

N-26 USMC H-1 UPGRADES

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

PROGRAM: USMC H-1 Upgrades

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): USMC H-1 Upgrades Program

2. DoD Component: Navy

3. Responsible Office and Telephone Number:

PROGRAM EXECUTIVE OFFICER (PMA-276) CAPT TOM CURTIS
AIR ASW ASSAULT AND SPECIAL MISSION Assigned: August 20, 1997
PROGRAMS, 47123 BUSE ROAD UNIT#IPT DSN 757-5500; COMM 301 757-5534
PATUXENT RIVER, MD 20670-1547 CURTISJT@NAVAIR.NAVY.MIL

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0603266N (Shared) (FY97) SUNK Project H2279
PE 0604245N Project H2279, H2419

PROCUREMENT:

APPN 1506 ICN 017800 (Navy)

5. References:

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline dated October 10, 1996, at the Milestone II decision.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated October 10, 1996.

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FOR OPEN PUBLICATION

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

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Washington, D.C. 20301-1000

99-C-0805

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6. Mission and Description:

The mission of the AH-1Z attack helicopter is to provide rotary wing close air support, anti-armor, armed escort, armed/visual reconnaissance and fire support coordination capabilities under day/night and adverse weather conditions. The mission of the UH-1Y utility helicopter is to provide command, control and assault support under day/night and adverse weather conditions. The USMC H-1 Upgrades effort involves conversion of the AH-1W and UH-1N from to the AH-1Z and UH-1Y, respectively. Major modifications include: a new four-bladed rotor system with semiautomatic blade fold of the new composite rotor blades, new performance matched transmissions, a new four-bladed tail rotor and drive system, upgraded landing gear, and pylon structural modifications. The H-1 Upgrades aircraft will have increased maneuverability, speed, and payload capability. Both aircraft will have fully integrated common cockpits/avionics that will reduce operator workload and improve situational awareness, thus increasing safety.

7. Executive Summary:

The Office for Naval Intelligence (ONI) published an Upgrades Joint System Threat Assessment Report (JSTAR) for V-22 OSPREY and H-1 aircraft. The threats were analyzed and found to be similar. The Defense Intelligence Agency validated this assessment. The USMC H-1 Upgrades Program was designated a Major Defense Acquisition Program on July 31, 1995.

Approval of the mission design series designation was issued by Commander, Naval Air Warfare Center Aircraft Division on Feb 19, 1998. The remanufactured H-1 Upgrades aircraft will be designated the AH-1Z and UH-1Y.

The integrated cockpit/avionics system for the UH-1Y, which is common to the AH-1Z, was placed on contract March 4, 1998. The airframes (AH-1Z and UH-1Y) Critical Design Review (CDR) was successfully completed September 1-2, 1998. As noted in the CDR Chairman's completion memorandum, dated October 6, 1998, the CDR "was an exceptionally fine one, from several aspects:

- The use of Cost as an Independent Variable (CAIV) in arriving at design decisions.
- Use of the Unigraphics electronic mockup to convey design details and understanding.
- Active participation of logistics personnel in design decisions."

The Targeting Sensor System (TSS) subcontract was awarded to Lockheed Martin on July 2, 1998.

In August 1998, four AH-1W and three UH-1N aircraft were delivered to the prime contractor facilities for conversion. Two of these aircraft, one AH-1W and one UH-1N, will become the structural static test articles. The remainder will be flight test aircraft.

The Critical Design Review for AH-1Z and UH-1Y avionics hardware was successfully completed December 15-17, 1998.

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8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
4BW (AH-1W)				
Milestone II	SEP 96	SEP 96	OCT 96	
Preliminary Design Review Complete	JUL 97	JUL 97	JUN 97	(Ch-1)
Critical Design Review Complete	JUL 98	JUL 98	SEP 98	
TECHEVAL Testing Complete	DEC 02	DEC 02	DEC 02	
SAE LRIP Review	FEB 03	FEB 03	FEB 03	
OPEVAL Testing Complete	SEP 03	SEP 03	SEP 03	
Milestone III (SAE FRP Review - Navy)	FEB 04	FEB 04	FEB 04	
IOC	SEP 06	SEP 06	SEP 06	
Navy Support Date	SEP 08	SEP 08	SEP 08	
4BN (UH-1N)				
Milestone II	SEP 96	SEP 96	OCT 96	
Preliminary Design Review Complete	JUL 97	JUL 97	JUN 97	(Ch-1)
Critical Design Review Complete	JUL 98	JUL 98	SEP 98	
DAB LRIP #1 Review	DEC 01	DEC 01	DEC 01	
TECHEVAL Testing Complete	AUG 02	AUG 02	AUG 02	
SAE LRIP #2 Review	FEB 03	FEB 03	FEB 03	
OPEVAL Testing Complete	MAY 03	MAY 03	MAY 03	
Milestone III (SAE FRP Review - Navy)	FEB 04	FEB 04	FEB 04	
IOC	JUN 05	JUN 05	JUN 05	
Navy Support Date	SEP 07	SEP 07	SEP 07	

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9b. Schedule (Cont'd):

b. Current Change Explanations --

(Ch-1) The Preliminary Design Review was held June 25-26, 1997. This change is made to reflect actual dates.

10. Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold		Demon- strated Perf	Current Estimate	
4BW (AH-1W)						
MFHBA (hrs)	35.0	35.0	/ 24.0	TBD	35.0	
MMH/FH (hrs)	3.6	3.6	/ 4.3	TBD	2.5	(Ch-1)
Cruise Speed (kts)	165	165	/ 140	TBD	143	(Ch-1)
Payload (Hot Day) (lbs)	3500	3500	/ 2500	TBD	2716	(Ch-1)
Weapon Stations						
Universal Mounts	6	6	/ 4	TBD	4	
Precision Guided Munitions	16	16	/ 12	TBD	16	(Ch-1)
Maneuverability/ Agility (G's)	-0.5 to +2.5	-0.5 to +2.5	/ -0.5 to +2.5	TBD	-0.5 to +2.8	(Ch-1)
Mission Radius (nm)	200nm x 1 (Aux Fuel)	200nm x 1 (Aux Fuel)	/ 50nm x 2 or 110nm x 1	TBD	125nm x 1	(Ch-1)
4BN (UH-1N)						
MFHBA (hrs)	40.2	40.2	/ 33.1	TBD	40.2	
MMH/FH (hrs)	2.9	2.9	/ 3.9	TBD	2.5	(Ch-1)
Cruise Speed (kts)	165	165	/ 140	TBD	152	(Ch-1)
Payload (Hot Day) (lbs)	4500	4500	/ 2800	TBD	3120	(Ch-1)
Weapon Stations	2 Univ. Mounts	2 Univ. Mounts	/ 2 Hard Mounts	TBD	2 Hard Mounts	
Maneuverability/ Agility (G's)	-0.5 to +2.5	-0.5 to +2.5	/ -0.5 to +2.5	TBD	-0.5 to +2.8	(Ch-1)
Mission Radius (nm)	200nm x 1 (Aux Fuel)	200nm x 1 (Aux Fuel)	/ 50nm x 2 or 110nm x 1	TBD	133nm x 1	(Ch-1)

b. Current Change Explanations --

(Ch-1) The current estimate is based on the Critical Design Review held September 1-2, 1998. No further changes are anticipated until after first flight of both aircraft. The current estimate changes are:

4BW (AH-1W) MMH/FM	from 3.6	to 2.5
Cruise Speed	142	143
Payload	2800	2716
Precision Guided	14	16
Maneuverability	-0.5 to +2.6	-0.5 to +2.8
Mission Radius	130nm x 1	125nm to 1
4BN (AH-1N) MMH/FM	2.9	2.5

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10b. Performance Characteristics (Cont'd):

Cruise Speed	150	152
Payload	3200	3120
Maneuverability	-0.5 to +2.6	-0.5 to +2.8
Mission Radius	121nm x 1	133nm x 1

11. Total Program Cost and Quantity (Dollars in Millions):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	537.8	537.8	585.8
Procurement	2254.7	2254.7	2471.6
Flyaway	(1892.2)		(2081.2)
Other Wpn System Costs	(240.4)		(267.9)
Peculiar Support	(40.1)		(42.9)
Initial Spares	(82.0)		(79.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	2792.5	2792.5	3057.4
Escalation	755.0	755.0	586.3
Development (RDT&E)	(54.5)	(54.5)	(32.9)
Procurement	(700.5)	(700.5)	(553.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3547.5	3547.5	3643.7
b. Quantity --			
Development (RDT&E)	4	4	4
Procurement	280	280	280
Total	284	284	284

Note: The LRIP quantities approved at Milestone II are 5 (1st year) and 17 (2nd year). These LRIP quantities do not represent more than 10% of the total planned buy.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

	UCR Baseline (OCT 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	2792.5	3057.4	
(2) Quantity	284	284	
(3) Unit Cost	9.833	10.765	19.48
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	2254.7	2471.6	
(2) Quantity	280	280	
(3) Unit Cost	8.052	8.827	+9.62

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	592.3	2955.2	-	3547.5
Previous Changes:				
Economic	-15.6	-114.4	-	-130.0
Quantity	-	-	-	-
Schedule	-5.1	-	-	-5.1
Engineering	+24.0	-	-	+24.0
Estimating	+0.1	-0.3	-	-0.2
Other	-	-	-	-
Support	-	-5.7	-	-5.7
Subtotal	+3.4	-120.4	-	-117.0
Current Changes:				
Economic	-8.9	-73.6	-	-82.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+8.3	+236.2	-	+244.5
Estimating	+23.6	-4.5	-	+19.1
Other	-	-	-	-
Support	-	+32.1	-	+32.1
Subtotal	+23.0	+190.2	-	+213.2
Total Changes	+26.4	+69.8	-	+96.2
Current Estimate	618.7	3025.0	-	3643.7

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

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	537.8	2254.7	-	2792.5
Previous Changes:				
Quantity	-	-	-	-
Schedule	-4.8	-	-	-4.8
Engineering	+22.4	-	-	+22.4
Estimating	+0.1	-0.1	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+17.7	-0.1	-	+17.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+7.7	+190.7	-	+198.4
Estimating	+22.6	-1.6	-	+21.0
Other	-	-	-	-
Support	-	+27.9	-	+27.9
Subtotal	+30.3	+217.0	-	+247.3
Total Changes	+48.0	+216.9	-	+264.9
Current Estimate	585.8	2471.6	-	3057.4

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) RDT&E

Revised escalation indices. (Economic)	N/A	-8.9
Engineering modification to add Ground Proximity Warning System (GPWS) integration, crash worthy troop seats. (Engineering)	+7.7	+8.3
Adjustment for Current and Prior Inflation. (Estimating)	+2.7	+2.8
Congressional increase in FY99 added funds to EMD contract. (Estimating)	+22.4	+23.4
Budget reduction for SBIR and Vectored thrust research efforts will reduce the number of planned ECPs. (Estimating)	-2.5	-2.6
RDT&E Subtotal	+30.3	+23.0

(2) Procurement

Revised escalation indices. (Economic)	N/A	-74.4
Economic adjustment for negative program change. (Economic)	N/A	+0.8

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

b. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Budget increase for modification of requirements to add UH-1Y cockpit and AH-1Z crashseats, Common Missile Warning Systems (CMWS), GPWS, and Integrated Mechanical Diagnostics (IMD) (Engineering)	+190.7	+236.2
Refinement of estimate for learning curve changes associated with changing the annual buy quantities. (Estimating)	-1.6	-4.5
Refinement of estimate for Initial Spares. (Support)	-2.4	-3.2
Increased estimate for peculiar support requirements associated with quantity profile changes. (Support)	+2.8	+3.2
Adjustment of requirements for Other logistics support Costs associated with quantity profile changes. (Support)	+27.5	+32.1
Procurement Subtotal	+217.0	+190.2

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
12.49	-0.75	--	-0.02	+0.95	+0.07	--	+0.09	+0.34	12.83

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
10.55	-0.67	+0.01	--	+0.84	-0.02	--	+0.09	+0.25	10.80

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14c. Unit Cost and Other History (Cont'd):

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	SEP 96	N/A	OCT 96
Milestone III	N/A	FEB 04	N/A	FEB 04
FUE/IOC	N/A	SEP 06	N/A	SEP 06
Total Cost	N/A	3547.5	N/A	3643.7
Total Quantity	N/A	284	N/A	284
Prog Acq Unit Cost	N/A	12.49	N/A	12.83

June 05 IOC date reflects UH-1Y IOC; SEP 06 IOC date for the AH-1Z.

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

a. MILCON --

EMD:

Bell Helicopter Textron, Fort Worth TX
N00019-96-C-0128, CPAF
Award: November 15, 1996
Definitized: November 15, 1996

Initial Contract Price		
Target	Ceiling	Qty
\$498.0	N/A	4

Current Contract Price		
Target	Ceiling	Qty
\$516.4	N/A	4

Estimated Price At Completion	
Contractor	Program Manager
\$538.4	\$555.3

Previous Cumulative Variances
Cumulative Variances To Date (11/29/98)
Net Change

Cost Variance	Schedule Variance
\$2.6	\$-3.4
\$-11.5	\$-5.6
\$-14.1	\$-2.2

Explanation of Change:

The net changes are attributed to the contractor's performance from November 1997 through November 1998. The contract is twenty-three percent complete.

The negative cumulative cost variance -\$11.5M resulted from increased Independent Research and Development (IR&D) overhead for Bell's acquisition of Boeing's interest in the commercial BB-609 aircraft, overtime worked to regain schedule and higher than planned labor rates for subcontractor system engineers.

The negative cumulative schedule variance -\$5.6 was caused by late release of approved engineering drawings and delivery of tools by the vendors.

The program manager's estimate (with DCMC concurrence) to complete has

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15. Contract Information (Cont'd):

increased from \$498.0M to \$555.3M, since the last report; increases are attributed to UH-1Y cockpit integration, higher material costs, and higher than anticipated labor rates.

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

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

<u>Appropriation</u>	<u>Prior Years (FY97-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-11)</u>	<u>Total</u>
RDT&E	269.5	157.7	108.8	82.7	618.7
Procurement	-	-	0.8	3024.2	3025.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	269.5	157.7	109.6	3106.9	3643.7

b. Annual Summary -- USMC H-1 UPGRADES

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY96 Dollars Nonrec</u>	<u>Flyaway FY96 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1997				66.4	67.9
1998				78.9	81.3
1999				115.4	120.3
2000				149.0	157.7
2001				101.2	108.8
2002				45.7	50.0
2003				17.9	19.9
2004				11.3	12.8
Subtotal	4			585.8	618.7

Excludes FY96 funds which were used for studies and analyses.

Appropriation: 1506 - Aircraft Procurement, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY96 Dollars Nonrec</u>	<u>Flyaway FY96 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
2001		0.7		0.7	0.8
2002	5	0.7	60.7	88.6	98.6
2003	17	0.6	161.4	239.5	271.9
2004	24		204.3	282.5	327.5
2005	36		278.7	337.1	399.0

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2006	36		264.4	308.6	373.0
2007	36		255.1	285.6	352.4
2008	36		248.4	274.1	345.3
2009	36		243.1	266.0	342.1
2010	36		238.9	258.5	339.5
2011	18		124.2	130.4	174.9
Subtotal	280	2.0	2079.2	2471.6	3025.0

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	284	2.0	2079.2	3057.4	3643.7

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 151.3

Percent Total Program Expended: 4.2%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

Squadrons are composed of 18 AH-1Z's and 9 UH-1Y's.

Life Cycle is Phase-in + 20 years operation per aircraft.

Attrition rates are 1.24% for the AH-1Z and 1.05% for the UH-1Y.

Pipeline rates are 11% for the AH-1Z and 15% for the UH-1Y.

Manning (fleet squadron) estimated at 90 percent.

- 45 officers for the AH-1Z and 23 officers for the UH-1Y.

- 184/60 Squadron/Marine Air Logistics Squadron, Augmented (SQD/MALS AUG) enlisted for the AH-1Z; 108/30 for the UH-1Y, totaling 68 officers.

164 AH-1Z's are required; 82 UH-1Y's are required.

Each aircraft has a service life of 10,000 hours per aircraft.

Operating and support cost estimations are based on the organic three-levels of maintenance concept.

Aircraft will fly 23 flight hours per month.

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

The Operating and Support cost estimate is dated January 1998.

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

USMC H-1 Upgrades		
Cost Element		
Mission Pay & Allowances	2081.0	N/A
Unit Level Consumption	2057.0	N/A
Intermediate Maintenance	721.0	N/A
Depot Maintenance	1118.0	N/A
Contractor Support	0.0	N/A
Sustaining Support	370.0	N/A
Indirect Costs	136.0	N/A
	N/A	N/A
	N/A	N/A
Total	6483.0	N/A

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: PATRIOT PAC-3

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Guided Missile System, Air Defense (PATRIOT) PAC-3 Program

2. (U) DoD Component: BMDO

Joint Participants:

The Department of the Army is the Executing Agency

3. (U) Responsible Office and Telephone Number:

Project Manager	COL Stephen J. Kuffner
Patriot Project Office	Assigned: July 27, 1995
PO Box 1500	DSN 645-3240; COMM (205) 955-3240
Huntsville, AL 35807-3801	kuffner-md-pa@redstone.army.mil

(U) Ballistic Missile Defense
 Organization, The Pentagon
 Washington, DC 20301-7100

LTG Lester Lyles, USAF
 Assigned: August 1, 1996
 DSN 223-3025 COMM (703) 693-3025

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

RDT&E:

(U) PE 0603216C (Shared)
 (U) PE 0604216C (Shared)
 (U) PE 0604225C (Shared)
 (U) PE 0604865C
 (U) PE 0604866C

AS AMENDED

MAR 22 1997

~~Classified by: PATRIOT Security Classification Guide dated 27 Aug 97
 Downgrade instructions: Remove UNCLASS when separated from CLASS sections
 Declassification: Originating Agency Determination Required (OADR)~~

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4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) PE 23801D036

PROCUREMENT:

(U) APPN 0300 ICN 0208060C (DCA/DNA) (Shared)

(U) APPN 0300 ICN 0208865C (DCA/DNA)

(U) APPN 2032 ICN C50700 (Army)

(U) APPN 2032 ICN CA0267 (Army)

5. (U) References:

SAR Baseline (Development Estimate):

(U) Milestone IV/II Acquisition Decision Memorandum, dated 7 July 1994, subject: "PAC-3 Acquisition Decision Memorandum," and the Defense Acquisition Executive (DAE) approved Acquisition Program Baseline (APB) dated February 22, 1995.

Approved Program:

(U) Approved Acquisition Program Baseline (APB) dated August 20, 1995.

6. (U) Mission and Description:

(U) PATRIOT, the centerpiece of the Army's echelon above corps and theater air defense forces, is an extremely capable high-to-medium altitude, long-range air defense missile system which provides air defense of ground combat forces and high-value assets against the air threat of the 1990s and beyond. PATRIOT is designed to cope with enemy defense suppression tactics that may include tactical ballistic missiles (TBM), cruise missiles, anti-radiation missiles, advanced aircraft employing saturation, maneuver, sophisticated electronic countermeasures (ECM), and low radar cross-section. In the Field Army, PATRIOT air defenses will be complemented by short-range, low altitude forward area defense weapons and will be integrated with other ground and air assets in the overall air defense of the theater of operations. The system can conduct multiple simultaneous engagements of high performance air breathing targets and TBMs with a high probability of target kill. The system will provide air defense protection in all weather conditions and in hostile ECM environments. At the battery level or Fire Unit (FU) level, the PATRIOT missile system consists of an Engagement Control Station (ECS), one Radar Set (RS), an Electric Power Plant (EPP), eight Launching Stations (LS), and associated communications equipment. At the battalion level, command and control is exercised through the Information and Coordination Central (ICC) and associated communications equipment including Communications Relay Groups (CRG). The PATRIOT RS is a multifunction phased array radar which performs a variety of surveillance, acquisition, and guidance tasks. The only manned element of the FU during air battle, the ECS, provides the human interface for control of automated operations.

The PATRIOT Advanced Capability (PAC-3) program is the result of a series of integrated, phased system improvements fielded in combination with the PAC-3 missile (formerly ERINT). The PAC-3 missile is a high velocity hit-to-kill, surface-to-air missile capable of intercepting and destroying tactical missiles and air breathing threats. The PAC-3 missile provides the range, accuracy, and

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

lethality to effectively defend against tactical missiles with conventional high explosive, biological, chemical, and nuclear warheads. The missile uses a solid propellant rocket motor, aerodynamic vane controls, and inertial guidance to navigate to an intercept point. Shortly before arrival at the intercept point, the missile's rate of spin is increased, the on-board radar homing seeker acquires the target, and terminal homing guidance is initiated to achieve hit-to-kill by high resolution maneuvers.

7. (U) Executive Summary:

(U) The PATRIOT PAC-3 program is the evolution of the phased material change improvement program and new missile procurement to upgrade PATRIOT System performance. As a result of evolving threat and analysis of PATRIOT performance in Operation Desert Storm, several system upgrades are being implemented. These upgrades include the PAC-3 missile, radar enhancements, communications upgrades, and increased computer capability. In February 1994, the Army Systems Acquisition Review Committee (ASARC) made a recommendation to proceed with development of the Extended Range Interceptor (ERINT), in lieu of the Multimode missile, as the PAC-3 missile. The Defense Acquisition Board (DAB) conducted a Milestone IV/II review in May 1994 and approved the PAC-3 missile for entry into the Engineering and Manufacturing Development (EMD) phase. Program reviews with Army, the Ballistic Missile Defense Organization (BMDO), and OSD, in late FY95 and early FY96 determined significant schedule risk in executing the PAC-3 program. As a result of these reviews, decisions were made to minimize program risk by restructuring the program to extend the EMD schedule. A new Acquisition Program Baseline (APB) was approved in August 1996 which implemented the OSD directed program restructure based on the FY97 President's Budget.

The first two PAC-3 missile developmental flight tests were successfully conducted in September and December 1997, at White Sands Missile Range, New Mexico. The test configurations did not include a missile seeker and no intercepts were attempted. Technical challenges encountered with integrating the seeker into the missile and validating performance delayed the start of planned intercept flight tests. A Seeker Characterization Flight (SCF) test was approved as a risk reduction measure to collect data on seeker performance in a flight environment and act as a pathfinder for the first intercept in the approved test program (DT-3). The SCF flight is also consistent with the findings in the Report of the Panel on Reducing Risk In Ballistic Missile Defense Flight Test Programs (February 27, 1998, Welch Report) and will add confidence to the DT-3 flight test. The SCF was planned in December 1998, but an in-flight target failure prior to launch of the PAC-3 missile caused the test to be rescheduled until March 1999. The SCF mission was conducted on March 15, 1999. Initial reports indicate the flight was successful and test objectives were achieved. Testing is scheduled to progress through an increasingly stressing series of flight tests that will validate performance against expected threats.

A schedule breach was reported in the December 1997 annual SAR for the Low Rate Initial Production (LRIP) Defense Acquisition Board (DAB) decision due to

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7. (U) Executive Summary (Cont'd):

delays in conducting flight testing. A Program Deviation Report was submitted in January 1998, stating that the PAC-3 program would breach schedule milestones for the LRIP DAB and LRIP Contract Award. Additional delays since the deviation report have caused the remaining PAC-3 missile milestones to exceed approved thresholds. In accordance with the Under Secretary of Defense for Acquisition and Technology memorandum of February 25, 1999, a proposed Acquisition Program Baseline (APB) will be submitted for approval by May 28, 1999. The FY99 Defense Appropriations Bill increased the requirement from one to two successful PAC-3 flight test intercepts prior to obligation of FY98 funds for LRIP. This requirement has been factored into the current program schedule and will be incorporated in the revised APB. To better focus attention on the more dynamic portion of the program, the Department is considering changing the program unit of measure from fire units to missile inventory in the new APB.

Since the September 30, 1998 SAR, significant changes have occurred in the PAC-3 missile development and procurement cost estimates. To accommodate the procurement cost growth within fiscal guidance, the Department reduced the projected inventory from 1200 PAC-3 missiles to 560. The Department will fund procurement cost reduction initiatives to minimize the potential reductions to missile quantities. In addition, the number of planned fire unit upgrades has been decreased from 54 to 36.

The Ad Hoc Cost Control Group, chartered by BMDO and the Army, has held a series of meetings with the prime contractor and the seeker subcontractor. These meetings have resulted in the establishment of a realistic schedule for the remainder of the EMD effort. In addition, the requirement for up to \$295M in additional funding has been identified for FY 99-01. A major challenge will be to lower the missile cost to insure a robust fielding plan. The Cost Reduction Group, operating in parallel with the Cost Control group, is actively pursuing the identification of evaluating initiatives to reduce the production cost of the PAC-3 missile. The most promising candidates have been identified and funding to initiate the efforts is being pursued. The Army and BMDO will continue to meet at the contractor corporate level to forge commitments to reduce the life-cycle cost of the system.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	Yes
Average Procurement Unit Cost	Yes

c. (U) Explanation of Breach:

Schedule - Due to challenges associated with integrating the seeker into the missile and validating performance, the first intercept flight is delayed until the third quarter of FY99. Current Estimates for PAC-3 missile milestones are updated based on a successful flight test in third quarter FY99, and exceed APB thresholds. The Program Deviation Report (PDR) submitted in January 1998, provided notification that the PAC-3 program would deviate from its approved Acquisition Program Baseline (APB). The September 30, 1998 exception SAR reported that remaining PAC-3 missile milestones would exceed thresholds.

Cost - Development (RDT&E) - The Current Estimate for RDT&E increased primarily as a result of schedule delays in the PAC-3 Missile Engineering and Manufacturing Development (EMD) contract. The Ad Hoc Cost Control Group meetings with the prime contractor have led to establishment of a realistic schedule for the remainder of the EMD program. Based on this program schedule, a requirement for additional funding in FY 99-01 was identified. The RDT&E current estimate exceeds the threshold based on the revised estimate of EMD completion costs.

Procurement - The Current Estimate change is primarily due to the inclusion of activities, funded by the Army, which include Remote Launch Communications Enhancement Link 16, addition of a fifth Communications Relay Group, and Integrated Diagnostics Support System (IDSS).

Nunn-McCurdy Unit Cost: The quantity of planned fire unit upgrades was reduced in the FY00 President's Budget. In the FY00 President's Budget, Ballistic Missile Defense Organization reduced the number of tactical Fire Units to be upgraded fully to PAC-3 capability from the baseline program quantity of 54 to 36. The decision to reduce tactical Fire Units was based on Medium Extended

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8c. (U) Threshold Breaches (Cont'd):

Air Defense System (MEADS) capability being fielded.

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
MISSILE				
Milestone II (Missile) (DAB)	MAY 94	MAY 94	MAY 94	
Development Contract Award	SEP 94	SEP 94	OCT 94	
Preliminary Design Review Complete	SEP 95	SEP 95	OCT 95	
Critical Design Review Complete	MAR 96	MAR 96	MAR 96	
Service Final DT&E				
Start	JAN 97	APR 97	SEP 97	
Complete	DEC 97	DEC 98	NOV 00	(Ch-1)
Low Rate Initial Production Decision (DAB)	JUN 97	SEP 97	JUN 99	(Ch-1)
Low Rate Initial Production Contract Award	JUL 97	OCT 97	JUL 99	(Ch-1)
Low Rate Production First Delivery	MAY 98	APR 99	JAN 01	(Ch-1)
IOT&E				
Start	JAN 98	FEB 99	JAN 01	(Ch-1)
Complete	JUN 98	MAR 99	MAR 01	(Ch-1)
Milestone III Production Decision	AUG 98	JUN 99	JUN 01	(Ch-1)
Full Rate Production Contract Award	AUG 98	OCT 99	JUN 01	(Ch-1)
First Unit Equipped	SEP 98	JUL 99	MAY 01	(Ch-1)
Service Depot Support	SEP 01	JUL 02	OCT 02	(Ch-1)
(b) Initial Operational Capability	(b)(1)			(Ch-1)
OTHER UPGRADES				
Configuration 1 Production	MAR 95	MAR 95	MAY 95	
Confirmatory Test				
Configuration 1 First Unit Equipped	JUN 95	JUN 95	DEC 95	
Configuration 2 Follow On Test	DEC 95	DEC 95	MAY 96	
Configuration 2 First Unit Equipped	JUN 96	JUN 96	DEC 96	
Configuration 3 Follow On Test	JUN 98	FEB 99	SEP 99	
Configuration 3 First Unit Equipped	SEP 98	JUL 99	DEC 99	

(U) PAC-3 Missile First Unit Equipped (FUE) is considered achieved when the first Fire Unit is equipped with sixteen PAC-3 missiles with which to load four PAC-3 missiles on each of four PAC-3 capable launching stations.

PAC-3 Initial Operational Capability (IOC) is considered achieved when a PATRIOT Battalion, consisting of five Fire Units (FU), is equipped with thirty-two PAC-3 missiles per FU.

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

b. Current Change Explanations --

(Ch-1) [U] Delays in missile flight testing have impacted program schedule. Revised milestones will be submitted in the proposed Acquisition Program Baseline to be concurrent with Low Rate Initial Production (LRIP) Defense Acquisition Board (DAB). The current estimate of program schedule milestones is based on a successful intercept in the third quarter of FY99.

Current Estimate changes since the September 30, 1998 SAR are: [U] Service Final DT&E - Complete, from FEB 00 to NOV 00; [U] Low Rate Initial Production Decision (DAB), from FEB 99 to JUN 99; [U] Low Rate Initial Production Contract Award, from MAR 99 to JUL 99; [U] Low Rate Production First Delivery, from MAR 00 to JAN 01; [U] IOT&E - Start, from MAR 00 to JAN 01; [U] IOT&E - Complete, from APR 00 to MAR 01; [U] Milestone III Production Decision, from JUN 00 to JUN 01; [U] Full Rate Production Contract Award from OCT 00 to JUN 01; [U] First Unit Equipped, from JUN 00 to MAY 01; [U] Service Depot Support, from JUL 02 to OCT 02; and [U]

(b)(1)

10. (U) Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Range (plus and minus 60 degrees from primary target line)				
Theater Ballistic Missiles (TBMs)				
Keepout Range (km)				
Missile Threat Ranges (km)				
Air Breathing Threats (ABTs)				
First Intercept Capability (km)				
Altitude				
TBMs (Keepout) (km)				
ABTs (above ground level, given line of sight)				
Altitude (Min) (meters)				
Altitude (Max) (km)				
Single Shot Engagement Kill Probability (SSEKP)				
TBMs				

(b)(1)

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10a. (U) Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
ABTs	(b)(1)			
Multiple Simultaneous Engagements				
TBMs (arriving within 10 seconds)				
ABTs (within 1 second while doing a TBM mission)				
System Effectiveness				
TBMs (two shots)				
ABTs (one shot)				
Missile Reliability (launch and flight to TBM intercept)				
Operational Availability (Ao)				
Fire Unit Mean Time Between Failure (hrs)	60	60 / 40	TBD	60
Nuclear Hardening (EMP) missile in flight (kv/m)	(b)(1)			

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(U) All performance parameters are for a PATRIOT Fire Unit unless otherwise stated.

(b)(1)

(U) System Effectiveness = $P(\text{DET}) \times [1 - (1 - P(\text{SSK}))^n]$, where n=number of shots, and SSK=Single Shot Kill

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10a. (U) Performance Characteristics (Cont'd):

(U) Missile Reliability is based on the Reliability Growth Curve. This is a technical parameter which supports the key Joint Requirements Oversight Council (JROC) validated characteristics.

(U) The Fire Unit Mean Time Between Failure parameter supports the key JROC validated characteristics.

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	2015.6	2332.3	2687.7
Procurement	2783.2	3122.7	3280.9
Recurring Flyaway	(1498.8)		(3061.9)
Nonrecurring Flyaway	(1244.7)		(43.4)
Total Flyaway	(2743.5)		(3105.3)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(39.7)		(175.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 88 Base-Year \$	4798.8	5455.0	5968.6
Escalation	1582.8	1798.4	1809.7
Development (RDT&E)	(420.2)	(528.5)	(627.6)
Procurement	(1162.6)	(1269.9)	(1182.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	6381.6	7253.4	7778.3
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>54</u>	<u>54</u>	<u>36</u>
Total	54	54	36

(U) The Unit of Measure is a Fire Unit (FU) which consists of a Radar Set, an Engagement Control Station, an Electric Power Plant, and up to eight Launching Stations equipped with missiles.

The program unit of measure, tactical PAC-3 Configuration-3 Fire Units, was reduced from 54 to 36 during the development of the FY00 President's Budget. The funds applied for the upgrade of the 18 FUs to Configuration 2 have not been removed from the calculation of the unit cost.

The Low Rate Initial Production (LRIP) quantity for the PAC-3 missile established by the July 7, 1994 Milestone IV/II Acquisition Decision Memorandum was 90. Due to the reduction in the PAC-3 missile procurement quantity from 1200 to 560 in the FY00 President's Budget, the LRIP quantity is 52 missiles.

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11b. (U) Total Program Cost and Quantity (Cont'd):

The planned LRIP missile quantity is within the 10% limit of the production quantity.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (AUG 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 88 BY\$)	5455.0	5968.6	
(2) Quantity	54	36	
(3) Unit Cost	101.019	165.794	+64.12
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 88 BY\$)	3122.7	3280.9	
(2) Quantity	54	36	
(3) Unit Cost	57.828	91.136	+57.60
	UCR Baseline (AUG 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
c. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (TY\$)	7253.4	7778.3	
(2) Unit Cost	134.322	216.064	+60.86
d. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (TY\$)	4392.6	4463.0	
(2) Unit Cost	81.344	123.972	+52.40
e. (U) Changes from Previous SAR (SEP 98)	Dollars/Qty	Percent	
(1) PAUC (BY\$)	59.031	+55.29	
(2) APUC (BY\$)	30.262	+49.71	
(3) PAUC Quantity	-18	-33.33	
(4) PAUC (TY\$)	75.779	+54.02	
(5) APUC (TY\$)	40.115	+47.84	
f. (U) Initial SAR Information			
Initial SAR Date (DEC 94):			
(1) Program Acquisition Cost (BY\$)		4798.8	
(2) Program Acquisition Cost (TY\$)		6381.6	
g. (U) Unit Cost PAUC Changes --			
The program unit of measure, tactical PAC-3 Configuration-3 Fire Units (FUs), was reduced from 54 to 36 during the development of the Ballistic Missile Defense Organization FY00 President's Budget. The funds used for			

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12g. (U) Unit Cost Summary (Cont'd):

the upgrade of the 18 FUs to Configuration 2 have not been removed from the calculation of the unit cost.

(U) Unit Cost APUC Changes --

The program unit of measure, tactical PAC-3 Configuration-3 Fire Units (FUs), was reduced from 54 to 36 during the development of the Ballistic Missile Defense Organization FY00 President's Budget. The funds used for the upgrade of the 18 FUs to Configuration 2 have not been removed from the calculation of the unit cost.

h. (U) Impact of Perf or Sched Changes --

While there have been no system performance changes associated with the increased unit cost, the development program has been extended until FY 01. This program extension resulted in the addition of RDT&E funds along with a delay in the production program.

The program schedule changes are the effect, not cause of the changes in unit costs. Technical challenges in developing and integrating the seeker into the PAC-3 missile have delayed the flight test schedule over one year.

i. (U) Program Management & Control --

Responsible personnel for program management and cost control:

Military: COL Stephen J. Kuffner
PATRIOT Project Manager

Civilian: Mr. Sidney W. Gaddy
Deputy PATRIOT Project Manager

j. (U) Cost Control Actions --

The Army and BMDO have chartered two separate groups to examine the PAC-3 program. The Ad Hoc Cost Control Group, chaired by BMDO, is responsible for the establishment of a realistic schedule for the completion of the EMD program. This group has held several meetings to date and identified the requirement for up to an additional \$295M being required. OSD program funding guidance provided for \$180M of the \$295M required. A second group, chaired by the Army, is focused on the identification of initiatives which could reduce the missile procurement cost.

k. (U) Contract Information (In Millions of Then-Year Dollars) --

- (U) (1) Contractor(s): LORAL VUGHT SYSTEMS
- (2) Contract Title: PAC-3 MISSILE EMD
- (3) Contract Number: DAAH01-95-C-0021
- (4) Actual Cost of Work Performed (ACWP) to date: 699.0
- (5) Percent contract completed (BCWP/target cost): 92.20

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12k. (U) Unit Cost Summary (Cont'd):

(6) Variances:

	Cost Variance (\$/%)	Schedule Variance (\$/%)
Baseline Report	\$-21.1/ -7.23	\$-15.7/ -5.12
Previous SAR	\$-85.1/ -14.90	\$-30.0/ -5.00
Current Values	\$-113.0/ -19.30	\$-28.1/ -4.60
Change from the Baseline Report	\$-91.9/ -12.07	\$-12.4/ +0.52
Change from the Previous SAR	\$-27.9/ -4.40	\$1.9/ +0.40

(U) Explanation of Variances --

In the first quarter of FY99, meetings with the contractor, Project Office, and the BMDO chartered Ad Hoc Cost Reduction Group were conducted to assess the contractor's schedule planning and cost projections. The reviews resulted in acknowledgement that an updated schedule and estimate-at-completion were required. Detailed assessments of the contractor's latest revised program estimate are ongoing and will be completed in the third quarter of FY99.

Program delays and resultant cost growth have been caused by missile seeker hardware and software development and integration challenges. The unfavorable cost variance is due to challenges in fabrication, integration, and testing of components for the flight test phase of the program. Initial flight testing has been delayed until rigorous ground testing validates flight readiness. Schedule delays have continued primarily in the missile seeker hardware and software integration.

The EMD program is continuing to pursue an event driven schedule to better assure success during flight testing. Delays in flight testing have impacted contract cost and schedule performance. The cost growth will require additional funding in FY99-01 to complete the EMD effort.

(U) Impact of Variances on Contract --

The PAC-3 Missile EMD contract has experienced significant schedule delay and cost growth as a result of technical challenges in proving out the seeker design and integrating into the missile. Findings from meetings with the Ad Hoc Cost Control team and the contractor have led to development of a realistic schedule for completion of the EMD effort. This schedule extends the program into FY 01. Current projections indicate contract cost growth could approach \$250M.

Impact of Variances on Unit Costs -- None.

(U) (1) Contractor(s): RAYTHEON CO.

(2) Contract Title: PAC-3 MSL INTEGRATION

(3) Contract Number: DAAH01-95-C-0022

(4) Actual Cost of Work Performed (ACWP) to date: 96.3

(5) Percent contract completed (BCWP/target cost): 78.90

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12. (U) Unit Cost Summary (Cont'd):

(6) Variances:

	Cost Variance		Schedule Variance	
	(\$/%)		(\$/%)	
Baseline Report	\$0.7/	+1.87	\$-2.7/	-6.97
Previous SAR	\$-1.2/	-1.39	\$-3.2/	-3.46
Current Values	\$-4.2/	-4.58	\$-3.1/	-3.25
Change from the Baseline Report	\$-4.9/	-6.45	\$-0.4/	+3.72
Change from the Previous SAR	\$-3.0/	-3.19	\$0.1/	+0.21

(U) Explanation of Variances --

The cost variance change is primarily due to the extended development cycle for activities leading to the start of intercept flight tests. Cost variance drivers include system software development, test equipment integration, and simulation validation.

Although contract performance to date has not been significantly impacted, the continued delay in conducting missile flight testing will require extending the period of performance and additional funds.

(U) Impact of Variances on Contract --

There are no significant impacts to the contract due to the cost and schedule variances. The Integration contract will require an extension to the period of performance once the schedule for the PAC-3 Missile EMD effort is determined.

Impact of Variances on Unit Costs -- None.

(U) (1) Contractor(s): Raytheon Co.

(2) Contract Title: REM LCH COMMO ENH UPGRAD

(3) Contract Number: DAAH01-96-C-0018

(4) Actual Cost of Work Performed (ACWP) to date: 57.8

(5) Percent contract completed (BCWP/target cost): 97.00

(6) Variances:

	Cost Variance		Schedule Variance	
	(\$/%)		(\$/%)	
Baseline Report	\$0.5/	+3.45	\$-1.6/	-10.04
Previous SAR	\$-0.8/	-1.36	\$-0.5/	-1.00
Current Values	\$-1.9/	-3.38	\$-2.8/	-4.81
Change from the Baseline Report	\$-2.4/	-6.83	\$-1.2/	+5.23
Change from the Previous SAR	\$-1.1/	-2.02	\$-2.3/	-3.81

(U) Explanation of Variances --

The program schedule was based on a completion date of December 1998, which has been extended to December 1999 to enable completion of production qualification testing. Replanning of activities was not completed by the current report date. As such, schedule variance is overstated. The primary schedule and cost variance drivers are software development and system testing.

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12. (U) Unit Cost Summary (Cont'd):

(U) Impact of Variances on Contract --
There is no significant impact to the contract because of the unfavorable net change in variances.

Impact of Variances on Unit Costs -- None.

- (U) (1) Contractor(s): Raytheon, Co.
(2) Contract Title: RADAR ENH PH3 MOD KITS
(3) Contract Number: DAAH01-95-C-0446
(4) Actual Cost of Work Performed (ACWP) to date: N/A
(5) Percent contract completed (BCWP/target cost): N/A
(6) Variances:

	Cost Variance (\$/%)	Schedule Variance (\$/%)
Baseline Report	N/A	N/A
Previous SAR	N/A	N/A
Current Values	N/A	N/A
Change from the Baseline Report	N/A	N/A
Change from the Previous SAR	N/A	N/A

(U) Explanation of Variances --
This contract is for procurement of Radar Enhancement Phase 3 and Classification, Discrimination, and Identification Phase 3 modification kits to upgrade the PATRIOT radar.

Cost and schedule variance reporting is not required on this Firm Fixed Price contract.

Impact of Variances on Contract -- None.

Impact of Variances on Unit Costs -- None.

1. (U) Contracts exceeding Contract Cost Baseline Thresholds -- None.

m. General Comments -- None.

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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	2435.8	3945.8	-	6381.6
Previous Changes:				
Economic	-17.9	-200.5	-	-218.4
Quantity	-	-	-	-
Schedule	+296.6	-394.3	-	-97.7
Engineering	+105.0	+477.6	-	+582.6
Estimating	+227.6	+534.2	-	+761.8
Other	-	-	-	-
Support	-	+165.5	-	+165.5
Subtotal	+611.3	+582.5	-	+1193.8
Current Changes:				
Economic	-10.0	-9.1	-	-19.1
Quantity	-	-1105.7	-	-1105.7
Schedule	-	+69.4	-	+69.4
Engineering	-	-	-	-
Estimating	+278.2	+959.8	-	+1238.0
Other	-	-	-	-
Support	-	+20.3	-	+20.3
Subtotal	+268.2	-65.3	-	+202.9
Total Changes	+879.5	+517.2	-	+1396.7
Current Estimate	3315.3	4463.0	-	7778.3

(U) Summary (FY 1988 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	2015.6	2783.2	-	4798.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	+218.6	-375.3	-	-156.7
Engineering	+75.3	+317.0	-	+392.3
Estimating	+168.5	+440.6	-	+609.1
Other	-	-	-	-
Support	-	+121.7	-	+121.7
Subtotal	+462.4	+504.0	-	+966.4
Current Changes:				
Quantity	-	-719.8	-	-719.8
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+209.7	+699.3	-	+909.0
Other	-	-	-	-
Support	-	+14.2	-	+14.2
Subtotal	+209.7	-6.3	-	+203.4
Total Changes	+672.1	+497.7	-	+1169.8
Current Estimate	2687.7	3280.9	-	5968.6

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PATRIOT PAC-3, December 31, 1998

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-10.2
Economic adjustment for negative program change. (Economic)	N/A	+0.2
Adjustment for Current and Prior Inflation. (Estimating)	+6.8	+8.8
Congressional reprogramming of procurement funding to cover EMD cost growth. (Estimating)	+45.6	+60.0
Supplemental Congressional and DoD funding to cover EMD cost growth. (Estimating)	+156.0	+210.0
Supplemental Congressional funding for Air Directed Surface-to-Air Missile. (Estimating)	+3.8	+5.0
Refinement of estimate for FY98-FY02 DoD reductions. (Estimating)	-2.5	-5.6
RDT&E Subtotal	+209.7	+268.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-85.5
Economic adjustment for negative program change. (Economic)	N/A	+76.4
Decrease in missile quantity from 1200 to 560. (Quantity)	-552.8	-811.7
Decrease in tactical fire units from 54 to 36. (Quantity)	-167.0	-294.0
Stretchout of annual procurement buy profile. (Schedule)	0.0	+69.4
Adjustment for Current and Prior Inflation. (Estimating)	+14.2	+18.7
Congressional reprogramming of procurement funding to RDT&E to cover EMD cost growth. (Estimating)	-45.6	-60.0
Revised estimate extrapolated from increased costs in EMD phase and includes effects of production rate changes and break in supplier production between EMD and LRIP. (Estimating)	+692.6	+945.4
Refinement of estimate for FY98-FY05 DoD reductions. (Estimating)	-2.3	-3.8
Revised estimate for Reliability, Availability, and Maintainability modifications. (Estimating)	+40.4	+59.5
Adjustment for Current and Prior Inflation. (Support)	+1.5	+2.0

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

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Revised estimate for Modification Initial Spares. (Support)	+12.7	+18.3
Procurement Subtotal	-6.3	-65.3

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
118.18	-6.60	+28.38	-0.79	+16.18	+55.55	--	+5.16	+97.88	216.06

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
73.07	-5.82	+5.81	-9.02	+13.27	+41.50	--	+5.16	+50.90	123.97

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	MAY 94	N/A	MAY 94
Milestone III	N/A	AUG 98	N/A	MAY 01
FUE/IOC	N/A	SEP 98	N/A	MAY 01
Total Cost	N/A	6381.6	N/A	7778.3
Total Quantity	N/A	54	N/A	36
Prog Acq Unit Cost	N/A	118.18	N/A	216.06

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PATRIOT PAC-3, December 31, 1998

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

a. RDT&E --

(U) PAC-3 MISSILE EMD: LORAL VOUGHT SYSTEMS, DALLAS, TX DAAH01-95-C-0021, CPIF/AF Award: October 26, 1994 Definitized: November 7, 1995	Initial Contract Price		
	Target	Ceiling	Qty
	\$515.8	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$699.6	N/A	0	\$861.8	\$868.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-85.1	\$-30.0
Cumulative Variances To Date (12/31/98)	<u>\$-113.0</u>	<u>\$-28.1</u>
Net Change	\$-27.9	\$1.9

Explanation of Change:

(U) The Current Contract Price increased primarily due to definitization of a contract modification for facilities lease at White Sands Missile Range. The Estimated Prices at Completion increased due to more extensive development effort than planned and delays in the PAC-3 missile flight testing program. In the first quarter of FY99, meetings with the contractor, Project Office, and the BMDO chartered Cost Reduction Group were conducted to assess the contractor's schedule planning and cost projections. The reviews resulted in acknowledgement that an updated schedule and estimate-at-completion were required. Detailed assessments of the contractor's latest revised program estimate are ongoing and will be completed in the third quarter of FY99.

