1987.

12. Program Acquisition/Current Procurement Unit Cost Summary (Current Dollars in Millions) (Cont'd):

	Current Year		Budget Year
	Current EST	UCR Baseline	UCR Baseline
	Dec 86 SAR	Dec 86 SAR	Dec 86 SAR

* (3) Unit Cost

TBD

TBD

TBD

13. Cost Variance Analysis:

a. Summary (Current (Then-Year) Dollars in Millions) --

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	12.1	1245.5	TBD	1257.6
Previous Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Current Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Total Changes	--	--	--	--
Current Estimate	12.1	1245.5	TBD	1257.6

*Quantities are not included in the FYDP. Cost and Operational Effectiveness Analysis (now underway) results will be used to determine fielded mix of FAADS components. The COEA will be presented to the JRMB scheduled for May 1987.

13. Cost Variance Analysis (Cont'd):

(FY 87 Constant Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	11.7	1045.9	TBD	1057.6
Previous Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Current Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Total Changes	--	--	--	--
Current Estimate	11.7	1045.9	TBD	1057.6

b. Previous Change Explanations -- NA - Initial SAR.

c. Current Change Explanations -- NA - Initial SAR.

d. References --

Planning Estimate: FY 88-89 President's Budget14. Program Acquisition Unit Cost (PAUC) History (Millions of Then-Year Dollars):

Current Baseline Estimate to Current Estimate --

PAUC (Plan Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
TBD	--	--	--	--	--	--	--	--	TBD

FAADS, LOS-R (PMS), December 31, 1986

15. Contract Information (Then-Year Dollars in Millions): N/A

No contracts have been awarded at this time.

16. Program Funding Summary (Current Estimate in Millions of Dollars):

a. Program Status --

(1) Percent Program Completed: 28.6% (2/7)

(2) Percent Program Cost Appropriated: 3.8% (\$47.9/\$1257.6)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Current & Prior Yrs (FY 87)</u>	<u>Budget Year (FY 88)</u>	<u>FYDP (FY 89-92)</u>	<u>Beyond FYDP (FY 93)</u>	<u>Total</u>
RD&E	7.3	4.8	0.0	TBD	12.1
Procurement	40.6	66.1	731.0	407.8	1245.5
MILCON	0.0	0.0	0.0	-	-
Total	47.9	70.9	731.0	407.8	1257.6

c. Annual Summary -- FAAD Line of Sight-Rear (Pedestal Mounted STINGER)

Fiscal Year	Qty	FY 87 Base-Year Dollars			Then-Year Dollars			Escl
		Flyaway		Total	Advance Proc		Total	Rate
		Nonrec	Rec		Debit	Credit		(%)

Appropriation: RD&E

1986 & Prior				4.0			4.0	2.9
1987				3.2			3.3	3.1
1988				4.5			4.8	3.5
1989								
1990								
1991								
1992								
To Compl								
Subtotal				11.7			12.1	

16. Program Funding Summary (Current Estimate in Millions of Dollars)(Cont'd):

Fiscal Year	1/ Qty	FY 87 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: Procurement

1986 & Prior				0			0	-
1987	TBD			38.2			40.6	3.1
1988	TBD			60.2			66.1	3.5
1989	TBD			120.5			136.1	3.5
1990	TBD			152.5			176.8	3.3
1991	TBD			149.1			177.1	2.9
1992	TBD			198.1			241.0	2.4
2/ To Compl	TBD			327.3			407.8	N/A
Subtotal	TBD			1045.9			1245.5	
TOTAL	TSD			1057.6			1257.6	-

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation: RDT&E

1986 & Prior	4.0	4.0	2.1
1987	3.3	0.0	0.0
To Complete	4.8	N/A	N/A
Total	12.1	4.0	2.1

Appropriation: Procurement

1987	40.6	0.0	0.0
To Complete	1217.0	N/A	N/A
Total	1257.6	0.0	0.0

- 1/ Quantities are not in FYDP. Cost and Operational Effectiveness Analysis (now underway) results will be used to determine fielded mix of FAADS components. The COEA will be presented to the JRMB scheduled for May 1987.
- 2/ Includes cost for FY93 only. To complete costs are TBD.