Program delays and resultant cost growth have been caused by missile seeker hardware and software development and integration challenges. The unfavorable cost variance is due to challenges in fabrication, integration, and testing of components for the flight test phase of the program. Initial flight testing has been delayed until rigorous ground testing validates flight readiness. Schedule delays have continued primarily in the missile seeker hardware and software integration.

The EMD program is continuing to pursue an event driven schedule to better assure success during flight testing. Delays in flight testing have impacted contract cost and schedule performance. The cost growth will require additional funding in FY99-01 to complete the EMD effort.

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PATRIOT PAC-3, December 31, 1998

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

(U) <u>PAC-3 MSL INTEGRATION:</u>			Initial Contract Price		
RAYTHEON CO., BEDFORD, MA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
DAAH01-95-C-0022, CPIF/AF			\$104.8	N/A	0
Award: October 31, 1994					
Definitized: October 23, 1995					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$136.1	N/A	0	\$136.0	\$136.1	
			<u>Cost Variance Schedule Variance</u>		
Previous Cumulative Variances			\$-1.3	\$-3.2	
Cumulative Variances To Date (12/31/98)			<u>\$-4.2</u>	<u>\$-3.1</u>	
Net Change			\$-2.9	\$0.1	

Explanation of Change:

(U) The cost variance change is primarily due to the extended development cycle for activities leading to the start of intercept flight tests. Cost variance drivers include system software development, test equipment integration, and simulation validation.

Although contract performance to date has not been significantly impacted, the continued delay in conducting missile flight testing will require extending the period of performance and additional funds.

(U) <u>REM LCH COMMO ENH UPGRAD:</u>			Initial Contract Price		
Raytheon Co., Bedford, MA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
DAAH01-96-C-0018, CPIF			\$66.5	N/A	0
Award: November 6, 1995					
Definitized: December 23, 1996					
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	0	\$68.2	\$68.5	
			<u>Cost Variance Schedule Variance</u>		
Previous Cumulative Variances			\$-0.8	\$-0.5	
Cumulative Variances To Date (12/31/98)			<u>\$-1.9</u>	<u>\$-2.8</u>	
Net Change			\$-1.1	\$-2.3	

Explanation of Change:

(U) The Estimated Price at Completion for both the Contractor and Program Manager increased as a result of extending the contract period of performance through the end of 1999 to enable completion of production qualification testing.

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PATRIOT PAC-3, December 31, 1998

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

The program schedule was based on a completion date of December 1998, which has been extended to December 1999. Replanning of activities was not completed by the current report date. As such, schedule variance is overstated. The primary schedule and cost variance drivers are software development and system testing.

There is no significant impact to the contract because of the unfavorable net change in variances.

b. Procurement --			Initial Contract Price		
(U) <u>RADAR ENH PH3 MOD KITS:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Raytheon, Co., Bedford, MA					
DAAH01-95-C-0446, FFP			\$201.3	N/A	0
Award: September 29, 1995					
Definitized: December 6, 1996					

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$355.6	N/A	0	\$355.6	\$355.6

Explanation of Change:

(U) The Radar Enhancement Phase 3 (REP-3) Modification Kits contract was initially awarded for modification kits and spares to retrofit PATRIOT Fire Unit radars. The contract was modified in June 1998, to include procurement of Classification, Discrimination, and Identification Phase 3 (CDI-3) modification kits and spares.

The Current Contract Price and Estimated Prices at Completion changed due to contract modifications which added the FY 99 option for procurement of REP-3, CDI-3 kits, and associated spares.

Cost and Schedule variance reporting is not required on this FFP contract.

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PATRIOT PAC-3, December 31, 1998

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

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

<u>Appropriation</u>	<u>Prior Years (FY83-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-12)</u>	<u>Total</u>
RDT&E	3174.8	36.9	45.8	57.8	3315.3
Procurement	1898.5	335.4	393.4	1835.7	4463.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	5073.3	372.3	439.2	1893.5	7778.3

b. Annual Summary -- FIRE UNIT

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY88 Dollars Nonrec	Flyaway FY88 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1983				38.0	33.3
1984				26.5	24.1
1985				21.8	20.4
1986				15.7	15.1
1987				30.5	30.2
1988				17.6	18.0
1989				60.9	65.2
1990				34.5	38.3
1991				127.1	146.5
1992				258.5	306.0
1993				189.5	229.5
1994				175.1	216.2
1995				274.3	345.4
1996				293.8	375.9
1997				295.6	382.8
1998				185.8	242.7
1999				242.7	320.8
2000				21.7	29.1
2001				28.7	39.1
Subtotal				2338.3	2878.6

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY88 Dollars Nonrec	Flyaway FY88 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				21.8	23.4
1990				28.8	32.1

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PATRIOT PAC-3, December 31, 1998

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

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY88 Dollars Nonrec	Flyaway FY88 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991				39.6	45.9
1992				32.0	37.9
1993				37.8	45.8
1994				30.9	38.2
1995				18.2	22.9
1996				33.6	43.1
1997				34.6	44.9
1998				16.1	21.0
1999				7.0	9.2
2000				5.8	7.8
2001				4.9	6.7
2002				3.3	4.6
2003				3.4	4.8
2004				6.2	9.0
2005				5.4	8.0
2006				5.4	8.2
2007				5.3	8.2
2008				3.2	5.0
2009				1.9	3.0
2010				1.8	3.0
2011				1.2	2.0
2012				1.2	2.0
Subtotal				349.4	436.7

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY88 Dollars Nonrec	Flyaway FY88 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992			20.6	20.6	24.9
1993			60.9	60.9	75.2
1994			96.0	96.0	120.1
1995			196.9	196.9	251.1
1996			221.6	221.6	285.1
1997		20.9	127.4	168.2	219.0
1998	20		211.1	241.0	316.8
1999		22.5	138.1	184.3	245.5
2000	32		207.6	222.3	300.9
2001	68		255.7	267.3	367.8
2002	90		276.0	285.8	400.2
2003	90		256.2	265.7	379.2
2004	120		241.9	251.3	366.2
2005	90		172.9	179.4	266.9

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

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY88 Dollars Nonrec	Flyaway FY88 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2006	50		115.9	115.9	176.0
2007			9.7	9.7	15.0
Subtotal	560	43.4	2608.5	2786.9	3809.9

(U) Flyaway costs include funding for missile and ground support equipment for FY98-06. All other flyaway costs are for ground support equipment.

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY88 Dollars Nonrec	Flyaway FY88 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990			16.5	16.5	19.1
1991			126.1	126.1	149.6
1992			39.8	39.8	48.3
1993			13.7	14.3	17.7
1994			14.8	20.2	25.4
1995			20.2	25.2	32.3
1996			5.3	7.9	10.2
1997			17.8	21.8	28.5
1998			5.9	7.9	10.5
1999			10.6	14.3	19.2
2000			22.6	25.3	34.5
2001			16.5	18.5	25.6
2002			16.9	17.4	24.5
2003			15.8	16.9	24.3
2004			35.1	37.8	55.6
2005			45.8	49.4	74.1
2006			15.3	18.3	28.1
2007			14.7	16.4	25.6
Subtotal			453.4	494.0	653.1

(U) Flyaway costs are for ground support equipment.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	560	43.4	2608.5	5125.2	6688.5
Army			453.4	843.4	1089.8
Grand Total	560	43.4	3061.9	5968.6	7778.3

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17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 3306.8

(U) Percent Total Program Expended: 42.5%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The O&S assumptions and costs are based on PATRIOT Operating Tempo, Fire Unit Mean Time Between Failure (MTBF), and the PATRIOT Baseline Cost Estimate dated February 1994.

The concept of operation is 54 tactical Fire Units (FUs). The costs are the direct cost to support the primary personnel and to operate the FUs. The O&S consumables are replenishment spares, repair parts, and petroleum, oil and lubricants (POL). The Direct Depot Maintenance costs are the labor, materials, and transportation for repair of major FU component parts, and software support. The sustaining investment consists of modification kits and support operations. Other Direct Support costs include maintenance civilian labor, and other direct support for mod kit installation. The Indirect Costs are for indirect support operations, Military Occupational Specialty (MOS) training costs, Quarters Maintenance and Utilities, Post Production Engineering, Central Supply, Unit Operations, Base Operations, and training activities. PAC-3 is an upgrade program to the fielded PATRIOT system, therefore, O&S costs remain unchanged. There is no antecedent system.

b. (U) Costs -- (FY 1988 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Patriot PAC-3 Fire Unit	Avg Annual Cost Per Antecedent System N/A
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	2.0	0.0
Intermediate Maintenance	0.9	0.0
Depot Maintenance	0.6	0.0
Contractor Support	0.2	0.0
Sustaining Support	0.1	0.0
Indirect Costs	1.2	0.0
Total	5.0	0.0

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N-24 TOMAHAWK TBIP

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

PROGRAM: TOMAHAWK TBIP

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): RGM-109/UGM-109 (TOMAHAWK TBIP)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:

PEO Cruise Missiles and Joint	RADM J. V. Chenevey
Unmanned Aerial Vehicles	Assigned: January 14, 1999
Patuxent River, MD 20670-1547	DSN 757-6332; COMM 301-757-6332
	cheneveyjv@navair.navy.mil

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

RDT&E:

(U) PE 0204229N Project A0545

(U) PE 0604367N Project W1784

PROCUREMENT:

(U) APPN 1507 ICN 30210100 (Navy)

(U) APPN 1507 ICN 30612000 (Navy)

(U) APPN 1810 ICN 33525000 (Navy)

(U) APPN 1810 ICN 33525500 (Navy)

(U) APPN 1810 ICN 33902000 (Navy)

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DEPARTMENT OF DEFENSE

99-C-0834

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5. (U) References:

SAR Baseline (Development Estimate):

(U) NAE Approved Acquisition Program Baseline dated September 16, 1994.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated July 3, 1997.

6. (U) Mission and Description:

(U) The TOMAHAWK Land Attack Missile counters threats against the U.S. Forces by destroying targets ashore including fleet command, control, logistic and ground-based air defense systems; industrial or other high value targets. The TOMAHAWK Anti-Ship Missile (TASM) redresses the current Commonwealth of Independent States (CIS) 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, worldwide theater nuclear capability. The TOMAHAWK program does not replace any existing weapon system.

Tomahawk Baseline Improvement Program (TBIP) was a major modification to all segments of the Tomahawk Weapon System (TWS) to improve system effectiveness, flexibility and responsiveness for Conventional Tomahawk. In response to 18 Dec 97 NPDM, and a Congressional reprogramming action, the TBIP contract is in the termination process while the Navy pursues the Tactical Tomahawk program. Tactical Tomahawk retains most of the TBIP enhancements, adds increased responsiveness, and reduces unit and life cycle cost.

7. (U) Executive Summary:

(U) Development of the Tomahawk generation of U.S. cruise missiles began in 1972. Since then, the 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 full rate production, and have been deployed: approximately 3,500 missiles in operational status have been delivered to the Navy. Sea-launched cruise missiles have been deployed in more than 150 surface ships and submarines.

TOMAHAWK cruise missiles played a key role in the initial stages of OPERATION DESERT STORM. The success of the TOMAHAWK in targeting high priority targets helped to ensure that there was greatly reduced risk to manned aircraft in the crucial early stages of the operation. There were 288 launches of Tomahawk missiles of which 282 successfully transitioned to cruise flight. Since Desert Storm, an additional 523 missiles have been launched in support of Operations including Southern Watch, Bushwacker, Deliberate Force and Desert Strike and Desert Fox.

In September 1994, the Tomahawk program which had been dual source competitive since 1984, was singled-up with Hughes Missile System Company [(HMSC) now Raytheon Missile Systems Company (RMSC)]. As a result of this acquisition

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TOMAHAWK TBIP, December 31, 1998

7. (U) Executive Summary (Cont'd):

strategy, PEO(CU) reduced the Tomahawk budget, FY 94 through the end of the program, by over \$500 million in WPN. These savings were returned to Navy. The Block IV AUR EMD contract, a key element of the Tomahawk Baseline Improvement Program (TBIP), was also awarded to HMSC.

As a result of lessons learned from recent conflicts, the CINCs have requested a more flexible, more responsive missile that has all the capabilities of the current Tomahawk but with the ability to respond in a more tactical-mission role. At about the same time, Raytheon, who was under contract for the Tomahawk Baseline Improvement Program, submitted an unsolicited proposal to the Navy that met the requirements requested by the CINCs at more affordable unit production and lower total ownership costs.

During the December 18, 1997 Tactical Tomahawk Navy Program Decision Meeting, ASN (RD&A) approved the slow down of TBIP pending Congressional approval of Tactical Tomahawk reprogramming. On May 8, 1998, a partial stop work was issued to RMSC and on June 5, 1998, a complete stop work was issued for the TBIP contract. A new contract was signed with RMSC on June 5, 1998 for the engineering manufacturing and development of the Tactical Tomahawk Missile. Therefore, this will be the final SAR for TBIP.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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TOMAHAWK TBIP, December 31, 1998

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
Milestone IV/II Development Contract Award	N/A	SEP 94	SEP 94	(Ch-1)
Tomahawk Multi-Mission Missile (TMMM)				
Development Flight Test				
Start	SEP 97	AUG 98	N/A	(Ch-1)
Complete (DT/OT)	JUN 99	SEP 99	N/A	(Ch-1)
Operational Flight Test				
Start	NOV 99	OCT 99	N/A	(Ch-1)
Complete (OT)	MAR 00	JAN 00	N/A	(Ch-1)
LRIP Authorization	APR 98	SEP 98	N/A	(Ch-1)
Tomahawk Hard Target Penetrator (THTP)				
Development Flight Test				
Start	APR 00	N/A	N/A	(Ch-1)
Complete (DT/OT)	OCT 00	N/A	N/A	(Ch-1)
Operational Flight Test				
Start	JAN 01	N/A	N/A	(Ch-1)
Complete (OT)	JUN 01	N/A	N/A	(Ch-1)
Milestone III	SEP 00	JUL 00	N/A	(Ch-1)
FRP Contract Award	OCT 00	JUL 00	N/A	(Ch-1)
Initial Operational Capability (TMMM)	SEP 00	AUG 00	N/A	(Ch-1)
Full Operational Capability (TMMM)	SEP 01	SEP 01	N/A	(Ch-1)
Follow on Test & Evaluation	N/A	N/A	N/A	(Ch-1)
Start	N/A	SEP 00	N/A	(Ch-1)
Complete	N/A	DEC 00	N/A	(Ch-1)

b. Current Change Explanations --

(U) (CH-1) TBIP stop work was issued June 5, 1998, and is currently in termination process.

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB)	Demon- strated Perf	Current Estimate	
(X) Accuracy Land Attack CEP (ft)	(b)(1)				(Ch-1)
(X) Penetration Capability (FT) (THTP)					(Ch-1)
(X) ECCM Jam Resistance					(Ch-1)
(X) GPS/Navigation (dBW)					
(X) Mission Reliability (%)					(Ch-1)
(X) Cruise Reliability (%)					(Ch-1)
(X) Range Operational (km)					(Ch-1)

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TOMAHAWK TBIP, December 31, 1998

10b. (U) Performance Characteristics (Cont'd):

b. Current Change Explanations --

(U) (Ch-1) TBIP stop work was issued June 5, 1998, and is currently in termination process.

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	288.8	221.9	181.7
Procurement	544.2	418.0	14.8
Flyaway	(440.0)		(0.0)
Other Procurement Costs	(51.3)		(14.8)
Peculiar Support	(32.2)		(0.0)
Initial Spares	(20.7)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 77 Base-Year \$	833.0	639.9	196.5
Escalation	1781.3	1261.0	273.5
Development (RDT&E)	(456.9)	(320.3)	(252.1)
Procurement	(1324.4)	(940.7)	(21.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2614.3	1900.9	470.0

(U) Note: TBIP stop work was issued June 5, 1998 and is currently in the termination process.

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>1181</u>	<u>1253</u>	<u>0</u>
Total	1181	1253	0

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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TOMAHAWK TBIP, December 31, 1998

12. (U) Unit Cost Summary:

	UCR Baseline (JUL 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 77 BY\$)	639.9	196.5	
(2) Quantity	1253	0	
(3) Unit Cost	0.511	N/A	-100.00
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 77 BY\$)	418.0	14.8	
(2) Quantity	1253	0	
(3) Unit Cost	0.334	N/A	-100.00

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	745.7	1868.6	-	2614.3
Previous Changes:				
Economic	-35.7	-161.8	-	-197.5
Quantity	-	+49.7	-	+49.7
Schedule	+83.5	+220.6	-	+304.1
Engineering	-259.3	-630.5	-	-889.8
Estimating	+0.4	+47.2	-	+47.6
Other	-	-	-	-
Support	-	+10.6	-	+10.6
Subtotal	-211.1	-464.2	-	-675.3
Current Changes:				
Economic	-1.3	-8.1	-	-9.4
Quantity	-	-1163.8	-	-1163.8
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-99.5	+7.3	-	-92.2
Other	-	-	-	-
Support	-	-203.6	-	-203.6
Subtotal	-100.8	-1368.2	-	-1469.0
Total Changes	-311.9	-1832.4	-	-2144.3
Current Estimate	433.8	36.2	-	470.0

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TOMAHAWK TBIP, December 31, 1998

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

(U) Summary (FY 1977 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	288.8	544.2	-	833.0
Previous Changes:				
Quantity	-	+21.5	-	+21.5
Schedule	+30.5	+63.0	-	+93.5
Engineering	-92.5	-182.2	-	-274.7
Estimating	-5.8	+12.9	-	+7.1
Other	-	-	-	-
Support	-	-10.9	-	-10.9
Subtotal	-67.8	-95.7	-	-163.5
Current Changes:				
Quantity	-	-355.2	-	-355.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-39.3	-	-	-39.3
Other	-	-	-	-
Support	-	-78.5	-	-78.5
Subtotal	-39.3	-433.7	-	-473.0
Total Changes	-107.1	-529.4	-	-636.5
Current Estimate	181.7	14.8	-	196.5

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RD&E</u>		
Revised escalation indices. (Economic)	N/A	-1.3
Increase in program estimate to reflect change in inflation assumptions. (Estimating)	0.0	+1.3
Revised estimate due to program termination. (Estimating)	-39.3	-100.8
RD&E Subtotal	-39.3	-100.8
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-8.1
Revised estimate due to program termination. (OPN) (Estimating)	0.0	+7.3
Revised support estimate due to program termination. (Support)	-78.5	-203.6
Deletion of quantity due to program termination (1253). (Quantity)	-355.2	-1163.8
Procurement Subtotal	-433.7	-1368.2

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TOMAHAWK TRIP, December 31, 1998

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.21	--	--	--	--	--	--	--	--	N/A

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.58	--	--	--	--	--	--	--	--	N/A

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	SEP 00	N/A	N/A
FUE/IOC	N/A	SEP 00	N/A	N/A
Total Cost	N/A	2614.3	N/A	1939
Total Quantity	N/A	1181	N/A	1253
Prog Acq Unit Cost	N/A	2.21	N/A	1.55

(U) Program restructure August 1996.

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

a. Procurement --

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TOMAHAWK TBIP, December 31, 1998

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

(U) <u>FY94 TBIP:</u>			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>		<u>Qty</u>	
Hughes Missile Systems Co, Tucson AZ	\$226.5	N/A		0	
N00019-94-C-0258, CPIF/AF					
Award: September 16, 1994					
Definitized: September 16, 1994					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$240.9	N/A	0	\$233.4	\$233.4	
			<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	

Explanation of Change:

(U) TBIP stop work was issued June 5, 1998 and currently in termination process. Current actuals through January 1999 are 211.4.

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

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

<u>Appropriation</u>	Prior <u>Years</u> (FY94-99)	Budget <u>Year</u> (FY00)	Budget <u>Year</u> (FY01)	Balance To <u>Complete</u>	<u>Total</u>
RDT&E	433.8	-	-	-	433.8
Procurement	36.2	-	-	-	36.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	470.0	-	-	-	470.0

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TOMAHAWK TBIP, December 31, 1998

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

b. Annual Summary -- TOMAHAWK TBIP

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY77 Dollars Nonrec	Flyaway FY77 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994				10.3	23.6
1995				30.3	71.0
1996				57.5	137.0
1997				50.3	121.3
1998				33.3	80.9
Subtotal				181.7	433.8

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY77 Dollars Nonrec	Flyaway FY77 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				4.7	11.4
1998				10.1	24.8
Subtotal				14.8	36.2

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total				196.5	470.0

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 384.7

(U) Percent Total Program Expended: 81.9%

(U) TBIP stop work issued June 5, 1998 and currently in termination process.

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TOMAHAWK TBIP, December 31, 1998

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

TBIP, as currently planned, will not increase the depot O&S costs of the Tomahawk system because there will be no net increase to Tomahawk inventory. TBIP assets will be remanufactured from older, existing Tomahawk missiles. There will be some decrease in Depot Maintenance costs because TBIP will have a ten-year recertification interval. As currently planned, the first TBIP recertification would not occur until FY 2009.

b. (U) Costs -- (FY Constant (Base-Year) Dollars in Thousands)

Cost Element		
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Total	N/A	N/A

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A-7 BLACK HAWK (UH-60L)

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: UH-60L BLACK HAWK

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name):

2. DoD Component: Army

3. Responsible Office and Telephone Number:

Utility Helicopters Project Mgr Off	COL Thomas M Harrison
ATTN: AMSAM-DSA-UH	Assigned: May 27, 1997
Building 5308	DSN 746-6821; COMM (205) 876-6821
Redstone Arsenal, AL	35898-5280

4. Program Elements/Procurement Line Items:

RDT&E:

PE 23744
PE 64206
PE 64217

PROCUREMENT:

APPN 0350 ICN ----- (NGRE)
APPN 2031 ICN A05002 (Army)
APPN 2031 ICN A09400 (Army)
APPN 2031 ICN AA0005 (Army)
APPN 2031 ICN AA0952 (Army)

MILCON:

PE 22483
PE 22496
PE 22696
PE 85796

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UH-60L BLACK HAWK, December 31, 1998

5. References:

SAR Baseline (Estimate):

UH-60A DCP #13, June 13, 1971 and DCP #13 Update, November 1, 1977.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated July 13, 1993.

UH-60L BLACK HAWK

SAR Baseline (Production Estimate):

AAE approved Acquisition Program Baseline, dated February 26, 1990.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated July 13, 1993.

6. Mission and Description:

The BLACK HAWK is a twin engine helicopter that is used in the performance of the air assault, air cavalry, and aeromedical evacuation mission. This aircraft is sized as an infantry squad assault helicopter, capable of carrying up to 14 troops, but normally configured for a crew of 3 and 11 troops. 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-60L BLACK HAWK is continuing to replace the UH-1H Iroquois in air assault, air cavalry, and aeromedical evacuation units.

7. Executive Summary:

The FY99 Defense Appropriation bill added seven aircraft to that requested in the FY99 President's Budget. The FY00 President's Budget modified the quantities planned for procurement in FY00-03, and added aircraft in FY04 and FY05. The Army is now funding all base quantities required by the current airframe multiyear contract, and is planning on buying all requirements for FY02 and beyond on a follow-on multiyear contract.

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UH-60L BLACK HAWK, December 31, 1998

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

UH-60L BLACK HAWK

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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UH-60L BLACK HAWK, December 31, 1998

9. Schedule:

a. Milestones --

	Unknown SAR Type Estimate (SAR)	Approved Program (APB)	Current Estimate
UH-60A			
Initial Production Contract Award (FY77)	N/A	DEC 76	DEC 76
Single Yr Contract Award (FY78)	N/A	OCT 77	OCT 77
Single Yr Contract Award (FY79)	N/A	OCT 78	OCT 78
Deliveries FY77 Contract Start	N/A	OCT 78	OCT 78
Deliveries FY78 Contract Start	N/A	MAY 79	MAY 79
FDT&E			
Start	N/A	JUL 79	JUL 79
Complete	N/A	OCT 79	OCT 79
MS IIIA	N/A	OCT 79	OCT 79
IOC	JUN 79	NOV 79	NOV 79
Single Yr Contract Award (FY80)	N/A	NOV 79	NOV 79
Deliveries FY79 Contract Start	N/A	AUG 80	AUG 80
Single Yr Contract Award (FY81)	N/A	DEC 80	DEC 80
Deliveries FY80 Contract Start	N/A	JUL 81	JUL 81
Deliveries FY81 Contract Start	N/A	MAR 82	MAR 82
Multiyear Contract Award (FY82-84)	N/A	APR 82	APR 82
Deliveries MYC 82-84 Start	N/A	DEC 82	DEC 82
Multiyear Contract Award (FY85-87)	N/A	OCT 84	OCT 84
Deliveries MYC 85-87 Start	N/A	MAR 85	MAR 85
Deployment Plan			
36th Med - Ft Polk	N/A	DEC 86	DEC 86
5/17 Atk Hel Bn - Ft Hood	N/A	DEC 86	DEC 86
5/17 Atk Hel Bn - Ft Hood	N/A	FEB 87	FEB 87
101st Av (Replacement) - Ft Campbell	N/A	MAR 87	MAR 87
82nd Av (Replacement) - Ft Bragg	N/A	MAR 87	MAR 87
228th Atk Bn - Ft Hood	N/A	MAR 87	MAR 87
82nd Av (Replacement) - Ft Bragg	N/A	APR 87	APR 87
247th med Det - Ft Irwin	N/A	APR 87	APR 87
9th LID (Replacement) - Ft Lewis	N/A	JUN 87	JUN 87
101st Av (Replement) Ft - Campbell	N/A	JUN 87	JUN 87
101st Av (Replacement) - Ft Campbell	N/A	SEP 87	SEP 87
82nd Av (Replacement) - Ft Bragg	N/A	SEP 87	SEP 87
VII Corps Atk Hel Bn - Ft Hood	N/A	SEP 87	SEP 87
101st Av (Replacement) - Ft Campbell	N/A	DEC 87	DEC 87
82nd Av (Replacement) - Ft. Bragg	N/A	DEC 87	DEC 87
VII Corps Atk Hel Bn - Ft Hood	N/A	DEC 87	DEC 87
3/227th AHB - Hanau, GE	N/A	FEB 89	APR 89
E/1st Aslt - Ft Riley	N/A	APR 89	FEB 89
1/245th Aslt - OKNG	N/A	APR 89	JUL 89
140th Aslt - CANG	N/A	MAY 89	MAY 89

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UH-60L BLACK HAWK, December 31, 1998

9a. Schedule (Cont'd):

	Unknown SAR Type <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
1/24th AHB - Hunter/Liggett AAF	N/A	JUL 89	JUL 89
2/1st AHB - Ansbach, GE	N/A	OCT 89	JUL 89
Multiyear Airframe Contract Award (FY88-91)	N/A	JAN 88	JAN 88
Deliveries MYC 88-91 Start	N/A	JAN 88	JAN 88
H-60 Series Competitive Engine Contract Award	N/A	MAY 88	MAY 88
Multiyear Airframe Contract Award (FY89)	N/A	NOV 88	NOV 88
Initial Proc Objective (1107) Completed	N/A	JUN 91	JUL 91
First Year of Funding	JUL 67	N/A	JUL 67
Engine Develop Contract Award	DEC 71	N/A	MAR 72
Prototype Dev Contract Awards	SEP 72	N/A	AUG 72
First Flight	SEP 74	N/A	NOV 74
Engine Mil Qual Test (150 hrs)	DEC 75	N/A	MAR 76
Development Test II	N/A	N/A	
Started	FEB 76	N/A	MAR 76
Completed	DEC 77	N/A	DEC 76
Milestone III (DSARC)	SEP 76	N/A	NOV 76

b. Current Change Explanations -- None

UH-60L BLACK HAWK

a. Milestones --

	Production <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Multiyear Airframe Contract Award (FY 88-91)	JAN 88	JAN 88	JAN 88
Multiyear Engine Contract Award (FY 89-93)	NOV 88	NOV 88	NOV 88
Approval of Revised UH-60 Procurement Objective (2253)	FEB 89	FEB 89	FEB 89
DA IPR for Type Class of UH-60L	SEP 89	SEP 89	SEP 89
Incorp of GE T701C Engine	OCT 89	OCT 89	OCT 89
Multiyear Airframe Contract Award (FY90)	NOV 89	NOV 89	NOV 89
Multiyear Engine Contract Award (FY90)	NOV 89	NOV 89	NOV 89
Multiyear Airframe Contract Award (FY91)	NOV 90	NOV 90	DEC 90
Multiyear Engine Contract Award (FY91)	NOV 90	NOV 90	DEC 90
Deployment Plan			
TXNG -- Austin, TX	NOV 89	NOV 89	NOV 89
2/229 Aslt -- Ft Rucker	JAN 90	JAN 90	JAN 90
1/6th AHB -- Ft Hood	MAR 90	MAR 90	MAR 90
4/6th AHB -- Ft Hood	MAR 90	MAR 90	MAR 90
3rd ACR -- Ft Bliss	APR 90	APR 90	APR 90
3/6 AHB -- Ft Hood	MAY 90	MAY 90	MAY 90

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UH-60L BLACK HAWK, December 31, 1998

9a. Schedule (Cont'd):

UH-60L BLACK HAWK

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
1/3rd AHB -- Ft Hood	MAY 90	MAY 90	MAY 90
C/25th Aslt -- Ft Drum	JUN 90	JUN 90	JUN 90
E/3 Aslt -- Ft Hood	JUN 90	JUN 90	JUN 90
1/4th AHB -- Ft Carson	JUL 90	JUL 90	JUL 90
1/5th AHB -- Ft Polk	SEP 90	SEP 90	SEP 90
SOCOM -- Ft Campbell, KY	N/A	AUG 90	AUG 90
2-82ns Aslt -- Ft Bragg, NC	N/A	DEC 90	DEC 90
E-149th Aslt TX ARNG -- Austin, TX	N/A	FEB 91	FEB 91
1-151st AHB SC ARNG -- Eastover, SC	N/A	MAR 91	MAR 91
1-111th AHB FL ARNG--Jacksonville, FL	N/A	APR 91	APR 91
1-207th Aslt AK ARNG--Ft Richardson, AK	N/A	MAY 91	MAY 91
MDW -- Ft Belvoir, VA	N/A	MAY 91	MAY 91
1-149th AHB TX ARNG -- Houston, TX	N/A	MAY 91	MAY 91
SOCOM -- Ft Campbell, KY	N/A	JUL 91	JUL 91
E-130th AVIM NC ARNG -- Salisbury, NC	N/A	APR 92	APR 92
E-131st AVIM AL ARNG -- Birmingham, AL	N/A	JUN 92	JUN 92
SOCOM -- Ft Campbell, KY	N/A	SEP 92	SEP 92
1-17th Cav -- Ft Bragg, NC	N/A	NOV 92	NOV 92
F-149th AVIM TX ARNG -- Austin TX	N/A	NOV 92	NOV 92
101st Abn Div -- Ft Campbell, KY	N/A	DEC 93	DEC 93
MY III Engine Contract Award (FY 92)	N/A	JAN 92	JAN 92
MY IV Airframe Contract Award (FY 92)	N/A	APR 92	APR 92
Deliveries MYC 92-96 Start	N/A	APR 92	APR 92
MY III Engine Contract Award (FY 93)	N/A	NOV 92	NOV 92
MY IV Airframe Contract Award (FY 93)	N/A	NOV 92	NOV 92
MY III A/F Contract Deliveries Complete	N/A	SEP 93	JAN 94
MY IV Engine Contract Award (FY 94)	N/A	NOV 93	APR 94
MY IV Airframe Contract Award (FY 94)	N/A	NOV 93	JAN 94

b. Current Change Explanations -- None

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UH-60L BLACK HAWK, December 31, 1998

10. Performance Characteristics:

a. Performance --

	Unknown SAR Type Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Payload				
Troops	11	11 / 11	11	11
Pounds	2640	2640 / 2640	2640	2640
Air Transportability				
C-130 (qty)	1	N/A / N/A	N/A	N/A
C-141 (qty)	2	2 / 2	2	2
C-5 (qty)	6	6 / 6	6	6
Flight Performance with Payload				
Vertical Rate of Climb (ft/min)	500	450 / 425	450	425
Cruise Speed (knots)	150	145 / 139	145	139
Endurance (hrs)	2.3	2.3 / 2.3	2.3	2.3
Mission Reliability				
Probability of Success	0.986	.991 / .987	.991	.991
Mean Time Between Maint action (hrs)	70.9	106.0 / 75.9	106.0	106.0
System MTBF (hrs)	4.0	4.0 / 4.0	6.6	4.3
Maintenance Manhrs per Flight Hour (MMH/FH)	3.8	3.0 / 3.0	3.0	3.0

Notes:

Vertical Rate of Climb (VROC) in FPM is predicated on using 95% of Intermediate Rated Power (IRP).

Cruise Speed in Knots is based on using Maximum Continuous Power (MCP).

Endurance in Hours is based on using a mission profile.

Maintenance Man-hours per Flight Hour (MMH/FH) include inspection and servicing, total corrective MMH/FH, through Aviation Intermediate Maintenance (AVIM) level.

The requirement for Air Transportability on a C-130 was approved for deletion from the program (TWX, DAMO-RQD, June 8, 1978).

Mission reliability is currently being measured in terms of Meantime Between Mission Aborts (MTBMA) in hours. The value shown is equivalent to the value for probability of success.

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10b. Performance Characteristics (Cont'd):

b. Current Change Explanations --- None

UH-60L BLACK HAWK

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>	
Payload (lbs)					
Troops	11	11 / 11	11	11	
Pounds	2640	2640 / 2640	2640	2640	
Air Transportability (qty)					
C-141	2	2 / 2	2	2	
C-5	6	6 / 6	6	6	
Flight Performance with Payload					
Vertical Rate of Climb (ft/min)	900	900 / 785	785	955	(Ch-1)
Cruise Speed (knots) (using max cont power)	152	152 / 150	150	153	(Ch-1)
Endurance (hrs)	2.3	2.3 / 2.1	2.1	2.26	(Ch-1)
Mission Reliability					
Probability of Success	.991	.991 / .987	.987	.987	
Mean Time Between Maintenance Actions (hrs)	106.0	106.0 / 75.9	75.9	75.9	
System Mean Time Between Failures (hrs)	4.7	4.7 / 4.0	4.0	4.0	
Maintenance Manhours per Flight Hours (MMH/FH)	3.0	3.0 / 3.8	3.8	3.8	

Notes:

The UH-60L is a derivative of the UH-60A. Approval for production incorporation was granted by a DA IPR for type classification.

Vertical Rate of Climb (VROC) in FPM is predicated on using 95% of Intermediate Rated Power (IRP).

Cruise Speed in Knots is based on using Maximum Continuous Power (MCP).

Endurance in Hours is based on using a mission profile.

Maintenance Man-hours per Flight Hour (MMH/FH) include inspection and

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10a. Performance Characteristics (Cont'd):

UH-60L BLACK HAWK

servicing, total corrective MMH/FH, through Aviation Intermediate Maintenance (AVIM) level.

The requirement for Air Transportability on a C-130 was approved for deletion from the program (TWX, DAMO-RQD, June 8, 1978).

Mission reliability is currently being measured in terms of Meantime Between Mission Aborts (MTBMA) in hours. The value shown is equivalent to the value for probability of success.

b. Current Change Explanations --

(CH-1) PM Current Estimate for Vertical Rate of Climb, Cruise Speed in Knots, and Endurance have been revised to reflect an updated Engineering assessment of these parameters for a Lot 21 UH-60L. These estimates exceed the Acquisition Program Baseline objective values. This information will be used in the assessment of the emerging UH-60X Modernized BLACK HAWK (draft) Operational Requirements Document.

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11. Total Program Cost and Quantity (Dollars in Millions):

	Unknown SAR Type <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. Cost --			
Development (RDT&E)	357.6	384.2	378.1
Procurement	374.1	1689.9	1673.3
Total Flyaway			(140.0)
Other			(0.5)
Peculiar Support	(53.0)		(14.3)
Initial Spares	(321.1)		(128.8)
Construction (MILCON)	0.0	5.6	5.8
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 71 Base-Year \$	731.7	2079.7	694.7
Escalation	1380.1	3400.9	3423.3
Development (RDT&E)	(52.3)	(155.2)	(161.3)
Procurement	(1327.8)	(3234.0)	(3250.5)
Construction (MILCON)	(0.0)	(11.7)	(11.5)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2111.8	5480.6	5480.5

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>980</u>	<u>980</u>	<u>980</u>
Total	980	980	980

Note: Excludes 16 RDT&E prototypes from the SAR Baseline and 10 from the Current Estimate that are not considered fully configured.

c. Foreign Military Sales -- None.

d. Nuclear Costs --
None.

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11a. Total Program Cost and Quantity (Cont'd):

UH-60L BLACK HAWK

a. Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	0.0	0.0	0.0
Procurement	2216.6	2257.8	1195.6
Airframe	(1449.6)		(799.2)
Engine	(304.4)		(155.2)
Avionics	(74.0)		(34.8)
Other recurring flyaway	(196.8)		(66.7)
Nonrecurring flyaway	(40.1)		(13.7)
Total Flyaway	(2064.9)		(1069.6)
OWS-Data	(25.7)		(17.0)
OWS-Training	(53.7)		(9.3)
Other	(0.0)		(53.2)
Total Other Wpn Sys	(79.4)		(79.5)
Peculiar Support	(23.6)		(2.4)
Initial Spares	(48.7)		(44.1)
Construction (MILCON)	0.0	2.7	2.9
Acquisition O&M	0.0	0.0	0.0
Total FY 71 Base-Year \$	2216.6	2260.5	1198.5
Escalation	8498.6	8610.3	3812.3
Development (RDT&E)	(0.0)	(0.0)	(0.0)
Procurement	(8498.6)	(8607.5)	(3804.7)
Construction (MILCON)	(0.0)	(2.8)	(7.6)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	10715.2	10870.8	5010.8

The Production Estimate shown above reflects what should have been the Initial SAR Baseline at the time this program started reporting.

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	1277	1268	646
Total	1277	1268	646

There was no Low Rate Initial Production (LRIP) on the UH-60L; The LRIP portion of the UH-60 Production program was completed in 1979 on the UH-60A program.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with
Section 2433, Title 10, USC.

The UH-60A was replaced by the UH-60L during the FY89 buy; There is no current
procurement.

UH-60L BLACK HAWK

	UCR Baseline (JUL 93 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 71 BY\$)	2260.5	1198.5	
(2) Quantity	1268	646	
(3) Unit Cost	1.783	1.855	+4.04
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 71 BY\$)	2257.8	1195.6	
(2) Quantity	1268	646	
(3) Unit Cost	1.781	1.851	+3.93

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UH-60L BLACK HAWK, December 31, 1998

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Unknown SAR Type Estimate	409.9	1701.9	-	2111.8
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-	-	-	-
Current Estimate	409.9	1701.9	-	2111.8

Summary (FY 1971 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Unknown SAR Type Estimate	357.6	1428.3	-	1785.9
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-	-	-	-
Current Estimate	357.6	1428.3	-	1785.9

b. Current Change Explanations -- None

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UH-60L BLACK HAWK, December 31, 1998

13. Cost Variance Analysis (Cont'd):

UH-60L BLACK HAWK

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	10715.2	-	10715.2
Previous Changes:				
Economic	-	-475.0	+0.7	-474.3
Quantity	-	-2625.2	-	-2625.2
Schedule	-	+220.1	-	+220.1
Engineering	-	-62.1	+27.5	-34.6
Estimating	-	-3050.0	-17.7	-3067.7
Other	-	+1.4	-	+1.4
Support	-	-205.6	-	-205.6
Subtotal	-	-6196.4	+10.5	-6185.9
Current Changes:				
Economic	-	-20.8	-0.1	-20.9
Quantity	-	+327.3	-	+327.3
Schedule	-	-3.2	-	-3.2
Engineering	-	-	-	-
Estimating	-	+99.9	+0.1	+100.0
Other	-	-	-	-
Support	-	+78.3	-	+78.3
Subtotal	-	+481.5	-	+481.5
Total Changes	-	-5714.9	+10.5	-5704.4
Current Estimate	-	5000.3	10.5	5010.8

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UH-60L BLACK HAWK, December 31, 1998

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

UH-60L BLACK HAWK

Summary (FY 1971 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	2216.6	-	2216.6
Previous Changes:				
Quantity	-	-498.9	-	-498.9
Schedule	-	-0.2	-	-0.2
Engineering	-	-5.4	+7.8	+2.4
Estimating	-	-578.8	-5.0	-583.8
Other	-	-	-	-
Support	-	-42.8	-	-42.8
Subtotal	-	-1126.1	+2.8	-1123.3
Current Changes:				
Quantity	-	+67.2	-	+67.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+20.8	+0.1	+20.9
Other	-	-	-	-
Support	-	+17.1	-	+17.1
Subtotal	-	+105.1	+0.1	+105.2
Total Changes	-	-1021.0	+2.9	-1018.1
Current Estimate	-	1195.6	2.9	1198.5

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-21.2
Economic adjustment for negative program change. (Economic)	N/A	+0.4
Total Quantity Variance associated with increase of 39 aircraft, from 607 to 646. (Quantity)	+67.2	+327.3
Acceleration of annual procurement buy profile. (Schedule)	0.0	-3.2
Adjustment for Current and Prior Inflation. (Estimating)	+2.7	+12.3
Change in categorization of cost from FLYAWAY to Support	0.0	0.0
Revision of cost categorization from FLYAWAY to Support (Estimating)	-0.1	-0.4
Change in Peculiar Support (Support)	+0.1	+0.4
Addition of Nonrecurring cost associated with production line conversion of base UH-60L to UH-60Q MEDEVAC (Estimating)	+0.9	+3.8
Reduction in planned procurement quantities of mission flexibility kits (Estimating)	-17.6	-78.6

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

UH-60L BLACK HAWK

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Increase due to revision of FLYAWAY cost for aircraft being procured in FY99 and beyond (Estimating)	+34.9	+162.8
Adjustment for Current and Prior Inflation. (Support)	0.0	+1.7
Increase in the estimated annual requirement, as well as two more years of APA funded contractor and government support (due to the two year extension to the procurement program).	+15.8	+73.5
Change in OWS-Data (All data being funded by Navy CH-60 program now considered unique to service) (Support)	+3.5	+16.3
Change in OWS-Other (Cost of PM Administration (increased to for support necessary for planned UH-60L Modernization)and Fielding) (Support)	+12.3	+57.2
Change in OWS-Training (Support)	-0.3	-1.3
Change in Initial Spares (Support)	+1.8	+5.2
Reduction in quantity of Air Transportability kits planned for procurement (Support)	-0.3	-1.2
Procurement Subtotal	+105.1	+481.5
(2) <u>MILCON</u>		
Revised escalation indices. (Economic)	N/A	-0.1
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
MILCON Subtotal	+0.1	0.0

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14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

UH-60L BLACK HAWK

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.39	-0.77	+4.64	+0.34	-0.05	-4.59	--	-0.20	-0.63	7.76

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.39	-0.77	+4.65	+0.34	-0.10	-4.57	--	-0.20	-0.65	7.74

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	OCT89	OCT 89
Total Cost	N/A	N/A	10715.2	5010.8
Total Quantity	N/A	N/A	1277	646
Prog Acq Unit Cost	N/A	N/A	8.39	7.76

Milestones I, II, and III were previously reported on the UH-60A BLACK HAWK program.