FAADS, LOS-R PMS, December 31, 1986

17. Production Rate Data: N/A

18. Operating and Support Costs:

a. Assumptions and Ground Rules -- TBD

b. Costs -- TBD

A-11 FAADS NLOS

SELECTED ACQUISITION REPORT (RCS: DD-COMP(Q&A)823)

PROGRAM: FORWARD AREA AIR DEFENSE SYSTEM (FAADS)
NON-LINE OF SIGHT (NLOS)

86-030

AS OF DATE: December 31, 1986

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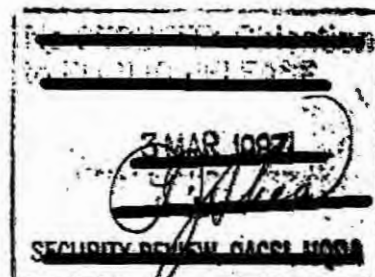
1. Designation and Nomenclature (Popular Name):	Forward Area Air Defense System (FAADS) Non-Line of Sight, Fiber Optics Guided Missile System (FOG-M)
2. DoD Component:	Department of the Army
3. Responsible Office and Telephone Number:	
Project Manager (Acting)	George G. Williams
Non-Line of Sight	ASSIGNED: October 19, 1986
Redstone Arsenal, AL 35898-5750	AUTOVON: 746-2001
	COMMERCIAL: (205) 876-2001
4. Program Elements/Procurement Line Items:	
RDT&E:	PE 63757 Project 465 (NLOS)
PROCUREMENT:	TBD
MILCON:	TBD
5. Related Programs:	Line of Sight-Forward-Heavy, Line of Sight-Rear, and Forward Area Air Defense Command, Control, and Intelligence

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6. Mission and Description: The Army has worked with the Office of the Secretary of Defense (OSD) to develop an effective and affordable program to fill the void in the forward area. In January 1986, OSD approved in principle an integrated air defense program to meet the growing air threat to the forward area of the battlefield. The FAADS program integrates weapons, sensors, and command, control and intelligence (C²I) architecture to counter the entire spectrum of the air threat to the forward area through the 90's. The FAADS concept is designed to provide total coverage in the division area and permits the enemy no preferred attack option. The acquisition strategy relies heavily on non-developmental items (NDI) and preplanned product improvements (P³I) to rapidly overcome our current air defense deficiencies and keep pace with the advancing threat. A Cost and Operational Effectiveness Analysis (COEA) is being conducted to assure the optimum mix of weapon characteristics.

The FAADS concept consists of weapons delivery elements tied together by a C²I network which also integrates FAADS into the Army command and control system architecture. The C²I initiative incorporates a family of sensors and identification equipment (ground and aerial, active and passive) with improved data processing and distribution capability.

The Non Line of Sight (NLOS) component will defeat threat class helicopters and ground armored vehicles masked to line of sight systems. The Fiber Optic Guided Missile (FOG-M) is being developed to fill this void. FOG-M, which is controlled through a fiber optic link from a ground station and is capable of locating and engaging targets by passing the seeker image through the fiber link to the remote gunner. A draft RFP was released to industry in Dec 86, the final RFP is planned for release in April 87. The Army will provide a detailed brief to the Joint Requirements and Management Board (JRMB) in May 1987 which will be a Milestone II decision review.

The components of FAADS are not new to air defense. Planning for C²I along with requirements for combined arms initiatives and improved air defense weapons has existed for several years. The FAADS program, using a systems approach, will integrate these relatively independent systems together to defeat the future enemy threat in the forward area. The components will work together to maximize total force effectiveness.

7. Program Highlights:

a. Significant Historical Developments -- On 29 July 1986, the JRMB approved the concept for execution of the overall FAAD program as a system of systems. The full scale development decision review of the NLOS weapons system will be held in May 1987. The FAADS, to include the NLOS component, is expected to satisfy mission requirements.

b. Changes Since "As Of" Date -- None.

8. Decision Coordinating Paper (DCP) Threshold Breaches: There is no DCP for the NLOS system.

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9. Schedule:

	<u>Planning Estimate/ Approved Program</u>	<u>Current Estimate</u>
a. Milestones --		
RFP (Competitive Technology Transfer Contract)	TBD/TBD	TBD
Milestone II Decision (JRMB II)	3QFY87/3QFY87	3QFY87
First Unit Equipped - Light	TBD/TBD	TBD
First Unit Equipped - Heavy	TBD/TBD	TBD
Milestone III Decision (JRMB III)	TBD/TBD	TBD
b. Previous Change Explanations -- NA - Initial SAR.		
c. Current Change Explanations -- NA - Initial SAR.		
d. References --		
<u>Planning Estimate:</u>	SDDM, August 14, 1986, and December 15, 1986; FY 88-89 President's Budget	

10. Technical/Operational Characteristics:

	<u>Planning Estimate/ Approved Program</u>	<u>Demonstrated Performance</u>	<u>Current Estimate</u>
a. Technical --			
NLOS	TBD/TBD	TBD	TBD
b. Operational --			
NLOS	TBD/TBD	TBD	TBD
c. Previous Change Explanations -- NA - Initial SAR.			
d. Current Change Explanations -- NA - Initial SAR.			
e. References --			
<u>Planning Estimate:</u>	SDDM, August 14, 1986, and December 15, 1986; FY 88-89 President's Budget		