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

a. Procurement --			Initial Contract Price		
<u>Airframe MYC V:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
United Technologies, Stratford, CT					
DAAJ09-97-C-0005, FFP			\$745.2	\$	108
Award: July 18, 1997					
Definitized: July 18, 1997					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$982.2	\$	127	N/A	\$1251.2	

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

<u>Engine IDIQ:</u>			Initial Contract Price		
General Electric, Lynn, MA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
DAAJ09-97-D-0196, FFP			\$21.4	\$	36
Award: September 4, 1997					
Definitized: September 4, 1997					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$91.6	N/A	15	N/A	\$150.8	

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years</u> (FY68-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-05)	<u>Total</u>
RDT&E	539.4	-	-	-	539.4
Procurement	9092.8	102.8	105.4	623.1	9924.1
MILCON	27.8	-	-	-	27.8
O&M	-	-	-	-	-
Total	9660.0	102.8	105.4	623.1	10491.3

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

<u>Appropriation</u>	<u>Prior Years</u> (FY68-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	539.4	-	-	-	539.4
Procurement	4923.8	-	-	-	4923.8
MILCON	17.3	-	-	-	17.3
O&M	-	-	-	-	-
Total	5480.5	-	-	-	5480.5

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

<u>Appropriation</u>	<u>Prior Years</u> (FY87-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-05)	<u>Total</u>
RDT&E	-	-	-	-	-
Procurement	4169.0	102.8	105.4	623.1	5000.3
MILCON	10.5	-	-	-	10.5
O&M	-	-	-	-	-
Total	4179.5	102.8	105.4	623.1	5010.8

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

b. Annual Summary --

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1968					0.5
1969					1.8
1970					1.2
1971					7.9
1972			0.1		22.7
1973			7.8		50.3
1974			21.0		102.6
1975			6.5		52.7
1976			8.1		93.6
1977			0.8		18.6
1977			3.9		76.0
1978			2.5		39.2
1979			0.6		11.4
1980			0.5		3.6
1981			0.7		7.0
1982			0.7		6.7
1983			0.4		9.1
1984			0.5		15.0
1985					
1986			0.1		15.9
1987					2.3
1988					0.7
1989					0.6
Subtotal			54.2		539.4

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1977	15	18.8	36.2		140.6
1978	56	12.5	83.1		245.7
1979	92	6.3	136.8		395.6
1980	94	3.4	120.6		380.2
1981	80	2.1	108.8		478.0
1982	96	2.3	130.3		618.8
1983	96	8.1	140.4		540.6
1984	84	1.3	123.1		389.6
1985	86	0.9	123.0		436.7
1986	78	1.4	110.3		411.5
1987	82	3.6	120.4		373.6

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

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988	72	9.0	109.2		376.6
1989	49	0.9	70.9		136.3
Subtotal	980	70.6	1413.1		4923.8

Appropriation: 2050 - Military Construction, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987					9.4
1988					7.9
Subtotal					17.3

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	980	70.6	1467.3		5480.5

b. Annual Summary -- UH-60L BLACK HAWK

Appropriation: 0350 - National Guard & Reserve Equipm, Defense

Fiscal Year	Qty	Flyaway FY71 Dollars Nonrec	Flyaway FY71 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991	24		39.5	39.6	156.0
1993	8		13.6	13.6	56.0
1994	5		7.6	7.6	31.8
1995	8		12.1	12.1	51.6
Subtotal	45		72.8	72.9	295.4

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY71 Dollars Nonrec	Flyaway FY71 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				2.4	7.3
1988				34.7	115.8
1989	23	2.2	39.9	91.5	336.8
1990	72	0.5	98.7	107.2	409.0

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

UH-60L BLACK HAWK

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY71 Dollars Nonrec	Flyaway FY71 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991	48	3.8	68.7	40.8	160.8
1992	60	1.5	97.2	124.5	502.3
1993	52	2.3	71.7	86.6	356.5
1994	63	0.1	92.6	101.4	425.0
1995	60	1.3	88.7	74.1	315.8
1996	60	1.1	92.1	92.9	401.3
1997	34	0.8	60.4	65.7	286.8
1998	28	0.1	65.5	64.1	282.7
1999	29		59.5	61.6	273.5
2000	8		13.1	22.8	102.8
2001	9		18.1	23.0	105.4
2002	11		22.2	26.9	125.6
2003	20		44.3	45.1	214.7
2004	4		9.2	17.9	87.1
2005	20		41.2	39.5	195.7
Subtotal	601	13.7	983.1	1122.7	4704.9

Recurring flyaway cost may exceed total base year dollars in years when the advance procurement credits inherent in multiyear contracting are significantly greater than the advance procurement funding for future years.

Appropriation: 2050 - Military Construction, Army

Fiscal Year	Qty	Flyaway FY71 Dollars Nonrec	Flyaway FY71 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				1.0	3.5
1996				1.9	7.0
Subtotal				2.9	10.5

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	45		72.8	72.9	295.4
Army	601	13.7	983.1	1125.6	4715.4
Grand Total	646	13.7	1055.9	1198.5	5010.8

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UH-60L BLACK HAWK, December 31, 1998

17. Delivery/Expenditure Information:

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	10	10
Procurement	980	980

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 0.0

Percent Total Program Expended: 0.0%

UH-60L BLACK HAWK

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	542	542

Percent Total Program Quantities Delivered: 83.9%

b. Total Expenditures To Date (In Millions of Dollars): \$ 3614.1

Percent Total Program Expended: 72.1%

18. Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

UH-60L BLACK HAWK

a. Assumptions and Ground Rules --
UH-60L cost estimates are based on a flying hour rate of 18.2 hours per aircraft per month, with aircraft deployed in three representative units--a Combat Aviation Company, an Air Cavalry Troop (Air Cavalry Squadron), and a Medical Evacuation Company. Personnel cost includes the Pay and Allowances and Permanent Change of Station (MPA appropriation) for crew, maintenance, and support personnel attributable to the UH-60A/L BLACK HAWK in the above listed units. Consumption includes the cost of replenishment spares and repair parts, war reserve spares and repair parts, and petroleum, oil, and lubricants (POL). Depot maintenance includes the cost of labor, material, and transportation associated with the end item as well as component repair programs. Material modifications reflect the estimated hardware cost of aircraft changes installed after fielding. Other direct costs include the cost of civilian maintenance on the flight simulators, as well as the application of modifications with OLR teams. Other indirect costs include the cost of replacement training for military personnel, as well as the cost of quarters, maintenance, and utilities. The source of the O&S estimate is the

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UH-60L BLACK HAWK, December 31, 1998

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

UH-60L BLACK HAWK

Baseline Cost Estimate (BCE) dated July 1991.

Assumptions and ground rules for the UH-1 (antecedent system) are the same as for the UH-60, except for a flying hour rate of 20 hours per aircraft per month and that the flight simulator maintenance as well as modification application are completed by military personnel. Source of the estimate is a 1987 study.

b. Costs -- (FY 1971 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per 1,000 Flying Hours UH-60L BLACK HAWK	Avg Annual Cost Per 1,000 Flying Hours UH-1 Iroquois
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	24.9	135.5
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Consumption	240.6	130.2
Personnel	463.5	355.7
Modifications--Material	25.2	19.4
Other Direct Cost	80.1	0.0
Other Indirect Cost	95.7	153.9
Total	930.0	794.7

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CVN-68 Class, December 31, 1998

5. (U) References:

CVN-76

SAR Baseline (Production Estimate):

(U) The FY 1992 President's Budget.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated October 2, 1992.

CVN-77

SAR Baseline (Production Estimate):

(U) FY 1994 President's Budget dated April 08, 1993.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated January 7, 1997.

6. (U) Mission and Description:

(U) 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. These ships have two nuclear reactors and nuclear fuel for at least 20 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 97,000 tons. The flight deck area is about 4.5 acres. The ship has four propellers, four aircraft elevators, and four catapults.

7. (U) Executive Summary:

(U) Construction of the CVN 68 Class aircraft carriers began in October 1967 with the start of the NIMITZ (CVN 68). To date eight ships have been delivered. The USS NIMITZ (CVN 68), USS DWIGHT D. EISENHOWER (CVN 69), USS CARL VINSON (CVN 70), USS THEODORE ROOSEVELT (CVN 71), USS ABRAHAM LINCOLN (CVN 72), USS GEORGE WASHINGTON (CVN 73), USS JOHN C. STENNIS (CVN 74), and USS HARRY S. TRUMAN (CVN 75) were delivered in 1975, 1977, 1982, 1986, 1989, 1992, 1995, and 1998 respectively. There is one ship currently under construction at Newport News Shipbuilding, the RONALD REAGAN (CVN 76). CVN 76 is scheduled for delivery in December 2002. CVN 77 construction to begin in FY 01.

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CVN-68 Class, December 31, 1998

8. (U) Threshold Breaches:

CVN-76

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

CVN-77

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The expanded scope of CVN 77 development and design work requires a change to the CVN 77 Development Cost Baseline. The Navy has designated CVN 77 as the transition ship to the future CVNX Class, and CVN 77 will be the first nuclear

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CVN-68 Class, December 31, 1998

8c. (U) Threshold Breaches (Cont'd):

aircraft carrier in recent history with a significant RDT&EN funding allocation. CVN 77 R&D funding is for both CVN 77 transition technologies efforts and an extensive contract design effort. The CVN 77 research and development transition technology efforts are focused on a new fully integrated combat system, enhancements to propulsion and electric power generation, and related initiatives to reduce total ownership costs. The R&D work effort increased \$72M over FY 98 through FY 05 for a total of \$235M.

9. (U) Schedule:

CVN-76

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
CVN-76			
Contract Award	JUN 95	JUN 95	DEC 94
Start Production	NOV 95	NOV 95	MAY 95
Lay Keel	DEC 97	DEC 97	FEB 98
Launch	DEC 00	DEC 00	SEP 00 (Ch-1)
Delivery	DEC 02	DEC 02	DEC 02

b. Current Change Explanations --

(U) Ch-1 The Launch date was changed from MAR 00 to the shipbuilder provided date of September 00. The date changed to allow for a more efficient and productive shipbuilding of steel fabrication in Shipway 12 regarding a normal build sequence.

CVN-77

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
CVN 77			
Definitization of Contracts	DEC 00	JUN 01	JAN 01
Start Production	NOV 01	NOV 01	MAR 01
Lay Keel	DEC 03	DEC 03	FEB 02
Launch	DEC 06	DEC 06	MAR 06
Delivery	DEC 08	DEC 08	JAN 08

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CVN-68 Class, December 31, 1998

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

CVN-77

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

CVN-76

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Length Overall	1092	1092 / 1092	1092	1092
Beam	134	134 / 134	134	134
Maximum Width	252	252 / 252	252	252
Draft (Combat Load) (ft)	38.4	39.0 / 40.4	40.4	38.9
Displacement (tons)	96300	99000 / 102500	102500 1/	97337
Propulsion	NUCLEAR	NUCLEAR / NUCLEAR	NUCLEAR	NUCLEAR
Shaft Horsepower	(b)(1)			
Trial Speed (kts)				
Endurance (at 20 kts)				
Stores (days)	75	75 / 75	75	75
Close In Weapon Systems	4	4 / 4	4	4
NATO Sea Sparrow Missile Systems	3	3 / 3	3	3
Aviation Strike Ordnance (long tons)	2400	2400 / 2400	2451	2451
Ave. fuel (gals)	(b)(1)			
Operational Number of Aircraft (deck multiple in A4 Equivalents)	151	151 / 151	151 3/	151 3/
Core Life (yrs)	13	N/A / N/A	-- 2/	20
Number of Reactors	2	N/A / N/A	2	2
Crew (Including Air Wing)	6280	N/A / N/A	6040	6048

(U) 1/ Actual based on CVN 68 Class standardization trials.

2/ Requires extensive operational data and is dependent on actual core life. The USS NIMITZ, the first CVN 68 class ship, was delivered in 1975 and is currently undergoing a Refueling Complex Overhaul (RCOH). Contract award was April 98.

3/ The operational number of aircraft (deck multiple) in A7 equivalents is 156. The CVN 76 is a modified repeat of the CVN 74/75. RDT&E funding became available in FY 1991 to begin contract design for CVN 76 which continued

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CVN-68 Class, December 31, 1998

10a. ~~(U)~~ Performance Characteristics (Cont'd):
CVN-76

through to FY 95.

b. Current Change Explanations -- None

CVN-77

a. Performance --

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Length Overall	1092	1092 / 1092	1092	1092
Beam	134	134 / 134	134	134
Maximum Width	252	252 / 252	252	252
Draft (Combat Load) (ft)	40.4	39.0 / 40.4	40.4	40.4
Displacement (tons)	97337	99000 / 102500	102500 1/	97337
Propulsion	Nuclear	Nuclear / Nuclear	Nuclear	Nuclear
Shaft Horsepower	(b)(1)			
Trial Speed (kts)				
Endurance (at 20 kts)				
Store (days)	75	75 / 75	75	75
Close in Weapons Systems	4	4 / 4	4	4
NATO Sea Sparrow Missile Systems	3	3 / 3	3	3
Aviation Strike Ordnance (Long Tons)	2451	2400 / 2400	2451	2451
Average Fuel (gals)	(b)(1)			
Operational Number of Aircraft (Deck Multiple in A4 Equivalents)	151	151 / 151	151 3/	151
Core Life (yrs)	15	N/A / N/A	-- 2/	20
Number of Reactors	2	N/A / N/A	2	2
Crew (Including Air Wing)	6048	N/A / N/A	6040	6048

(U) 1/ Actual based on CVN 68 Class standardization trials.

2/ Requires extensive operational data and is dependent on actual core life. The USS NIMITZ, the first CVN 68 class ship, was delivered in 1975 and is currently undergoing a Refueling Complex Overhaul (RCOH). Contract award was April 98.

3/ The operational number of aircraft (deck multiple) in A7 equivalents is 156.

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CVN-68 Class, December 31, 1998

10b. (U) Performance Characteristics (Cont'd):

CVN-77

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

CVN-76

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	48.1	48.1	38.2
Procurement	3862.7	4488.6	4375.0
Basic	(2458.7)		(2974.0)
Government Furnished Eq	(1311.7)		(1271.5)
Other	(18.6)		(38.5)
OF/PD	(73.7)		(91.0)
Total Sailaway	(3862.7)		(4375.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 95 Base-Year \$	3910.8	4536.7	4413.2
Escalation	386.4	433.2	125.7
Development (RDT&E)	(-1.1)	(-1.1)	(-0.8)
Procurement	(387.5)	(434.3)	(126.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	4297.2	4969.9	4538.9
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	1	1	1
Total	1	1	1

c. Foreign Military Sales -- None.

d. (U) Nuclear Costs --
\$901.9M

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CVN-68 Class, December 31, 1998

11a. (U) Total Program Cost and Quantity (Cont'd):

CVN-77

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	0.0	145.7	188.6
Procurement	4557.1	4719.2	4418.9
Basic	(2901.1)		(3287.4)
Government Furnished Eq	(1547.8)		(1003.4)
Other Costs	(21.9)		(28.5)
OF/PD	(86.3)		(99.6)
Total Sailaway	(4557.1)		(4418.9)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 95 Base-Year \$	4557.1	4864.9	4607.5
Escalation	983.7	1037.0	602.8
Development (RDT&E)	(0.0)	(17.3)	(17.5)
Procurement	(983.7)	(1019.7)	(585.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	5540.8	5901.9	5210.3
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	1	1	1
Total	1	1	1

c. Foreign Military Sales -- None.

d. (U) Nuclear Costs --
\$695.5M

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CVN-68 Class, December 31, 1998

12. (U) Unit Cost Summary:

CVN-76

	UCR Baseline (OCT 92 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	4536.7	4413.2	
(2) Quantity	1	1	
(3) Unit Cost	4536.700	4413.200	-2.72
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	4488.6	4375.0	
(2) Quantity	1	1	
(3) Unit Cost	4488.600	4375.000	-2.53

CVN-77

	UCR Baseline (JAN 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	4864.9	4607.5	
(2) Quantity	1	1	
(3) Unit Cost	4864.900	4607.500	-5.29
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	4719.2	4418.9	
(2) Quantity	1	1	
(3) Unit Cost	4719.200	4418.900	-6.36

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CVN-68 Class, December 31, 1998

13. (U) Cost Variance Analysis:
CVN-76

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	47.0	4250.2	-	4297.2
Previous Changes:				
Economic	+0.8	-256.0	-	-255.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-10.4	+380.7	-	+370.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-9.6	+124.7	-	+115.1
Current Changes:				
Economic	-	-23.1	-	-23.1
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+35.6	-	+35.6
Estimating	-	+114.1	-	+114.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+126.6	-	+126.6
Total Changes	-9.6	+251.3	-	+241.7
Current Estimate	37.4	4501.5	-	4538.9

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	48.1	3862.7	-	3910.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-9.9	+367.2	-	+357.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-9.9	+367.2	-	+357.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+34.5	-	+34.5
Estimating	-	+110.6	-	+110.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+145.1	-	+145.1
Total Changes	-9.9	+512.3	-	+502.4
Current Estimate	38.2	4375.0	-	4413.2

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CVN-68 Class, December 31, 1998

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

CVN-76

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-23.1
Increase attributable to the addition of new scope efforts (i.e., Cooperative Engagement Capability, Information Technology-21, and Long Range Line Up Systems). (Engineering)	+34.5	+35.6
Adjustment for Current and Prior Inflation. (Estimating)	+20.8	+21.4
Revised Shipbuilder Cost Estimate. (Estimating)	+55.0	+57.7
Revised Outfitting costs. (Estimating)	+3.9	+4.2
Revised Post Delivery costs. (Estimating)	+0.4	-0.8
Increase for change orders to upgrade the product baseline. (Estimating)	+30.5	+31.6
Procurement Subtotal	+145.1	+126.6

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CVN-68 Class, December 31, 1998

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

CVN-77

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	5540.8	-	5540.8
Previous Changes:				
Economic	-3.9	-310.7	-	-314.6
Quantity	-	-	-	-
Schedule	-	-141.4	-	-141.4
Engineering	+157.3	-479.0	-	-321.7
Estimating	+30.5	-44.7	-	-14.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+183.9	-975.8	-	-791.9
Current Changes:				
Economic	-3.0	-72.0	-	-75.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+256.0	-	+256.0
Estimating	+25.2	+255.2	-	+280.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+22.2	-439.2	-	-417.0
Total Changes	+206.1	-536.6	-	-330.5
Current Estimate	206.1	5004.2	-	5210.3

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CVN-68 Class, December 31, 1998

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

CVN-77

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	4557.1	-	4557.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-138.9	-	-138.9
Engineering	+141.2	-372.3	-	-231.1
Estimating	+26.1	-77.1	-	-51.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+167.3	-588.3	-	-421.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+225.8	-	+225.8
Estimating	+21.3	+224.3	-	+245.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+21.3	+450.1	-	+471.4
Total Changes	+188.6	-138.2	-	+50.4
Current Estimate	188.6	4418.9	-	4607.5

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-3.0
Adjustment for Current and Prior Inflation. (Estimating)	+1.0	+1.0
Revised Program estimate to reflect changes in inflation and adjustments for Small Business Innovative Research. (Estimating)	-1.6	-1.7
Adjustment due to budget realignment. (Estimating)	+0.8	+1.0
Increase for design requirements. (Estimating)	+21.1	+24.9
RDT&E Subtotal	+21.3	+22.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-72.0
Adjustment for Current and Prior Inflation. (Estimating)	+2.2	+2.3
Revised Program estimate to reflect changes in inflation and adjustments for Navy Working Capital Fund (NWCF), and outsourcing. (Estimating)	-1.2	-1.3

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CVN-68 Class, December 31, 1998

13b. (U) Cost Variance Analysis (Cont'd):
CVN-77

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Increase associated with incorporation of Transition Technologies. (Engineering)	+225.8	+256.0
Revised Outfitting costs. (Estimating)	+9.7	+11.6
Revised Post Delivery costs. (Estimating)	+2.7	+3.6
Adjustments to the CVN 77 funding profile to reflect more refined construction estimates. (Estimating)	+210.9	+239.0
Procurement Subtotal	+450.1	+439.2

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):
CVN-76

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4297.20	-278.30	--	--	+35.60	+484.40	--	--	+241.70	4538.90

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4250.20	-279.10	--	--	+35.60	+494.80	--	--	+251.30	4501.50

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	DEC 02	DEC 02
Total Cost	N/A	N/A	4297.2	4538.9
Total Quantity	N/A	N/A	1	1
Prog Acq Unit Cost	N/A	N/A	4297.2	4538.9

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CVN-68 Class, December 31, 1998

14a. (U) Unit Cost and Other History (Cont'd):

CVN-77

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC	Changes								PAUC
Prod Est	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	Cur Est
5540.80	-389.60	--	-141.40	-65.70	+266.20	--	--	-330.50	5210.30

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC	Changes								PUC
Prod Est	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	Cur Est
5540.80	-382.70	--	-141.40	-223.00	+210.50	--	--	-536.60	5004.20

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	DEC 08	JAN 08
Total Cost	N/A	N/A	5540.8	5210.3
Total Quantity	N/A	N/A	1	1
Prog Acq Unit Cost	N/A	N/A	5540.8	5210.3

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

a. Procurement --

(U) Nuclear Components:

Westinghouse Electric Co., Schenectady NY

N00024-88-C-4008, FFP/CPFF

Award: February 28, 1988

Definitized: February 28, 1988

Initial Contract Price		
Target	Ceiling	Qty
\$354.6	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$354.6	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$354.6	\$354.6

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CVN-68 Class, December 31, 1998

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	<u>N/A</u>	<u>N/A</u>
Net Change	N/A	N/A

Explanation of Change:

(U) The contract amounts include funding for CVN 74/75 and CVN 76. Cost performance reporting is not required for this FFP contract.

(U) <u>CVN-76 Construction:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Newport News Shipbuilding, Newport News VA	\$2517.3	\$2884.0	1
NO0024-95-C-2106, FPIF			
Award: December 8, 1994			
Definitized: December 8, 1994			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$2563.5	\$2937.0	1	\$2724.2	\$2724.8

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-18.5	\$-5.8
Cumulative Variances To Date (11/22/98)	<u>\$-55.8</u>	<u>\$-9.6</u>
Net Change	\$-37.3	\$-3.8

Explanation of Change:

(U) The net change in both cost and schedule variances is less than 1% of the progress earned to date and is considered insignificant.

(U) <u>Nuclear Components:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
DEPARTMENT OF ENERGY, WASHINGTON DC	\$865.2	N/A	0
NO0024-67-F-5110, FFP/CPFF			
Award: February 1, 1988			
Definitized: February 1, 1988			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$859.2	N/A	0	\$859.2	\$859.2

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CVN-68 Class, December 31, 1998

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	<u>N/A</u>	<u>N/A</u>
Net Change	N/A	N/A

Explanation of Change:

(U) The contract amounts include funding for CVN 74/75 and CVN 76. Cost performance reporting is not required on this FFP contract.

(U) <u>Nuclear Components:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Westinghouse Electric Co., Monroeville PA			
N00024-88-C-4007, FFP/CPFF	\$814.0	N/A	0
Award: February 1, 1988			
Definitized: February 1, 1988			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$853.1	N/A	0	\$853.1	\$853.1

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	<u>N/A</u>	<u>N/A</u>
Net Change	N/A	N/A

Explanation of Change:

(U) The contract amounts include funding for CVN 74/75 and CVN 76. Cost performance reporting is not required on the FFP contract.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years</u> (FY82-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	108.5	34.9	39.2	60.9	243.5
Procurement	4568.1	753.6	3970.9	213.1	9505.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	4676.6	788.5	4010.1	274.0	9749.2

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CVN-68 Class, December 31, 1998

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

CVN-76

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

<u>Appropriation</u>	<u>Prior Years (FY91-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-04)</u>	<u>Total</u>
RDT&E	37.4	-	-	-	37.4
Procurement	4395.7	2.1	20.3	83.4	4501.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	4433.1	2.1	20.3	83.4	4538.9

CVN-77

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

<u>Appropriation</u>	<u>Prior Years (FY98-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-09)</u>	<u>Total</u>
RDT&E	71.1	34.9	39.2	60.9	206.1
Procurement	172.4	751.5	3950.6	129.7	5004.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	243.5	786.4	3989.8	190.6	5210.3

b. Annual Summary - CVN-76

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991				1.9	1.8
1992				8.6	8.2
1993				12.3	12.0
1994				10.6	10.5
1995				4.8	4.9
Subtotal				38.2	37.4

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				832.2	829.4
1994					
1995	1		4375.0	3451.7	3566.3

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CVN-68 Class, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
CVN-76

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999					
2000				1.9	2.1
2001				17.9	20.3
2002				29.8	34.4
2003				39.8	46.9
2004				1.7	2.1
Subtotal		1	4375.0	4375.0	4501.5

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total		1	4375.0	4413.2	4538.9

b. Annual Summary -- CVN-77

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				31.3	32.9
1999				35.9	38.2
2000				32.3	34.9
2001				35.7	39.2
2002				23.7	26.4
2003				8.5	9.6
2004				9.9	11.5
2005				11.3	13.4
Subtotal				188.6	206.1

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				45.3	48.7
1999				113.2	123.7
2000				675.4	751.5
2001		1	4418.9	3485.3	3950.6
2002					

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CVN-68 Class, December 31, 1998

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

CVN-77

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2005				15.5	19.1
2006				10.3	12.9
2007				9.7	12.4
2008				15.4	20.1
2009				48.8	65.2
Subtotal		1	4418.9	4418.9	5004.2

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total		1	4418.9	4607.5	5210.3

17. (U) Delivery/Expenditure Information:

CVN-76

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 2164.7

(U) Percent Total Program Expended: 47.7%

CVN-77

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 35.7

(U) Percent Total Program Expended: 0.7%

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CVN-68 Class, December 31, 1998

18. (U) Operating and Support Costs:
CVN-76

a. (U) Assumptions and Ground Rules --

These costs are based on the operating costs for supplies, equipage, and pier side support when deployed. This O&S estimate assumes carrier life cycle is 50 years vice the 48 years in previous estimates. Indirect costs have been embedded in personnel costs (Mission Pay and Allowances). Cost estimate performed FEB 99. These assumptions are carried over from the CVN 74/75.

b. (U) Costs -- (FY 1992 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per CVN	N/A
Mission Pay & Allowances	245.3	N/A
Unit Level Consumption	30.0	N/A
Intermediate Maintenance	1.2	N/A
Depot Maintenance	106.1	N/A
Contractor Support	0.0	N/A
Sustaining Support	14.0	N/A
Indirect Costs	0.0	N/A
Total	396.6	N/A

CVN-77

a. (U) Assumptions and Ground Rules --

Same as CVN 76 above.

b. (U) Costs -- (FY 1992 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per CVN	N/A
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	N/A	N/A

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AF-20 NAVSTAR GPS

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: NAVSTAR GPS

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): NAVSTAR Global Positioning System (NAVSTAR GPS)

2. (U) DoD Component: USAF

Joint Participants:

United States Army (USA), United States Navy (USN), United States Marine Corps (USMC)

3. (U) Responsible Office and Telephone Number:

NAVSTAR GPS Joint Program Office	COL JAMES B. ARMOR, JR.
Space and Missile Systems Center	Assigned: July 28, 1996
2435 Vela Way, Suite 1613	DSN 833-1526; COMM (310) 363-1526
El Segundo, CA 90245-5500	JAMES.ARMOR@LOSANGELES.AF.MIL

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

RDT&E:

(U)	PE 0206626M
(U)	PE 0305164A
(U)	PE 0305164F
(U)	PE 0305164M
(U)	PE 0305164N
(U)	PE 0305165F
(U)	PE 0603421F
(U)	PE 0604478F
(U)	PE 0604480F

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NAVSTAR GPS, December 31, 1998

4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) PE 0604777N
(U) PE 0604778A
(U) PE 0604778F

PROCUREMENT:

(U) APPN 3010 ICN 000000 (Air Force)
(U) APPN 3080 ICN 836730 (Air Force)
(U) APPN 3080 ICN 836790 (Air Force)
(U) APPN 3080 ICN 86190A (Air Force)
(U) APPN 1810 ICN BLI265700 (Navy)
(U) APPN 2035 ICN K47800 (Army)
(U) APPN 3020 ICN MGPS00 (Air Force)
(U) APPN 1611 ICN N/A (Navy)
(U) APPN 1506 ICN OSIP 17-88 (Navy)

MILCON:

(U) PE 0305165F

O&M:

(U) PE 0305164F
(U) PE 0305164N
(U) PE 0305165F

5. (U) References:

NAVSTAR GPS Satellite

SAR Baseline (Development Estimate):

(U) Decision Coordinating Paper (DCP) #133, Revision B, February 1, 1980.

Approved Program:

(U) AFAE Approved Acquisition Program Baseline (APB) dated May 3, 1996.

NAVSTAR GPS User Equip

SAR Baseline (Development Estimate):

(U) Decision Coordinating Paper (DCP) #133, Revision B, February 1, 1980.

Approved Program:

(U) Approved Acquisition Program Baseline (APB) dated May 3, 1996.

6. (U) Mission and Description:

(U) The NAVSTAR Global Positioning System (GPS) is a space-based radio positioning, navigation, and time distribution system. GPS provides precise, continuous, all-weather, common-grid positioning, velocity, navigation, and time reference capability to civil, commercial, and military users worldwide. Military mission areas supported include navigation and position fixing, air interdiction, close air support, special operations, strategic attack, counterair and aerospace defense, theater and tactical command, control, communications, and intelligence, precision munition guidance, and ground/sea

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

warfare. GPS carries a suite of nuclear detonation detection system sensors as a secondary payload. These sensors provide worldwide, near realtime, 3-dimensional location of nuclear detonations. NAVSTAR GPS does not replace any United States Air Force weapon system; however, it provides the capability to replace the following support systems: Very High Frequency (VHF) Omnidirectional Range (VOR), Tactical Air Navigation (TACAN), and Distance Measurement Equipment (DME). Many of these systems are planned to be retired over the next decade, as OMEGA was on 30 Sep 97.

7. (U) Executive Summary:

(U) Full scale development of the NAVSTAR GPS satellite program began in June 1979, with approval of Milestone II. Between this date and October 1985, the Joint Program Office (JPO) launched 10 Block I satellites and developed the associated ground control system software to support system testing. Twelve developmental Block I satellites were built, one satellite was lost as a result of an Atlas-Centaur launch vehicle failure, and one satellite was modified to become the qualification model for the production satellite program.

In 1983, the NAVSTAR GPS JPO awarded a production contract for 28 Block II satellites. The JPO successfully launched the first production satellite in February 1989. Initial Operational Capability (IOC) of the Global Positioning System was declared on 8 December 1993 in a joint announcement by the Department of Defense (DoD) and Department of Transportation (DOT). The Air Force Space Command (AFSPC) declared Full Operational Capability (FOC) in July 1995 after the deployment of 24 Block II/IIA satellites and completion of operational testing. The last Block IIA satellite was launched on 5 November 1997.

The JPO's on-going analysis of constellation health indicates the predicted life of the Block IIA satellites is currently underestimated. Block IIA satellite reliability will be updated to reflect actual on-orbit performance, and launch schedules will be adjusted accordingly.

In June 1989, the NAVSTAR GPS JPO awarded a production contract for a block change of 20 additional replenishment satellites (Block IIR) to the approved program with priced options for six more. Of the six satellites covered by the options, one was exercised in 1995. On 17 January 1997, a Delta II launch vehicle carrying the first Block IIR satellite exploded after launch from Cape Canaveral Air Station, FL. The second Block IIR satellite was successfully launched on 22 July 1997 and on-orbit testing continued through January 1998. On-orbit testing identified a problem with the satellite's UHF Crosslink receiver. Radio signal interference affects the satellite's ability to exchange data with other GPS satellites. This problem has no adverse effect on the navigation signal. Bench-level testing of the IIR crosslink receiver modification is in progress. The contractor is proceeding with efforts to complete crosslink modifications in time to meet April 1999 GPS launch availability. On-orbit testing will be conducted during the summer of 1999.

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7. (U) Executive Summary (Cont'd):

In April 1996, the JPO awarded a sustainment contract for six production satellites (Block IIF), with priced options for 27 additional satellites. Preliminary satellite design was completed on 21 February 1997. The satellite Final Design Complete (FDC) milestone was attained on 30 April 1998. The next satellite program milestone, Functional Design Verified (FDV), is scheduled for 15 February 2000.

GPS user equipment development began in June 1979 with receiver testing (using Block I satellites) in a variety of land, sea, and air vehicles. Since then, the JPO has awarded contracts for the research, development, and production of airborne, shipboard, and handheld receivers. GPS user equipment successfully completed the Defense Acquisition Board (DAB) Milestone IIIB in January 1992 and achieved depot IOC in March 1993. Miniaturized Airborne GPS Receiver (MAGR) depot FOC was declared by Tobyhanna Army Depot on 22 November 1996. This completed the full depot capability milestone seven months ahead of the objective date.

AFSPC assumed management responsibility for the ground control segment in April 1990. This segment consists of ground antennas, monitor stations, and a master control station necessary to command and control GPS satellites. In 1995 the program office awarded a contract to Lockheed Martin Mission Systems (LM-MS) to replace the OCS mainframe computers with a new distributed architecture. The Global Positioning System (GPS) Operational Control Segment (OCS) Support Contract (GOSC) and IIF OCS development are the critical path to the first IIF launch. Preliminary activities to transition the new OCS architecture to operations per the evolving transition plan were started. Subsequent to the formulation of the FY00 budget, it was determined that additional resources and assets are required to ensure a seamless and timely transition of GPS operations from the legacy mainframe system to the new distributed architecture. At this time, transition to operations schedules indicate the OCS cannot meet the projected first Block IIF launch in March 2003. Based on concerns expressed by Air Force Space Command (AFSPC) and the GPS Block IIF contractor, a joint AFSPC/program office transition working group was formed to ensure the new OCS architecture transition to operations supports constellation sustainment.

In 1995, work began on the Navigation Warfare (Navwar) Advanced Concept Technology Demonstration (ACTD). The ACTD objectives included: 1) formulating a Concept of Operations for joint forces using GPS in an electronic warfare environment; 2) developing, fielding, and demonstrating new protection and operational employment (prevention) capabilities for airborne and ground-based platforms; and 3) providing the basis for a program to implement these new capabilities into DoD and Allied forces.

In March 1996, the President approved a comprehensive national policy of the future management and use of the Global Positioning System and related U.S. Government augmentations. Recognizing the nation's reliance on GPS as an issue of national security and economic well being, the Presidential Decision Directive established policy guidelines which addressed a broad range of military, civil, commercial, and scientific interests, both national and

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7. (U) Executive Summary (Cont'd):

international. On 7 April 1998, the Under Secretary of Defense for Acquisition and Technology designated the GPS Program Acquisition Category (ACAT) ID. The JPO is preparing a strategy with the Office of the Secretary of Defense (OSD) for a program review for GPS Modernization and Navwar in the summer of 1999 that will present to the Space Overarching Integrated Product Team (OIPT) and the Defense Acquisition Board (DAB) a comprehensive family of road maps for all segments of the program, including Space and Control, User Equipment (UE), and Prevention. Top level acquisition strategies and funding requirements will be identified.

Vice President Gore announced on 25 Jan 99 a \$426 million initiative to modernize the GPS, including the addition of two new civil signals to the next generation of GPS satellites scheduled for launch beginning in 2005. Implementation of the GPS improvements is funded in the FY00 President's Budget, a total of \$426 million over six years. Of that amount, \$130 million will come from the Department of Transportation (DOT), to support the civil use improvements. When combined with the current civil signal, the two new civil signals will significantly improve the robustness and reliability of GPS for civil users, and will enable unprecedented real-time determination of highly accurate position location anywhere on Earth.

Increased program content driven by Navwar and GPS Modernization improvements caused increases in funding that led to an APB cost breach in User Equipment RDT&E. The program office will update the APB to reflect cost objectives and thresholds for Navwar and GPS Modernization.

Overall program schedule and cost risk remain moderate. However, this is contingent upon receiving funding to support the requirements as listed in the Acquisition Program Baseline (APB). The NAVSTAR GPS program is expected to satisfy all mission requirements.

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8. (U) Threshold Breaches:

NAVSTAR GPS Satellite

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

NAVSTAR GPS User Equip

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Increased program content from the Navwar and GPS Modernization programs caused increases in program funding that led to the User Equipment RDT&E cost breach. Also, the GPS JPO will submit a Program Deviation Report (PDR) and

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8c. (U) Threshold Breaches (Cont'd):

update the APB to reflect cost objectives and thresholds for Navwar and GPS Modernization.

9. (U) Schedule:

NAVSTAR GPS Satellite

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I (DSARC)	DEC 73	DEC 73	DEC 73
Milestone II (DSARC)	JUN 79	JUN 79	JUN 79
First Production Satellite Launch	JAN 87	FEB 89	FEB 89
Block IIR Contract Award	N/A	JUN 89	JUN 89
Control Segment Turnover to AFSPACECOM	N/A	APR 90	APR 90
Last Block IIA Satellite Delivery	N/A	NOV 92	MAY 93
21 Satellites on-orbit	N/A	MAR 93	JUN 93
Last Block IIA Satellite Delivery	N/A	NOV 92	
First Block IIR Contract Delivery	N/A	AUG 96	AUG 96
Second Block IIR Contract Delivery	N/A	NOV 96	NOV 96
Availability of First Block IIR Satellite for Launch	N/A	JAN 97	JAN 97

b. Current Change Explanations -- None

NAVSTAR GPS User Equip

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I (DSARC)	DEC 73	N/A	DEC 73
Milestone II (DSARC)	JUN 79	N/A	JUN 79
Milestone III (DSARC)	SEP 83	N/A	SEP 83
Milestone IIIA (JRMB) Award	N/A	JUN 86	JUN 86
AF DT User Equipment (UE)			
Begin	N/A	JUL 88	JUL 88
Complete	N/A	MAY 89	AUG 89
User Equipment OT&E			
Begin	N/A	JUN 89	JUN 89
Complete	N/A	JUL 91	JUL 91
Milestone IIIB (DAB) UE	MAR 89	SEP 91	JAN 92
Initial Depot Capability	N/A	SEP 92	MAR 93
First Full-Rate UE Production Delivery	N/A	NOV 93	NOV 93
Full Depot Capability	N/A	JUN 97	NOV 96

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9b. (U) Schedule (Cont'd):
NAVSTAR GPS User Equip

b. Current Change Explanations --
(U) None

10. (U) Performance Characteristics:

NAVSTAR GPS Satellite

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
3-D System Positioning Accuracy (meters) (Spherical Error Probable (SEP))	16	16 / 16	10	16
3-D System Positioning Accuracy for 180 days after last Nav Update				
Block II SEP (km)	N/A	10 / 10	TBD	10
Block IIR SEP (m)	N/A	16 / 16	TBD	16
Block II Satellite Mean Mission Duration (MMD)(yrs)	6	6 / 6	5.35 /A	8.45
System Availability % (minimum of 21 satellites are operational at any time)	98	98 / 98	99.49 /B	98
Satellite: (Block II) 13-49 -	N/A	N/A / N/A	TBD	
Survivability				
Gamma Dose Rate (rad (Silicon))	N/A			
X-ray Fluence (cal/cm2)	N/A			
Neutron (n/cm2)	N/A			
Satellite: (Block IIR) 41-50 -	N/A			
Survivability				
Gamma Dose Rate (rad (Silicon))	N/A			
X-ray Fluence (cal/cm2)	N/A			
Neutron (n/cm2)	N/A			



(b)(1)

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NAVSTAR GPS, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):
NAVSTAR GPS Satellite

	Development Estimate (SAR)	Approved Program (APB) Oni/Threshold	Demon- strated Perf	Current Estimate
 Total Dose (mega rad (Silicon))	N/A	(b)(1)		
 Spaced Based Laser Threat (w/cm2)	N/A			
Satellite Maximum Weight (lbs) (Delta II)	N/A	4480	/ 4480	4480
Expected Ground Power (End of Life)(dbw)				
L1 (C/A)	-160	-160	/ -160	-160
L1 (Precision Code)	-163	-163	/ -163	-163
L2 (Precision Code)	-166	-166	/ -166	-166
Cesium Clock Stability (f/f)	2×10^{-13}	2×10^{-13}	/ 2×10^{-13}	1×10^{-13}
Time Transfer (Universal Coordinated Time) (nsec)	+/-100	+/- 100	/ +/- 100	+/-25
Block II Satellite Design Life (yrs)	N/A	7.5	/ 7.5	5.35 /A 7.5
Block I Satellite Expected Ground Power (End of Life (dbw)	N/A	N/A	/ N/A	TBD
L1 (C/A)	-160	N/A	/ N/A	-155
L1 (Precision Code)	-163	N/A	/ N/A	-158
L2 (Precision Code)	-166	N/A	/ N/A	-159
Cesium Clock Stability f/f 2/	2×10^{-13}	N/A	/ N/A	2×10^{-13}

(U) A/ Current demonstrated performance reflects Block II only. Reliability model projections incorporating actual on-orbit experience averaged over the constellation, as of October 1997 indicate an expected Mean Mission Duration (MMD) of 8.45 years versus the required MMD of 6.0 years and Demonstrated Performance of 5.35 years versus 4.69 years in the last report. The additional MMD is due mostly to longer solar array life. The reliability model will be updated to reflect changes in the constellation. The Air Force Space Command (AFSPC) and the Joint Program Office (JPO) are currently working on an approval and update plan for reliability modeling. Demonstrated performance will continue to change based on experience with on-orbit satellites.

(U) B/ Requirement is 98% probability of 21 satellites operational. Demonstrated performance is based upon actual availability of the satellites in the constellation.

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NAVSTAR GPS, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):
NAVSTAR GPS Satellite

(U) C/ Gamma dose rate parameters listed in the approved program column are derived from the approved system operation requirements documents and technical requirements documents.

b. Current Change Explanations -- None

NAVSTAR GPS User Equip

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Reliability Mean Time Between Operational Mission Failures (hours)				
Airborne				
5-Channel	550	590 / 500	2130.2	2130.2
2-Channel	550	929 / 500	722.8	722.8
Ground (hrs)	850	2000 / 500	1653.2	1653.2
Sea (hrs)	900	680 / 680	2880.8	2880.8
Maintainability Mean Time to Repair (hours)				
Airborne				
5-Channel	1.3	1 / 1	.75	.75
2-Channel	1.3	.75 / .75	.27	.27
Ground (hrs)	1.2	.75 / .75	.18	.18
Sea (hrs)	1.3	1.5 / 1.5	.77	.77

(U) Note: The mean time to repair reflects intermediate-level repair of the sets, not operational-level.

b. Current Change Explanations -- None

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NAVSTAR GPS, December 31, 1998

11. (U) Total Program Cost and Quantity (Dollars in Millions):
NAVSTAR GPS Satellite

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	967.6	1563.3	1581.8
Procurement	623.4	3026.9	2977.3
Flyaway	(583.6)		(2963.5)
Other Weapon Systems	(39.8)		(13.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	8.4	4.7	4.7
Acquisition O&M	0.0	0.0	0.0
Total FY 79 Base-Year \$	1599.4	4594.9	4563.8
Escalation	707.3	6798.0	5587.6
Development (RDT&E)	(204.9)	(1389.2)	(1209.5)
Procurement	(496.1)	(5406.2)	(4375.5)
Construction (MILCON)	(6.3)	(2.6)	(2.6)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2306.7	11392.9	10151.4
b. (U) Quantity --			
Development (RDT&E)	12	12	12
Procurement	28	106	103
Total	40	118	115

(U) Note: All Research Development Test and Evaluation (RDT&E) prototypes are considered fully configured.

Note: The above table shows Department of Defense (DoD) funding only. Beginning in FY00, the Department of Transportation (DOT) will fund the civil share of the GPS Modernization.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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NAVSTAR GPS, December 31, 1998

11a. (U) Total Program Cost and Quantity (Cont'd):

NAVSTAR GPS User Equip

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	941.8	1005.3	1161.5
Procurement	1613.1	2143.3	2029.4
Flyaway	(1115.9)		(1394.3)
Other Weapon Systems	(497.2)		(560.9)
Peculiar Support	(0.0)		(32.0)
Initial Spares	(0.0)		(42.2)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>56.9</u>
Total FY 79 Base-Year \$	2554.9	3148.6	3247.8
Escalation	2320.9	3492.9	3466.5
Development (RDT&E)	(441.9)	(593.7)	(752.9)
Procurement	(1879.0)	(2899.2)	(2649.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(64.0)</u>
Total Then Year \$	4875.8	6641.5	6714.3
b. (U) Quantity --			
Development (RDT&E)	129	248	248
Procurement	<u>27210</u>	<u>119695</u>	<u>232872</u>
Total	27339	119943	233120

(U) Notes: The family of NAVSTAR GPS user equipment consists of over 25 different end items or line replaceable units (LRU's). These LRU's are grouped into six broad categories: receivers, antenna electronics, antennas, control display units, mounts, and support equipment. A user equipment set consists of one or more of these LRU's, depending upon the host vehicle. All Research Development Test and Evaluation (RDT&E) units are considered fully configured end items.

On September 1990, the Defense Acquisition Board approved the low rate initial production (LRIP) quantities for Receivers 3A and 3S of 900 units (FY90) and 1,000 units (FY91).

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11c. (U) Total Program Cost and Quantity (Cont'd):
NAVSTAR GPS User Equip

c. (U) Foreign Military Sales --		
Country	Dollars	Quantities Ancillary/Receivers/Security Devices
Australia	\$.8M	0/38/1624
Belgium	\$.5M	12/12/534
Canada	\$ 2.9M	1768/268/9553
Denmark	\$.9M	0/0/3478
Finland	\$.1M	99/10/350
France	\$ 2.3M	12/3/8477
Germany	\$ 11.4M	59/100/8579
Greece	\$ 1.9M	47/45/225
Israel	\$ 1.8M	392/43/7523
Italy	\$.6M	0/0/1882
Japan	\$ 8.0M	25/90/718
Korea	\$ 5.9M	132/144/1190
Kuwait	\$.0M	74/37/0
Luxembourg	\$.1M	225/37/0
NATO	\$.1M	7/0/23
Netherlands	\$ 1.1M	4/0/4349
New Zealand	\$.0M	0/0/317
Norway	\$.9M	11/50/1379
Portugal	\$.0M	0/0/11
Singapore	\$ 1.4M	64/36/90
Spain	\$.6M	2335/182/253
Saudi Arabia	\$.1M	464/140/0
Switzerland	\$.1M	0/0/235
Turkey	\$ 5.8M	3536/596/1140
United Kingdom	\$ 3.2M	17/0/9158
Mid-Life Update	\$ 12.7M	322/325/1625

Notes: 1) Security devices refer to one of many types of auxiliary output chips or security modules. 2) The mid-life update is the program for F-16 sales to Belgium, Norway, Denmark, and the Netherlands. 3) Sales to Kuwait, New Zealand, and Portugal have a dollar value which rounds to less than \$.1M.

d. Nuclear Costs -- None.

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NAVSTAR GPS, December 31, 1998

12. (U) Unit Cost Summary:

NAVSTAR GPS Satellite

	UCR Baseline (MAY 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 79 BY\$)	4594.9	4563.8	
(2) Quantity	118	115	
(3) Unit Cost	38.940	39.685	+1.91
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 79 BY\$)	3026.9	2977.3	
(2) Quantity	106	103	
(3) Unit Cost	28.556	28.906	+1.23

NAVSTAR GPS User Equip

	UCR Baseline (MAY 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 79 BY\$)	3148.6	3247.8	
(2) Quantity	119943	233120	
(3) Unit Cost	0.026	0.014	-46.15
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 79 BY\$)	2143.3	2029.4	
(2) Quantity	119695	232872	
(3) Unit Cost	0.018	0.009	-50.00

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NAVSTAR GPS, December 31, 1998

13. (U) Cost Variance Analysis:
NAVSTAR GPS Satellite

a. (U) 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	-217.3	-857.5	-1.4	-1076.2
Quantity	-	+5198.7	-	+5198.7
Schedule	+37.9	+580.1	-	+618.0
Engineering	+292.7	+319.4	-	+612.1
Estimating	+935.7	+670.7	+0.5	+1606.9
Other	-	-	-	-
Support	+339.6	-22.1	-6.5	+311.0
Subtotal	+1388.6	+5889.3	-7.4	+7270.5
Current Changes:				
Economic	-30.0	-101.1	-	-131.1
Quantity	-	-114.0	-	-114.0
Schedule	-	-	-	-
Engineering	+239.2	+361.7	-	+600.9
Estimating	+21.0	+180.1	-	+201.1
Other	-	-	-	-
Support	-	+17.3	-	+17.3
Subtotal	+230.2	+344.0	-	+574.2
Total Changes	+1618.8	+6233.3	-7.4	+7844.7
Current Estimate	2791.3	7352.8	7.3	10151.4

(U) Summary (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	-	+1654.8	-	+1654.8
Schedule	+18.1	-18.4	-	-0.3
Engineering	+161.1	+230.9	-	+392.0
Estimating	+197.9	+350.4	+0.4	+548.7
Other	-	-	-	-
Support	+122.6	-33.6	-4.1	+84.9
Subtotal	+499.7	+2184.1	-3.7	+2680.1
Current Changes:				
Quantity	-	-40.0	-	-40.0
Schedule	-	-	-	-
Engineering	+107.2	+138.6	-	+245.8
Estimating	+7.3	+63.6	-	+70.9
Other	-	-	-	-
Support	-	+7.6	-	+7.6
Subtotal	+114.5	+169.8	-	+284.3
Total Changes	+614.2	+2353.9	-3.7	+2964.4
Current Estimate	1581.8	2977.3	4.7	4563.8

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices (Economic)	N/A	-30.0
Funds added for GPS Modernization (FY97-FY06)	+63.0	+140.3
(Engineering)		
Funds added for GPS command and control	+9.8	+21.6
(FY00-FY02) (Engineering)		
Funds added for IIF satellite control system	+34.4	+77.3
(FY00-FY05) (Engineering)		
Adjustment for Current and Prior Inflation	+1.4	+3.2
(Estimating)		
Congressional undistributed reductions	-0.2	-0.4
(FY97-FY99) (Estimating)		
Inflation decrease in Air Force data base	-3.5	-7.8
(FY00-FY05) (Estimating)		
Funds reprogrammed for higher AF priorities	-0.4	-0.8
(FY97-FY05) (Estimating)		
Increased estimate to reflect revised	+10.0	+26.8
economic assumptions (FY00-FY16) (Estimating)		
RDT&E Subtotal	+114.5	+230.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-118.1
Economic Adjustment for negative program	N/A	+17.0
change (Economic)		
Cancellation of three IIF satellites	-40.0	-114.0
(FY99-FY00) (Quantity)		
Funds added for GPS Modernization (FY00-FY05)	+95.2	+254.9
(Engineering)		
Funds added for IIR Satellite Crosslink fix	+25.5	+60.9
(FY94-FY01) (Engineering)		
Funds added for IIF satellite control system	+6.6	+17.0
(FY01-FY05) (Engineering)		
Funds added for IIF satellite launch support	+11.3	+28.9
(FY00-FY05) (Engineering)		
Adjustment for Current and Prior Inflation.	+3.5	+8.3
(Estimating)		
Congressional undistributed reductions	-1.6	-3.8
(FY99) (Estimating)		
Reprogrammed to PE 0305913F for Nuclear	-0.7	-1.7
Detonation (NUDET) Detection System (NDS)		
Augmentation Payload (NAP) (FY97) (Estimating)		
Inflation decrease in Air Force data base	-12.1	-31.0
(FY00-FY05) (Estimating)		

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Funds reprogrammed for higher Air Force priorities (FY96-FY98) (Estimating)	-1.7	-4.0
Change in satellite acquisition strategy from multiyear procurement to annual buy (FY99-FY04) (Estimating)	+45.0	+119.0
Funding reprogrammed for higher Air Force priorities in FYDP extension (FY04-FY05) (Estimating)	-6.2	-16.5
Increased estimate to reflect revised economic assumptions (FY00-FY16) (Estimating)	+37.4	+109.8
Funds added for Congressionally mandated Alternate Master Control Station (FY00-FY01) (Support)	+7.6	+17.3
Procurement Subtotal	+169.8	+344.0

NAVSTAR GPS User Equip

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	1383.7	3492.1	-	-	4875.8
Previous Changes:					
Economic	-50.1	-323.7	-	-9.7	-383.5
Quantity	-	+2212.5	-	-20.0	+2192.5
Schedule	+20.7	+801.3	-	-	+822.0
Engineering	+83.2	-46.8	-	-	+36.4
Estimating	+446.9	-1609.6	-	+107.4	-1055.3
Other	-	-	-	-	-
Support	-17.8	+402.9	-	+38.0	+423.1
Subtotal	+482.9	+1436.6	-	+115.7	+2035.2
Current Changes:					
Economic	-7.6	-15.5	-	-1.1	-24.2
Quantity	-	-786.0	-	-	-786.0
Schedule	-	+9.0	-	-	+9.0
Engineering	-	-	-	-	-
Estimating	+55.4	+549.0	-	-0.4	+604.0
Other	-	-	-	-	-
Support	-	-6.2	-	+6.7	+0.5
Subtotal	+47.8	-249.7	-	+5.2	-196.7
Total Changes	+530.7	+1186.9	-	+120.9	+1838.5
Current Estimate	1914.4	4679.0	-	120.9	6714.3

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13a. (U) Cost Variance Analysis (Cont'd):
NAVSTAR GPS User Equip

(U) Summary (FY 1979 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	941.8	1613.1	-	-	2554.9
Previous Changes:					
Quantity	-	+854.0	-	-10.0	+844.0
Schedule	+10.6	+199.4	-	-	+210.0
Engineering	+38.1	-21.3	-	-	+16.8
Estimating	+153.3	-673.1	-	+49.1	-470.7
Other	-	-	-	-	-
Support	-5.1	+129.5	-	+15.2	+139.6
Subtotal	+196.9	+488.5	-	+54.3	+739.7
Current Changes:					
Quantity	-	-309.3	-	-	-309.3
Schedule	-	+3.2	-	-	+3.2
Engineering	-	-	-	-	-
Estimating	+22.8	+225.2	-	-	+248.0
Other	-	-	-	-	-
Support	-	+8.6	-	+2.6	+11.2
Subtotal	+22.8	-72.3	-	+2.6	-46.9
Total Changes	+219.7	+416.2	-	+56.9	+692.8
Current Estimate	1161.5	2029.3	-	56.9	3247.7

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices (Economic)	N/A	-7.6
Increased estimate for development of GPS Enhancements (FY00-FY05) -NAVY. (Estimating)	+22.3	+53.3
Increased estimates for development of GPS Enhancements (FY98-FY05) -AIR FORCE (Estimating)	-0.1	+0.2
Adjustment for current and prior year escalation (FY94-FY98) -AIR FORCE (Estimating)	+0.4	+1.1
Adjustment for current and prior year escalation (FY94-FY99) -NAVY (Estimating)	+0.2	+0.8
RDT&E Subtotal	+22.8	+47.8
(2) <u>Procurement</u>		
Revised escalation indices (Economic)	N/A	-15.5
Revised Army UE requirements from 193,327 to 195,960(2,633) with increased handheld sets (FY02-FY05) -ARMY (Quantity)	+3.1	+7.3
Quantity decrease of 3,720 aircraft sets from 11,997 to 8,277 (FY00-FY06) -AIR FORCE (Quantity)	-323.4	-818.6

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13b. (U) Cost Variance Analysis (Cont'd):
NAVSTAR GPS User Equip

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Quantity increase of 542 Navy aircraft sets from 4417 to 4959 (FY97-FY04)-NAVY (Quantity)	+11.0	+25.3
Increase to recurring unit cost of handheld sets due to a shift in schedule to the right -AIR FORCE (Schedule)	+0.1	+0.4
Increase to recurring unit cost of handheld sets due to a shift in schedule -ARMY (Schedule)	+2.5	+7.1
Increase to recurring unit cost of aircraft sets due to a shift in schedule to the right (FY 98-FY01) -NAVY (Schedule)	+0.6	+1.5
Revised estimates for Line Replaceable Unit(LRU) average unit costs -AIR FORCE (Estimating)	+214.9	+514.5
Adjustment for current and prior year escalation (FY93-FY99) -AIR FORCE (Estimating)	+6.8	+16.1
Revised estimates for Line Replaceable Units (LRU) Average Unit Costs for ground sets. (FY00-FY12) -ARMY (Estimating)	+13.3	+34.5
Adjustment for current and prior year escalation (FY95-FY97) -ARMY (Estimating)	+0.1	+0.5
Revised estimates for Line Replaceable Units (LRU) Average Unit Costs (FY98-FY05) -NAVY (Estimating)	-9.9	-16.6
Revised estimate for program support (FY98-FY05) -NAVY (Support)	-37.4	-107.5
Adjustment for current and prior year escalation (FY96-FY99) -NAVY (Support)	+0.5	+1.2
Revised estimates for program support (FY99-FY03) -AIR FORCE (Support)	+51.9	+119.9
Revised estimates for Program Support of ground sets (FY00-FY12) -ARMY (Support)	-6.4	-19.8
Procurement Subtotal	-72.3	-249.7
(3) <u>O&M</u>		
Revised escalation indices (Economic)	N/A	-1.1
Adjustment for current and prior year escalation (FY95-FY96) -NAVY (Estimating)	0.0	-0.2
Adjustment for current and prior year escalation (FY96-FY97) -AIR FORCE (Estimating)	0.0	-0.2
Increased estimate for UE support (FY98-FY03) -AIR FORCE (Support)	+0.9	+2.2

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13b. (U) Cost Variance Analysis (Cont'd):
NAVSTAR GPS User Equip

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

Increased estimate for UE support -NAVY
(Support)

+1.7 +4.5

O&M Subtotal

+2.6 +5.2

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):
NAVSTAR GPS Satellite

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
57.67	-10.50	+6.61	+5.37	+10.55	+15.72	--	+2.85	+30.60	88.27

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
39.98	-9.31	+20.27	+5.63	+6.61	+8.26	--	-0.05	+31.41	71.39

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	DEC 73	N/A	DEC 73
Milestone II	N/A	JUN 79	N/A	JUN 79
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	N/A	N/A
Total Cost	N/A	2306.7	N/A	10151.4
Total Quantity	N/A	40	N/A	115
Prog Acq Unit Cost	N/A	57.67	N/A	88.27

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NAVSTAR GPS, December 31, 1998

14a. (U) Unit Cost and Other History (Cont'd):

NAVSTAR GPS User Equip

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.18	--	-0.15	--	--	--	--	--	-0.15	0.03

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.13	--	-0.11	--	--	--	--	--	-0.11	0.02

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	DEC 73	N/A	DEC 73
Milestone II	N/A	JUN 79	N/A	JUN 79
Milestone III	N/A	MAR 89	N/A	JAN 92
FUE/IOC	N/A	N/A	N/A	MAR 93
Total Cost	N/A	4875.8	N/A	6714.3
Total Quantity	N/A	273339	N/A	233120
Prog Acq Unit Cost	N/A	0.02	N/A	0.03

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

a. RDT&E --

(U) OPERATIONAL CNTL SYS SPT:
LOCKHEED MARTIN MISSION S, GAITHERSBURG MD
F04606-95-D-0239, CPAF/FF/FFP/T&M
Award: July 21, 1995
Definitized: July 21, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$25.0	\$26.4	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$151.6	\$51.3	0	\$199.9	\$215.1

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NAVSTAR GPS, December 31, 1998

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.5	\$-4.0
Cumulative Variances To Date (12/25/98)	<u>\$-11.9</u>	<u>\$-2.7</u>
Net Change	\$-12.4	\$1.3

Explanation of Change:

(U) This contract includes effort under four different pricing arrangements: Cost-Plus-Award-Fee (CPAF), Cost-Plus-Fixed-Fee (CPFF), Time and Material (T&M), and Firm-Fixed-Price (FFP). The contractor's Cost Performance Report (CPR) reports on the CPAF and CPFF Contract Line Item Numbers (CLINs) only; therefore the data presented here reflects only the cost reimbursable work. The T&M and FFP CLINs represent another \$21.9M of work. The ceiling price is lower than the target price because it applies only to development of the software required for full-functionality of Block IIR and the Operational Control Segment (OCS) Re-Architecture development. The target price applies to all CLINs currently reported in the CPR.

The Air Force approved an Over Target Baseline (OTB) in September 1997 which zeroed out the cumulative cost variance. Initially, Lockheed Martin Mission System (LM-MS) reported a favorable cost variance. However, the contractor has since experienced cost growth primarily associated with the development, integration and test of Phase 2 of the New Architecture, as well as development of Phase 3/4. The majority of the -\$11.9M cost variance results primarily from delays in development, integration and test of Phase 2. These difficulties resulted in a restructuring of the contract phases which resulted in a shift of some Phase 2 requirements and an increase in the Phase 3/4 technical effort.

Since the last SAR, the schedule variance has fluctuated and currently stands at (-\$2.7M) due primarily Phase 3/4 development schedule difficulties for CLIN 4AA System Development, continuing CLIN 7 Modifications delays associated with Monitor Station Receiver Element (MSRE), and difficulties with Phase B of the Simulator (CLIN 4AD) effort. CLIN 7 slips are due to a delay in operational acceptance of the MSRE receivers from the subcontractor and subsequent research and analysis to isolate and correct the deficiencies. The program impacts include a delay to the overall schedule for the Station Computer System Replacement effort. The schedule variance associated with CLIN 4AA results from delays in the development of Phase 3/4 activities. The schedule variance on CLIN 4AD results in part from difficulties associated with Government Furnished Information, due in part to a GPS Block IIR launch failure. Since the last SAR, LMMS submitted an Equitable Adjustment Proposal (EAP) for the Block IIR integration impacts which were accepted by the government and revised the delivery schedule approximately one month to November 1999.

Preliminary activities to transition the new OCS architecture to operations per the evolving transition plan were started. Subsequent to the formulation of the FY00 budget, it was determined that additional resources and assets are required to ensure a seamless and timely transition of GPS

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NAVSTAR GPS, December 31, 1998

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

operations from the legacy mainframe system to the new distributed architecture. At this time, transition to operations schedules indicate OCS cannot meet the projected first Block IIF launch in March 2003.

The current contract price is \$151.6M, which reflects an increase of \$42.6M since the last SAR, due to additions to CLIN 4AA System Development and the CLIN 4AD System Simulator, the Operational Support Environment (OSE) effort, and budget for the software maintenance and configuration management efforts. The OSE is a new effort driven in large part by operational concerns about the transition to the new distributed architecture.

Furthermore, the Contract Budget Baseline (CBB) is \$196.5M which is \$44.9M above the target price due to the incorporation of OTB budgets for CLIN 4AA approved in September 1997, as well as the additions to the Estimated Cost of Authorized/Unpriced Work (ECAUW) which accommodate a 4AD Simulator impact due to CLIN 4AA Phase 2/3/4 replans.

(U) <u>BLKIIF SAT DEV/PROD/MOSC:</u>			Initial Contract Price		
BOEING NORTH AMERICAN, SEAL BEACH CA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F04701-96-C-0025, FFP/AF/EPA/CPAF			\$382.4	N/A	6
Award: April 22, 1996					
Definitized: April 22, 1996					
			Current Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
			\$400.8	N/A	6
			Estimated Price At Completion		
			<u>Contractor</u>	<u>Program Manager</u>	
			\$445.6	\$487.2	
			<u>Cost Variance Schedule Variance</u>		
Previous Cumulative Variances			\$0.0	\$-0.1	
Cumulative Variances To Date (12/31/98)			\$0.2	\$-0.7	
Net Change			\$0.2	\$-0.6	

Explanation of Change:

(U) Contract F04701-96-C-0025 has been consolidated into one cost report. Because cost and schedule variance reporting is not required on a firm fixed price contract, the cost and schedule variances only pertain to the Cost Plus Award Fee (CPAF) efforts of the contract.

The purpose of the GPS Block IIF contract is to develop and produce a system incorporating current technology to sustain the GPS utility for both military and commercial use. The basic requirement for the Block IIF is to sustain the GPS capability at an affordable cost. If all options on the contract are exercised, this effort will sustain the GPS signal beyond 2020.

The cost variance of \$0.2M was a result of lower than anticipated costs in

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NAVSTAR GPS, December 31, 1998

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

the Program Management and System Engineering areas. The cost variance was due to requirements analysis and software coding being accomplished with fewer than planned resources.

The current contract price has increased by \$4.7M to fund the system simulator development, additional launch operations support, and advanced integration studies. The negative schedule variance of -\$.7M is primarily due to the System Engineering cost elements as a result of Block IIF Control Segment development delays and stretched development schedules caused, in part, by changes in the predecessor development project for the new architecture Operational Control Segment (OCS).

The PM's best estimate is \$445.6M which is based on the expectation that the Contractor will maintain cost and make up schedule variance upon definitization of current contract proposals. Boeing submitted a proposal for the Block IIF OCS development effort, adjusted for the new architecture OCS development replan. We have evaluated the OCS development proposal update submitted by Boeing (the Block IIF contractor) in June 1998, but based on the results of the OCS working group meetings, the proposal must be updated again. The worst estimate of \$487.2M includes \$28.4M FFP production to fix the crosslink anomaly, an additional \$11M CP development to reflect the government's best estimate for the OCS Replan, and \$2.1M FFP development to fund two contractor claims.

b. Procurement --		Initial Contract Price		
(U) BLOCK IIR SATELLITE PROD:		Target	Ceiling	Qty
LOCKHEED MARTIN ASTRO SP., VALLEY FORGE PA				
FO4071-89-C-0073, FFP		\$580.4	N/A	20
Award: June 1, 1989				
Definitized: October 31, 1990				

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$738.5	N/A	21	\$791.0	\$828.8

Explanation of Change:

(U) Note: As directed by SAF/AQ, contract cost and schedule variance reporting has been discontinued on the Block IIR program.

The current contract price of \$738.5M reflects no change from last year's SAR. Two crosslink transponder deficiencies were identified during the on-orbit operations which will require software and hardware fixes and an upward adjustment of \$92.5M to the contract price. Bench-level testing of the IIR crosslink receiver modification is in progress. The contractor is proceeding with efforts to complete crosslink modification in time to meet April 1999 GPS launch availability. On-orbit testing will be conducted during the summer of 1999.

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NAVSTAR GPS, December 31, 1998

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

In late 1999, Lockheed Martin Missiles and Space (LMMS) plans to close the Valley Forge, PA facility where GPS Block IIR satellites are produced. The contractor has accelerated production of IIR satellites to support the closure and plans to move the program office and support operations to Sunnyvale, CA.

Cost and Schedule variance reporting is not required on this FFP contract.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY74-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-16)</u>	<u>Total</u>
RDT&E	3200.5	163.3	160.6	1181.3	4705.7
Procurement	5685.3	423.1	456.3	5467.1	12031.8
MILCON	7.3	-	-	-	7.3
O&M	63.5	5.4	4.7	47.3	120.9
Total	8956.6	591.8	621.6	6695.7	16865.7

NAVSTAR GPS Satellite

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

<u>Appropriation</u>	<u>Prior Years (FY74-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-16)</u>	<u>Total</u>
RDT&E	1594.8	98.9	108.9	988.7	2791.3
Procurement	2772.5	181.6	263.9	4134.8	7352.8
MILCON	7.3	-	-	-	7.3
O&M	-	-	-	-	-
Total	4374.6	280.5	372.8	5123.5	10151.4

(U) Note: Tables do not include Department of Transportation (DOT) funding.

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NAVSTAR GPS, December 31, 1998

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

NAVSTAR GPS User Equip

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

<u>Appropriation</u>	<u>Prior Years (FY74-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-12)</u>	<u>Total</u>
RDT&E	1605.7	64.4	51.7	192.6	1914.4
Procurement	2912.8	241.5	192.4	1332.3	4679.0
MILCON	-	-	-	-	-
O&M	63.5	5.4	4.7	47.3	120.9
Total	4582.0	311.3	248.8	1572.2	6714.3

(U) Note: Tables do not include DOT funding.

b. Annual Summary -- NAVSTAR GPS Satellite

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY79 Dollars Nonrec</u>	<u>Flyaway FY79 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1974				9.4	6.4
1975				25.5	19.1
1976				72.2	58.9
1977				12.0	10.6
1978				56.3	50.2
1979				56.0	53.3
1980				53.9	56.0
1981				88.3	101.9
1982				78.8	100.7
1983				100.6	137.4
1984				67.3	96.2
1985				67.8	100.7
1986				49.0	75.2
1987				28.7	45.1
1988				21.3	35.0
1989				15.3	25.9
1990				25.7	45.4
1991				18.0	32.9
1992				24.8	46.9
1993				26.3	51.3
1994				28.3	56.2
1995				18.2	36.7
1996				17.1	35.2
1997				20.8	43.6
1998				39.1	83.2
				45.0	96.4

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS Satellite

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999				43.6	94.4
2000				45.0	98.9
2001				48.8	108.9
2002				33.8	76.6
2003				17.1	39.5
2004				14.5	34.1
2005				14.4	34.6
2006				20.3	50.0
2007				29.4	73.7
2008				46.8	120.0
2009				41.7	109.1
2010				35.9	95.8
2011				35.4	96.7
2012				29.0	80.9
2013				16.8	47.9
2014				12.7	36.8
2015				12.1	36.0
2016				18.8	57.0
Subtotal	12			1581.8	2791.3

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1982		0.7		13.2	20.1
1983				69.3	111.5
1984	1	0.6	25.2	152.7	256.0
1985	6	0.1	132.3	192.1	331.4
1986	9	2.0	203.4	112.6	203.4
1987	8		145.4	37.8	71.2
1988	4	2.4	119.1	53.5	104.5
1989		2.5	30.6	33.1	67.5
1990		5.5	14.8	20.3	42.1
1991		8.8	26.5	73.7	157.5
1992	4	8.4	79.2	92.3	199.7
1993	4	9.3	84.1	90.7	200.2
1994	4	8.4	75.6	79.2	178.3
1995	5	9.2	89.0	92.4	210.0
1996	4	8.4	74.1	66.8	153.7
1997	3	7.4	80.0	84.9	198.3
1998	3	9.4	71.1	68.9	162.6

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS Satellite

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999		10.1	29.0	39.1	93.6
2000		9.0	48.1	70.2	170.8
2001	3	8.9	95.0	104.1	257.4
2002	3	7.7	81.4	89.0	224.1
2003	3	6.9	82.1	89.1	228.9
2004	3	7.3	81.9	112.1	293.9
2005	3	7.1	75.2	81.4	218.0
2006	3	7.0	81.4	83.1	227.1
2007	3	7.1	82.8	77.2	215.5
2008	3	7.2	75.7	100.6	286.5
2009	3	7.3	138.4	127.4	370.5
2010	3	7.4	105.1	110.1	326.9
2011	3	7.4	105.7	99.9	302.8
2012	3	7.4	86.0	93.3	288.8
2013	3	7.2	49.6	91.5	289.1
2014	3	7.1	106.1	87.0	280.6
2015	3	7.0	82.2	87.4	287.9
2016	3	7.0	88.2	87.5	294.2
Subtotal	103	219.2	2744.3	2963.5	7324.6

(U) Note: Recurring dollars that are reflected in FYs 89, 90, 91, 99 and 00 are due to Launch and On-Orbit support that cannot be identified to specific satellites.

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				1.5	2.6
1988				4.7	8.3
2000				4.8	10.8
2001				2.8	6.5
Subtotal				13.8	28.2

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS Satellite

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984				4.7	7.3
Subtotal				4.7	7.3

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	115	219.2	2744.3	4563.8	10151.4

b. Annual Summary -- NAVSTAR GPS User Equip

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				0.1	0.2
1990				1.2	2.1
1991				0.2	0.4
1992				0.1	0.1
1993				0.2	0.3
1994				0.2	0.4
1995					
1996				3.2	6.7
1997				2.0	4.2
1998				1.8	3.9
1999				0.1	0.3
Subtotal				9.1	18.6

(U) Note: Appropriation 0400 Research Development Test and Evaluation (RDT&E), Defense Agencies is Marine Corps RDT&E - Program Element (PE) 0206626M-1319 Appropriation for fiscal years FY89-FY94 and Department of Defense 0400 Research Development and Test for FY96-FY99.

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1974				6.0	4.1
1975				8.7	6.5
1976				13.5	11.0
1977				1.8	1.6
1977				7.4	6.6
1978				3.8	3.6
1979				9.5	9.9
1980				8.8	10.1
1981				13.4	17.1
1982				22.0	30.0
1983				19.7	28.1
1984				39.9	59.3
1985				38.3	58.8
1986				35.8	56.2
1987				39.1	64.3
1988				29.3	49.4
1989				22.4	39.6
1990				23.1	42.2
1991				25.8	48.8
1992				25.3	49.2
1993				24.7	49.2
1994				24.3	49.2
1995				15.7	32.4
1996				14.1	29.5
1997				13.4	28.4
1998				10.8	23.2
1999				12.0	25.9
2000				4.6	10.0
2001				4.4	9.8
2002				4.5	10.1
2003				8.7	20.0
2004				9.1	21.5
2005				7.5	18.1
Subtotal	89			547.4	923.7

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1974				1.8	1.2
1975				4.4	3.3

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1976				7.8	6.4
1977				1.8	1.6
1977				8.4	7.5
1978				7.4	7.0
1979				9.3	9.7
1980				11.7	13.5
1981				13.8	17.7
1982				5.1	7.0
1983				7.5	10.7
1984				3.9	5.8
1985				7.6	11.6
1986				6.7	10.5
1987				2.7	4.5
1988				5.9	10.0
1989				5.0	8.9
1990				2.7	5.0
1991				3.3	6.3
1992					
1993					
1994				0.2	0.5
1995				0.2	0.5
1996				0.2	0.4
1997				0.2	0.4
1998				0.2	0.4
1999				0.2	0.4
2000				0.2	0.4
2001				0.2	0.4
Subtotal	13			118.4	151.6

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1974				1.5	1.0
1975				6.4	4.8
1976				19.5	15.9
1977				3.1	2.7
1977				15.5	13.8
1978				14.4	13.7
1979				18.9	19.6
1980				29.8	34.4

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1981				19.2	24.5
1982				20.5	28.0
1983				18.1	25.9
1984				13.3	19.8
1985				13.5	20.7
1986				16.4	25.8
1987				17.2	28.3
1988				22.4	37.8
1989				21.7	38.3
1990				18.0	32.8
1991				6.7	12.6
1992				7.6	14.7
1993				10.2	20.3
1994				9.7	19.7
1995				7.2	14.9
1996				9.1	19.0
1997				15.9	33.8
1998				20.1	43.1
1999				16.7	36.2
2000				24.6	54.0
2001				18.6	41.5
2002				6.6	15.0
2003				6.7	15.5
2004				6.8	16.1
2005				6.9	16.5
2006				7.9	19.5
2007				7.9	19.9
2008				8.0	20.4
Subtotal	146			486.6	820.5

Appropriation: 1109 - Procurement, Marine Corps

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989	456		1.0	2.2	4.1
1990	504		0.7	0.8	1.6
1991					
1992					
1993	3304	0.1	2.7	2.9	5.8
1994	557		0.4	0.4	0.8
Subtotal	4821	0.1	4.8	6.3	12.3

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988	42		2.0	2.2	4.3
1989	108		4.4	5.0	10.0
1990	121		3.9	4.6	9.6
1991	24		0.7	1.9	4.0
1992	215		10.8	17.3	38.0
1993	200		11.3	7.0	15.5
1994	537	0.5	10.7	17.5	39.5
1995	352	0.3	6.1	19.0	43.5
1996	522	0.3	8.8	18.9	43.8
1997	495	0.3	7.5	16.0	37.6
1998	517	0.3	6.6	24.8	58.5
1999	351	0.3	1.0	13.6	32.5
2000	232	0.3	0.9	5.6	13.6
2001	309	0.3	0.9	9.9	24.4
2002	277	0.4	0.9	5.6	14.1
2003	208	0.3	1.6	9.4	24.2
2004	283	2.3	2.8	5.1	13.4
2005	166	0.1	4.9	5.0	13.4
Subtotal	4959	5.7	85.8	188.4	439.9

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987	11		0.8	0.8	1.4
1988	6		0.5	0.5	1.0
1989	11		0.7	0.7	1.5
1990	17		0.8	1.1	2.3
1991	11		0.4	0.4	0.8
1992	11		0.5	0.8	1.8
1993	9		0.2	0.2	0.4
1994				0.1	0.3
1995				0.4	1.0
1996				1.3	3.0
1997				2.3	5.5
1998				2.3	5.5
1999				2.5	6.0
2000				1.6	4.0
Subtotal	76		3.9	15.0	34.5

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986	62	5.7	5.8	12.1	20.0
1987	148	8.1	5.4	13.8	23.6
1988	188	1.3	5.8	7.4	13.2
1989	133	0.4	5.2	6.1	11.2
1990	79	0.6	2.8	3.8	7.2
1991	38	0.1	2.0	3.8	7.3
1992	130	0.1	6.6	8.5	16.9
1993	1840	0.1	4.1	4.4	8.9
1994				2.3	4.8
1995				7.2	15.1
1996				0.6	1.3
1997				1.9	4.1
1998				2.2	4.8
1999				4.3	9.5
2000				3.8	8.5
2001				4.4	10.0
2002				4.0	9.3
2003				4.0	9.4
2004				4.0	9.6
2005				3.8	9.3
Subtotal	2618	16.4	37.7	102.4	204.0

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986	67	3.6	4.0	7.7	13.7
1987	133	1.3	3.8	6.3	11.6
Subtotal	200	4.9	7.8	14.0	25.3

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986	70	3.8	1.6	5.6	9.2
1987	60	1.3	1.2	3.1	5.3
1988	147	7.6	4.0	11.9	21.1
1989	175	4.3	3.1	7.6	13.9
1990	1092	5.0	5.2	10.6	20.0

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991	74	3.1	3.0	6.1	11.8
1992	37	9.3	1.3	13.6	27.1
1993	11014	4.3	8.2	13.5	27.4
1994	14318	0.3	12.5	15.6	32.3
1995	15317	0.1	9.7	15.2	32.0
1996	21777	1.3	15.3	22.8	48.5
1997	15074		6.1	12.1	26.1
1998				2.5	5.4
1999				2.9	6.5
2000				2.9	6.6
2001	8196	0.4	9.3	13.8	31.5
2002	9639	1.7	11.0	14.0	32.7
2003	14487	0.6	16.5	20.9	49.8
2004	13028	0.3	14.8	19.8	48.1
2005	9631	0.3	10.9	15.8	39.1
2006	7473	0.5	8.5	12.6	32.0
2007	7473	0.8	8.5	12.4	32.0
2008	7594	0.8	8.6	12.1	32.0
2009	9284	0.7	10.6	11.9	32.0
2010	10000		11.2	11.6	32.0
2011	10000		11.2	11.4	32.0
2012	10000		11.2	11.2	32.0
Subtotal	195960	46.5	203.5	313.5	718.4

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985		3.2		4.7	8.0
1986	70	5.5	7.7	23.8	42.4
1987	299	4.5	20.6	40.3	74.8
1988	351	6.9	19.3	53.8	104.8
1989	327	23.3	15.8	58.6	117.8
1990	207	5.1	9.0	28.3	58.6
1991	36	4.1	8.0	12.8	27.6
1992	65	20.5	9.1	47.4	103.9
1993	207	16.3	4.6	41.8	92.9
1994	194	36.8	15.2	70.2	158.5
1995	262	33.3	28.9	78.6	180.2
1996	571	52.8	64.1	120.4	279.4
1997	714	20.9	98.1	124.0	291.0

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	748	14.3	95.5	113.3	267.7
1999	417	16.3	45.4	74.1	177.5
2000	446	4.1	68.4	84.2	205.0
2001	365	1.7	47.8	49.5	122.7
2002	429	0.7	9.6	38.4	96.9
2003	769		14.3	51.0	131.2
2004	822		20.4	51.1	134.3
2005	453		20.3	51.0	136.8
2006	206		22.6	39.9	109.2
2007	214		16.3	36.1	101.1
2008	105		10.8	36.1	103.1
Subtotal	8277	270.3	671.8	1329.4	3125.4

(U) Note: Air Force aircraft procurement funding and quantities reflect requirements for aircraft installs (funds controlled within the Global Positioning System (GPS) program element, 0305164F), as well as planned GPS modifications to existing aircraft (funds controlled within each aircraft system program director's program element).

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986	87	1.1	2.3	6.2	10.3
1987	121	0.6	2.2	6.4	11.0
1988	757	0.1	3.8	8.3	14.7
1989	445	0.1	5.7	7.1	13.1
1990	179	0.1	4.3	5.7	10.7
1991					
1992	101		0.1	2.1	4.2
1993	2512		2.2	2.7	5.5
1994	1702		1.4	2.2	4.6
1995	795		0.7	1.8	3.7
1996	812		2.0	2.2	4.7
1997	800		0.4	1.3	2.8
1998	650		0.3	0.7	1.5
1999				0.7	1.5
2000				1.7	3.8
2001				1.7	3.8
2002	1500		1.7	1.9	4.5
2003	1500		1.6	1.8	4.3

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2004	1500		1.6	2.0	4.8
2005	1500		1.6	1.8	4.5
2006	500		0.6	0.7	1.7
2007	500		0.6	0.7	1.7
2008				0.7	1.8
Subtotal	15961	2.0	33.1	60.4	119.2

Appropriation: 1804 - Operation and Maintenance, Navy

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				1.7	2.8
1989				2.6	4.6
1990				6.8	12.5
1991				3.3	6.2
1992				3.4	6.7
1993				2.3	4.6
1994				1.6	3.3
1995				1.4	2.8
1996				1.7	3.5
1997				1.2	2.6
1998				1.3	2.8
1999				0.6	1.4
2000				1.0	2.2
2001				1.1	2.4
2002				1.1	2.5
2003				1.1	2.6
2004				1.1	2.6
2005				1.1	2.7
Subtotal				34.4	68.8

Appropriation: 3400 - Operation & Maintenance, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				0.3	0.5
1993				1.2	2.3
1994				0.6	1.3
1995				0.5	1.0

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NAVSTAR GPS, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Appropriation: 3400 - Operation & Maintenance, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				0.5	1.0
1997				0.4	0.9
1998				0.4	0.8
1999				0.9	1.9
2000				1.5	3.2
2001				1.0	2.3
2002				1.0	2.2
2003				1.0	2.4
2004				2.9	6.8
2005				2.8	6.8
2006				2.5	6.1
2007				2.5	6.2
2008				2.5	6.4
Subtotal				22.5	52.1

(U) Note: Tables do not include DOT funding.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD				9.1	18.6
Navy	12563	22.2	132.2	893.9	1683.2
Army	196173	51.4	211.3	445.9	895.3
USAF	24384	272.3	704.9	1898.9	4117.2
Grand Total	233120	345.9	1048.4	3247.8	6714.3

17. (U) Delivery/Expenditure Information:

NAVSTAR GPS Satellite

a. (U) Deliveries To Date	Plan	Actual
RDT&E	12	12
Procurement	40	40

(U) Percent Total Program Quantities Delivered: 45.2%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 3714.1

(U) Percent Total Program Expended: 36.6%

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NAVSTAR GPS, December 31, 1998

17b. (U) Delivery/Expenditure Information (Cont'd):
NAVSTAR GPS User Equip

NAVSTAR GPS User Equip

a. (U) Deliveries To Date	Plan	Actual
RDT&E	248	248
Procurement	123172	123172

(U) Percent Total Program Quantities Delivered: 52.9%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 2739.8

(U) Percent Total Program Expended: 40.8%

18. (U) Operating and Support Costs:
NAVSTAR GPS Satellite

a. (U) Assumptions and Ground Rules --
Operations and support costs include all costs of operating, maintaining, and supporting the NAVSTAR Global Positioning System (GPS) spacecraft from the dedicated Master Control Station (MCS) located at Schriever Air Force Base (AFB) CO. Also included are the costs for operating, maintaining, and supporting four dedicated GPS Ground Antennas (GAs) (located at Cape Canaveral Air Force Station (AFS) FL, Kwajalein Atoll, the Ascension Islands, and Diego Garcia); and five monitor stations (located at Schriever AFB, Maui, HI, Kwajalein Atoll, the Ascension Islands, and Diego Garcia). Satellite operations at the MCS include mission planning, mission payload operations, and monitoring of satellite state of health. GAs transmit navigation data uploads and commands to the GPS spacecraft and receive telemetry data from the spacecraft. Monitor stations receive mission payload data and transfer this data to the MCS to ensure spacecraft are operating as desired. These costs do not include the unallocated costs associated with the shared use of remote tracking stations which are programmed and borne by the Air Force Satellite Control Network and the Consolidated Space Operations Center program elements. The Sustaining Support cost includes the Material Support Division (MSD) Direct Costs. Costs reflect updates for the fiscal year FY00 President's Budget.

There is no applicable antecedent program.

b. (U) Costs -- (FY 1979 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per NAVSTAR GPS Sat	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.8	0.0
Unit Level Consumption	0.0	N/A

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18b. (U) Operating and Support Costs (Cont'd):
NAVSTAR GPS Satellite

b. (U) Costs -- (FY 1979 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per NAVSTAR GPS Sat	Avg Annual Cost Per Antecedent
Intermediate Maintenance	0.0	N/A
Depot Maintenance	0.7	N/A
Contractor Support	0.1	N/A
Sustaining Support	0.1	N/A
Indirect Costs	N/A	N/A
Total	1.7	0.0

NAVSTAR GPS User Equip

a. (U) Assumptions and Ground Rules --

(1) The operations and support costs are the direct costs to repair, replenish and support the Global Positioning System (GPS) user equipment. The maintenance cost includes the material and labor costs at the organizational and depot levels. The training costs are necessary to maintain the required quantity of maintenance and operations personnel. The software support costs include all costs to provide life cycle software engineering for GPS user equipment. The support equipment support cost includes the cost of all necessary support and maintenance of the GPS user equipment. The sustaining investment costs include the cost of replenishment spares of air, sea, and ground sets, including their respective batteries and support equipment. Costs reflect updates for the fiscal year FY00 President's Budget.

There is no applicable antecedent program.

Note: Current estimates for intermediate maintenance is less than \$50,000 and rounded down to zero (0.0).

b. (U) Costs -- (FY 1979 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per NAVSTAR GPS User	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.0	0.0
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	1.5	0.0
Contractor Support	0.0	0.0
Sustaining Support	0.0	0.0
Indirect Costs	0.0	0.0
SUSTAINING INVESTMENT	35.3	0.0
SYSTEM/PROJECT MGT	5.9	0.0
Total	42.7	0.0

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AF-8 EELV

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: EELV

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Evolved Expendable Launch Vehicle

2. DoD Component: USAF

3. Responsible Office and Telephone Number:

SMC/MV	Col Richard W. McKinney
2420 Vela Way, Suite 1467/A2	Assigned: June 27, 1995
El Segundo, CA 90245-4659	DSN 833-4614; COMM (310) 336-4614
	richard.mckinney@losangeles.af.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0603011F
PE 0603226E
PE 0603853F
PE 0604853F

PROCUREMENT:

APPN 3020 ICN MSEELV (Air Force)

\$3.316M of RDT&E funding (PE 0305953F) was appropriated in the FY99 President's budget. These funds are no longer required due to a change in the EELV acquisition strategy and have been reprogrammed to other higher priority Air Force requirements. FY00-FY05 RDT&E funding for PE0305953F was not requested as part of the FY00 President's Budget. Therefore, this PE is not reported in this SAR.

PE 0603853F, 0603226E, and 0603011F reflect sunk funding (FY94-FY98) for all EELV Pre-Milestone II activities. These Program Elements are no longer reflected in the President's budget. All RDT&E funding is represented by PE 0604853F in the current President's Budget.

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5. References:

SAR Baseline (Planning Estimate):

DAE Approved Acquisition Program Baseline (APB) dated December 11, 1996.

Approved Program / Development Estimate (DE):

DAE Approved Acquisition Program Baseline (APB) dated October 15, 1998.

6. Mission and Description:

The mission of the Evolved Expendable Launch Vehicle is to partner with industry to develop a national launch capability that satisfies the Government's national mission model requirements and reduces the cost of space launch by at least 25% over existing systems. The EELV system includes the launch vehicles, infrastructure, support systems, and payload interfaces. EELV will be a family of launch vehicles evolved from current expendable launch systems or components thereof. EELV will support military, intelligence, and civil mission requirements in the National Mission Model (NMM) through 2020 (currently serviced by Titan II, Delta II, Atlas II, and Titan IV).

7. Executive Summary:

1. The current EELV acquisition strategy was approved by USD(A&T) on 3 November 1997. The previous strategy was to award a development contract and a launch services contract to only one EELV contractor. The new approach allowed two contractors to enter the Engineering and Manufacturing Development (EMD)/Initial Launch Services (ILS) phase. The strategy also maintains competition throughout the life of the program, leverages the growing commercial launch market, caps the Government's EMD costs, allows partnering with industry, while still reducing the Government's overall cost to launch the National Mission Model (NMM) by at least 25% over existing systems.
2. The EELV program began its source selection on 21 July 1998 and awarded contracts on 16 October 1998. The Boeing Company and Lockheed Martin Aerospace were each awarded a fixed-price Other Transaction (OT) Development agreement and a fixed-price FAR Part 12 Initial Launch Services contract.
3. USD(A&T) granted Milestone II approval (entry into EMD) and issued ADM/APB guidance on 15 October 1998. Approval was granted after the program demonstrated a cost savings greater than 30% over existing systems. The consensus of the Defense Acquisition Board (DAB) Readiness Meeting (DRM) was that the cost savings from a modular family of vehicles, along with the other benefits of the program, such as improved payload processing and standard interfaces, amply justified approval to enter EMD and Initial Launch Services. The Milestone Decision Authority (MDA) stated in the ADM, "The EELV Program represents a model acquisition reform program in that it provides for continuing competition over the life of the program, innovative contracting, a comprehensive life-cycle cost reduction effort, civil/military integration and

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EELV, December 31, 1998

7. Executive Summary (Cont'd):

the potential of foreign sourcing."

4. The total program quantities reported in this SAR are based on an AFSPC EELV National Mission Model (dated 24 May 1998) covering the period FY02-FY20 and including 117 USAF and 64 NRO missions for a total program quantity of 181 missions.