11. Program Acquisition Cost (Current Estimate in Millions of Dollars): 1/

	<u>Planning Estimate</u>	<u>Changes</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)			
FAAD System	485.8	--	485.8
Procurement	TBD		TBD
Construction (MILCON)	TBD	0	TBD
Total FY 87 Base Year \$	485.8	--	485.8
<u>2/</u> Escalation	46.6	--	46.6
Development (RDT&E)	(46.6)	--	(46.6)
Procurement	TBD	--	TBD
Construction (MILCON)	TBD		TBD
Total Then-Year \$	532.4		532.4
<u>3/</u> b. Quantities -- N/A			
Development (RDT&E)	TBD	--	TBD
Procurement	TBD	--	TBD
Total	TBD	--	TBD
c. Unit Cost -- N/A			
d. Approved Design to Cost Goal -- N/A			
e. Foreign Military Sales -- None planned at this time.			
f. Nuclear Costs -- None.			

1/ Note that costs presented in this report include only RDT&E budget years through FY 92. Costs for FY 93 and beyond are TBD. FAADS NLOS is reported as a development program in accordance with FY 1987 Authorization Act.

2/ Total escalation costs are TBD pending final program and schedule definition.

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12. Program Acquisition/Current Procurement Unit Cost Summary (Current Dollars in Millions): N/A

NOTE: In accordance with FY 1987 Authorization Act, unit cost reporting shall not apply to programs that are reporting on the development program only.

13. Cost Variance Analysis:

a. Summary (Current (Then-Year) Dollars in Millions) --

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	532.4	TBD	TBD	532.4
Previous Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Current Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Total Changes	--	--	--	--
Current Estimate	532.4	TBD	TBD	532.4

13. Cost Variance Analysis (Cont'd):

(FY 87 Constant Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	485.8	TBD	TBD	485.8
Previous Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Current Changes:				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	--	--	--
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Total Changes	--	--	--	--
Current Estimate	485.8	TBD	TBD	485.8

b. Previous Change Explanations -- NA - Initial SAR.

c. Current Change Explanations -- NA - Initial SAR.

d. References --

Planning Estimate: SDDM, August 14, 1986, and December 15, 1986;
President's Budget

14. Program Acquisition Unit Cost (PAUC) History (Millions of Then-Year Dollars):

Current Baseline Estimate to Current Estimate --

PAUC (Plan Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
TBD	--	--	--	--	--	--	--	--	TBD

15. Contract Information (Then-Year Dollars in Millions): N/A16. Program Funding Summary (Current Estimate in Millions of Dollars):

a. Program Status --

(1) Percent Program Completed: 16.7% (1 yr/6 yrs)

(2) Percent Program Cost Appropriated: 11.4% (\$60.9/\$532.4)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Current & Prior Yrs (FY 87)	Budget Year (FY 88)	FYDP (FY 89-92)	Beyond FYDP (FY 93)	1/	Total
RDT&E	60.9	131.6	339.9	TBD		532.4
Procurement	TBD	TBD	TBD	TBD		TBD
MILCON	TBD	TBD	TBD	TBD		TBD
Total	60.9	131.6	339.9	TBD		532.4

c. Annual Summary -- FAAD Non-Line of Sight

Fiscal Year	Qty	FY 87 Base-Year Dollars			Then-Year Dollars			Escal Rate (%)
		Flyaway		Total	Advance Proc		Total	
		Nonrec	Rec		Debit	Credit		

Appropriation: RDT&E

1986 & Prior	0							
1987	TBD			59.5			60.9	3.1
1988	TBD			124.2			131.6	3.5
1989	TBD			152.1			166.5	3.5
1990	TBD			54.2			61.1	3.3
1991	TBD			45.4			52.6	2.9
1992	TBD			50.4			59.7	2.4
To Compl	TBD			TBD			TBD	-
Subtotal	TBD			485.8			532.4	-

1/ Balance to complete beyond FY93 is TBD.

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16. Program Funding Summary (Current Estimate in Millions of Dollars (Cont'd):

d. Obligations and Expenditures --

Fiscal Year	Then-Year Dollars (Current Estimate in Millions)		
	Total	Obligated	Expended

Appropriation. RDT&E

1987	60.9	27.4	0.1
To Complete	471.5	N/A	N/A
Total	532.4	27.4	0.1

17. Production Rate Data: N/A

18. Operating and Support Costs:

a. Assumptions and Ground Rules -- TBD

b. Costs -- TBD