5. The EELV program includes planned funding for 34 USAF launch services over the FYDP (FY00-FY05). During this same period, the NRO will fund at least four (4) launch services. All 38 missions are scheduled for FY02-FY07 delivery.

6. On 15 October 1998, the MDA authorized the Air Force to award Initial Launch Services (ILS) through FY06. On 16 October 1998, the Air Force awarded ILS contracts for 24 of the 34 USAF missions in the FYDP, and for 4 NRO missions. The remaining 10 USAF FYDP missions currently in the President's Budget include two (2) FY06 missions and eight (8) FY07 missions (funded in FY04-FY05). These missions will be awarded in a Follow On Launch Services (FOLS) contract(s).

7. The FY00 Presidents Budget (PB) reflected acting SECAF Peters' agreement with USD(A&T) to fund Procurement shortfalls across the FYDP.

8. The FY99 Appropriations Conference decreased the RDT&E program by \$20 (TY\$M). Inflation adjustments further reduced RDT&E by \$17 (TY\$M) and Procurement by \$58.2 (TY\$M) across the FYDP, thereby making the program non-executable beyond FY99 for RDT&E and beyond FY00 for Procurement without supplemental funding. Due to the nature of the Other Transaction development agreement, all funding (\$500M per contractor) must be completed by FY02 to avoid default by the government. All EELV Launch Services are fully funded and fixed price. Any reductions to procurement funding will result in launch cancellation(s), or delay(s) of at least one year.

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8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program; DE	Current Estimate
Milestone I	DEC 96	DEC 96	DEC 96
Milestone II	JUN 98	JUN 98	OCT 98 (Ch-1)
Tailored CDR	JUL 98	JUL 99	JUL 99 (Ch-2)
First System Test Flight (MLV)	DEC 00	N/A	N/A (Ch-3)
MLV First Operational Flight	DEC 01	DEC 01	DEC 01 (Ch-2)
Second System Test Flight (HLV)	JUL 03	N/A	N/A (Ch-3)
Milestone III	JUL 03	JUN 03	JUN 03 (Ch-2)
Initial Operational Capability	TBD	TBD	TBD (Ch-2)
HLV First Operational Flight	N/A	JUL 03	JUL 03 (Ch-2)
OIPT Review II	N/A	TBD	TBD (Ch-2)
MLV - First Operational Government Flight	N/A	MAY 02	MAY 02 (Ch-2)
HLV - First Operational Government Flight	N/A	JUL 03	JUL 03 (Ch-2)

b. Current Change Explanations --

(Ch-1) Milestone II from JUN 98 to OCT 98. USD(A&T) granted Milestone II approval (entry into EMD) and issued ADM/APB guidance on October 15, 1998.

(Ch-2) As a result of the 15 October 1998 Milestone II ADM/APB guidance, the following table represents the current Program Schedule Milestones governing the 28 government missions on contract, and replaces the above Schedule Milestones in Section 9. First operational government MLV (DSCS)

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9b. Schedule (Cont'd):

and HLV (DSP) flights will be performed under the Initial Launch Services (ILS) contract awarded on 16 October 1998.

	<u>Objective</u>	<u>Threshold</u>
Milestone I	DEC 96	DEC 96
Milestone II	JUN 98	OCT 98
Tailored Critical Design Review (TCDR)	JUL 99	DEC 99
Milestone III	JUN 03	DEC 03
MLV First Operational Flight*	MAY 02	NOV 02
HLV First Operational Flight*	JUL 03	JAN 04
Initial Operational Capability **	TBD	TBD

* MLV and HLV Operational Flight Dates are based on operational satellite need dates. If satellite need dates are postponed - MLV and HLV objective and threshold dates will also move.

** IOC dates are event-driven based on ORD definitions.

(Ch-3) First System Test Flight (MLV) from JUN 01 to N/A, and Second System Test Flight (HLV) from JUL 03 to N/A. The revised 3 November 1997 Acquisition Strategy eliminated all dedicated system test flights. This was formally reflected in the 15 October 1998 ADM.

10. Performance Characteristics:

a. Performance --

	<u>Planning</u>	<u>Approved</u>	<u>Demon-</u>	<u>Current</u>
	<u>Estimate (SAR)</u>	<u>Program;DE</u>	<u>strated</u>	<u>Estimate</u>
		<u>Obj/Threshold</u>	<u>Perf</u>	
Performance Mass to Orbit				
LEO: 100nm X 100nm	19,550	19,550 / 17,000	TBD	17,000
63.4 deg (lbs)	(15%)	(15%) /		
POLAR 1: 450nm x	5,060-	5,060- / 4,400-	TBD	4,400-
450nm, 98.2 deg	8,050	8,050 / 7,000		7,000
(lbs)	(15%)	(15%) /		
POLAR 2: 100nm x	43,050	43,050 / 41,000	TBD	41,000
100nm, 90 deg	(5%)	(5%) /		
(lbs)				
SEMI-SYNC: 10,998nm	2,875-	2,875- / 2,500-	TBD	2,500- (Ch-1)
x 100nm, 38.8 deg	5,152	5,152 / 4,725		4,725
(lbs)	(15%)	(15%) /		
GTO: 19,324nm x	7,015-	7,015- / 6,100-	TBD	6,100-
90nm, 27 deg (lbs)	9,775	9,775 / 8,500		8,500
	(15%)	(15%) /		
MOLNIYA: 21,150nm x	8,050	8,050 / 7,000	TBD	7,000
650nm, 63.4 deg	(15%)	(15%) /		
(lbs)				
GEO: 19,323nm x	14,175	14,175 / 13,500	TBD	13,500
19,323nm, 0 deg	(5%)	(5%) /		
(lbs)				

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10a. Performance Characteristics (Cont'd):

	Planning <u>Estimate (SAR)</u>	Approved Program;DE <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Vehicle Design	>98	>98 / 98	TBD	98
Reliability (%)				
Standardization				
Launch Pads	Standard ized and able to launch all configs of EELV for that site	Standard/ ized and/ able to / launch / all / configs / of / EELV for/ that / site /	Standard ized and able to launch all configs of EELV for that site Std TBD	Standard ized and able to launch all configs of EELV for that site Std
Payload interfaces	One std payload inter- face	One std / payload / inter- / face / face / for each vehicle class {add'l inter- face rqmts met by payload adapter)	TBD	Std payload interfac e for each vehicle class {add'l inter- face rqmts met by payload adapter)

b. Current Change Explanations --

{Ch-1} Semi-Sync Threshold adjusted from (2,500 - 4,480) to (2,500 - 4,725), reflecting the EELV ORD II (15 Sep 98).

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11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Planning Estimate (SAR)	Approved Program;DE	Current Estimate
Development (RDT&E)	1700.0	1344.0	1344.0
Procurement	0.0	11772.6	11772.6
Total Flyaway Costs			(11772.6)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 95 Base-Year \$	1700.0	13116.6	13116.6
Escalation	300.0	4231.2	4231.0 4231.2
Development (RDT&E)	(300.0)	(107.1)	(107.1)
Procurement	(0.0)	(4124.1)	(4123.9) 4124.1
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2000.0	17347.8	17347.8

(U) 1. The current estimate above reflects both the September 1998 USAF Service Cost Position after the OSD CAIG, and total EELV procurement cost. Both are based on an AFSPC EELV National Mission Model (dated 24 May 98) covering the period FY02-FY20 and including 181 USAF and NRO missions. 117 of the 181 missions are USAF and 64 are NRO. AFSPC EELV National Mission Model updates will require annual revisions to the total EELV procurement cost estimate.

2. On 15 October 1998, the MDA authorized the Air Force to award Initial Launch Services (ILS) through FY06. On 16 October 1998, the Air Force awarded ILS contracts for 24 of the 34 USAF missions in the FYDP, and for 4 NRO missions. The remaining 10 USAF FYDP missions currently in the President's Budget include two (2) FY06 missions and eight (8) FY07 missions (funded in FY04-FY05). These missions will be awarded in a Follow On Launch Services (FOLS) contract(s).

3. The EELV program includes planned funding for 34 USAF launch services over the FYDP (FY00-FY05). During this same period, the NRO will fund at least four (4) launch services.

b. Quantity --

Development (RDT&E)	2	0	0
Procurement	N/A	181	181
Total	2	181	181

1. The revised 3 November 1997 Acquisition Strategy eliminated all dedicated

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11b. Total Program Cost and Quantity (Cont'd):

system test flights. This was formally reflected in the 15 October 1998 ADM.

2. All EELV Launch Services are fully funded and fixed price. Any reductions to procurement funding will result in launch cancellation(s), or delay(s) of at least one year.

3. Because the program is an ongoing commercial competition, the actual launch service prices remain competition sensitive.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (OCT 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	13116.6	13116.6	
(2) Quantity	181	181	
(3) Unit Cost	72.467	72.467	0.00
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	11772.6	11772.6	
(2) Quantity	181	181	
(3) Unit Cost	65.042	65.042	0.00

1. Unit cost data as calculated by the Consolidated Acquisition Reporting System (CARS) software (i.e., APUC and PAUC) is a notional measure and not reflective of a "true" unit cost. The EELV program procures fixed price, fully funded commercial launch services, not individual "unit" hardware. Each EELV launch service price is mission (LEO, GEO, GTO, polar, semi-sync, molniya, etc.), payload, payload integration, vehicle configuration, and contractor dependent. There are significant cost differences between the contractors' Medium and Heavy configurations, but the CARS software does not distinguish between configurations in the unit cost calculations.

2. See also footnotes from Section 11: Total Program Cost and Quantity.

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13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2000.0	-	-	2000.0
Previous Changes:				
Economic	-37.4	-	-	-37.4
Quantity	-211.1	-	-	-211.1
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-263.4	-	-	-263.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-511.9	-	-	-511.9
Current Changes:				
Economic	-23.0	-	-	-23.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-14.0	-	-	-14.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-37.0	-	-	-37.0
Total Changes	-548.9	-	-	-548.9
Adjustments	-	+15896.7	-	+15896.7
Current Estimate	1451.1	15896.7	-	17347.8

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

Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Planning Estimate	1700.0	-	-	1700.0
Previous Changes:				
Quantity	-182.7	-	-	-182.7
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-160.5	-	-	-160.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-343.2	-	-	-343.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-12.8	-	-	-12.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-12.8	-	-	-12.8
Total Changes	-356.0	-	-	-356.0
Adjustments	-	+11772.6	-	+11772.6
Current Estimate	1344.0	11772.6	-	13116.6

RD&E: See footnotes from Section 7: Executive Summary, Comment 8.

Procurement: See footnotes from Section 11: Total Program Cost and Quantity

b. Current Change Explanations --

		(Dollars in Millions)	
		Base-Year	Then-Year
(1)	RD&E		
	Revised escalation indices. (Economic)	N/A	-23.4
	Economic adjustment for negative program change. (Economic)	N/A	+0.4
	Adjustment for Current and Prior Inflation. (Estimating)	+5.9	+6.5
	FY99 Congressional funding reduction. (Estimating)	-18.2	-20.0
	Decrease in estimate to reflect revised inflation assumptions. (Estimating)	-0.5	-0.5
	RD&E Subtotal	-12.8	-37.0

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14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Plan Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A	--	--	--	--	--	--	--	-904.16	95.84

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Plan Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A	--	--	--	--	--	--	--	--	87.83

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	DEC 96	DEC 96	N/A	DEC 96
Milestone II	JUN 98	JUN 98	N/A	OCT 98
Milestone III	JUL 03	JUL 03	N/A	JUN 03
FUE/IOC	TBD	TBD	N/A	TBD
Total Cost	2000	2000	N/A	17347.8
Total Quantity	N/A	N/A	N/A	181
Prog Acq Unit Cost	N/A	N/A	N/A	95.84

See footnotes from Section 9: Schedule

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

McDonnell Douglas Corporation is a wholly-owned subsidiary of the Boeing Company.

a. RDT&E --

Prototype Dev. Agreement:

Lockheed Martin Corp., Denver, CO

F04701-98-9-0004, OTA

Award: October 16, 1998

Definitized: October 16, 1998

Initial Contract Price		
Target	Ceiling	Qty
\$500.0	N/A	0

Current Contract Price

Target	Ceiling	Qty
\$500.0	N/A	0

Estimated Price At Completion

Contractor	Program Manager
\$500.0	\$500.0

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15a. Contract Information (Cont'd):

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this OTA contract.

Contract Comments:

OTA - Other Transaction Agreement

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>Prototype Dev. Agreement:</u>			
McDonnell Douglas Corp., Huntington Beach CA			
F04701-98-9-0005, OTA	\$500.0	N/A	0
Award: October 16, 1998			
Definitized: October 16, 1998			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$500.0	N/A	0	\$500.0	\$500.0

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this OTA contract.

Contract Comments:

OTA - Other Transaction Agreement

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>b. Procurement --</u>			
<u>Initial Launch Services:</u>			
Lockheed Martin Corp., Denver, CO			
F04701-98-D-0001, FP	\$649.0	N/A	9
Award: October 16, 1998			
Definitized: October 16, 1998			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$649.0	N/A	9	\$649.0	\$649.0

Explanation of Change:

None.

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15. Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this
FP contract.

<u>Initial Launch Services:</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
McDonnell Douglas Comm., Huntington Beach CA			
F04701-98-D-0002, FP	\$1378.0	N/A	19
Award: October 16, 1998			
Definitized: October 16, 1998			

<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>
\$1378.0	N/A	19	\$1378.0	\$1378.0

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this
FP contract.

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

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

<u>Appropriation</u>	<u>Prior</u> <u>Years</u> (FY94-99)	<u>Budget</u> <u>Year</u> (FY00)	<u>Budget</u> <u>Year</u> (FY01)	<u>Balance To</u> <u>Complete</u> (FY02-20)	<u>Total</u>
RDT&E	564.8	324.8	307.5	254.0	1451.1
Procurement	-	70.8	564.4	15261.5	15896.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	564.8	395.6	871.9	15515.5	17347.8

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

b. Annual Summary -- EELV

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994		9.8		9.8	9.8
1995		29.6		29.6	30.0
1996		107.1		107.1	110.7
1997		60.1		60.1	62.9
1998		87.6		87.6	92.3
1999		243.1		243.1	259.1
2000		300.1		300.1	324.8
2001		279.6		279.6	307.5
2002		214.3		214.3	239.5
2003		12.7		12.7	14.5
2004					
Subtotal		1344.0		1344.0	1451.1

National User Funding Breakout (TY\$M) (Included in above)

FY96: 72.3

FY97: 18.6

FY98: 5.1

ARPA Funding (TY\$M) (Included in above)

FY94: 9.8

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	1		64.3	64.3	70.8
2001	7		504.1	504.1	564.4
2002	9		633.4	633.4	722.2
2003	7		474.7	474.7	551.9
2004	6		413.6	413.6	491.0
2005	8		592.7	592.7	718.4
2006	9		459.2	459.2	568.2
2007	12		797.8	797.8	1007.9
2008	11		719.0	719.0	927.4
2009	13		769.5	769.5	1013.5
2010	11		667.9	667.9	898.1
2011	13		839.1	839.1	1152.0

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2012	14		824.9	824.9	1156.2
2013	12		784.6	784.6	1122.9
2014	8		509.5	509.5	744.5
2015	12		782.1	782.1	1166.8
2016	11		655.7	655.7	998.8
2017	7		452.7	452.7	704.1
2018	10		766.2	766.2	1216.7
2019			30.8	30.8	50.0
2020			30.8	30.8	50.9
Subtotal	181		11772.6	11772.6	15896.7

See footnotes from Section 11: Total Program Cost and Quantity

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	181	1344.0	11772.6	13116.6	17347.8

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	181	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 407

Percent Total Program Expended: 2.3%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

All O&S costs are funded by Air Force Space Command (AFSPC) and therefore are not reported in the EELV program.

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

b. Costs -- (FY Constant (Base-Year) Dollars in Thousands)

Cost Element		
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	N/A	N/A

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N-25 TRIDENT II MSL

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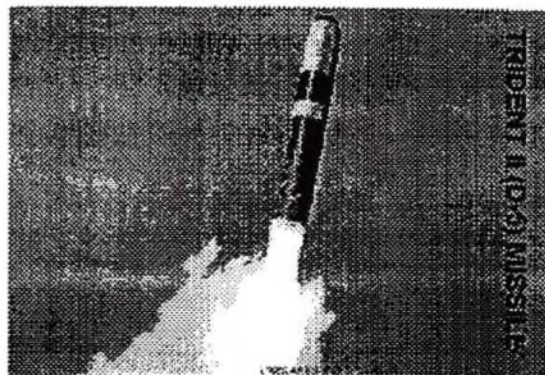
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: TRIDENT II MISSILE

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Sea Launched Ballistic Missile-UGM 133A TRIDENT II (D-5) Missile
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:
STRATEGIC SYSTEMS PROGRAMS RADM JOHN F. SHIPWAY
DEPARTMENT OF THE NAVY Assigned: April 28, 1998
WASHINGTON, DC 20376-5002 DSN 327-0456; COMM (703) 607-0453
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0603371N Project J0951
(U) PE 0604363N Project J0951
PROCUREMENT:
(U) APPN 1507 ICN 1150 (Navy)

No Security Objection
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99-C-0738
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5. (U) References:

SAR Baseline (Production Estimate):

(U) UNSECDEF Memorandum for SECNAV of June 4, 1987, subject TRIDENT II (D-5) Missile Program.

UNSECNAV Memorandum for DIRSSP of December 1, 1987, subject TRIDENT (D-5) Navy Program Review.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated May 25, 1995.

6. (U) Mission and Description:

(U) The TRIDENT II (D-5) Strategic Weapons System program developed an improved Sea Launched Ballistic Missile (SLBM) with greater accuracy and payload capability at equivalent ranges as compared to the TRIDENT I (C-4) system. TRIDENT II enhances U.S. strategic deterrence by providing a survivable sea-based system capable of engaging the full spectrum of potential targets. It enhances the U.S. position in strategic arms negotiation by providing a weapon system with performance and payload flexibility that accommodates various treaty initiatives. TRIDENT II's increased payload allows the deterrent mission to be achieved with fewer submarines.

7. (U) Executive Summary:

(U) In March 1980 the Secretary of Defense described a Sea Launched Ballistic Missile Modernization Advanced Development Program to Congress. Subsequently, a FY 1983 Defense System Acquisition Review Council Milestone II decision selected a weapon system option to achieve specific performance objectives with an IOC of CY 1989. In October 1983, the Deputy Secretary of Defense 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. Flight testing from the flat pad at Cape Canaveral was completed in January 1989 with fifteen flight tests fully successful, one flight partially successful, two flights failing to meet test objectives, and one flight terminated by the range safety officer as a "no test." The first TRIDENT II (D-5) Performance Evaluation Missile (PEM) was launched from the SSBN 734 (USS TENNESSEE) on 21 March 1989. The missile experienced loss of control just after first stage (F/S) ignition and was subsequently auto-destructed by the onboard flight termination system (FTS). The second PEM launched on 2 August 1989 was fully successful while the third PEM launched on 15 August 1989 experienced a control loss early in first stage flight. After corrective actions were completed, PEM flight tests resumed in December 1989 with six fully successful tests and the PEM flight test program was completed in February 1990. The system achieved IOC in March of 1990 with the outload and deployment of the SSBN 734.

Beginning with the FY 1994 President's Budget, both the annual procurement rate of missiles and the missile inventory objective have been reduced. The maximum facilitated rate was reduced from 72 missiles per year to 24 per year. The annual procurement quantities have been reduced over time from a high of 66 per

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7. (U) Executive Summary (Cont'd):

year in FY 1988 and FY 1989 to the new facilitized rate of 24 missiles per year in FY 1994, to 12 per year in FY 1998 and thereafter. The inventory objective of TRIDENT II (D-5) missiles has changed as a result of reductions in flight test program requirements and force structure. The current force structure is based on the outcome of the Department of Defense's Nuclear Posture Review and is in accordance with Presidential Decision Directive/NSC-30 of September 21, 1994. Four TRIDENT I (C-4) configured submarines will be backfit to the TRIDENT II (D-5) configuration for a total force structure of 14 TRIDENT II (D-5) SSBNs.

Because of the low annual procurement quantities the Navy began looking at ways to preserve the industrial base in a cost-effective manner. The acquisition strategy adopted for the FY 1996 and subsequent President's budgets is based on affordable low rate production augmented by critical component production continuity quantities as required to ensure quality, reliability and safety. This approach minimizes both annual funding requirements and program risk associated with supplier base instability. Recent Congressional reductions to program funding have put additional strain on the fragile supplier base. However, funding requested in the FY 2000 President's budget is sufficient to restart broken production lines and reprocur all hardware that was impacted by the FY 1998 and FY 1999 Congressional funding reductions.

During 1998 the Navy reduced the inventory objective for the 14 SSBN program from 434 missiles to 425 missiles by reducing the number of TRIDENT test flights. This reduction in test flights resulted from a reevaluation of the test flight data needed to ensure the TRIDENT weapon system's reliability and safety. The Director, Strategic Systems Programs concluded that some of the Demonstration and Shakedown Operation (DASO) flight test data, previously not used to calculate system reliability and safety, can be used to complement Follow-on Commander-in-Chief (CINC) Evaluation Test (FCET) data. Use of the DASO data reduces the number of FCET tests required to ensure weapon system reliability and safety. This change assumes appropriate adjustments to DASO procedures to make DASO flight tests more representative of tactical conditions and the continued success of flight tests.

Also during 1998 the Department determined that the planned service life of the TRIDENT SSBNs could be extended from 30 to 42 years. This extension delays the need for funds to replace these platforms, effectively delaying the expenditure of up to \$25 Billion in new construction costs. It also creates the need to extend the service life of the TRIDENT II (D-5) missile to match the extended SSBN service life. The FY 2000 President's budget contains funding in FY 2005 to commence life extension of the D-5 missile.

Since last year the SSBN 743 has completed strategic loadout and has deployed. The other TRIDENT II (D-5) submarines which have completed strategic loadout and deployed are: the SSBN 734 in March 1990, the SSBN 735 in October 1990, the SSBN 736 in September 1991, the SSBN 737 in June 1992, the SSBN 738 in May 1993, the SSBN 739 in May 1994, the SSBN 740 in June 1995, the SSBN 741 in July 1996 and the SSBN 742 in August 1997.

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7. (U) Executive Summary (Cont'd):

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I (Initiate Concept Definition)	OCT 77	OCT 77	OCT 77
Commence Advanced Dev Phase	OCT 80	OCT 80	OCT 80
Milestone II (Commence FSD)	OCT 83	OCT 83	OCT 83
First Development Flight Test	JAN 87	JAN 87	JAN 87
Milestone III (Production Approval)/ Award Initial Missile Production Contract	APR 87	APR 87	APR 87
IOC (may be less than full msl outload)	DEC 89	DEC 89	MAR 90

b. Current Change Explanations -- None

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TRIDENT II MISSILE, December 31, 1998

10. (U) Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
1. Max Range Full Payload (nm)	(b)(1)			
2. System Circular Error Probable (CEP) (ft)				
3. System Reliability				
4. Max Payload - Yield				

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	8434.9	8420.5	8414.8
Procurement	17588.5	12098.9	12011.0
Flyaway	(14471.2)		(8660.0)
Other weapon systems	(3082.9)		(3327.4)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(34.4)		(23.6)
Construction (MILCON)	532.9	363.2	373.6
Acquisition O&M	0.0	0.0	0.0
Total FY 83 Base-Year \$	26556.3	20882.6	20799.4
Escalation	8962.2	7286.9	6556.2
Development (RDT&E)	(1018.3)	(998.9)	(996.5)
Procurement	(7808.4)	(6221.4)	(5484.7)
Construction (MILCON)	(135.5)	(66.6)	(75.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	35518.5	28169.5	27355.6
b. (U) Quantity --			
Development (RDT&E)	30	28	28
Procurement	815	434	425
Total	845	462	453

c. Foreign Military Sales -- None.

d. (U) Nuclear Costs -- (b)(1)
Department of Energy cost (b)(1) Million (Then-Year \$).

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TRIDENT II MISSILE, December 31, 1998

12. (U) Unit Cost Summary:

	UCR Baseline (MAY 95 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 83 BY\$)	20882.6	20799.4	
(2) Quantity	462	453	
(3) Unit Cost	45.200	45.915	+1.58
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 83 BY\$)	12098.9	12011.0	
(2) Quantity	434	425	
(3) Unit Cost	27.878	28.261	+1.37

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	9453.2	25396.9	668.4	35518.5
Previous Changes:				
Economic	-21.5	-285.4	-11.1	-318.0
Quantity	-48.0	-9776.2	-	-9824.2
Schedule	-	+1584.8	+25.6	+1610.4
Engineering	-	-	-	-
Estimating	+27.6	+352.2	-253.2	+126.6
Other	-	-	-	-
Support	-	+338.1	-	+338.1
Subtotal	-41.9	-7786.5	-238.7	-8067.1
Current Changes:				
Economic	-	-78.7	-0.2	-78.9
Quantity	-	-273.1	-	-273.1
Schedule	-	-29.5	-	-29.5
Engineering	-	-	-	-
Estimating	-	-46.5	+19.1	-27.4
Other	-	-	-	-
Support	-	+313.1	-	+313.1
Subtotal	-	-114.7	+18.9	-95.8
Total Changes	-41.9	-7901.2	-219.8	-8162.9
Current Estimate	9411.3	17495.7	448.6	27355.6

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TRIDENT II MISSILE, December 31, 1998

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

(U) Summary (FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	8434.9	17588.5	532.9	26556.3
Previous Changes:				
Quantity	-40.0	-5486.1	-	-5526.1
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+19.9	-141.4	-170.8	-292.3
Other	-	-	-	-
Support	-	+61.2	-	+61.2
Subtotal	-20.1	-5566.3	-170.8	-5757.2
Current Changes:				
Quantity	-	-144.8	-	-144.8
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-38.9	+11.5	-27.4
Other	-	-	-	-
Support	-	+172.5	-	+172.5
Subtotal	-	-11.2	+11.5	+0.3
Total Changes	-20.1	-5577.5	-159.3	-5756.9
Current Estimate	8414.8	12011.0	373.6	20799.4

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-89.2
Economic adjustment for negative program change. (Economic)	N/A	+10.5
Total Quantity Variance associated with decrease of 9 units.	-164.6	-309.2
Quantity decrease of -9 units from 434 to 425 missiles. (Quantity)	-144.8	-273.1
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	0.0	-29.5
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	-19.8	-6.6
Adjustment for Current and Prior Inflation. (Estimating)	+6.4	+10.6
Migration of post missile production warhead components to support costs. (Estimating)	-48.3	-94.7
Revised estimates based on contract experience. (Estimating)	+22.8	+44.2
Adjustment for Current and Prior Inflation. (Support)	+4.7	+7.2
Reduction associated with migration of initial spares to replenishment spares. (Support)	-115.3	-214.6

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TRIDENT II MISSILE, December 31, 1998

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

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Revision of estimates associated with production support. (Support)	-22.1	-39.3
Initiation of efforts required to extend the life of the TRIDENT II (D-5) missile to coincide with the recently extended life of the TRIDENT SSBN. (Support)	+134.4	+244.9
Age-driven missile and guidance system supportability modifications. (Support)	+60.9	+109.5
Age-driven replacement of the the Mk-4 Arming, Fuzing and Firing system. (Support)	+61.6	+110.7
Migration of post missile production warhead components from flyaway costs. (Support)	+48.3	+94.7
Procurement Subtotal	-11.2	-114.7

(2) MILCON

Revised escalation indices. (Economic)	N/A	-0.2
Revised estimates for Bangor Washington TRIDENT II backfit projects. (Estimating)	+1.2	+1.8
New projects to modify wharfs at Kings Bay GA and Bangor Washington to support TRIDENT II backfit program requirements. (Estimating)	+10.3	+17.3
MILCON Subtotal	+11.5	+18.9

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
42.03	-0.88	+14.09	+3.49	--	+0.22	--	+1.44	+18.36	60.39

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14b. (U) Unit Cost and Other History (Cont'd):

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
31.16	-0.86	+4.96	+3.66	--	+0.72	--	+1.53	+10.01	41.17

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	OCT 77	OCT 77	OCT 77
Milestone II	N/A	OCT 83	OCT 83	OCT 83
Milestone III	N/A	MAR 87	APR 87	APR 87
FUE/IOC	N/A	DEC 89	DEC 89	MAR 90
Total Cost	N/A	37645.1	35518.5	27356.7
Total Quantity	N/A	740	845	453
Prog Acq Unit Cost	N/A	50.87	42.03	60.39

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

a. Procurement --

(U) MISSILE FOLLOW-ON PROD:
LOCKHEED MARTIN, SUNNYVALE, CA
N00030-95-C-0095, CPIF/FF
Award: November 3, 1994
Definitized: September 29, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$827.7	N/A	18

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$836.1	N/A	18	\$812.3	\$820.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$19.7	\$-3.8
Cumulative Variances To Date (06/28/98)	\$16.2	\$-2.8
Net Change	\$-3.5	\$1.0

Explanation of Change:

(U) The (\$3.5) million unfavorable cost variance change is a result of a retroactive change resulting from a repair and maintenance credit proposal and difficulties with the motor supplier's extended first stage motor mold tooling removal and motor resistance operation.

The \$1.0 million schedule improvement is due to the Joint Venture rocket motor manufacturer recovery.

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TRIDENT II MISSILE, December 31, 1998

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

This will be the last report on this contract.

(U) MISSILE FOLLOW-ON PRODUC:			Initial Contract Price		
LOCKHEED MARTIN, SUNNYVALE, CA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00030-96-C-0096, CPIF/FF			\$634.0	N/A	6
Award: October 1, 1995					
Definitized: November 30, 1995					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$642.0	N/A	6	\$637.0	\$640.0	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$1.0	\$1.0	
Cumulative Variances To Date (11/29/98)			\$7.3	\$-3.0	
Net Change			\$6.3	\$-4.0	

Explanation of Change:

(U) The \$6.3 million improvement in cost is the result of Lockheed Martin Missiles and Space manufacturing labor efficiencies and the motor supplier's favorable overhead rates.

The (\$4.0) million unfavorable change in schedule variance is due to subcontract billings not occurring as planned.

(U) MISSILE FOLLOW- ON PROD:			Initial Contract Price		
LOCKHEED MARTIN, SUNNYVALE, CA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00030-96-C-0097, CPIF/FF			\$588.1	N/A	14
Award: October 1, 1996					
Definitized: November 1, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$594.5	N/A	14	\$594.5	\$593.0	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$4.6	\$-1.3	
Cumulative Variances To Date (11/29/98)			\$0.0	\$-0.3	
Net Change			\$-4.6	\$1.0	

Explanation of Change:

(U) The (\$4.6) million unfavorable cost variance change is a result of adjustments made to correct performance data provided by the motor supplier in the first contractor cost report.

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TRIDENT II MISSILE, December 31, 1998

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

The \$1.0 million schedule improvement is the result of early delivery of the integrated valve assembly and the sequence valve assembly in addition to billings not occurring as planned.

(Note that last year cost variance for this contract was incorrectly reported under schedule variance and schedule variance was incorrectly reported under cost variance.)

(U) MISSILE FOLLOW-ON-PROD::			Initial Contract Price		
LOCKHEED MARTIN, SUNNYVALE, CA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00030-97-C-0100, CPIF/FF			\$536.0	N/A	12
Award: October 1, 1997					
Definitized: May 29, 1998					

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$547.2	N/A	12	\$546.9	\$545.0

		<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances		\$0.0	\$0.0
Cumulative Variances To Date (11/29/98)		\$-3.2	\$0.3
Net Change		\$-3.2	\$0.3

Explanation of Change:

(U) None.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY78-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-07)	<u>Total</u>
RDT&E	9411.3	-	-	-	9411.3
Procurement	14056.1	488.9	486.3	2464.4	17495.7
MILCON	420.6	1.6	5.7	20.7	448.6
O&M	-	-	-	-	-
Total	23888.0	490.5	492.0	2485.1	27355.6

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TRIDENT II MISSILE, December 31, 1998

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

b. Annual Summary -- TRIDENT II (D-5) MISSILE

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1978				5.0	5.0
1979				5.0	5.0
1980				25.6	25.6
1981				96.7	96.7
1982				198.4	198.4
1983				343.9	351.0
1984				1368.5	1447.3
1985				1818.1	1982.6
1986				1731.3	1942.3
1987				1355.1	1565.3
1988				862.5	1029.7
1989				439.3	546.5
1990				130.9	169.5
1991				32.1	43.0
1992				1.6	2.2
1993				0.3	0.4
1994					
1995				0.3	0.5
1996				0.2	0.3
Subtotal	28			8414.8	9411.3

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985				137.7	160.8
1986				420.7	508.4
1987	21		839.8	1075.6	1346.9
1988	66		1314.1	1562.7	2033.5
1989	66		1173.2	1359.8	1839.0
1990	41		796.4	1001.1	1400.6
1991	52		866.4	1054.4	1512.6
1992	28		555.9	745.8	1096.9
1993	21		480.5	653.1	978.1
1994	24		647.8	720.8	1100.7
1995	18		390.9	428.9	665.4
1996	6		118.7	325.1	510.7
1997	7		131.8	199.3	316.3
1998	5		94.1	167.1	268.3
1999	5		106.8	195.2	317.9

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

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	12		202.6	295.4	488.9
2001	12		200.3	289.0	486.3
2002	12		250.4	298.6	511.8
2003	12		243.9	286.1	500.3
2004	12		172.1	278.0	496.2
2005	5		74.3	305.7	557.2
2006				49.0	91.2
2007				161.9	307.7
Subtotal	425		8660.0	12011.0	17495.7

(U) Prior year and total program costs are different than the Procurement Annex. A technical correction to the Procurement Annex will be made prior to the next update.

Procurement costs in FY 2007 include cost to complete funding through FY 2027.

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984				72.8	79.3
1985				73.4	82.4
1986				109.3	126.3
1987				17.6	21.0
1988				14.6	18.1
1989				12.0	15.4
1990				5.7	7.6
1991				51.3	70.5
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000				1.0	1.6
2001				3.5	5.7
2002				0.8	1.3
2003				10.3	17.3
2004				0.4	0.6

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

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2005				0.9	1.5
Subtotal				373.6	448.6

(U) MILCON costs in FY 2000 through FY 2006 are necessary to upgrade facilities at Bangor, Washington in order to support limited TRIDENT II missile processing capability.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	453		8660.0	20799.4	27355.6

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	28	28
Procurement	342	348

(U) Percent Total Program Quantities Delivered: 83.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 22770.6

(U) Percent Total Program Expended: 83.2%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The Cost Elements are those included for Milestone II providing the Strategic Weapon System (SWS) subsystems' (launcher, fire control, navigation, test instrumentation, missile checkout, missile and guidance) average annual support costs through FY 2027. The source of the costs displayed is the Program Manager's estimate as reflected in the FY 2000 President's Budget through FY 2005 and extended through FY 2027. The intermediate maintenance costs are for operating the Strategic Weapons Facilities. Depot maintenance costs are for repair of SWS equipments at contractors facilities. Sustaining support costs are for sustaining engineering and acquisition of replacement support equipment, modification kits and spare parts for shipboard systems. Indirect costs are for base operating support. O&S costs and assumptions for the antecedent system TRIDENT I (C-4) have not previously been developed.

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TRIDENT II MISSILE, December 31, 1998

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

b. (U) Costs -- (FY 1983 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost for TRIDENT II Weapon System	N/A
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	64.0	0.0
Depot Maintenance	71.1	0.0
Contractor Support	N/A	N/A
Sustaining Support	383.4	N/A
Indirect Costs	14.0	N/A
Total	532.5	0.0

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N-8 DDG 51

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: DDG 51 DESTROYER

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): DDG 51 Guided Missile Destroyer; ARLEIGH BURKE CLASS

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:

PEO TSC	RADM W.W. COBB, JR. USN
2531 JEFFERSON DAVIS HIGHWAY	Assigned: December 3, 1998
ARLINGTON, VA 22242-5165	DSN 332-7396; COMM (703) 602-7396
	cobbww@navsea.navy.mil

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

RDT&E:

(U) PE 0604307N

PROCUREMENT:

(U) APPN 161 ICN 24222N (Navy)

MILCON:

(U) PE P-261

(U) PE P-263

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DDG 51 DESTROYER, December 31, 1998

5. (U) References:

SAR Baseline (Production Estimate):

(U) DCP #1337 Rev 1, Change 1 of 22 August 1986.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated March 1, 1999.

6. (U) Mission and Description:

(U) - The DDG 51 is a multi-mission guided missile destroyer designed to operate offensively and defensively, independently, or as units of Carrier Battle Groups and Surface Action Groups, in support of Underway Replenishment Groups and the Marine Amphibious Task Forces in multi-threat environments that include air, surface, and subsurface threats. These ships will respond to Low Intensity Conflict/Coastal and Littoral Offshore Warfare (LIC/CALOW) scenarios as well as open ocean conflict providing or augmenting power projection and forward presence requirements. These ships will bring new capabilities (TBMD, CEC, and Land Attack) into the fleet, providing improved air and anti-missile defense in the littoral.

- The DDG 51 Class ships provide outstanding combat capability and survivability characteristics while considering procurement and lifetime support costs. They feature extraordinary seakeeping and low observability characteristics.

- The DDG 51 features the AEGIS Weapon System (AWS), which has quick reaction time, high firepower, and improved Electronic Countermeasures (ECM) capability in Anti-Air Warfare (AAW). The ships' Anti-Submarine Warfare (ASW) System provides superior long range multi-target detection and engagement capability with two embarked LAMPS MK-III helicopters (Flight IIA, DDG 79 and follow). Their Tomahawk, Harpoon, and MK-45 gun weapon systems provide excellent strike and Anti-Surface (ASU) warfare capability. The AWS is the heart of an integrated combat system that provides area coverage and command/control focus in all dimensions of Naval Warfighting and Joint Military Operations: AAW; ASW; ASU; Command, Control, Communications & Intelligence (C3I); and Strike Warfare (STW).

- Structural features are an all steel hull and deckhouse with vital spaces protected and located within the hull. The ship employs a gas turbine propulsion system with Controllable Pitch propellers similar to the CG 47 class.

- The DDG 51 Destroyer is being produced to fulfill a surface combatant requirement to provide air dominance, maritime dominance and land attack capability including future Theater Ballistic Missile Defense (TBMD).

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DDG 51 DESTROYER, December 31, 1998

7. (U) Executive Summary:

(U) Funding for the lead ship, ARLEIGH BURKE, was provided in FY85 with the lead ship construction contract awarded, as the result of full and open competition, to Bath Iron Works (BIW), Bath, Maine in April 1985. The Navy established Ingalls Shipbuilding Incorporated (ISI) as the second source, by awarding the DDG 52 construction contract in May 1987 in a full and open competition. SECDEF's Major Warship Review in 1991 validated the Navy requirement for the DDG 51 ARLEIGH BURKE Class Destroyers and approved the introduction of Flight upgrades. Flight II was incorporated in the last ship in FY 1992 (DDG 72). A 57 ship program was approved by the Milestone IV Acquisition Decision Memorandum of 2 February 1994, which approved the introduction of Flight IIA Upgrades on the last FY94 ship (DDG 79). In July 1995, the Under Secretary of Defense (Acquisition and Technology) redesignated the DDG 51 Program from an ACAT 1D to an ACAT 1C program. To date, shipbuilding contracts for 51 ships have been awarded, 27 delivered, and 21 have joined the fleet and are meeting mission requirements.

The DDG 51 Class ships incorporate the best warfighting capability U.S. technology can provide. The Navy plans to bring new capabilities into the fleet that will provide the DDG 51 Class Destroyers with improved air and anti-missile defense. These improvements include Theater Missile Defense improvements, Cooperative Engagement Capability to improve air defense, new ship self-defense and command and control systems, long range surface fire and precision land attack, and improvements to the AEGIS radar system to boost its effectiveness in a littoral environment. These capabilities are designed to provide the Navy with its 21st century fighting edge. The challenge is to integrate the complex web of different software development efforts for AEGIS to ensure planned deployment of new capabilities as scheduled. The Navy is working with each manufacturer and integrator to ensure that systems are fully compatible and interoperable.

On 6 March 1998, the Navy awarded DDG 51 Class multiyear procurement (MYP) contracts for 12 ships, 3 per year (FY98-01), plus an option for an additional ship in FY98. BIW was awarded six ships and ISI was awarded seven. The ISI MYP contract also contains an option (unexercised) for an additional ship in FY01. The MYP provides the Navy with affordable ships and maintains the surface combatant industrial base. The 6 March 1998 contract awards funded the first year of the shipbuilding MYP (four FY98 ships). The second year of the shipbuilding MYP was funded in December 1998 (three FY99 ships). The AEGIS Weapon System MYP contract was awarded on 1 May 1998. These contracts, as well as the Sonar Dome Rubber Window MYP, are projected to save the Navy \$1.4B.

The FY98-01 DDG 51 Class MYP introduces AEGIS Baseline 7 Phase I, including the AN/SPY-1D(V) Littoral Radar Upgrade and Advanced Processing, on DDG 91 and follow. Additional core warfighting capability includes: Area TBMD, CEC, Remote Minehunting System, Advanced Integrated Electronic Warfare System (AIEWS), Naval Surface Fire Support/Extended Range Guided Munitions, and AN/SQQ-89(V)15 Sonar System.

The MYP is tightly budgeted, and funding stability is mandatory to execute these contracts as planned. Congressional specific and undistributed

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7. (U) Executive Summary (Cont'd):

reductions are contrary to a basic premise of executing an MYP - funding stability. Approximately 75% of the DDG 51 Class MYP budget is based on forward priced shipbuilding and Government Furnished Equipment (GFE) contracts and contract options. The Navy's ability to sustain reductions during MYP execution is severely limited. To resolve budget marks, due to revised inflation forecasts, the Program is requesting in the FY2000 President's Budget Estimate Submission funding levels that assume existing GFE contract options can be renegotiated at reduced prices in line with current inflation projections.

A Bath Iron Works shipyard expansion project commenced construction on 7 November 1998. The expansion when completed will make the shipyard more competitive and efficient. The showpiece of the project is the land level transfer facility that, when completed, will eliminate the need to launch ships on inclined ways. DDG 90 will be the 1st DDG 51 Class ship to utilize this facility in 2001.

Y2K testing aboard DDG 76 on 6 January 1999 verified that no critical operational problems existed at the ship level with regard to systems available prior to ship custody transfer. Land-based testing of all operational AEGIS baselines, 1-5, have been tested at the AEGIS Combat System Center (ACSC), and are operationally Y2K compliant. Additional Y2K testing of shipboard systems is currently being planned. Two DDG 51 Destroyers will participate in the USS CONSTELLATION Battle Group System Integration Test scheduled in February. Intra-ship Y2K testing will be conducted as part of Trial D onboard DDG 78, scheduled for 1-5 March at Ingalls. Further testing onboard DDG 77 will occur in late March at BIW. Early planning of ship-to-ship testing is being conducted.

Affordability is a top priority for the DDG 51 Destroyer Class Program. PEO-TSC has recently directed planning for developing Total Ownership Cost (TOC) reduction initiatives. The Program Manager is continuing to aggressively pursue the identification and implementation of acquisition and life cycle cost reduction and cost avoidance initiatives. Major reform initiatives include innovative contracting methods such as the Profit Related to Offers (PRO) concept, promoting expanded BIW-ISI cooperation in the area of joint procurement, multiyear procurement, establishment of Total Ownership Cost reduction initiative programs, and the incorporation of initiatives evolving from the Smart Ship integrated ship control program. The DDG 51 Program Manager has established life cycle cost reduction (LCC) programs at both BIW and ISI to identify design, process or other initiatives that would reduce the overall cost of ownership.

DDG 51 Class ship construction has achieved numerous production milestones since the last report. The more significant are the following:

DDG 73 (DECATUR) ship custody transfer occurred 13 March 1998
DDG 77 (O'KANE) launched 28 March 1998
USS McFAUL (DDG 74) commissioned 25 April 1998
DDG 85 (McCAMPBELL) started fabrication 28 June 1998

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7. (U) Executive Summary (Cont'd):

DDG 84 (BULKELEY) started fabrication 20 July 1998
 DDG 75 (DONALD COOK) ship custody transfer occurred 21 August 1998
 USS DECATUR (DDG 73) commissioned 29 August 1998
 DDG 79 (OSCAR AUSTIN) launched 7 November 1998
 USS DONALD COOK (DDG 75) commissioned 4 December 1998
 DDG 78 (PORTER) ship custody transfer occurred 10 January 1999
 DDG 76 (HIGGINS) ship custody transfer occurred 14 January 1999
 DDG 80 (ROOSEVELT) launched 16 January 1999
 DDG 87 (SHOUP) started fabrication 24 January 1999

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Complete Concept Design	N/A	DEC 80	DEC 80
DNSARC I	JUN 81	JUN 81	JUN 81
Complete Preliminary Design	N/A	MAR 83	MAR 83
DSARC II	DEC 83	DEC 83	DEC 83
Complete Contract Design	N/A	JUN 84	JUN 84
DDG 51 Contract Award	APR 85	APR 85	APR 85
Milestone IIIA	OCT 86	OCT 86	OCT 86
DDG 52 Contract Award	JAN 87	MAY 87	MAY 87
DDG 53 Contract Award	N/A	SEP 87	SEP 87
Lay Keel DDG 51	N/A	DEC 88	DEC 88
Launch DDG 51	N/A	SEP 89	SEP 89
DDG 51 Delivery	N/A	APR 91	APR 91

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

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Launch DDG 52	N/A	MAR 91	MAY 91
Organic Support Available	N/A	JUL 91	JUL 91
Depot Support Available	N/A	JUL 91	JUL 91
OPEVAL	N/A	FEB 92	FEB 92
DDG 52 Delivery	N/A	MAY 92	OCT 92
DDG 51 IOC	OCT 90	FEB 93	FEB 93
DDG 53 Delivery	N/A	FEB 93	AUG 93
Milestone IV	N/A	APR 93	OCT 93
DDG 51 Flight IIA Contract Award	N/A	MAR 94	JUL 94
Complete ESSM COEA	N/A	NOV 94	NOV 94
ESSM Milestone IV	N/A	NOV 94	NOV 94
SH-60B Hellfire IOC	N/A	DEC 97	DEC 97
DDG 51 Flight IIA Delivery	N/A	SEP 99	FEB 00
DDG 51 Flight IIA IOC	N/A	OCT 00	OCT 00
ESSM IOC	N/A	AUG 02	AUG 02

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
SHIP:				
Length (ft)	466	N/A / N/A	TBD	471
Beam (ft)	59	N/A / N/A	TBD	59
Navigational Draft (ft)	30.6	N/A / N/A	TBD	31.7
Displacement (long tons)	8300	N/A / N/A	TBD	9300
Propulsion IM (Gas Turbine)	2500	N/A / N/A	TBD	2500
Accommodations	341	N/A / N/A	TBD	380
MOBILITY:				
Speed (knots)	30	30 / 30	TBD	30 -
Endurance (@ 20 Knots) (nm)	(b)(1)		TBD	(b)(1)
ANTI-AIR WARFARE:				
CONDUCT SUCCESSFUL AAW ENGAGEMENT:				
Probability of Successful Engagement-ESSM	N/A	TBD / 0.75	TBD	0.75
ANTI-SURFACE WARFARE:				
CONDUCT SUCCESSFUL ASW ENGAGEMENT:				
Probability of Successful Engagement				

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10a. (U) Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obi/Threshold		Demon- strated Perf	Current Estimate
(S) HELO	N/A	(b)(1)		TBD	(b)(1)
NAVAL SURFACE FIRE SUPPORT					
Probability of Suc- cessful Engagement					
(S) HELO	N/A			TBD	
ANTI-SUBMARINE WARFARE:					
CONDUCT SUCCESSFUL ASW ENGAGEMENT:					
Figure of Merit:					
(S) Probability of	N/A			TBD	
Achieving Attack Criteria					
(S) Number VLS Missiles	N/A			TBD	1)
MINE WARFARE:					
Detection Range of Moored/Floating Mine (YDS)	N/A	1000	/ 800	TBD	800
SIGNATURE:		(b)(1)			
(S) Radar Cross section (dbsm)	N/A			TBD	(b)(1) (2)
SURVIVABILITY/ VULNERABILITY:					
Nuclear					
(S) Airblast	N/A			TBD	(3)
Overpressure (psi)					
Armament					
Anti-Submarine Warfare					
ASW System	AN/SQQ- 89	N/A	/ N/A	TBD	AN/SQQ- 89(V)10
ASROC	VLA	N/A	/ N/A	TBD	VLA
Helo	SEAHAWK; LAMPS	2	/ 2	TBD	2
		EMBARKED/ HELOS	EMBARKED / HELOS		EMBARKED HELOS
Anti-Air Warfare					
Launchers	MK 41 VLS	N/A	/ N/A	TBD	MK 41 VLS
Missiles	SM-2 MR	N/A	/ N/A	TBD	SM-2 MR
Missile Fire	3 MK 99	N/A	/ N/A	TBD	3 MK 99
Control System					
Guns	2 PHALANX	N/A	/ N/A	TBD	2 PHALANX /ESSM

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10a. (U) Performance Characteristics (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Anti-Surface/Strike Warfare				
Guns	1 5"/54	N/A	/ N/A	TBD
Gunfire Control System	MK 160	N/A	/ N/A	TBD
Anti-Ship Cruise Missile	HARPOON	N/A	/ N/A	TBD
Cruise Missile	TOMAHAWK	N/A	/ N/A	TBD
Electronic Warfare	SLQ-32	N/A	/ N/A	TBD
	SRBOC			(V) 3, SRBOC, Combat DF
Radars				
Surface	SPS-67	N/A	/ N/A	TBD
3D	SPY-1D	N/A	/ N/A	TBD

(U) */ General Note: Approved Program, Demonstrated Performance, and Current Estimate are for the Flight IIA configuration.

- 1/ There are three types of missiles (SM-2, TOMAHAWK, and VLA) which are shot from 96 tubes.
- 2/ DBSM reduction from conventionally constructed ships of similar displacement, e.g. CG 47 Class ship.
- 3/ For structure and developmental systems.

b. Current Change Explanations -- None

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11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Production <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	979.8	2242.9	2247.7
Procurement	15948.3	39092.2	39005.8
Basic Ship Costs	(5383.6)		(16516.2)
HM&E and Combat Systems	(9427.9)		(20213.2)
Other Costs	(621.9)		(743.5)
OF/PD	(514.9)		(1532.9)
Total Sailaway	(15948.3)		(39005.8)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	25.6	34.8	37.7
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 87 Base-Year \$	16953.7	41369.9	41291.2
Escalation	3163.8	15842.0	12674.0
Development (RDT&E)	(-63.2)	(397.1)	(379.8)
Procurement	(3224.8)	(15438.7)	(12287.4)
Construction (MILCON)	(2.2)	(6.2)	(6.8)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	20117.5	57211.9	53965.2
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>23</u>	<u>57</u>	<u>57</u>
Total	23	57	57

c. (U) Foreign Military Sales --

There are 37 Japanese AEGIS Weapon System FMS cases totaling \$2.0B. There is also one Spanish AEGIS Weapon System FMS case totaling \$0.7B.

d. (U) Nuclear Costs --

None.

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12. (U) Unit Cost Summary:

	UCR Baseline (MAR 99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 87 BY\$)	41369.9	41291.2	
(2) Quantity	57	57	
(3) Unit Cost	725.788	724.407	-0.19
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 87 BY\$)	39092.2	39005.8	
(2) Quantity	57	57	
(3) Unit Cost	685.828	684.312	-0.22

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	916.6	19173.1	27.8	20117.5
Previous Changes:				
Economic	-97.5	-4115.9	+0.2	-4213.2
Quantity	-	+31714.7	-	+31714.7
Schedule	+44.8	+926.4	-	+971.2
Engineering	+15.5	+1965.7	+13.2	+1994.4
Estimating	+1577.9	+1719.0	-	+3296.9
Other	-	-	-	-
Support	-	-	-0.2	-0.2
Subtotal	+1540.7	+32209.9	+13.2	+33763.8
Current Changes:				
Economic	-16.2	-376.3	-0.2	-392.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	+3.5	+3.5
Estimating	+186.4	+286.5	-	+472.9
Other	-	-	-	-
Support	-	-	+0.2	+0.2
Subtotal	+170.2	-89.8	+3.5	+83.9
Total Changes	+1710.9	+32120.1	+16.7	+33847.7
Current Estimate	2627.5	51293.2	44.5	53965.2

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

(U) Summary (FY 1987 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	979.8	15948.3	25.6	16953.7
Previous Changes:				
Quantity	-	+21363.6	-	+21363.6
Schedule	+27.3	-	-	+27.3
Engineering	+11.1	+1293.2	+9.3	+1313.6
Estimating	+1096.8	+161.5	+0.2	+1258.5
Other	-	-	-	-
Support	-	-	-0.1	-0.1
Subtotal	+1135.2	+22818.3	+9.4	+23962.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	+2.6	+2.6
Estimating	+132.7	+239.2	-	+371.9
Other	-	-	-	-
Support	-	-	+0.1	+0.1
Subtotal	+132.7	+239.2	+2.7	+374.6
Total Changes	+1267.9	+23057.5	+12.1	+24337.5
Current Estimate	2247.7	39005.8	37.7	41291.2

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) RDT&E

Revised escalation rates (Economic)	N/A	-16.2
Revised program estimates required to develop AEGIS Weapon System interoperability solutions (Estimating)	+132.7	+186.4
RDT&E Subtotal	+132.7	+170.2

(2) Procurement

Revised escalation rates (Economic)	N/A	-376.3
Revised for current (FY98) and prior year (FY85-FY97) program due to (BY87\$) Ship Cost Adjustment (SCA) for ship construction escalation and GFE escalation (Estimating)	+24.4	+31.4
Revised for funding of Baseline 7 Phase I Warfighting upgrade options exercised in FY00/01 (Estimating)	+49.0	+68.6
Revised for MYP related contracts (FY98-01) not subject to reprice for inflation changes (Estimating)	+33.6	+47.0

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

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

Revised for Outfitting/Post Delivery change as a result of COSAL and Post Delivery Test and Trial policy changes (Estimating)	+86.0	+123.3
Revised for ship construction and GFE cost estimates and Outfitting and Post Delivery estimates as a result of policy change (Estimating)	+46.2	+16.2
Procurement Subtotal	+239.2	-89.8

(3) MILCON

Revised escalation rates (Economic)	N/A	-0.2
Revised program to construct an additional four story deckhouse to house a SPY-1D(V) at the AEGIS Combat Systems Center (Wallops Island, VA) (Engineering)	+2.7	+3.7
Correction to previous SAR - Funding moved from Engineering to Support (Engineering)	-0.1	-0.2
Correction to previous SAR - Funding moved from Engineering to Support (Support)	+0.1	+0.2
MILCON Subtotal	+2.7	+3.5

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1217.10	-233.23	-263.20	+15.10	-25.10	+145.80	--	+18.20	-342.43	874.67

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14a. (U) Unit Cost and Other History (Cont'd):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
874.67	-80.81	+34.67	+17.04	+35.05	+66.14	--	--	+72.09	946.76

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1119.26	-205.16	-197.71	+13.94	+61.66	+27.38	--	+14.24	-285.65	833.61

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
833.61	-78.81	+59.16	+16.25	+34.49	+35.18	--	--	+66.27	899.88

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	JUN 81	JUN 81	JUN 81	JUN 81
Milestone II	MAY 83	DEC 83	DEC 83	DEC 83
Milestone III	AUG 86	AUG 86	OCT 86	OCT 86
FUE/IOC	N/A	N/A	OCT 90	FEB 93
Total Cost	10953.5	14910.6	20117.5	53965.2
Total Quantity	9	14	23	57
Prog Acq Unit Cost	1217.06	1065.04	874.67	946.76

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

a. Procurement --

(U) DDG 73,75,76 CONSTRUCTION:

BATH IRON WORKS, BATH, ME
N00024-93-C-2800, FPI
Award: January 19, 1993
Definitized: January 19, 1993

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$777.0	\$865.8	3

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$830.7	\$924.0	3	\$888.4	\$914.3

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$11.2	\$-15.2
Cumulative Variances To Date (11/30/98)	<u>\$11.4</u>	<u>\$-8.9</u>
Net Change	\$0.2	\$6.3

Explanation of Change:

(U) Cost and schedule variance improvement is due to labor and overhead performance. All ships on this contract have delivered. This is the last time this contract will be reported.

(U) Contract Comments:

Target Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements, future changes estimates, nor escalation compensation commitments (\$141.3M).

(U) DDG 77,79,81 CONSTRUCTION:

BATH IRON WORKS, BATH, ME
N00024-94-C-2808, FPI
Award: July 20, 1994
Definitized: January 4, 1995

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$964.5	\$1077.2	3

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1020.5	\$1138.3	3	\$1077.3	\$1119.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-43.3	\$2.3
Cumulative Variances To Date (11/30/98)	<u>\$-88.3</u>	<u>\$-12.4</u>
Net Change	\$-45.0	\$-14.7

Explanation of Change:

(U) Cost variance is driven by labor and overhead rates. Schedule variance is due to labor/overhead on DDG 81 Units and Outfit packages.

(U) Contract Comments:

This contract introduces the Flight IIA ships(DDGs79 and 81) at BIW. Target

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

Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements, future changes estimates, nor escalation compensation commitments (\$136.9M).

(U) <u>DDG 78,80,82 CONSTRUCTION:</u>	Initial Contract Price		
INGALLS SHIPBUILDING, INC., PASCAGOULA MS	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00024-94-C-2800, FPI	\$993.8	\$1107.5	3
Award: July 20, 1994			
Definitized: January 4, 1995			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1053.6	\$1174.4	3	\$1083.2	\$1084.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-43.0	\$6.0
Cumulative Variances To Date (11/30/98)	<u>\$-46.7</u>	<u>\$-34.3</u>
Net Change	\$-3.7	\$-40.3

Explanation of Change:

(U) Cost variance is driven by labor. Schedule variance is driven by material and is not unusual at this early stage of construction.

(U) Contract Comments:

This contract introduces the Flight IIA ships (DDGs 80 and 82) at ISI. Target Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements, future change estimates, nor escalation compensation commitments (\$94.5M).

(U) <u>DDG 84,86,88 CONSTRUCTION:</u>	Initial Contract Price		
INGALLS SHIPBUILDING, INC, PASCAGOULA MS	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00024-96-C-2304, FPI	\$1034.9	\$1165.8	3
Award: June 20, 1996			
Definitized: December 13, 1996			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1053.9	\$1186.9	3	\$1039.7	\$1099.4

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DDG 51 DESTROYER, December 31, 1998

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.1	\$-8.4
Cumulative Variances To Date (11/30/98)	<u>\$-15.6</u>	<u>\$-22.3</u>
Net Change	\$-15.7	\$-13.9

Explanation of Change:

(U) Cost and Schedule variance is driven by material and is not unusual at this early stage of construction.

(U) Contract Comments:

Target Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements nor future changes estimates (\$55.1M). This contract is forward priced, incorporating escalation compensation in the basic contract.

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) DDG 83,85,87 CONSTRUCT:			
BATH IRON WORKS, BATH, ME			
N00024-96-C-2305, FPI	\$1071.3	\$1219.7	3
Award: June 20, 1996			
Definitized: December 13, 1996			

<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>
\$1088.1	\$1237.1	3	\$1088.1	\$1105.8

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$8.6	\$28.0
Cumulative Variances To Date (11/30/98)	<u>\$1.6</u>	<u>\$66.8</u>
Net Change	\$-7.0	\$38.8

Explanation of Change:

(U) Cost and Schedule variance performance is driven by material and is not unusual at this early stage of construction.

(U) Contract Comments:

Target Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements nor future changes estimates (\$58.1M). This contract is forward priced, incorporating escalation compensation in the basic contract.

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DDG 51 DESTROYER, December 31, 1998

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

(U) <u>DDG 89,91,93,95 CONSTRUC:</u>			Initial Contract Price		
Ingalls Shipbuilding, Inc, Pascagoula MS	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
N00024-98-C-2307, FPI	\$1408.9	\$1601.9	4		
Award: March 6, 1998					
Definitized: December 14, 1998					

Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$1409.2	\$1602.8	4	\$1408.4	\$1432.9	

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (11/30/98)	<u>\$0.4</u>	<u>\$-27.3</u>
Net Change	\$0.4	\$-27.3

Explanation of Change:

(U) Cost and Schedule variances are not significant at this stage of contract performance.

(U) Contract Comments:

This contract reflects 4 of 7 MYP ships awarded at ISI. Target Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements nor future changes estimates (\$88.2M).

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

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

<u>Appropriation</u>	<u>Prior Years (FY80-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-09)</u>	<u>Total</u>
RDT&E	1821.3	176.0	137.1	493.1	2627.5
Procurement	38744.1	2752.9	2981.3	6814.9	51293.2
MILCON	41.0	-	3.5	-	44.5
O&M	-	-	-	-	-
Total	40606.4	2928.9	3121.9	7308.0	53965.2

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DDG 51 DESTROYER, December 31, 1998

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

b. Annual Summary -- DDG 51 Destroyer

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY87 Dollars Nonrec	Flyaway FY87 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1980				14.9	10.5
1981				45.1	35.3
1982				121.2	102.0
1983				170.8	150.7
1984				132.2	121.1
1985				146.5	138.8
1986				96.0	93.5
1987				100.4	100.4
1988				90.7	93.4
1989				48.7	52.3
1990				36.1	41.2
1991				73.9	87.5
1992				71.6	87.2
1993				88.7	110.6
1994				80.9	102.7
1995				69.2	89.6
1996				66.3	87.3
1997				61.9	82.5
1998				58.7	78.8
1999				114.8	155.9
2000				127.6	176.0
2001				97.8	137.1
2002				94.7	134.9
2003				67.4	97.8
2004				57.7	85.4
2005				57.3	86.7
2006				31.7	49.0
2007				18.7	29.4
2008				6.2	9.9
Subtotal				2247.7	2627.5

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY87 Dollars Nonrec	Flyaway FY87 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984					78.5
1985	1	307.6	899.0	1177.8	1145.8
1986					98.1
1987	3	143.6	2185.8	2255.0	2484.7
1988				4.0	9.6

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

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY87 Dollars Nonrec	Flyaway FY87 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989	4		2570.8	2474.9	2873.6
1990	5	11.2	3107.9	3014.4	3623.5
1991	4	2.9	2577.5	2533.5	3170.7
1992	5	29.7	3184.6	3142.5	4055.8
1993	4	6.1	2574.7	2634.3	3402.9
1994	3	65.0	2076.2	2153.9	2778.4
1995	3	25.2	2054.7	2080.8	2759.4
1996	2	42.1	1509.6	1594.6	2337.7
1997	4	27.4	2571.2	2559.5	3651.9
1998	4	86.1	2614.0	2622.7	3530.0
1999	3	45.9	2052.2	2049.0	2743.5
2000	3	28.7	2030.1	1998.5	2752.9
2001	3		2023.6	2013.3	2981.3
2002	3		1994.9	1967.3	2735.8
2003	3		2157.5	2146.6	3221.0
2004				119.5	168.5
2005				127.5	183.6
2006				115.6	169.9
2007				100.9	151.4
2008				82.6	126.6
2009				37.1	58.1
Subtotal	57	821.5	38184.3	39005.8	51293.2

(U) FY 84 and FY 86 Then Year figures are for advanced procurement for FY 85 and FY 87, respectively. The associated Base Year amounts are reflected in the year of the end item procurement.

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY87 Dollars Nonrec	Flyaway FY87 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986				4.5	4.6
1988				13.5	14.7
1989				7.5	8.5
1990					
1991					
1992					
1993					
1994					
1995					
1996					
1997					

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DDG 51 DESTROYER, December 31, 1998

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

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY87 Dollars Nonrec	Flyaway FY87 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				9.7	13.2
1999					
2000					
2001				2.5	3.5
Subtotal				37.7	44.5

(U) The FY01 funds are required to construct an additional four story deckhouse at the AEGIS Combat Systems Center (ACSC) at Wallops Island, VA to house a SPY-1D(V), AWS radar, and associated equipment. This facility is needed to support development of training, integration, evaluation, and testing on the third generation AEGIS radar system baseline under development.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	57	821.5	38184.3	41291.2	53965.2

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	27	27

(U) Percent Total Program Quantities Delivered: 47.4%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 27767.1

(U) Percent Total Program Expended: 51.5%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
The O&S estimate projects costs for a 57 ship buy and encompasses the Flight I, II, and IIA designs. The Flight IIA design begins with the last ship in fiscal year 1994. Estimates are based almost exclusively on DDG 51 Class actual operating experience cost information from the Visibility and Management of Operating and Support Cost (VAMOSOC) database for hulls operating in the fleet (DDGs 51-78). The average annual cost per ship for Operating and Support costs is estimated at \$37.2M in FY87 dollars.

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

Manning levels are based on a "peace-time" operating tempo, with direct and indirect manpower rates obtained from the Naval Center for Cost Analysis (NCCA) and Cost of Manpower Estimating Tool (COMET). These estimates were made in accordance with DoD 5000.4M "Department of Defense Cost Analysis Guidance and Procedures" (Dec 92) and the Office of the Secretary of Defense "Cost Analysis Improvement Group, Operating and Support Cost Estimating Guide" (May 92).

b. (U) Costs -- (FY 1987 Constant (Base-Year) Dollars in Millions)

Cost Element	Average Annual Cost Per Ship (FY87\$)	Average Annual Cost Per Ship
Mission Pay & Allowances	9.3	0.0
Unit Level Consumption	4.4	0.0
Intermediate Maintenance	0.2	0.0
Depot Maintenance	13.0	0.0
Contractor Support	0.0	0.0
Sustaining Support	3.5	0.0
Indirect Costs	6.8	0.0
acts	N/A	N/A
Total	37.2	0.0

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: AMRAAM (AIM-120)

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM)

2. (U) DoD Component: USAF

Joint Participants:
USAF/USN

3. (U) Responsible Office and Telephone Number:

Air-to-Air Joint Systems Program	SES JUDY A. STOKLEY
Office (JSPO)	Assigned: June 10, 1997
AAC/YA	DSN 872-3531; COMM (850) 882-3531
Eglin AFB, FL 32542-6844	stokley@eglin.af.mil

(U) Navy Program Director	RICHARD T. CALANO
Air-to-Air Joint Systems Program	Assigned: October 26, 1997
Office (AAC/YA)	AV 872-2412 COMM (904) 882-2412
EGLIN AFB, FL 32542-6844	calanor@eglin.af.mil

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

RDT&E:

(U)	PE 0207163F	
(U)	PE 0207163N	Project E0981 (Shared)
(U)	PE 0603316F	
(U)	PE 0603370F	
(U)	PE 0603370N	Project W0981

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AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

CAC/DAS

~~Classified by: AMRAAM SECURITY CLASSIFICATION CHANGE, 30 APR 97~~
~~Downgrade instructions: Reason: E012000 (Section 1.5e)~~
~~Declassify on: Original Source Marked "OADR", 30 APR 97~~

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4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) PE 0604314F
(U) PE 0604314N Project E0981 (Shared)
(U) PE 063370F

PROCUREMENT:

(U) APPN 1507 ICN 2206 (Navy)
(U) APPN 3020 ICN MAMRAO (Air Force)

5. (U) References:

SAR Baseline (Production Estimate):

(U) DAE Approved Acquisition Program Baseline dated January 17, 1992.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated September 27, 1996.

6. (U) Mission and Description:

(U) The AMRAAM program provides for the acquisition of the most advanced all-weather, all-environment medium range air-to-air missile system in response to USAF, USN, NATO, and other allied operational requirements for the 1989-2007 time period. The system is an active radar guided intercept missile with inherent Electronic Protection (EP) capabilities for air-to-air applications against massed penetration aircraft and is designed to augment the AIM-7 Sparrow.

7. (U) Executive Summary:

(U) In January 1979 Defense Systems Acquisition Review Council (DSARC) Milestone I validated the requirement for AMRAAM. In January 1989 Full Scale Development flight testing was completed by the Hughes Aircraft Company and the Raytheon Company completed second-source qualification. AMRAAM Initial Operational Capability on the F-15 occurred in September 1991, and the first F-16 unit established Full Operational Capability in January 1992. In April 1992 a follow-up to the DAB Milestone IIIB review authorized Full-Rate production for the FY93 procurement. Successful completion of the Navy Operational Evaluation occurred in March 1994. The first missile incorporating the Phase 1 Pre-Planned Product Improvement (P3I) missile design was delivered in November 1995, providing increased Electronic Protection capability and a compressed airframe for F-22 internal carriage. Under the P3I program, a new software tape was fielded in June 1997 to substantially improve weapon effectiveness in the presence of ECM. In January 1997, contracts from the seventh production competition were awarded. In December 1997 Raytheon and Hughes merged into the Raytheon Systems Company. Part of the Department of Justice merger approval included a price agreement, which was signed in October 1997 for four years of production.

The AMRAAM Massachusetts missile production transition to Tucson, AZ, was accomplished in May 1998. This transition occurred two months earlier than planned. For the remainder of calendar year 1998, the Tucson facility has

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AMRAAM (AIM-120), December 31, 1998

7. (U) Executive Summary (Cont'd):

delivered missiles for the combined contracts on time or ahead of schedule.

The Lot 12 production contract was awarded on April 13, 1998 with priced options for Lots 13, 14, and 15. This contract included a long term pricing agreement with the single producer and the contractor assumption of Total Systems Performance Responsibility (TSPR). TSPR is the acceptance of responsibility to do what is necessary and sufficient to deliver, warrant, and support missiles that are affordable, combat capable, and readily available. The merger and new acquisition strategy have decreased FY98 and later costs. These savings have been removed from the FY00 budget submissions.

Foreign Military Sales (FMS) continue to play an important role in maintaining an affordable missile price. Two thirds of the Lot XII production award went to foreign sales (173 Air Force, 120 Navy, and 584 FMS). The National Disclosure Policy Committee approved Direct Commercial Sales (DCS) to the United Kingdom in May 1998. Completed FMS missile deliveries provided initial AMRAAM operational capability to Greece, Netherlands, Finland, and Sweden.

Under the P3I Phase 2 program, test flights were completed with four successful launches in the October through December 1998 time period. Software tape 7B completed a functional configuration audit on December 18, 1998. The first AIM-120 C-4 missiles with the improved software and warhead are scheduled for delivery in August 1999. The first AIM-120 C-5 missiles with the longer rocket motor are scheduled for delivery in May 2000. A \$172.9M P3I Phase 3 contract was awarded on October 29, 1998. This phase will provide an upgraded missile (AIM-120 C-7) with substantial improvements in the guidance section hardware and software. Development will be conducted through FY03. Production incorporation will be in Lot 16 with deliveries in FY04. This contract incorporates the full concept of contractor TSPR. Future missile production cost is a key element in the new missile specification. Costs are being managed under the Cost as an Independent Variable (CAIV) process with a substantial portion of the contract award fee tied to the success of meeting future production cost goals.

The AMRAAM program accomplished 149 AIM-120 launches during 1998. The launches demonstrated 83% missile success and 78% system success.

The AMRAAM missile system was certified Y2K compliant for mission-critical systems in November 1998. On December 9, 1998, an AIM-120B missile was successfully fired off an F-15C in an operationally representative Y2K environment to demonstrate end-to-end Y2K compliance. The contractor factory development, production, support, and test equipment have been determined to be Y2K compliant, or an acceptable work-around is in place until fully-compliant replacements can be implemented. Completion of these efforts will occur in 1999.

All missile intermediate and depot maintenance was consolidated at the Tucson facility. A long-term sustainment contract will be awarded in 1999.

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AMRAAM (AIM-120), December 31, 1998

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I (DSARC)	NOV 78	NOV 78	NOV 78
Milestone II (DSARC)	SEP 82	SEP 82	SEP 82
Start DT&E/IOT&E	OCT 83	N/A	OCT 83
Certification	FEB 86	FEB 86	FEB 86
Milestone IIIA (DAB)	JUN 87	JUN 87	JUN 87
DAE Program Review	MAY 88	MAY 88	MAY 88
Start Production Deliveries	SEP 88	SEP 88	SEP 88
Complete D/IOT&E (Air Force)	JAN 89	JAN 89	JAN 89
Complete IOT&E/Captive Carry	JUN 90	JUN 90	JUN 90
Reliability Program w/Lot 1 Assets (Air Force)			
Initial Equippage	DEC 90	DEC 90	DEC 90
Initial Operational Capability (IOC) Air Force	MAR 91	MAR 91	SEP 91
Milestone IIIB (DAB) (Lot IV Full Go-Ahead Rate Production)	APR 91	APR 91	MAY 91
DAB Program Review Full Rate Production Approval	MAR 92	MAR 92	APR 92
Full Operational Capability (FOC) 1st F-16 Unit Fully Operational w/AMRAAMs	MAR 92	MAR 92	JAN 92
Complete FOT&E (OPEVAL) (Navy)	MAR 92	JAN 94	MAR 94
Complete AF FOT&E Phase I	MAR 92	FEB 93	APR 93
P3I Phase 1 CDR Complete	OCT 92	OCT 92	JAN 93
Initial Operational Capability (IOC) (Navy)	SEP 92	SEP 93	SEP 93

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AMRAAM (AIM-120), December 31, 1998

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

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Joint Depot Activated	SEP 94	JUL 99	JUL 99
P3I Phase 1 Flight Test Completed	DEC 94	DEC 94	APR 95
Last Delivery	SEP 01	N/A	NOV 09

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate	
Weight (lbs)	327	327 / 350	344	345	
F-Pole at 25NM Range	(b)(1)				
A-Pole at 25NM Range	(b)(1)				
Probability of Kill	(b)(1)				(Ch-1)
Look-Down Shoot-Down	(b)(1)				
Target alt (ft)	(b)(1)				
over:					
Land	(b)(1)				
Water	(b)(1)				
Reliability					
Ready Storage (hrs)	60000	60000 / 45000	N/A	45000	
(mature msl - 90K operational flight hours)					
Availability (%)	86	86 / 82	N/A	96	
Captive-Carry (MTBM- Type I) (hrs)	600	600 / 450	1152	1152	(Ch-2)
On Alert Storage MTBM	30000	30000 / 22500	N/A	30000	
Aircraft Configure/ Load - 3 Man Load Crew					
Install 4 Rail Launchers (mins)	20	20 / 25	21	21	
Load 4 Missiles from trailer (mins)	15	15 / 20	18	18	
Load 4 Missiles from container (mins)	20	20 / 30	22	22	
Missile checks (mins)	1	1 / 5	1	1	
All Weather Capability	Day, Night, Rain, Clouds	Day, Night, Rain, Clouds	Day, Night, Rain, Clouds	Day, Night, Rain, Clouds	

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AMRAAM (AIM-120), December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate	
(S) All-Aspect Launch & Track	(b)(1)				
Aircraft Compatibility	F-15, F-16, F-14, F/A-18	F-15, / F-16, / F-14, / F/A-18 /	ity F-15, / F-16, / F-14, / F/A-18	F-15, F-16, F/A-18	(Ch-3)
All-Up Round	Control Surfaces field in- stalled	Control / Surfaces/ field / in- / stalled /	Control Control Surface s field in- stalled	Control Surface s field in- stalled	
(S) ECCM Capability	(b)(1)				
(S) Terminal Mode Acquisition & Launch	(b)(1)				
Target Discrimination (cluster target): Attack Multiple Targets which are unresolved by friendly fighter A/C radars	(b)(1)				
Range (ft) Range Rate (ft/sec) Angle (deg)	(b)(1)				

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AMRAAM (AIM-120), December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

(U) F-Pole - The distance between the shooter and the target when the missile intercepts the target.

A-Pole - The distance between the shooter and the target when the missile goes active.

b. Current Change Explanations --

(Ch-1): Probability of Kill has changed from (b)(1) based on AIM-120C-3, Tape 7 Rev 7 simulations.

(Ch-2): Captive Carry Mean Time Between Maintenance (MTBM) has increased from 282 hours to 1152 hours and the current estimate has changed from 750 hours to 1152 hours based on actual flight hour experience.

(Ch-3): The Navy has deleted the F-14 requirement from the Aircraft Compatibility list.

(Ch-4): ECCM Capability: Pk for Dual Shot with ECM has changed from (b)(1) to (b)(1) based on AIM-120C-3, Tape 7 Rev 7 simulations. This is compared to the threshold requirement to be greater than or equal to the Single Shot Pk without ECM.

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AMRAAM (AIM-120), December 31, 1998

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	1725.7	2097.2	2197.8
Procurement	10552.5	10205.7	8050.0
Flyaway	(10038.5)		(7538.6)
Other Weapon Cost	(378.0)		(0.0)
Peculiar Support	(0.0)		(423.2)
Initial Spares	(136.0)		(88.2)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 92 Base-Year \$	12278.2	12302.9	10247.8
Escalation	834.2	1025.0	111.4
Development (RDT&E)	(-375.1)	(-275.7)	(-276.3)
Procurement	(1209.3)	(1300.7)	(387.7)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	13112.4	13327.9	10359.2

(U) Note: Other Weapon Cost has been recategorized as Peculiar Support to track to the program office estimate.

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	15450	13038	10917
Total	15450	13038	10917

(U) Excludes 169 non-fully configured RDT&E missiles in the development estimate and 111 in the current estimate. The original plan was to procure 810 LRIP missiles or 3.3% of the total planned quantity of 24,320. However, LRIP was extended from FY87 through FY92 with a quantity of 4,159 missiles (27% of the production estimate total quantity). This resulted from two actions: (1) the planned total procurement decreased from 24,320 missile at Milestone IIIA to 15,450 missiles at Milestone IIIB, and (2) Milestone IIIB authorized the program to continue LRIP through FY92, adding 3,349 missiles to the LRIP quantities.

c. ~~(U)~~ Foreign Military Sales --

- (U) *TURKEY (TK-D-YDO) Case signed 14 May 1991
\$61.1M PURPOSE: 96 AMRAAMS (Lots VII), 96 (MRLs) and associated equipment
- (U) *SOUTH KOREA (KS-D-YGL) Case signed 24 October 1991
\$70.5M PURPOSE: 96 AMRAAMS (Lot VII) and support
- (U) *NATO EF2000 and Tornado Development, Production, and Logistics Management Agency (NETMA) (M1-D-YAA)
Case signed 5 November 1991

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AMRAAM (AIM-120), December 31, 1998

11c. ~~(S)~~ Total Program Cost and Quantity (Cont'd):

\$9.0M PURPOSE: 6 AMRAAMS (Lot VII)

- (U) *UNITED KINGDOM (UK-D-YDR) Case signed 13 March 1992
\$104.9M PURPOSE: 210 AMRAAMS (Lots VII,VIII) and support
- (U) *NORWAY (NO-D-ICY) Case signed 7 October 1992
\$60.0M PURPOSE: 100 AMRAAMS (Lots VIII,IX), 134 Missile Rail Launchers (MRLs), and support
- (U) *TURKEY (TK-D-YDS) Case signed 17 December 1992
\$12.7M PURPOSE: 20 AMRAAMS (Lot VIII)
- (U) *TURKEY (TK-D-YDT) Case signed 25 October 1993
\$22.6M PURPOSE: 60 AMRAAMS (Lot IX)
- (U) *SOUTH KOREA (KS-D-YGN) Case signed 30 December 1993
\$133.3M PURPOSE: 190 AMRAAMS (Lot IX) and support

(b)(1)

- (U) *NORWAY (NO-D-YCZ) Case signed 31 August 1994
\$79.8M PURPOSE: 228 AMRAAMS (Lots IX,X) and support
- (U) *SWEDEN (SW-D-YCC) Case signed 1 September 1994
\$31.1M PURPOSE: 7 AMRAAMS (Lot X) and support. Missile procurement is FMS administered direct commercial sales
- (U) SWEDEN (SW-D-YCD) Case signed 1 September 1994
\$54.1M PURPOSE: 103 AMRAAMS (Lots X,XII) and support. Missile procurement is FMS administered direct commercial sales
- (U) FINLAND (FI-D-YAA) Case signed 4 November 1994
\$112.6M PURPOSE: 300 AMRAAMS (Lots X,XI,XII). Missile procurement is FMS administered direct commercial sales
- (U) *TURKEY (TK-D-YDU) Case signed 1 December 1994
\$33.2M PURPOSE: 80 AMRAAMS (Lot X) and support
- (U) *DENMARK (DE-D-YAS) Case signed 8 December 1994
\$54.6M PURPOSE: 150 AMRAAMS (Lots IX,X), 72 MRLs, and support
- (U) *GERMANY (GY-D-YEK) Case signed 28 June 1995
\$42.6M PURPOSE: 96 AMRAAMS (Lots VII,X) and support
- (U) *GREECE (GR-D-YDR) Case signed 30 June 1995
\$37.3M PURPOSE: 100 AMRAAMS (Lot X) and support

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AMRAAM (AIM-120), December 31, 1998

11c. ~~(S)~~ Total Program Cost and Quantity (Cont'd):

- (U) *SOUTH KOREA (KS-D-YGP) Case signed 28 August 1995
\$35.7M PURPOSE: 100 AMRAAMs (Lot X). Missile procurement
is FMS administered direct commercial sales
- (U) NETHERLANDS (NE-D-YME) Case signed 29 September 1995
\$87.1M PURPOSE: 200 AMRAAMs (Lots X,XI) and support
- (U) BELGIUM (BE-D-YCD) Case signed 22 December 1995
\$30.6M PURPOSE: 72 AMRAAMs (Lot XI)
- (U) NORWAY (NO-D-YDA) Case signed 1 April 1996
\$224.0M PURPOSE: 250 AMRAAMs and 228 MRLs (Lots XI)
- (U) SPAIN (SP-D-YDH) Case signed 11 July 1996
\$13.0M PURPOSE: 32 AMRAAMs (Lot XI) and support
- (U) GREECE (GR-D-SBD) Case amended 26 September 1996
\$52.5M PURPOSE: 140 AMRAAMs (Lot XI,XII)
- (U) ISRAEL (IS-D-YEO) Case signed 6 February 1997
\$12.2M PURPOSE: 80 AMRAAMs (Lot X,XI,XII) and support
- (U) SOUTH KOREA (KS-D-YGQ) Case signed 13 March 1997
\$41.5M PURPOSE: 100 AMRAAMs (Lot XII). Missile procurement
is FMS administered direct commercial sales
- (U) TURKEY (TK-D-YDV) Case signed 24 November 1997
\$58.5M PURPOSE: 138 AMRAAMs (Lot XII) and support
- (U) ITALY (IT-D-YAC) Case signed 1 December 1997
\$40.6M PURPOSE: 93 AMRAAMs (Lot XII-XV) and support

~~(S)~~ (b)(1)

*These cases will not be reported again, deliveries are over 90% complete.

d. Nuclear Costs -- None.

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AMRAAM (AIM-120), December 31, 1998

12. (U) Unit Cost Summary:

	UCR Baseline (Sep 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 92 BY\$)	12302.9	10247.8	
(2) Quantity	13038	10917	
(3) Unit Cost	0.944	0.939	-0.53
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 92 BY\$)	10205.7	8050.0	
(2) Quantity	13038	10917	
(3) Unit Cost	0.783	0.737	-5.87

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	1350.6	11761.8	-	13112.4
Previous Changes:				
Economic	-42.6	-294.7	-	-337.3
Quantity	-	-2977.1	-	-2977.1
Schedule	-7.3	+1750.1	-	+1742.8
Engineering	+440.0	+107.4	-	+547.4
Estimating	+111.3	-1773.5	-	-1662.2
Other	-	-	-	-
Support	-	-40.2	-	-40.2
Subtotal	+501.4	-3228.0	-	-2726.6
Current Changes:				
Economic	-8.5	-15.2	-	-23.7
Quantity	-	-	-	-
Schedule	-	+8.2	-	+8.2
Engineering	+20.1	-	-	+20.1
Estimating	+57.9	-168.8	-	-110.9
Other	-	-	-	-
Support	-	+79.7	-	+79.7
Subtotal	+69.5	-96.1	-	-26.6
Total Changes	+570.9	-3324.1	-	-2753.2
Current Estimate	1921.5	8437.7	-	10359.2

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AMRAAM (AIM-120), December 31, 1998

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

(U) Summary (FY 1992 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Production Estimate	1725.7	10552.5	-	12278.2
Previous Changes:				
Quantity	-	-1965.1	-	-1965.1
Schedule	-8.1	+791.9	-	+783.8
Engineering	+357.2	+74.7	-	+431.9
Estimating	+58.3	-1287.3	-	-1229.0
Other	-	-	-	-
Support	-	-64.5	-	-64.5
Subtotal	+407.4	-2450.3	-	-2042.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+16.1	-	-	+16.1
Estimating	+48.6	-114.1	-	-65.5
Other	-	-	-	-
Support	-	+61.9	-	+61.9
Subtotal	+64.7	-52.2	-	+12.5
Total Changes	+472.1	-2502.5	-	-2030.4
Current Estimate	2197.8	8050.0	-	10247.8

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RD&E</u>		
Revised escalation indices. (Economic)	N/A	-8.5
Adjustment for Current and Prior Inflation. (Estimating)	+1.5	+1.7
Reinvest Procurement Savings into P3I Phase 3 (Estimating)	+47.1	+56.2
Added Navy FY04 and FY05 P3I Effort (Engineering)	+16.1	+20.1
RD&E Subtotal	+64.7	+69.5
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-42.0
Economic adjustment for negative program change. (Economic)	N/A	+26.8
Rephased annual procurement buy profile by shifting missiles from earlier to later years. (Schedule)	0.0	+8.2
Adjustment for Current and Prior Inflation. (Estimating)	+9.1	+10.0
Unit Cost Increase due to Decreased FMS sales (Estimating)	+5.3	+6.4

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AMRAAM (AIM-120), December 31, 1998

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

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Actual savings from assigning Total Systems Performance Responsibility (TSPR) to the contractor. (AR)(Estimating)	-2.1	-2.6
Procurement Savings as the result of TSPR. (AR)(Estimating)	-126.4	-182.6
Adjustment for Current and Prior Inflation. (Support)	+0.7	+0.7
Change in Initial Spares as a result of TSPR. (AR)(Support)	-20.8	-26.2
Change in Peculiar Support as a result of TSPR. (AR)(Support)	-2.4	-1.4
Change in Other Weapon Cost - Moved Warhead Replaceable Tactical Telemetry Unit from Replen Spares account to Missile account (Support) (Support)	+84.4	+106.6
Procurement Subtotal	-52.2	-96.1

AR = Acquisition Reform related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.48	-0.06	+0.14	+0.12	+0.02	+0.19	--	-0.04	+0.37	0.85

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.85	-0.03	+0.08	+0.16	+0.05	-0.16	--	--	+0.10	0.95

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AMRAAM (AIM-120), December 31, 1998

14b. (U) Unit Cost and Other History (Cont'd):

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.43	-0.06	+0.12	+0.12	+0.01	+0.18	--	-0.04	+0.33	0.76

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.76	-0.03	+0.05	+0.16	+0.01	-0.18	--	--	+0.01	0.77

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	NOV 78	NOV 78
Milestone II	N/A	NOV 82	SEP 82	SEP 82
Milestone III	N/A	N/A	JUN 87	JUN 87
FUE/IOC	N/A	SEP 86	MAR 91	SEP 91
Total Cost	N/A	11591.6	13112.4	10385.8
Total Quantity	N/A	24335	15450	10917
Prog Acq Unit Cost	N/A	0.48	0.85	0.95

(U) The SAR Development Estimate data is for the Air Force only and does not include Navy data.

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

a. RDT&E --

(U) HUGHES P31 PHASE 2:

HUGHES MISSILE SYSTEM CO., TUCSON AZ

F08626-93-C-0044, CPAF/CPFF/FFP

Award: June 30, 1994

Definitized: June 30, 1994

Initial Contract Price		
Target	Ceiling	Qty
\$89.6	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$126.5	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$124.4	\$126.5

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AMRAAM (AIM-120), December 31, 1998

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-0.2	\$-1.2
Cumulative Variances To Date (11/27/98)	<u>\$-0.1</u>	<u>\$-0.6</u>
Net Change	\$0.1	\$0.6

Explanation of Change:

(U) The net changes in cost and schedule variances are inconsequential.

The net change in current target price from initial contract target price is due to the award of the +5" Rocket Motor contract, award fee for periods one and two, and the exercise of options.

(U) Contract Comments:

The contract is on cost and schedule.

This contract will not be reported again, since contract effort is 90% complete.

(U) <u>Raytheon P3I Phase 3:</u> Raytheon Systems Company, Tucson AZ F08626-98-C-0027, CPAF Award: October 29, 1998 Definitized: October 29, 1998	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$150.5	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$150.5	N/A	0	\$150.5	\$150.5

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	<u>N/A</u>	<u>N/A</u>
Net Change	N/A	N/A

Explanation of Change:

None.

(U) Contract Comments:

This is the first time this contract has been reported in the SAR.

Cost and Schedule variances are not available yet as detailed contract planning is on-going.

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AMRAAM (AIM-120), December 31, 1998

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

b. Procurement --			Initial Contract Price		
(U) <u>HUGHES LOTS IX/X:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
HUGHES AIRCRAFT COMPANY, TUCSON AZ					
FO8626-94-C-0029, FFP			\$129.0	N/A	456
Award: March 7, 1995					
Definitized: March 7, 1995					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$369.1	N/A	1161	\$369.1	\$369.1	

Explanation of Change:

(U) The net change in current target price from initial contract target price is due to the addition of contract modifications and exercising the Lot X option.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:
This contract will not be reported again, since contract deliveries are over 90% complete.

(U) <u>RAYTHEON LOTS IX/X:</u>			Initial Contract Price		
RAYTHEON COMPANY, BEDFORD, MA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
FO8626-94-C-0030, FFP					
Award: March 7, 1995			\$141.8	N/A	604
Definitized: March 7, 1995					

Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$308.1	N/A	1268	\$308.1	\$308.1	

Explanation of Change:

(U) The net change in current target price from initial contract target price is due to the addition of contract modifications and exercising the Lot X option.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:
This contract will not be reported again, since contract deliveries are over 90% complete.

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AMRAAM (AIM-120), December 31, 1998

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

(U) HUGHES LOT XI: HUGHES AIRCRAFT COMPANY, TUCSON AZ F08626-97-C-0001, FFP Award: January 28, 1997 Definitized: January 28, 1997	Initial Contract Price		
	Target	Ceiling	Qty
	\$134.3	N/A	439

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$172.6	N/A	439	\$172.6	\$172.6

Explanation of Change:

(U) The net change in current target price from initial contract target price is due to the addition of contract modifications and the award of an option for an FMS case.

The original contract was identified as HUGHES LOT XI/XII with LOT XII being an option. This option was never exercised. Instead a new contract F08626-98-C-0018 was awarded to the merged company. Therefore, this contract is listed only as LOT XI.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) RAYTHEON LOT XI: RAYTHEON SYSTEMS COMPANY, BEDFORD MA F08626-97-C-0002, FFP Award: January 28, 1997 Definitized: January 28, 1997	Initial Contract Price		
	Target	Ceiling	Qty
	\$124.3	N/A	390

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$124.5	N/A	390	\$124.5	\$124.5

Explanation of Change:

(U) The original contract was identified as RAYTHEON LOT XI/XII with LOT XII being an option. This option was never exercised. Instead a new contract F08626-98-C-0018 was awarded to the merged company. Therefore, this contract is listed only as LOT XI.

Cost and Schedule variance reporting is not required on this FFP contract.

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

(U) Raytheon Lot XII:	Initial Contract Price		
Raytheon Systems Company, Tucson AZ	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F08626-98-C-0018, FFP	\$187.5	N/A	618
Award: April 13, 1998			
Definitized: April 13, 1998			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$187.5	N/A	618	\$187.5	\$187.5

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

This is the first time this contract has been reported in the SAR.

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

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

<u>Appropriation</u>	<u>Prior Years (FY77-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-07)</u>	<u>Total</u>
RDT&E	1525.0	63.3	66.5	266.7	1921.5
Procurement	7022.4	144.0	145.7	1125.6	8437.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	8547.4	207.3	212.2	1392.3	10359.2

b. Annual Summary -- AMRAAM (AIM-120)

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1978				11.9	6.0
1979				33.5	18.3
1980				45.0	27.3
1981				36.0	24.2
1982				4.6	3.3
1983				5.7	4.3

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984				9.3	7.3
1985				9.7	7.8
1986				5.1	4.2
1987				5.8	5.0
1988				25.1	22.3
1989				13.3	12.4
1990				7.2	6.9
1991				3.5	3.5
1992				2.4	2.5
1993				3.0	3.1
1994					
1995				7.2	7.8
1996				3.9	4.3
1997				1.9	2.1
1998				4.9	5.5
1999				4.1	4.7
2000				11.7	13.5
2001				10.5	12.3
2002				9.2	11.0
2003				6.9	8.4
2004				8.0	9.9
2005				8.1	10.2
Subtotal				297.5	248.1

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1977				10.3	4.8
1978				13.2	6.7
1979				29.5	16.1
1980				43.2	26.2
1981				34.1	22.9
1982				192.1	137.9
1983				283.1	212.9
1984				252.6	197.3
1985				256.0	206.6
1986				110.2	91.1
1987				43.6	37.7
1988				30.1	26.7
1989					
1990				12.4	11.9

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991				18.0	17.9
1992				29.6	30.3
1993				37.2	38.9
1994				61.0	64.8
1995				58.9	63.8
1996				40.1	44.2
1997				8.7	9.7
1998				34.8	39.2
1999				30.4	34.6
2000				43.1	49.8
2001				46.2	54.2
2002				43.1	51.4
2003				27.9	33.9
2004				27.0	33.5
2005				27.3	34.5
2006				28.2	36.4
2007				28.4	37.5
Subtotal				1900.3	1673.4

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989	26	2.7	26.4	31.6	31.1
1990	85	18.6	61.3	84.8	85.1
1991	300	51.2	185.4	253.6	262.0
1992	191	36.3	110.1	186.1	194.5
1993	165	19.0	68.0	98.6	105.1
1994	75	19.8	24.5	52.2	56.8
1995	106	22.4	36.9	68.3	75.0
1996	115	25.6	31.6	66.2	73.7
1997	100	14.4	26.9	46.5	52.5
1998	120	8.9	33.5	47.8	54.5
1999	100	9.4	30.1	45.1	52.1
2000	100	9.6	25.8	39.6	46.5
2001	100	10.1	25.3	39.0	46.6
2002	100	11.6	27.8	45.4	55.3
2003	100	10.7	27.2	45.0	55.9
2004	100	8.7	26.8	42.2	53.5
2005	100	8.9	26.4	42.0	54.4
2006	218	9.0	56.5	72.3	95.5
2007	218	9.1	56.2	103.9	140.2

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AMRAAM (AIM-120), December 31, 1998

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

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal	2419	306.0	906.7	1410.2	1590.3

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984		34.2	1.9	36.1	29.3
1985		84.0	4.8	88.8	74.1
1986		164.0	58.0	226.7	197.9
1987	180	205.5	427.0	655.1	596.1
1988	400	216.4	521.0	753.5	711.3
1989	874	104.2	677.5	798.3	786.3
1990	803	88.1	574.6	680.6	682.6
1991	600	184.1	384.8	592.3	611.8
1992	700	70.0	419.6	506.9	529.7
1993	1000	131.8	396.1	556.6	593.3
1994	983	74.9	319.0	410.8	446.9
1995	412	68.8	112.3	209.9	230.5
1996	291	19.5	131.4	161.5	179.7
1997	133	9.6	82.9	99.7	112.6
1998	173	16.6	70.4	90.4	103.0
1999	180	6.3	72.2	82.1	94.9
2000	210	6.0	65.9	83.0	97.5
2001	207	9.5	62.4	82.9	99.1
2002	226	9.4	75.5	95.9	116.7
2003	226	2.4	74.7	89.4	110.9
2004	226		75.7	88.8	112.5
2005	226		75.2	88.3	114.2
2006	230		70.7	83.0	109.7
2007	218		67.0	79.2	106.8
Subtotal	8498	1505.3	4820.6	6639.8	6847.4

(U) Summary does not include funding or quantities for Seek Eagle procurements of 12 AMRAAMS in FY90, 24 AMRAAMS in FY94, and 2 Separation Test Vehicles in FY01.

The recurring flyaway in FYs 84 - 86 is for 15 missiles in the Raytheon qualification lot and are not considered fully configured end items.

Funding reflects OSD approved inflation indices dated January 1999.

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AMRAAM (AIM-120), December 31, 1998

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

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	2419	306.0	906.7	1707.7	1838.4
USAF	8498	1505.3	4820.6	8540.1	8520.8
Grand Total	10917	1811.3	5727.3	10247.8	10359.2

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	7206	7212

(U) Percent Total Program Quantities Delivered: 66.1%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 8121.3

(U) Percent Total Program Expended: 78.4%

(U) Raytheon is ahead of scheduled deliveries by 6 missiles.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
The AMRAAM will augment the AIM-7 and be integrated and maintained using existing support resources with no additional manpower requirements. The All-Up-Round (AUR) maintenance concept calls for aircraft loading/unloading, removal/replacement of wings and fins and Built-In-Test (BIT) within the missiles. A missile failing BIT will be sent to the Intermediate-Level Shop for test verification on the Missile Bit Test Set (MBTS). For the Navy, the missile will be downloaded/uploaded on a different station or aircraft to verify missile failure. Failed missiles will be returned to the contractor AMRAAM depot for repair.

The O&S costs are the direct costs for the tactical missile and the Load Trainer/Captive Carry Missile (LT/CCM) associated with operating, supporting, and maintaining the AMRAAM missile over a 20 year deployment phase starting in FY91 for the AF and FY92 for the Navy. The AF estimate covers base operations including Load Trainer/Captive Carry Missile (LT/CCM), AUR fault verification, operational firings, depot repairs (seven year ICS), supply/item management, transportation, replenishment spares, and field software updates. The Navy estimate includes AMRAAM fleet operations and support, depot rework (five years ICS), technical support (fleet support, engineering services, quality surveillance, program management), supply support, replenishment spares, and contractor augmented support.

The O&S cost estimate was updated December 1997.

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AMRAAM (AIM-120), December 31, 1998

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

There are no antecedent systems; the AMRAAM is designed to augment the AIM-7 Sparrow.

b. (U) Costs -- (FY 1992 Constant (Base-Year) Dollars in Millions)

Cost Element	AMRAAM Average Annual Cost Per Year	Antecedent Average Annual Cost Per Year
Mission Pay & Allowances	1.9	N/A
Unit Level Consumption	12.1	0.0
Intermediate Maintenance	0.3	0.0
Depot Maintenance	9.6	0.0
Contractor Support	0.3	0.0
Sustaining Support	10.5	0.0
Indirect Costs	0.1	0.0
Total	34.8	0.0

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N-17 SH-60R

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

PROGRAM: SH-60R

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): SH-60R Multi-Mission Helicopter Upgrade
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:
Air ASW, and Special Mission Program CAPT Larrie Cable
(PMA-299) 47123 Buse Rd Assigned: May 25, 1995
Unit IPT, Suite 156 DSN 757-5409; COMM 301-757-5409
Patuxent River, MD 20670-1547 cablelg@navair.navy.mil
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0604212N Project H0485, H1707, H2412
(U) PE 0604216N Project H1707
PROCUREMENT:
(U) APPN 1506 ICN 018200 (Navy)

No Security Objection
to
(S) ~~SECRET~~
99-C-0156
MAR 17 1999
Office of
Naval
Defense

~~Derived from
Downgrade instruction: OPNAVINST C5513.213
Declassify on: A3~~

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DEPARTMENT OF DEFENSE

99-C-0803

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5. (U) References:

SAR Baseline (Development Estimate):

(U) FY 1996/1997 President's Budget

ASN,RDA Acquisition Decision Memorandum dated August 1993.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated May 9, 1997.

6. (U) Mission and Description:

(U) The Multi-Mission Helicopter Upgrade (formally called LAMPS MK III Block II Upgrade) is a development program which brings critical capability improvements to the SH-60B/F helicopters. The capability improvements are essential to future tactical rotary-wing effectiveness in providing battlegroup protection while achieving coastal littoral battlespace dominance. The Block II Upgrade entered Engineering and Manufacturing Development (EMD) in FY93 and represents a major avionics modification to the SH-60B, greatly enhancing both primary mission areas of Anti-Submarine Warfare (ASW) and Anti-Surface Warfare (ASuW). The Airborne Low Frequency Sonar (ALFS) will be added to enhance the existing acoustic suite. ASuW effectiveness will be improved with the addition of a multi-mode radar which includes an inverse synthetic aperture imaging radar mode to permit stand-off classification of hostile threats. An improved Electronic Surveillance Measures (ESM) system will enable passive detection and targeting of radar sources not detectable with the current system. Aircrew and aircraft survivability in hostile environments will be significantly improved through software integration of the self-defense equipments. Provisions for a tactical data transfer system to improve platform interoperability by rapid, secure transfer of mission information between multiple air and surface units is included in the upgrade.

The ALFS program develops a low frequency sonar and increased sonobuoy processing capability for the SH-60 helicopter to maintain and improve undersea warfare mission effectiveness against the quiet submarine threat in both deep and shallow water environments. This project provides a dipping sonar with demonstrated deep water capabilities typically 3 to 6 times greater than the current in-service helicopter sonar (square miles of ocean searched per hour). The ALFS system (designated AN/AQS-22) will be installed in the SH-60R aircraft. ALFS provides longer detection ranges and greater detection capability by using lower frequencies, less signal attenuation, longer pulse lengths, improved processing and increased transmission power. This improvement will significantly increase battle group and independent ship protection providing improved survivability and operating flexibility. The ALFS program will utilize the Enhanced Modular Signal Processor (EMSP), designated UYS-2A, as its acoustic processor. The incorporation of enhanced shallow water detection/classification capability, improvements to the acoustic processor, and onboard acoustic performance predictions represent current developments to meet littoral challenges.

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7. (U) Executive Summary:

(U) A Tentative Operational Requirement (TOR) for the Block II Upgrade was received in the Naval Air Systems Command (NAVAIRSYSCOM) in May 1986. NAVAIRSYSCOM responded with a Development Options Paper in September of 1986 which listed options for meeting the established requirements and outlined the associated costs. A formal Operational Requirement (OR) for the LAMPS MK III Block II Upgrade was initiated. In April 1987 the Block II OR was revised to include the requirement for dipping sonar. The "Operational Requirements for SH-60B Block II Upgrade" (OR# 209-05-90) was approved in April 1988. The OR was again rewritten to respond to the format and requirements of DODINST 5000.2 and include Congressionally directed Electronic Surveillance Measures (ESM) improvements in 1991. The latest Operational Requirements Document (ORD# 314-03-92) was approved August 3, 1992. The program achieved a MSII decision for entry into Engineering, Manufacturing, and Development (EMD) in July 1993.

Since December 1990, IBM Federal Sector Division of Owego, NY has been under contract to define air vehicle and mission avionics systems required to meet the Navy's requirements. A structured systems engineering process has been implemented to identify requirements, flow them down into systems, subsystem, prime item and critical item specifications, allocate the requirements to hardware and software critical items, perform industry surveys, trade studies, performance analysis, identification of promising technologies, risk identification and mitigation, and cost-benefit analysis of performance criteria. IBM was awarded an EMD contract on August 23, 1993. IBM Federal Sector Division was subsequently acquired by Loral Federal Systems in March 1994, and Lockheed Martin in April 1996.

On 30 June 1998, an 845 Other Transaction Authority was provided to Lockheed Martin Federal Systems for RDT&E funds (\$61.8M) for the development of a Common Cockpit. This effort will develop a cockpit that will be common to the SH-60 and the CH-60 platforms. Therefore, both programs are funding this effort.

The last SAR reported that Airborne Low Frequency Sonar (ALFS) flight testing uncovered issues regarding reliability of Weapon Replaceable Assemblies and compliance with system specifications. These issues have been resolved.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
Milestone II	JUL 93	JUL 93	JUL 93	
EMD Contract Award	JUL 93	JUL 93	AUG 93	
Preliminary Design Review	JUL 95	JUL 95	NOV 95	
Critical Design Review	OCT 96	MAR 99	JUL 99	(Ch-1)
LRIP Contract Award	NOV 98	NOV 99	MAR 00	(Ch-1)
LRIP First Delivery	JUL 00	JUL 01	JAN 02	(Ch-1)
TECHEVAL				
Start	JAN 00	MAR 01	JUN 01	(Ch-1)
Complete	JUN 00	MAR 02	JUN 02	(Ch-1)
OPEVAL				
Start	SEP 00	MAR 01	JUN 01	(Ch-1)
Complete	MAR 01	MAR 02	JUN 02	(Ch-1)
Milestone III	OCT 01	OCT 02	OCT 02	
Airborne Low Frequency Sonar				
EMD Contract Award	JAN 92	JAN 92	JAN 92	
Preliminary Design Review	OCT 92	OCT 92	OCT 92	
Critical Design Review	APR 93	APR 93	AUG 93	(Ch-1)
TECHEVAL				
Start	FEB 98	MAR 01	JUN 01	(Ch-1)
Complete	JUN 98	MAR 02	JUN 02	(Ch-1)
OPEVAL				
Start	JUL 98	MAR 01	JUN 01	(Ch-1)
Complete	SEP 98	MAR 02	JUN 02	(Ch-1)
Milestone III	JAN 99	OCT 02	OCT 02	
Production Contract Award	MAR 99	JAN 03	JAN 03	

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

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Initial Operating Capability	MAR 01	MAR 02	SEP 02

b. Current Change Explanations --

(U) (Ch-1): The below schedule changes are due to revised test plan that incorporates equipment and software releases that support the CH-60 and SH-60R test programs most effectively.

Critical Design Review from MAR 99 to JUL 99
 LRIP Contract Award from JAN 00 to MAR 00
 LRIP First Delivery from JUL 01 to JAN 02
 TECHEVAL Start from MAR 01 to JUN 01
 TECHEVAL Complete from MAR 02 to JUN 02
 OPEVAL Start from MAR 01 to JUN 01
 OPEVAL Complete from MAR 02 to JUN 02
 ALFS TECHEVAL Start from MAR 01 to JUN 01
 ALFS TECHEVAL Complete from MAR 02 to JUN 02
 ALFS OPEVAL Start from MAR 01 to MAR 02
 ALFS OPEVAL Complete from MAR 02 to JUN 02

10. (U) Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Maximum Operating Sea State	5	5 / 5	TBD	5
Mission Duration (ASW) (hrs)	5 3.3	3.3 / 2.3	TBD	2.3
Mission Duration (ASUW) (hrs)	3.5	3.5 / 3.0	TBD	3.0
Multi-Mode Radar	(b)(1)			
Range to Detect a 10000 Sq Meter Target				
Range to Detect a 0.5 Sq Meter Target				

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10a. (X) Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
1/ Using ISAR Classify a Surface Combatant at a percentage of the Target's Maximum Detectable Range	(b)(1)			
Electronic Support Measures				
1/ Detectable Frequency Bandwidth (GHz)				
1/ Ability to Detect a Threat Emitter X times Detection Range of the Threat Radar				
Reliability and Maintainability				
MFHBCF (ASW) (hrs)	35.7	35.7 / 14.8	TBD	14.8
MFHBCF (ASUW) (hrs)	43.9	43.9 / 21.8	TBD	21.8
1/ Acoustic System				
1/ Sonobuoys: Maximum AOU with a 75% Probability of Detection for a Nuclear Subsurface Target (sqnm)	(b)(1)			
1/ ALFS: Maximum AOU with a 90% Probability of Detection for a Subsurface Target (sqnm)				
Airborne Low Frequency Sonar				
Operating Frequency (Khz)	<5	<5 / <5	TBD	<5
Maximum System Weight	550	550 / 550	TBD	550
1/ Source Level (db)	(b)(1)			
1/ Minimum Long Pulse Length (sec) (minimum duty cycle 6.7%)				
Reeling Machine MCBCF (cycles)	1000	1000 / 150	TBD	150

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10a. (U) Performance Characteristics (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Avionics MTRMCF (hrs) (excluding cable and reeling machine)	78	78 / 53	TBD	53
MTBF (hrs)	58	58 / 39	TBD	39
MTTR, O Level (hrs)	2.0	2.0 / 3.8	TBD	3.8
Availability (%)	0.98	0.98 / 0.90	TBD	.90

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development <u>Estimate (SAR)</u>	Approved Program (APB)	Current <u>Estimate</u>
Development (RDT&E)	508.4	814.2	848.5
Procurement	3512.1	3512.1	3267.6
Airframe/CFE	(2119.0)		(2063.6)
GFE	(435.7)		(529.5)
Nonrecurring flyaway	(150.6)		(63.1)
Total Flyaway	(2705.3)		(2656.2)
Pubs	(40.0)		(25.1)
Weapon System	(5.6)		(29.6)
Field Activities	(165.5)		(51.6)
ILS/LSA/MES	(79.2)		(59.4)
Total Other Wpn Sys	(290.3)		(165.7)
Peculiar Support	(238.9)		(347.5)
Initial Spares	(277.6)		(98.2)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 93 Base-Year \$	4020.5	4326.3	4116.1
Escalation	1615.9	1651.7	847.6
Development (RDT&E)	(40.3)	(76.1)	(61.2)
Procurement	(1575.6)	(1575.6)	(786.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	5636.4	5978.0	4963.7

b. (U) Quantity --

Development (RDT&E)	0	4	3
Procurement	<u>188</u>	<u>184</u>	<u>185</u>
Total	188	188	188

Note: Excludes 2 RDT&E prototypes from the SAR Baseline and 0 from the Current Estimate that are not considered fully configured.

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11b. (U) Total Program Cost and Quantity (Cont'd):

(U) The total LRIP quantity was reduced from 52 to 34 due to a rephasing of procurement profile FY00-05. In order to provide a balanced budget submit, meet program objectives, mitigate risk, and ensure aircraft availability for fleet operations based on the designed life limit of 10,000 flight hours, LRIP rephasing ensured that SH-60B aircraft will be delivered for remanufacture in time to avoid a Service Life Extension Program yet maintain the inventory requisite for operational tempo and readiness.

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
None.

12. (U) Unit Cost Summary:

	UCR Baseline (MAY 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 93 BY\$)	4326.3	4116.1	
(2) Quantity	188	188	
(3) Unit Cost	23.012	21.894	-4.86
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 93 BY\$)	3512.1	3267.6	
(2) Quantity	184	185	
(3) Unit Cost	19.087	17.663	-7.46

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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	548.7	5087.7	-	5636.4
Previous Changes:				
Economic	-18.1	-555.3	-	-573.4
Quantity	+171.2	-162.3	-	+8.9
Schedule	-	-146.1	-	-146.1
Engineering	+40.0	-519.6	-	-479.6
Estimating	+89.7	+503.8	-	+593.5
Other	-	-	-	-
Support	+70.2	+300.7	-	+370.9
Subtotal	+353.0	-578.8	-	-225.8
Current Changes:				
Economic	-7.6	-1.4	-	-9.0
Quantity	-	-	-	-
Schedule	-	+8.0	-	+8.0
Engineering	+10.0	-	-	+10.0
Estimating	+5.6	+195.8	-	+201.4
Other	-	-	-	-
Support	-	-657.3	-	-657.3
Subtotal	+8.0	-454.9	-	-446.9
Total Changes	+361.0	-1033.7	-	-672.7
Current Estimate	909.7	4054.0	-	4963.7

(U) Summary (FY 1993 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	508.4	3512.1	-	4020.5
Previous Changes:				
Quantity	+149.2	-141.7	-	+7.5
Schedule	-	-117.7	-	-117.7
Engineering	+36.2	-354.5	-	-318.3
Estimating	+80.1	+409.1	-	+489.2
Other	-	-	-	-
Support	+60.4	+208.1	-	+268.5
Subtotal	+325.9	+3.3	-	+329.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+9.2	-	-	+9.2
Estimating	+5.0	+155.7	-	+160.7
Other	-	-	-	-
Support	-	-403.5	-	-403.5
Subtotal	+14.2	-247.8	-	-233.6
Total Changes	+340.1	-244.5	-	+95.6
Current Estimate	848.5	3267.6	-	4116.1

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-7.6
Adjustment for Current and Prior Inflation. (Estimating)	+4.4	+4.8
Budget increase for engineering requirements for the LAMPS COTS Acoustics/Radar Data Processor (Engineering)	+9.2	+10.0
Refinement of estimates and rounding. (Estimating)	+0.6	+0.8
RDT&E Subtotal	+14.2	+8.0
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-110.5
Economic adjustment for negative program change. (Economic)	N/A	+109.1
Rephasing of annual procurement profile and acceleration of FY09 requirements (Schedule)	0.0	+8.0
Increase due to refinement of Common Cockpit and Airframe estimates. (Estimating)	+133.1	+167.7
Refinement of estimate for non-recurring costs associated with remanufacture. (Estimating)	+22.6	+28.1
Decrease Initial Spares requirements for the current platform. (Support)	-143.9	-232.2
Refinement of estimate for Peculiar Support equipment for the current platform. (Support)	-212.4	-348.6
Refinement of estimate for Pubs associated with the current platform. (Support)	-59.3	-94.2
Refinement of estimate for other weapon system support. (Support)	+23.7	+37.2
Reduced requirements for Field Activities costs associated with current platform. (Support)	-10.6	-16.7
Reduced requirements for ILS/LSA/MES associated with the current platform. (Support)	-1.0	-2.8
Procurement Subtotal	-247.8	-454.9

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
29.98	-3.10	+0.04	-0.73	-2.50	+4.23	--	-1.52	-3.58	26.40

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
27.06	-3.01	-0.43	-0.75	-2.81	+3.78	--	-1.93	-5.15	21.91

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	JUL 93	N/A	JUL 93
Milestone III	N/A	OCT 01	N/A	OCT 02
FUE/IOC	N/A	MAR 01	N/A	SEP 02
Total Cost	N/A	5636.4	N/A	4963.7
Total Quantity	N/A	188	N/A	188
Prog Acq Unit Cost	N/A	29.98	N/A	26.4

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

a. RDT&E --

(U) Development (Block II):

Lockheed Martin, Owego, NY

N00019-93-C-0196, CPFF

Award: August 23, 1993

Definitized: December 22, 1994

Initial Contract Price
Target Ceiling Qty

\$242.0 N/A 2

Current Contract Price
Target Ceiling Qty
\$266.5 N/A 2

Estimated Price At Completion
Contractor Program Manager
\$305.8 \$309.7

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-16.0	\$-4.0
Cumulative Variances To Date (11/02/98)	\$-18.3	\$-2.4
Net Change	\$-2.3	\$1.6

Explanation of Change:

(U) The cumulative cost variance is associated with technical problems in the Integrated Mission Processor, Multi-Mode Radar, and Data Display Subsystem. These technical problems have been resolved. The MMR development is the highest risk item remaining in the Phase I development. The MMR Integrated Product Team has adopted numerous cost reduction and cost mitigation initiatives to minimize addition cost growth. The cumulative schedule variance is also driven by technical problems as shown in the cost variance which have been resolved.

(U) Contract Comments:

Contract N00019-92-C-0001 is over 94% complete and will no longer be reported.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY90-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-10)	<u>Total</u>
RDT&E	744.7	118.7	31.3	15.0	909.7
Procurement	-	230.1	289.3	3534.6	4054.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	744.7	348.8	320.6	3549.6	4963.7

b. Annual Summary -- Multi-Mission Helicopter

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY93 Dollars Nonrec</u>	<u>Flyaway FY93 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				11.1	10.3
1991				29.6	28.5
1992				53.7	53.2
1993				72.1	73.1
1994				68.5	70.8
1995				66.6	70.1
1996				60.9	65.2

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY93 Dollars Nonrec	Flyaway FY93 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				50.9	55.2
1998				84.9	92.8
1999				204.1	225.5
2000				105.8	118.7
2001				27.5	31.3
2002				7.0	8.1
2003				5.8	6.9
Subtotal	3			848.5	909.7

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY93 Dollars Nonrec	Flyaway FY93 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	7	3.8	131.5	201.9	230.1
2001	9	3.5	165.4	249.7	289.3
2002	18		272.5	366.6	432.6
2003	22		316.2	420.7	506.4
2004	26	36.2	353.1	452.2	555.8
2005	27	19.6	358.7	440.5	552.8
2006	27		352.5	381.7	489.0
2007	27		348.7	389.1	509.0
2008	22		294.5	333.1	444.9
2009				16.4	22.3
2010				15.7	21.8
Subtotal	185	63.1	2593.1	3267.6	4054.0

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	188	63.1	2593.1	4116.1	4963.7

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date - None.

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 510.3

(U) Percent Total Program Expended: 10.3%

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SH-60R, December 31, 1998

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The basis for this estimate, dated October 16, 1996, was demonstrated current systems Operating and Support costs adjusted for anticipated improvements in reliability (primarily based on an analogy with the SH-60B aircraft). Personnel costs are based on a 90% manning estimate to reflect the fact that operational squadrons are not always fully manned.

b. (U) Costs -- (FY 1993 Constant (Base-Year) Dollars in Millions)

Cost Element	Average Annual Cost per Squadron	Avg Annual Cost per SH-60B Squadron
Mission Pay & Allowances	8.7	6.3
Unit Level Consumption	9.3	1.4
Intermediate Maintenance	0.0	N/A
Depot Maintenance	3.1	2.3
Contractor Support	N/A	N/A
Sustaining Support	1.6	0.8
Indirect Costs	0.5	0.2
Total	23.2	11.0

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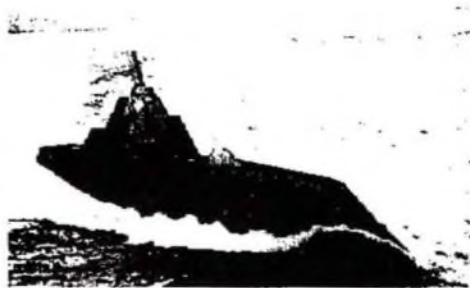
SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)

PROGRAM: DD 21

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): DD 21

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:

PEO DD 21 (PMS 500)

CAPT C. T. BUSH

2531 JEFFERSON DAVIS HIGHWAY

Assigned: July 11, 1997

ARLINGTON, VA 22242-5165

DSN 323-6453; COMM (703) 602-6453 x100

BushCT@Navsea.Navy.mil

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

RDT&E:

(U) PE 0603513N Project 32467, 32468, 32469, 32470, 32471

S0382 (Shared), S1712 (Shared)

(U) PE 0603514N Project S0384 (Shared), S1565 (Shared)

(U) PE 0603553N Project V1704 (Shared)

(U) PE 0603563N Project S2196 (Shared)

(U) PE 0603564N Project S0408

(U) PE 0603573N Project S1314 (Shared)

(U) PE 0603795N Project K2323 (Shared)

(U) PE 0604300N Project 32464, 32465, 32466

(U) PE 0604516N Project S1828, S2054

(U) PE 0604567N Project S1803 (Shared), S2198 (Shared)

(U) PE 0604755N Project U2348

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5. (U) References:

SAR Baseline (Planning Estimate):

(U) DAE Approved Acquisition Program Baseline (APB) dated January 12, 1998.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated March 11, 1999.

6. (U) Mission and Description:

(U) Twenty-First Century Surface Combatants must support National Military Strategy, Joint Vision 2010, Navy Operational Concept, Operational Maneuver From The Sea and the evolving Surface Warfare Vision. The mission of the ship is to provide credible independent forward presence / deterrence and operate as an integral part of Naval, Joint or Combined Maritime Forces. DD 21 will provide an advanced level of land attack in support of the ground campaign and contribute to Naval, Joint and Combined battlespace dominance in littoral operations. It will establish and maintain surface and subsurface superiority, and provide local air defense. DD 21 will incorporate signature reduction to operate in all threat environments. The Twenty-First Century Destroyer will have seamless Joint interoperability to integrate all source information for battlespace awareness and weapons direction.

7. (U) Executive Summary:

(U) PEO DD 21 was established on April 6, 1998 and assigned the responsibility for the development of the DD 21 class of surface combatants and the major technology development and risk reduction efforts that are critical for DD 21 to meet its required mission capabilities.

The Navy awarded a \$70 million 845/804 Agreement (Other Transaction Authority established by the National Defense Authorization Act of FY94/FY97, P.L. 103-160/P.L. 104-201) in August 1998 to begin Contract Phase I, DD 21 System Concept Development. The two competing DD 21 industry teams are Ingalls Shipbuilding Inc. (ISI)/Raytheon Systems Corp. (Gold Team) and Bath Iron Works (BIW)/Lockheed Martin Corp. (Blue Team). In Contract Phase I the teams will propose total DD 21 system concept designs to meet the Navy's stated operational requirements, as well as cost, schedule and performance objectives. Contract Phase I will last approximately 14 months.

The Navy has conducted two In-Process Reviews (November 1998, February 1999) during Contract Phase I. An Alternate Systems Review (ASR) is scheduled for June 1999.

Limited SAR reporting is permitted for pre-Milestone II programs in accordance with Title 10, United States Code, Section 2432, "SARs".

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Planning Estimate (\$AR)	Approved Program (APB)	Current Estimate	
Milestone 0	JAN 95	JAN 95	JAN 95	
Milestone I	DEC 97	DEC 97	JAN 98	
System Concepts Contracts Award	JAN 98	JAN 98	JUN 98	
Milestone II	JUL 03	JUL 03	JUL 03	
Lead Ship Award	OCT 03	OCT 03	DEC 03	(Ch-1)
First Ship Delivery	AUG 07	AUG 07	DEC 07	(Ch-1)
Initial Operational Capability	AUG 08	AUG 08	DEC 08	(Ch-1)
Milestone III	AUG 11	AUG 11	AUG 11	

b. Current Change Explanations --

(U) (Ch-1) The DD 21 Class schedule adjustments are as follows:

	FROM	TO
Lead Ship Award	Oct 03	Dec 03
First Ship Delivery	Aug 07	Dec 07
Initial Operational Capability	Aug 08	Dec 08

(U) Changes to these Current Estimate Milestone dates resulted from refinement of the DD 21 Master schedule.

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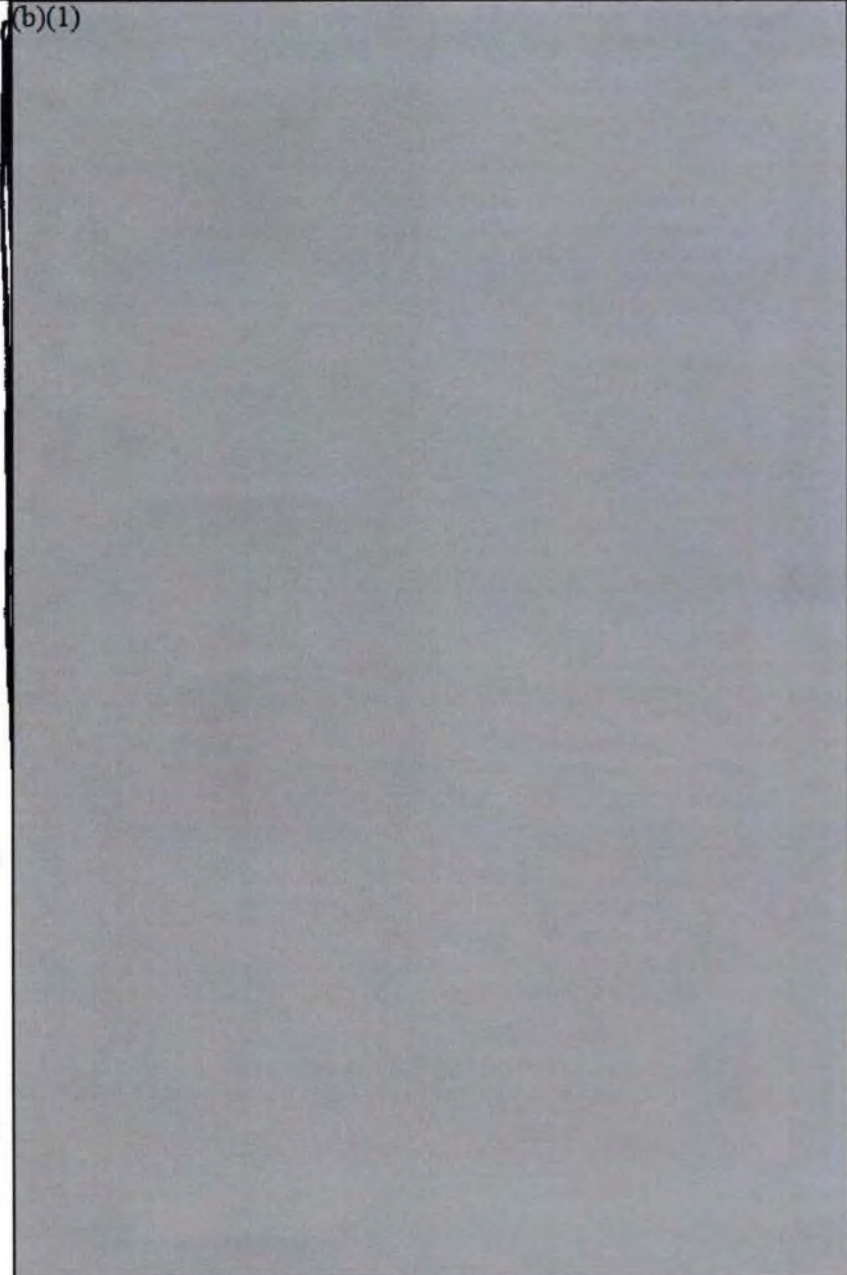
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10. (U) Performance Characteristics:

a. Performance --

Planning Estimate (SAR)	Approved Program (APR) Obj/Threshold	Demon- strated Perf	Current Estimate
----------------------------	--	---------------------------	---------------------

- 11 Land Attack:
 - 11 A minimum of two separate gun systems with a total of ____ 155 mm artillery battery equivalency
 - 11 (b)(1) MK 198 Towed Howitzers)
 - 11 NSFS Gun range (nm)
 - 11 Gun system accuracy (m CEP)
 - 11 Ship C4ISR architecture accommodates Joint Interoperability for the following types of information and data:
 - 11 Strategic (National sensor downlink of equivalents)
 - 11 Theater (UAV and JSTARS Direct Down Link or equivalents)
 - 11 Force Coordination (BGIKS or equivalent)
 - 11 Force Control (JTIDS and AFATIDS or equivalents)
 - 11 Weapons Control (CEC or equivalent)
 - 11 Signature Reduction:
 - 11 Radar Cross Section (dBsm median) 0-360 degrees azimuth
 - 11 0-10 degrees elevation
 - 11 2-4 and 8-18Ghz RCS smoothly distributed over length of ship
 - 11 Minimize wake contribution
 - 11 Infrared



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10a. (U) Performance Characteristics (Cont'd):

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(1) Contrast Radiance for non-stack areas (sr=steradians) (μ W/cm ² /sr) (3-5 μ m band)/ (8-12 μ m band) 0-10 degrees elevation. Minimize wake contribution	(b)(1)			
(2) Contrast Radiant Intensity for stack and plume (W/sr) (3-5 μ m band)/(8-12 μ m band) 0-10 degrees elevation	(b)(1)			
(3) Magnetic (nanoTeslas)	(b)(1)			
(4) Acoustic =< 15kts	(b)(1)			
(5) Sustained speed (kts)	(b)(1)			
(6) Endurance (nm radius at 20 kts)	(b)(1)			
Vertical launch cell capacity (#)	(b)(1)			
Magazine capacity per tube system	(b)(1)			
Manning: Number of ship's company personnel (helo det included)	(b)(1)			
Logistics and Readiness:	(b)(1)			
Operational	0.95	0.95	/ 0.90	TBD
Availability (Ao) for mission critical systems				.95

(U) Charts depicting the acoustics Objective / Threshold can be found in the DD 21 Operational Requirements Document (ORD) dated November 3, 1997.

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10b. (U) Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	1754.0	2764.2	2819.9
Procurement	0.0	N/A	0.0
Total Sailaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	1754.0	2764.2	2819.9
Escalation	335.0	428.0	371.2
Development (RDT&E)	(335.0)	(428.0)	(371.2)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2089.0	3192.2	3191.1
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	N/A	N/A	N/A
Total	0	0	0

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2089.0	-	-	2089.0
Previous Changes:				
Economic	-53.1	-	-	-53.1
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+124.5	-	-	+124.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+71.4	-	-	+71.4
Current Changes:				
Economic	-44.4	-	-	-44.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+1022.0	-	-	+1022.0
Estimating	+53.1	-	-	+53.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1030.7	-	-	+1030.7
Total Changes	+1102.1	-	-	+1102.1
Current Estimate	3191.1	-	-	3191.1

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

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1754.0	-	-	1754.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+107.2	-	-	+107.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+107.2	-	-	+107.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+927.9	-	-	+927.9
Estimating	+30.8	-	-	+30.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+958.7	-	-	+958.7
Total Changes	+1065.9	-	-	+1065.9
Current Estimate	2819.9	-	-	2819.9

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) RDT&E

Change due to revised inflation rates.
(Economic)

N/A -44.4

A number of Associated Systems /
Technologies were realigned under the
direct control of PEO 21. These systems
include: MFR, AGS, IPS, IUSW, ITD, and
Consolidated HM&E. (Engineering)

+927.9 +1022.0

Revised Program funding estimates
(+50.7M) and adjustments for Current and
Prior Year inflation (+2.4M). (Estimating)

+30.8 +53.1

RDT&E Subtotal

+958.7 +1030.7

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	DEC 97	N/A	N/A	JAN 98
Milestone II	JUL 03	N/A	N/A	JUL 03
Milestone III	AUG 11	N/A	N/A	AUG 11
FUE/IOC	AUG 08	N/A	N/A	DEC 08
Total Cost	2089	N/A	N/A	3191.1
Total Quantity	0	N/A	N/A	0
Prog Acq Unit Cost	0	N/A	N/A	0

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

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

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-15)</u>	<u>Total</u>
RDT&E	306.4	270.4	365.4	2248.9	3191.1
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	306.4	270.4	365.4	2248.9	3191.1

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

b. Annual Summary -- DD 21

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				7.0	7.0
1996				9.9	10.0
1997				11.7	12.0
1998				51.9	53.5
1999				214.8	223.9
2000				255.5	270.4
2001				339.7	365.4
2002				361.2	394.8
2003				328.5	365.6
2004				339.0	385.2
2005				314.7	365.2
2006				154.2	182.7
2007				111.5	134.9
2008				91.1	112.5
2009				32.5	41.0
2010				32.6	42.0
2011				32.7	43.0
2012				32.8	44.0
2013				32.8	45.0
2014				32.9	46.0
2015				32.9	47.0
Subtotal				2819.9	3191.1

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total				2819.9	3191.1

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date - None.

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 59.7

(U) Percent Total Program Expended: 1.9%

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18. (U) Operating and Support Costs:

Not applicable for Pre-Milestone 11 programs.

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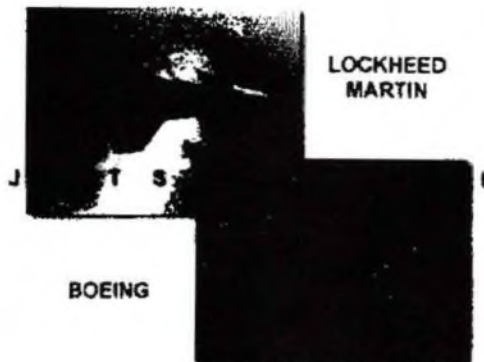
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PROGRAM: Joint Strike Fighter

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): JSF

2. DoD Component: OSD

Joint Participants:

USAF, USN, USMC, DARPA, United Kingdom, Norway, Denmark, The Netherlands, Canada and Italy

3. Responsible Office and Telephone Number:

Joint Strike Fighter Program Office MGen Leslie Kenne
1213 Jefferson Davis Hwy Assigned: August 1, 1997
Suite 600 DSN 332-7638; COMM (703) 602-7638
Arlington, VA 22202-3402 kennelf@jast.mil

The JSF Program is a joint DoD program with no executive service. Service Acquisition Executive (SAE) Authority alternates between the Department of the Navy and the Department of the Air Force, and currently resides with the Navy.

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0603800E
PE 0603800F
PE 0603800N
PE 0604800F
PE 0604800N

The United Kingdom, The Netherlands, Denmark, Norway, Canada and Italy are contributing funding for current JSF development efforts under the terms of formal agreements. Foreign participation in the Engineering and

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4. Program Elements/Procurement Line Items (Cont'd):

Manufacturing Development (E&MD) Phase commencing in 2001 is anticipated. This SAR includes funding from foreign sources as reflected in Section 16.

5. References:

SAR Baseline (Planning Estimate):

Defense Acquisition Executive (DAE) Approved Program Baseline (APB) dated November 15, 1996.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated November 15, 1996.

6. Mission and Description:

The Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next-generation strike aircraft for the United States Navy, Air Force, Marine Corps and allies. The carrier suitable variant of the JSF will provide the Navy a multi-role, stealthy strike fighter aircraft to complement the F/A-18E/F. The Air Force variant will be a multi-role aircraft, primary-air-to-ground, to replace the F-16 and A-10 (Service intent) and complement the F-22. The Short Takeoff and Vertical Landing (STOVL) variant will be a multi-role strike fighter aircraft to replace the AV-8B and F/A-18A/C/D for the Marine Corps, and replace the Sea Harrier for the United Kingdom Royal Navy. The cornerstone of the JSF Program is affordability -- reducing the development cost, production cost, and cost of ownership of the JSF family of aircraft. The program was structured from the beginning to be a model of acquisition reform, with an emphasis on jointness, technology maturation and concept demonstrations, and early cost and performance trades integral to the weapon system requirements definition process.

7. Executive Summary:

The Department of Defense established the Joint Strike Fighter Program, originally named Joint Advanced Strike Technology (JAST) Program, as an outcome of the 1993 Secretary of Defense Bottom-Up Review. The program was created as the focal point for defining affordable next-generation strike weapon systems to replace aging Navy and Air Force tactical assets. Program emphasis is on affordability -- reducing the Total Ownership Cost of the JSF family of aircraft. This demands a new way of doing business and JSF is accomplishing that through an innovative acquisition approach that uses this phase of the program to define an affordable weapon system for the warfighter, explore technological innovations, and reduce risk. Program activities to accomplish these objectives center on evolving affordable requirements, maturing/demonstrating technology, and flying concept demonstrator aircraft.

Fiscal Year 1995 legislation merged the Defense Advanced Research Projects Agency (DARPA) Advanced Short Take-Off and Landing (ASTOVL) program with the then-JAST Program. The United Kingdom became a collaborative partner in the

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7. Executive Summary (Cont'd):

program in 1995, extending a collaboration begun under the DARPA ASTOVL program. Denmark, Norway, The Netherlands, Canada and Italy subsequently joined the current phase of the program.

Facilitated by the JSF Program Office, the Services produced the Joint Initial Requirements Document (JIRD) in 1995, with updates in 1997 and 1998. The requirements evolution process, based on extensive cost and performance trades emphasizing Cost As An Independent Variable (CAIV), will culminate in the Services' Joint Operational Requirements Document in FY 2000.

The Concept Exploration and Concept Development Phases of the JSF Program are completed. On-going Concept Demonstration efforts commenced in November 1996 with competitive contract awards to Boeing and Lockheed Martin for Concept Demonstration Programs (CDP), with Pratt and Whitney providing propulsion hardware and engineering support. The competing contractors are conducting concept unique ground demonstrations; continuing refinement of the weapon system concepts that will be proposed for Engineering and Manufacturing Development (E&MD) and Production; and building concept demonstrator aircraft for flight demonstrations in 2000. These demonstrators are not full prototypes (i.e., production representative) but basic airframe, propulsion, minimal avionics, and many off-the-shelf subsystems necessary for flight. Specifically the Boeing and Lockheed Martin concept demonstrator aircraft will demonstrate commonality and modularity, STOVL hover and transition, and low speed handling qualities of their respective concepts.

In 1998 Pratt and Whitney successfully commenced engine testing. Boeing and Lockheed Martin completed Final Design Reviews and continued build of their respective Concept Demonstrator Aircraft. The Services completed the third iteration of their requirements document based on Cost and Operational Performance Trades (COPT). Technology maturation demonstrations continued as well. Both COPT and technology maturation demonstrations are essential to achieving JSF affordability goals and lowering risk prior to E&MD entry in 2001. Funding stability is also essential for the remainder of the program. Italy joined the program with a focus on the STOVL variant.

General Electric is continuing technical efforts related to development of an alternate engine source for production. Specifically, they are developing a core for an alternate engine which will be followed with a fan and turbine development after the winning aircraft design is selected. Funding for the alternate engine program is programmed through the current FYDP, which ends in FY 2005. The Navy and Air Force are committed to funding the program in the outyears as well, and this SAR reflects outyear funding to support production Lot VII availability.

The Department is currently (January 1999) addressing some program cost growth issues that recently surfaced. Details of those issues cannot be provided in this report due to the proprietary and competition sensitive nature of the information. The Program Director or other Department officials will provide additional information on request.

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7. Executive Summary (Cont'd):

The Under Secretary of Defense for Acquisition and Technology designated the JSF Program a joint, DoD Acquisition Category ID Program in May 1996.

This is an RDT&E-only SAR since JSF is a pre-Milestone II program. Limited reporting is permitted for pre-Milestone II programs in accordance with Title 10, United States Code, Section 2432, "SARs."

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

Nunn-McCurdy unit cost is not applicable for pre-Milestone II programs.

9. Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Concept Demonstration	NOV 96	NOV 96	NOV 96
Contract Award			
Milestone II	MAR 01	MAR 01	MAR 01
Milestone III	TBD	TBD	TBD
IOC	TBD	TBD	TBD

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9b. Schedule (Cont'd):

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Jt Init Rqmts Document (JIRD) 1 Desired Operational Characteristics				
CTOL Capability	Yes	Yes / Yes	TBD	Yes
STOVL Capability (STOVL Variant)	Yes	Yes / Yes	TBD	Yes
Aircraft Carrier Suitable (CV Variant and STOVL Variant)	Yes	Yes / Yes	TBD	Yes
Range Radius NM - CTOL Variant	450-600	450-600 / N/A	TBD	500-600 (Ch-1)
Range Radius NM - STOVL Variant	450-550	450-550 / N/A	TBD	450-550
Range Radius NM - CV Variant	>600	>600 / N/A	TBD	500-600 (Ch-2)
Internal Weapons Carriage - CTOL Variant	2 X 1000# class A-G, 2 X AIM-120, Internal Gun	2 X / N/A 1000# / class / A-G, 2 X/ AIM-120,/ Internal/ Gun /	TBD	2X (Ch-3) 2000# class A-G, 2X AIM-120, internal advanced gun
Internal Weapons Carriage - STOVL Variant	2 X 1000# class A-G, 2X AIM-120	2 X / N/A 1000# / class / A-G, 2X / AIM-120 /	TBD	2X 1000 (Ch-4) # class A-G, 2X AIM-120, mission- ized advanced gun
Internal Weapons Carriage - CV Variant	2 X 2000# class A-G, 2 X AIM-120	2 X / N/A 2000# / class / A-G, / 2 X / AIM-120 /	TBD	2X (Ch-5) 2000# class A-G, 2X AIM-120, mission- ized advanced gun

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10a. Performance Characteristics (Cont'd):

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Speed & Maneuverability	compa- rable to F-16 / F/A-18	Compa- / N/A rable to/ F-16 / / F/A-18 /	TBD	compa- rable to F-16/ F/A-18
Strike and Destroy Targets Day or Night in Adverse Weather Conditions	Yes	Yes / N/A	TBD	Yes
Integration of Offboard Sensors and Data Fusion	Yes	Yes / N/A	TBD	Yes
Signature Reduction /Low Observables	Yes	Yes / N/A	TBD	Yes
Logistic Footprint	5-8 C-141B equiva- lent loads	5-8 / N/A C-141B / equiva- / lent / loads /	TBD	no (Ch-6) more than 6 C-17 equiva- lent loads
Sortie Generation Rate - CTOL Variant	3-4/day sus- tained; 4-5/day surge	3-4/day / N/A sus- / tained; / 4-5/day / surge /	TBD	4/day (Ch-7) initial surge; 3/day sustain- ed surge; 1- 2/day sustain- ed wartime
Sortie Generation Rate - CV Variant	3/day sus- tained; 4/day surge	3/day / N/A sus- / tained; / 4/day / surge /	TBD	4/day (Ch-8) initial surge; 3/day sustain- ed surge; 1-2/day sustain- ed wartime

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10a. Performance Characteristics (Cont'd):

	Planning <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Sortie Generation	4/day	4/day / N/A	TBD	6/day (Ch-9)
Rate - STOVL	sus-	sus- /		initial
Variant	tained;	tained; /		surge;
	6/day	6/day /		4/day
	surge	surge /		sustain-
				cd
				surge;
				1-2/day
				sustain-
				ed
				wartime
Unit Flyaway Cost	\$28M	\$28M / N/A	TBD	\$28M
- CTOL Variant				
Unit Flyaway Cost	\$31-38M	\$31-38M / N/A	TBD	\$31M-38M
- CV Variant				
Unit Flyaway Cost	\$30-35M	\$30-35M / N/A	TBD	\$30M-35M
- STOVL Variant				

□

NOTES:

The above Desired Operational Characteristics are documented in the Services' Joint Interim Requirements Document (JIRD) which was updated October 1998. The Services update the JIRD annually with the Joint Requirements Oversight Council (JROC) based on results of cost and operational trades using cost as an independent variable; consequently the Desired Operational Characteristics are subject to change. Objectives and additional thresholds will be established for Key Performance Parameters upon signature of the Joint Operational Requirements Document (JORD) nearing Milestone II.

JSF Variants:

USAF - Conventional Take-Off and Landing (CTOL)
USN - Aircraft Carrier Suitable (CV)
USMC - Short Take-Off and Vertical Landing (STOVL)

Unit flyaway costs above are constant base year FY94 dollars.

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10b. Performance Characteristics (Cont'd):

b. Current Change Explanations --

[The Approved Program (APB) column reflects the Services' Joint Interim Requirements Document (JIRD) I. The "Current Estimate" column reflects the October 1998 update, JIRD III:

(Ch-1) Range Radius NM - CTOL variant: changed from "450-600" to "500-600"

(Ch-2) Range Radius NM - CV variant: changed from ">600" to "500-600"

(Ch-3) Internal Weapons Carriage - CTOL variant: changed from "...design space for internal gun" to "...internal advanced gun"

(Ch-4) Internal Weapons Carriage - STOVL variant: changed to reflect addition of "missionized advanced gun"

(Ch-5) Internal Weapons Carriage - CV variant: changed to reflect addition of "missionized advanced gun"

(Ch-6) Logistic Footprint: changed from "no more than 4 C-17 equivalent loads (8x C-141B)" to "no more than 6 C-17 equivalent loads"

(Ch-7) Sortie Generation Rate - CTOL variant: changed from "3/day sustained; 4/day surge" to "4/day initial surge; 3/day sustained surge; 1-2/day sustained wartime"

(Ch-8) Sortie Generation Rate - CV variant: changed from "3/day sustained; 4/day surge" to "4/day initial surge; 3/day sustained surge; 1-2/day sustained wartime"

(Ch-9) Sortie Generation Rate - STOVL variant: changed from "4/day sustained; 6/day surge" to "6/day initial surge; 4/day sustained surge; 1-2/day sustained wartime"

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11. Total Program Cost and Quantity (Dollars in Millions):

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. Cost --			
Development (RDT&E)	19000.0	19000.0	20015.5
Procurement	0.0	N/A	0.0
Total Sailaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 94 Base-Year \$	19000.0	19000.0	20015.5
Escalation	5800.0	5800.0	3347.0
Development (RDT&E)	(5800.0)	(5800.0)	(3347.0)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	24800.0	24800.0	23362.5
b. Quantity.--			
Development (RDT&E)	N/A	N/A	N/A
Procurement	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Total	N/A	N/A	N/A

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

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13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	24800.0	-	-	24800.0
Previous Changes:				
Economic	-1976.1	-	-	-1976.1
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-494.9	-	-	-494.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-2471.0	-	-	-2471.0
Current Changes:				
Economic	-427.7	-	-	-427.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+1420.0	-	-	+1420.0
Estimating	+41.2	-	-	+41.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1033.5	-	-	+1033.5
Total Changes	-1437.5	-	-	-1437.5
Current Estimate	23362.5	-	-	23362.5

Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	19000.0	-	-	19000.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-139.7	-	-	-139.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-139.7	-	-	-139.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+1120.8	-	-	+1120.8
Estimating	+34.4	-	-	+34.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1155.2	-	-	+1155.2
Total Changes	+1015.5	-	-	+1015.5
Current Estimate	20015.5	-	-	20015.5

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

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) RD&E

Revised escalation indices (Economic)	N/A	-427.7
Adjustment for current & prior year inflation (Estimating)	+28.0	+30.1
Addition of funding for the alternate engine program in FY04-FY11 (Engineering)	+1120.8	+1420.0
Adjustments for phasing and minor changes to Service funding (Estimating)	+6.4	+11.1
RD&E Subtotal	+1155.2	+1033.5

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	MAR 01	N/A	N/A	MAR 01
Milestone III	TBD	N/A	N/A	TBD
FUE/IOC	TBD	N/A	N/A	TBD
Total Cost	24800	N/A	N/A	23362.5
Total Quantity	0	N/A	N/A	0
Prog Acq Unit Cost	0	N/A	N/A	0

[This is an RD&E-only SAR since JSF is a pre-Milestone II program. Limited reporting is permitted for pre-Milestone II programs in accordance with Title 10, United States Code, Section 2432, "SARs."

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14. Unit Cost and Other History (Cont'd):

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

a. RDT&E --			Initial Contract Price		
<u>Propulsion CDP:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Pratt and Whitney, West Palm Beach FL			\$832.0	\$	
N00019-97-C-0050, CPAF					
Award: January 23, 1997					
Definitized: January 23, 1997					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$	\$		\$	\$	
			<u>Cost Variance</u> <u>Schedule Variance</u>		
Previous Cumulative Variances			\$	\$	
Cumulative Variances To Date			\$	\$	
Net Change			\$	\$	

Explanation of Change:

Further contract data is not provided here due to the competitive nature of the contract. Data is available from the Program Office on request.

<u>Weapon System CDP:</u>			Initial Contract Price		
Lockheed Martin Corp., Ft. Worth TX			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00019-97-C-0038, CPFF			\$718.8	\$	
Award: November 16, 1996					
Definitized: November 16, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$	\$		\$	\$	
			<u>Cost Variance</u> <u>Schedule Variance</u>		
Previous Cumulative Variances			\$	\$	
Cumulative Variances To Date			\$	\$	
Net Change			\$	\$	

Explanation of Change:

Further contract data is not provided here due to the competitive nature of the contract. Data is available from the Program Office on request.

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15. Contract Information (Cont'd):

<u>Weapon System CDP:</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 Defense and Space, Seattle WA			\$661.8	\$	
N00019-97-C-0037, CPFF					
Award: November 16, 1996					
Definitized: November 16, 1996					

<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>
\$	\$		\$	\$
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>
Cumulative Variances To Date			\$	\$
Net Change			\$	\$

Explanation of Change:

Further contract data is not provided here due to the competitive nature of the contract. Data is available from the Program Office on request.

<u>Alternate 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, Cincinnati, OH			\$96.0	\$	
N00019-96-C-0176, CPFF					
Award: February 13, 1997					
Definitized: February 13, 1997					

<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>
\$	\$		\$	\$
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>
Cumulative Variances To Date			\$	\$
Net Change			\$	\$

Explanation of Change:

Further contract data is not provided here due to the competitive nature of the contract. Data is available from the Program Office on request.

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15. Contract Information (Cont'd):

<u>J/IST:</u>			Initial Contract Price		
McDonnell Douglas Corp., St. Louis MO	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
F33615-95-K-3801, CPFF	\$64.8	\$			
Award: September 22, 1995					
Definitized: September 22, 1995					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$64.8	\$		\$64.8	\$67.0	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
			\$-1.0	\$0.4	
Cumulative Variances To Date (11/30/98)			<u>\$-1.4</u>	<u>\$-0.8</u>	
Net Change			\$-0.4	\$-1.2	

Explanation of Change:

Variances are not significant. Variances and Program Manager's Estimate at Completion are expected to improve as benefits of ongoing management actions are realized.

<u>MIRFS:</u>			Initial Contract Price		
Raytheon Company, Los Angeles, CA	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
N00019-96-C-0074, CPFF	\$54.6	\$			
Award: February 12, 1996					
Definitized: February 12, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$53.4	\$		\$53.4	\$53.4	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
			\$1.2	\$-0.4	
Cumulative Variances To Date (12/25/98)			<u>\$0.7</u>	<u>\$-1.2</u>	
Net Change			\$-0.5	\$-0.8	

Explanation of Change:

Variance is not significant.

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

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

<u>Appropriation</u>	<u>Prior Years (FY94-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-11)</u>	<u>Total</u>
RD&E	3018.6	510.4	1187.2	18646.3	23362.5
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3018.6	510.4	1187.2	18646.3	23362.5

b. Annual Summary -- JSF

Appropriation: 0400 - RD&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY94 Dollars Nonrec</u>	<u>Flyaway FY94 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				27.5	28.9
1997				64.2	68.2
1998				19.5	20.9
Subtotal				111.2	118.0

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY94 Dollars Nonrec</u>	<u>Flyaway FY94 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994				29.1	29.5
1995				95.2	98.3
1996				76.6	80.4
1997				228.9	243.3
1998				418.4	448.2
1999				432.5	468.5
2000				219.3	241.2
2001				502.3	561.5
2002				1178.1	1338.4
2003				1575.8	1823.1
2004				1592.5	1881.1
2005				1375.5	1658.9
2006				875.2	1077.6
2007				416.4	523.5
2008				242.5	311.3
2009				90.8	119.0
2010				48.6	65.0
2011				19.8	27.0

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal				9417.5	10995.8

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				81.2	83.8
1996				77.4	81.3
1997				236.8	251.6
1998				414.8	444.3
1999				419.8	454.8
2000				214.0	235.4
2001				500.2	559.1
2002				1173.2	1332.9
2003				1568.3	1814.4
2004				1584.2	1871.3
2005				1367.7	1649.5
2006				875.2	1077.6
2007				416.4	523.5
2008				242.5	311.3
2009				90.8	119.0
2010				48.6	65.0
2011				19.8	27.0
Subtotal				9330.9	10901.8

Appropriation: 9991 - Other RDT&E Funding

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				13.3	14.0
1997				66.8	71.0
1998				72.0	77.1
1999				50.3	54.5
2000				30.7	33.8
2001				59.6	66.6
2002				141.0	160.2
2003				188.5	218.1
2004				116.1	137.1
2005				167.7	202.3
2006				105.6	130.0

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

Appropriation: 9991 - Other RDT&E Funding

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2007				114.5	144.0
2008				29.8	38.2
Subtotal				1155.9	1346.9

(1) "Other RDT&E Funding" reflects current and anticipated foreign funding.

(2) USN and USAF appropriation data includes funding for the alternate engine program to support Lot VII production availability.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD				111.2	118.0
Navy				9417.5	10995.8
USAF				9330.9	10901.8
Other Funding				1155.9	1346.9
Grand Total				20015.5	23362.5

17. Delivery/Expenditure Information:

a. Deliveries To Date - None.

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 2251

Percent Total Program Expended: 9.6%

18. Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: C-17A

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): C-17 Globemaster III
2. DoD Component: USAF
3. Responsible Office and Telephone Number:
C-17 SYSTEM PROGRAM OFFICE BGEN CHARLES L. JOHNSON
AERONAUTICAL SYSTEMS CENTER Assigned: June 4, 1996
2590 LOOP ROAD WEST DSN 785-1545; COMM 937-255-1545
WPAFB, OH 45433-7142 Charles.Johnson@c17.wpafb.af.mil
4. Program Elements/Procurement Line Items:
RDT&E:
PE 0401130F
PE 0604227F (Shared) Project 663282
PE 0604231F
PE 0604609F (Shared) Project 663263 (Shared)
PROCUREMENT:
APPN 3010 ICN C017AD (Air Force)
MILCON:
PE 0401130F

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C-17A, December 31, 1998

5. References:

SAR Baseline (Production Estimate):

Program Management Directive 0020(22), dated May 10, 1989. Amended FY91 President's Budget.

Approved Program:

SAE Approved Acquisition Program Baseline (APB) dated February 25, 1999.

6. Mission and Description:

The C-17 is a multi-engine, turbofan, wide-body, strategic airlift aircraft which improves the overall capability of the United States Air Force to rapidly project, reinforce, and sustain combat forces worldwide. The aircraft augments the C-5 and C-141 in intertheater deployment and the C-130 with intratheater operations. The C-17 is capable of carrying outsized cargo over intertheater ranges into austere airfields and introduces a direct deployment capability that significantly improves airlift responsiveness. The C-17 provides needed total force structure modernization and responsiveness to dramatically improve the mobility of our general purpose forces.

Significant features of the multi-engine C-17 include: super critical wing design and winglets reduce drag and increase fuel efficiency and range; receiving inflight refueling capability increases range; externally blown flap configuration, direct lift control spoilers, and a high impact landing gear system contribute to the aircraft capability to operate into and out of small austere airfields; a forward and upward directed thrust reverser system provides backup capability, reduces the aircraft ramp space requirements, and minimizes interference of dust and debris with the activities of ground personnel; cargo door, ramp airdrop, and cargo restraint systems which are operable by a single loadmaster and permit immediate equipment offload without special handling equipment; two-man cockpit, with cathode ray tube displays, reduces complexity and improves reliability; built-in test features reduce maintenance and troubleshooting times; and walk-in avionics bays improve accessibility. These items significantly reduce maintenance manhours per flight hour.

7. Executive Summary:

The C-17 research and development contract was awarded in July 1982, and initial production began in January 1988. The Milestone IIIB decision authorized the full rate production of 120 total aircraft in November 1995.

On May 31, 1996, Secretary Widnall signed letters of transmittal to McDonnell Douglas Aircraft (now Boeing Airlift and Tankers) and Pratt & Whitney for procurement of 80 C-17 aircraft and the associated engines. The contracts are valued at \$16.2B. These long-term commitments are the longest and largest multiyear contracts ever entered into by the Department of Defense. Execution of the multiyear procurement strategy will save the U.S. taxpayers more than \$1B over a seven year period. This \$1B savings is in addition to the previously negotiated annual savings of more than \$4.4B realized from

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7. Executive Summary (Cont'd):

production efficiencies, streamlining, and reform initiatives.

To replace several of Air Mobility Command's (AMC's) aging C-141 aircraft, fourteen C-17s will be procured to support AMC's Special Operations Low Level mission. Total aircraft to be procured has now increased from 120 to 134. The additional aircraft are reflected in the FY 00 President's Budget.

C-17 PRODUCTION

Forty-six C-17 aircraft have been delivered to date. Aircraft P-46 was delivered to Charleston Air Force Base (CAFB) on December 22, 1998, 76 days early to contract. P-46 is the sixth of eight Lot IX aircraft. Lot IX is the first lot of the multiyear procurement contract. P-47 is scheduled to deliver to CAFB by February 26, 1999.

NACELLE/ENGINE AFFORDABILITY TEAM (N/EAT)

The N/EAT team completed engine compatibility testing at Pratt & Whitney including 200 cycle endurance and cowl load share tests. N/EAT started the flight test program on March 18, 1998. The team delivered N/EAT nacelles to support the production line installation, which began with P-41. Over the past year, many engineering tests and revisions have been executed to assure successful deployment of N/EAT.

FLEXIBLE SUSTAINMENT

A letter was sent to Boeing in November reporting a final rating of Excellent for its January 1, 1998 to September 30, 1998 period of performance. This was the first completed Award Fee Review Board action under the Flexible Sustainment Contract.

The Flexible Sustainment integrated master plan and schedule were expanded to reflect the current transition, implementation actions and strategic planning requirements. This revision addresses implementation of the FY 01 contract and the long-term depot support decision in FY 03.

GLOBAL AIR TRAFFIC MANAGEMENT (GATM)

This effort equips C-17s with initial sets of GATM features: the International Marine Satellite (INMARSAT) Aero-I commercial satellite voice and data capability, Traffic Alerting and Collision Avoidance System (TCAS), and Air Traffic Control (ATC) electronic messaging. Production cut-in is slated for Block 12, with P-71 delivery in early 2001. The Undefined Contract Action was definitized on September 30, 1998. The Systems Preliminary Design Review was successfully conducted on December 10, 1998. The program is on schedule and within cost.

AIR MOBILITY CONTINGENCY PRECISION APPROACH CAPABILITY (AMCPAC)

The fleet retrofit began April 20, 1998, with the first C-17 retrofitted aircraft delivered to Charleston Air Force Base (CAFB) on April 23, 1998. Fleet retrofit (40 aircraft) completed on September 1, 1998. The C-17 AMCPAC production installation commenced with P-41. By January 31, 1999, there will be 46 AMCPAC equipped C-17 aircraft consisting of 40 aircraft retrofitted and six production installed aircraft.

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7. Executive Summary (Cont'd):

DUAL ROW AIRDROP

Initial developmental testing of the Dual Row Airdrop system was completed in August 1998. This test evaluated the ability of the C-17 to gravity airdrop cargo from both sets of logistic rails simultaneously and sequentially, doubling the airdrop capability. A total of 2.4 million pounds of cargo including seven live High Mobility Multi-Purpose Wheeled Vehicles (HMMWVs) and 14 live howitzers were successfully dropped during the test.

UNIVERSAL STATIC LINE

Air Mobility Command and the Army successfully completed personnel airdrop testing with the 20-foot static line in September 1998. Test results led to the Army issuing an interim safety release clearing the way for resumption of paratroop operations using the static line. Development of a final Universal Static Line solution will continue in 1999.

AEROMEDICAL LITTER STATION

Lot IX deliveries include a significant Aeromedical Litter Station capability. Six of eight Lot IX aircraft (P-41 through P-46) have been delivered to date. This capability is planned to continue through the entire production program, and retrofit of the first forty production aircraft is scheduled to begin installation in FY00.

OFFICIAL FOLLOW-ON OPERATIONAL TEST AND EVALUATION (FOT&E) COMPLETE

Official Follow-on Operational Test and Evaluation completed September 30, 1998. The final FOT&E report is currently being written by Headquarters Air Mobility Command.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

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8. Threshold Breaches (Cont'd):

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Source Selection Decision	AUG 81	N/A	AUG 81
Contract Award	JUL 82	N/A	JUL 82
Start FSED	FEB 85	N/A	FEB 85
Milestone II (DSARC)	NOV 87	FEB 85	FEB 85
First Full Funded Production Lot	JAN 88	JAN 88	JAN 88
Milestone IIIA (DAB)	NOV 87	JAN 89	JAN 89
Low-Rate Initial Production	N/A	JAN 89	JAN 89
First Flight	JUN 91	N/A	SEP 91
T-1 First Flight	N/A	JUN 91	SEP 91
IOC (Delivery of 12 A/C to sqdn)	JUN 93	JAN 95	JAN 95
Complete DT&E/IOT&E	JUN 93	N/A	N/A
DT&E			
Start	N/A	JUN 91	SEP 91
Complete	N/A	DEC 94	DEC 94
IOT&E			
Start	N/A	DEC 94	DEC 94
Complete	N/A	JUN 95	JUN 95
Full Rate Production Contract Award	N/A	FEB 96	FEB 96
RM&AE (Formerly ORE)	N/A	JUL 95	AUG 95
Milestone IIIB	SEP 93	NOV 95	NOV 95
FOC	SEP 01	TBD	TBD
Depot Support Date	N/A	TBD	TBD

b. Current Change Explanations --
None.

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10. Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Maintenance Manhours Per Flying Hour (Air Vehicle)	14.6	N/A / N/A	N/A	N/A
Mean Time Between Maintenance Inherent (hrs) (MTBMI)	1.69	N/A / N/A	N/A	N/A
Mean Time Between Maintenance Corrective (hrs) (MTBMC)	.83	.78 / .75	1.56	0.88
Mean Time Between Removal (hrs) (MTBR)	5.37	2.8 / 2.5	7.45	4.67
Mean Manhours to Repair (hrs)	4.51	7.35 / 7.35	2.7	6.67
Maximum Take-off Gross Weight (lbs) (TOGW)	580000	N/A / N/A	N/A	N/A
Maximum Payload (lbs)	172200	N/A / N/A	N/A	N/A
Payload at Range (lbs @ 2400 nm)	167006	N/A / N/A	N/A	N/A
Range Unrefueled (nm)	2372	N/A / N/A	N/A	N/A
Landing Field Length (ft)	2541	3,000 / 3,000	2,500	2,900
Takeoff Field Length (ft)	7370	N/A / N/A	N/A	N/A
Cruise Speed (Mach) (450 KTAS)	.77	N/A / N/A	N/A	N/A
Backup Capability (% grade)	2	2 / 1.5	3.8	3.8
Mission Completion Success Probability (%)	94	N/A / N/A	N/A	N/A
Payload Range at 3200 nm (lbs)	N/A	130,000 / 110,000	113,000	130,000
Turning Capability (ft for 180 degree turn)	N/A	96 / 90	96/80	96/80
Vehicles/Rolling Stock/Outsize Cargo (no of vehicle load configurations)	N/A	15 / 15	15	15
Airdrop				
No. of persons	N/A	102 / 102	102	102
Lbs of heavy eqmt	N/A	110,000 / 60,000	110,000/ 60,000	110,000/ 60,000
No. of CDS bundles	N/A	40 / 30	40	40

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10a. Performance Characteristics (Cont'd):

PERFORMANCE CHARACTERISTICS: Reliability, Maintainability and Availability estimates for Mean Time Between Maintenance Corrective (hrs) (MTBMC), Mean Time Between Removal (hrs) (MTBR) and Mean Manhours to Repair were estimated through 100,000 fleet flying hours. 100,000 fleet flying hours was achieved in August 1998. Therefore, the Program Manager's current estimate for MTBMC, MTBR and Mean Manhours to Repair (hrs) are no longer applicable beyond 100,000 hours. Growth curve projections beyond 100,000 hours have not been calculated nor specified. These performance characteristics are no longer Key Performance Parameters in the June 10, 1998, Air Mobility Command Operational Requirements Document.

b. Current Change Explanations -- None

11. Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	6463.2	7763.9	7763.4
Procurement	34419.2	36787.4	35992.7
Airframe	(22158.8)		(25817.1)
Engines	(5478.3)		(2602.0)
Avionics	(1168.8)		(1033.8)
ECO			(0.0)
Product Improvement			(354.8)
Non Recurring			(1054.9)
Total Flyaway	(28805.9)		(30862.6)
Total Other Wpn Sys			(0.0)
Peculiar Support	(2267.0)		(3681.5)
Initial Spares	(3346.3)		(1448.6)
Construction (MILCON)	368.5	357.9	357.9
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	41250.9	44909.2	44114.0
Escalation	561.0	951.4	799.6
Development (RDT&E)	(-1122.3)	(-925.1)	(-924.6)
Procurement	(1673.7)	(1873.1)	(1720.8)
Construction (MILCON)	(9.6)	(3.4)	(3.4)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	41811.9	45860.6	44913.6
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	210	134	134
Total	210	134	134

NOTES:

The quantity excludes one aircraft (T-1) which is fully configured as a test

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11b. Total Program Cost and Quantity (Cont'd):

article. It is not maintained in the current production configuration.

Fourteen C-17s have been added to the production total to replace Air Mobility Command's C-141s to support their the Special Operations Low Level mission. Total aircraft to be procured has increased from 120 to 134.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (FEB99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	44909.2	44114.0	
(2) Quantity	134	134	
(3) Unit Cost	335.143	329.209	-1.77
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	36787.4	35992.7	
(2) Quantity	134	134	
(3) Unit Cost	274.533	268.602	-2.16

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13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	5340.9	36092.9	378.1	41811.9
Previous Changes:				
Economic	+76.4	-886.1	-12.3	-822.0
Quantity	-	-11383.3	-	-11383.3
Schedule	-	+2939.8	+10.1	+2949.9
Engineering	+50.6	+86.5	-	+137.1
Estimating	+1070.9	+7484.6	-18.6	+8536.9
Other	+170.0	+178.0	-	+348.0
Support	-21.8	-371.0	-	-392.8
Subtotal	+1346.1	-1951.5	-20.8	-626.2
Current Changes:				
Economic	-14.9	-489.4	-2.5	-506.8
Quantity	-	+1847.3	-	+1847.3
Schedule	-	+324.3	-	+324.3
Engineering	+23.5	+9.5	-	+33.0
Estimating	+143.2	+1631.7	+6.5	+1781.4
Other	-	-	-	-
Support	-	+248.7	-	+248.7
Subtotal	+151.8	+3572.1	+4.0	+3727.9
Total Changes	+1497.9	+1620.6	-16.8	+3101.7
Current Estimate	6838.8	37713.5	361.3	44913.6

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	6463.2	34419.2	368.5	41250.9
Previous Changes:				
Quantity	-	-8927.8	-	-8927.8
Schedule	-	+641.4	-	+641.4
Engineering	+48.9	+81.4	-	+130.3
Estimating	+964.3	+6826.1	-16.2	+7774.2
Other	+171.6	+170.7	-	+342.3
Support	-28.1	-699.8	-	-727.9
Subtotal	+1156.7	-1908.0	-16.2	-767.5
Current Changes:				
Quantity	-	+1567.6	-	+1567.6
Schedule	-	+83.1	-	+83.1
Engineering	+22.4	+10.5	-	+32.9
Estimating	+121.1	+1603.7	+5.6	+1730.4
Other	-	-	-	-
Support	-	+216.6	-	+216.6
Subtotal	+143.5	+3481.5	+5.6	+3630.6
Total Changes	+1300.2	+1573.5	-10.6	+2863.1
Current Estimate	7763.4	35992.7	357.9	44114.0

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-14.9
Open Architecture for Avionics (FY00&02). (Engineering)	+22.4	+23.5
Adjustment for Current and Prior Inflation. (Estimating)	+3.5	+3.6
Product Improvement extension for programming years (FY04-05). (Estimating)	+157.9	+182.2
Congressional and General Reductions (FY99). (Estimating)	-4.7	-4.9
Fuel Inflation Reduction (FY00-05). (Estimating)	-0.1	-0.2
Reallocation between RDT&E and Procurement (FY00-02). (Estimating)	-27.8	-29.7
Omnibus Reductions. (Estimating)	-1.0	-1.0
Small Business Innovative Research Reduction. (Estimating)	-5.2	-5.3
Transfer to other programs. (Estimating)	-1.5	-1.5
RDT&E Subtotal	+143.5	+151.8
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-489.4
Total Quantity Variance associated with increase of 14 units from 120 to 134 aircraft.	+2545.8	+3006.7
Quantity increase of 14 units. (Quantity)	+1567.6	+1847.3
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	+83.1	+324.3
Allocation to Engineering variance resulting from Quantity Change. (Engineering)	+10.5	+9.5
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	+884.6	+825.6
Adjustment for Current and Prior Inflation. (Estimating)	+141.3	+147.9
Congressional Reductions (FY99). (Estimating)	-8.8	-9.4
Low rate production impact for additional 14 aircraft. (Estimating)	+287.7	+336.5
C-17 Multi-year procurement exempt from escalation. (Estimating)	+246.0	+272.9
Transfers to other programs. (Estimating)	-3.3	-3.4
GFE Reallocation/adjustment. (Estimating)	-4.0	-4.1
Reallocation between RDT&E and Procurement (FY00-01). (Estimating)	+60.2	+65.7
Adjustment for Current and Prior Inflation. (Support)	+19.3	+20.1

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

b. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Revised estimate for Initial Spares in FY04-05. (Support)	-400.2	-461.6
Extension of Flexible Sustainment Contract Estimate through FY05. (Support)	+597.5	+690.2
Procurement Subtotal	+3481.5	+3572.1

(3) MILCON

Revised escalation indices. (Economic)	N/A	-2.5
Adjustment for Current and Prior Inflation. (Estimating)	+1.9	+2.0
Revised estimate for a realignment of Military Construction projects at Charleston AFB and McChord AFB in FY00 and FY01. (Estimating)	+3.7	+4.5
MILCON Subtotal	+5.6	+4.0

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
189.30	-16.62	--	+5.04	+1.82	+13.76	--	+5.80	+9.80	199.10

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
199.10	-9.92	+41.78	+24.43	+1.27	+77.00	+2.60	-1.08	+136.08	335.18

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14b. Unit Cost and Other History (Cont'd):

b. Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
170.16	-15.97	--	+3.45	+1.33	+7.71	--	+5.21	+1.71	171.87

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
171.87	-10.26	+26.30	+24.36	+0.72	+68.03	+1.33	-0.91	+109.57	281.44

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	NOV 87	N/A	FEB 85	FEB 85
Milestone III	NOV 87	N/A	JAN 89	JAN 89
FUE/IOC	JAN 92	N/A	JUN 93	JAN 95
Total Cost	39753.8	N/A	41811.9	44913.6
Total Quantity	210	N/A	210	134
Prog Acq Unit Cost	189.3	N/A	199.1	335.18

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

a. RDT&E --

Performance Improvement:

Boeing Airlift & Tankers, Long Beach, CA
F33657-95-D-2026, CPAF
Award: July 9, 1995
Definitized: July 9, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$71.3	N/A	0

Current Contract Price

Target	Ceiling	Qty
\$270.7	N/A	0

Estimated Price At Completion

Contractor	Program Manager
\$268.2	\$268.2

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15a. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.6	\$-0.7
Cumulative Variances To Date (11/29/98)	<u>\$0.2</u>	<u>\$-4.5</u>
Net Change	\$-0.4	\$-3.8

Explanation of Change:

Current Contract Price changed from the previous SAR with additional funding for the following Performance Improvement projects: Global Air Traffic Management (GATM); Air Mobility Contingency Precision Approach (AMCPAC); Cabin Pressure; Aeromed Redesign; Command & Control System; Block Software Upgrades; and Follow-On Flight Test.

Cost Variance: The negative impact on the positive cost variance was primarily due to delays and replanning for the Software Block Upgrade project.

Schedule Variance: The primary driver for the increase to the negative schedule variance was the defective supplier parts returned for the Automated Communication Processor (ACP) project.

b. Procurement -- <u>Producibility Enhancement:</u> Boeing Airlift & Tankers, Long Beach, CA F33657-95-D-2026, CPAF Award: July 9, 1995 Definitized: July 9, 1995	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$123.4	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$369.5	N/A	0	\$369.4	\$376.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-5.1	\$-9.6
Cumulative Variances To Date (11/29/98)	<u>\$-7.5</u>	<u>\$-8.5</u>
Net Change	\$-2.4	\$1.1

Explanation of Change:

Current Contract Price changed from the previous SAR primarily due to the additional funding required for the Nacelle/Engine Affordability Team (N/EAT), Pollution Prevention and Support Equipment Improvement projects.

Cost Variance: The primary drivers of the increased negative variance were the cost overruns associated with the tests required for the Core Integrated Processor (CIP) project. Performance and test issues, also drove cost overruns for the Nacelle/Engine Affordability Team (N/EAT) project.

Schedule Variance: The primary drivers of the reduction of the negative

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15. Contract Information (Cont'd):

variance were the improved performance for the Wing Spar Improvement and Skin Splicing & Framing projects.

<u>Aircraft MYP (FY97-03):</u> Boeing Airlift & Tankers, Long Beach, CA F33657-96-C-2059, FFP Award: May 31, 1996 Definitized: May 31, 1996	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$14209.4	N/A	80

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$14209.4	N/A	80	\$14209.4	\$14209.4

Explanation of Change:

On May 31, 1996, a 7-year multiyear procurement contract for 80 aircraft (P-41 through P-120) was signed.

Cost and Schedule variance reporting is not required on this FFP contract.

<u>FY96 Lot VIII Buy:</u> Boeing Airlift & Tankers, Long Beach, CA F33657-94-C-2251, FFP Award: February 23, 1996 Definitized: February 23, 1996	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$1877.1	N/A	8

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1877.1	N/A	8	\$1877.1	\$1877.1

Explanation of Change:

The Lot VIII contract authorized the production of eight aircraft, P-33 through P-40. The contract was awarded on February 23, 1996. All aircraft are delivered. The last aircraft delivered May 1998. This is the final time this contract will be reported in the SAR.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

Appropriation	Prior Years (FY81-99)	Budget Year (FY00)	Budget Year (FY01)	Balance To Complete (FY02-05)	Total
RDT&E	6091.8	170.7	132.3	444.0	6838.8
Procurement	21978.4	3385.0	3368.5	8981.6	37713.5
MILCON	327.9	6.2	27.2	-	361.3
O&M	-	-	-	-	-
Total	28398.1	3561.9	3528.0	9425.6	44913.6

b. Annual Summary -- C17

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1981				54.1	33.4
1982					
1983				86.4	59.6
1984				37.4	26.8
1985				163.3	121.0
1986				461.7	350.4
1987				787.8	625.5
1988				1351.4	1101.4
1989				1098.7	938.3
1990				1026.0	903.9
1991				818.7	748.3
1992				269.0	252.9
1993				171.0	164.3
1994				228.8	223.5
1995				184.9	184.2
1996				70.9	72.0
1997				64.6	66.3
1998				98.5	101.8
1999				113.1	118.2
2000				160.9	170.7
2001				122.7	132.3
2002				101.2	110.9
2003				97.4	108.7
2004				97.5	111.1
2005				97.4	113.3
Subtotal				7763.4	6838.8

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

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987		32.2		74.2	61.1
1988	2	91.0	695.7	849.0	733.5
1989	4	17.3	1038.5	1329.9	1186.3
1990	4	77.2	1248.6	1641.4	1511.7
1991		80.3		244.7	233.7
1992	4	43.3	1392.2	1856.5	1804.5
1993	6	19.5	1934.7	1987.2	1959.4
1994	6	155.7	1834.4	2202.1	2206.5
1995	6	380.5	1706.5	2333.9	2373.6
1996	8	7.6	2013.1	2490.9	2565.6
1997	8	11.2	1773.5	1998.6	2080.5
1998	9	1.7	1910.2	2155.5	2259.0
1999	13	2.2	2469.8	2822.4	3003.0
2000	15	2.3	2691.3	3131.4	3385.0
2001	15	2.3	2677.1	3065.1	3368.5
2002	15	2.2	2663.7	2888.9	3235.6
2003	6	0.8	1232.7	1676.9	1915.0
2004	5		913.9	1307.7	1524.8
2005	8	127.2	1611.8	1936.4	2306.2
2006					
2007					
Subtotal	134	1054.5	29807.7	35992.7	37713.5

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				6.6	5.7
1990				5.4	5.0
1991				31.3	29.5
1992				79.2	76.1
1993				31.7	31.1
1994				15.2	15.2
1995					
1996				6.7	6.9
1997				78.2	80.9
1998				6.2	6.5
1999				66.9	71.0
2000				5.8	6.2
2001				24.8	27.2
Subtotal				358.0	361.3

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	134	1054.5	29807.7	44114.1	44913.6

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	1	1
Procurement	46	46

Percent Total Program Quantities Delivered: 35.1%

b. Total Expenditures To Date (In Millions of Dollars): \$ 22668

Percent Total Program Expended: 50.5%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The average annual cost per C-17 squadron was derived from the most current Air Force Service Cost Position (dated September 13, 1995, revised on February 22, 1999), adjusted to include impacts from the Flexible Sustainment maintenance concept. The total Operating and Support (O&S) cost was divided by the nine operational squadrons and further divided by the number of years covered by the estimate (36 years, from FY96 through FY31). This estimate was developed in FY96 BY dollars.

The O&S costs were based on a total of 120 aircraft, 96 were operated under the Active/Associate Reserve concept, six under the Air Reserve Component Unit Equipped, eight training aircraft, and ten in backup aircraft inventory. The estimate includes direct and indirect costs, as described below:

(1) Direct costs include: mission personnel, unit-level consumables, depot maintenance, interim contractor support (ICS), contractor logistics support (CLS), and sustaining support costs. Mission personnel consist of aircrew, base maintenance, wing/squadron overhead, and weapon system security personnel requirements. Unit-level consumables include: fuel, base maintenance supplies, and depot-level reparable. Depot maintenance costs consist primarily of government furnished equipment software maintenance. Other costs previously included under depot maintenance are now captured under ICS/CLS. Sustaining support includes; replacement support equipment, sustaining engineering, and sustaining software support.

(2) Indirect costs include personnel support and installation support activities. Personnel support covers medical personnel and supplies, training (aircrew training system contracted support, maintenance trainer contract

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

support, initial C-17 flying training, and initial specialty training), and permanent change of station costs. Installation support covers base operating and real property maintenance personnel and miscellaneous operating expenses.

b. There is no antecedent system for the C-17 aircraft. The C-17 has a much wider range of capabilities than exists in the other current airlift aircraft. It can carry outsize cargo similar to the C-5, airdrop similar to the C-141, and operate in small austere environments similar to the C-130.

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per C-17 Squadron	Avg Annual Cost for Antecedent System
Mission Pay & Allowances	26.3	0.0
Unit Level Consumption	34.7	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.2	0.0
Contractor Support	56.7	0.0
Sustaining Support	2.4	0.0
Indirect Costs	23.5	0.0
Total	143.8	0.0

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: DMSP

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): DMSP Block 5D-2
Improved/5D-3/Defense Meteorological Satellite Program
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:
DMSP Office Col Jeffery A. Quirk
SMC/CI Assigned: February 2, 1998
2420 Vela Way Suite 1467-A8 DSN 833-4333; COMM (310) 336-4333
El Segundo, CA 90245-4659
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0305160F
PROCUREMENT:
(U) APPN 3080 ICN 833340 (Air Force)
(U) APPN 3080 ICN 836740 (Air Force)
(U) APPN 3020 ICN MS0554 (Air Force)
MILCON:
(U) PE 0305160F

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5. (U) References:

SAR Baseline (Production Estimate):

(U) (U) Production Estimate:

PMD R-S 3015 (20), dated May 31, 1983, subject "DMSP"

Approved Program:

(U) AFAE Approved Acquisition Program Baseline (APB) dated February 5, 1998.

6. (U) Mission and Description:

(U) The mission of the Defense Meteorological Satellite Program (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, the Air Force Space Forecast Center, and to deployed tactical 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. Three Block 5D-2 Improved satellites are operational.

7. (U) Executive Summary:

(U) DMSP is a Joint-Service program in accordance with the Memorandum of Agreement on Joint Service Management and Operations, dated December 15, 1976. DMSP is a continuing program to support requirements of special strategic missions, the Joint-Service mission, and the Joint Chiefs of Staff. On December 19, 1995, DMSP and the 5D-3 spacecraft production contractor (Lockheed-Martin) negotiated a revised production schedule. In January 1996, Lockheed-Martin announced the calendar year 1998 plant closure at East Windsor, New Jersey. Lockheed Martin's East Windsor facility was officially closed on June 26, 1998. In March 1996, Lockheed-Martin notified the program office of an overrun on the spacecraft production contract due to recurring problems with solar arrays and power systems hardware as well as schedule delays and rate increases. The SPO had projected an overrun at completion since April 1992. A one-year extension to the spacecraft production contract was negotiated, extending the contract to June 1999. \$2.4M was approved to cover the projected cost. With the exception of the solar arrays, all contract line item selloff will be complete by March 1999.

On July 1, 1998 during S15 readiness testing, a Gates 50Ah test battery ruptured causing minor damage to the spacecraft. The independent investigation team attributed the rupture to the design and age of the battery cell. DMSP has now

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7. (U) Executive Summary (Cont'd):

permanently discontinued the use of 50AH batteries containing the pellow 2538 separator and is currently processing S20 using new 40Ah test batteries manufactured by SAFT (Bordeaux, France).

Special Sensor Microwave Imager Sounder (SSMIS) Flight Unit 1, which experienced numerous technical and schedule setbacks due to component failures, was delivered in October 1997. Flight Units 2 and 3 were delivered on April 22 and July 8, 1998 respectively.

DMSP S14, the final 5D-2 Improved satellite, launched on April 4, 1997. A premature loss of two of the four satellite tape recorders occurred in February and October 1998. On November 29, 1998, F-14 experienced a third premature tape recorder failure. The program office concluded that the F-14 experience indicates a fleet-wide problem that, if left uncorrected, jeopardizes Mean Mission Duration (MMD) on future launches. F-14's final tape recorder is continuing to work nominally; rework is continuing on two Digital Tape Recorders (DTRs) to complete F-15's recorder complement. The program office is investigating replacing DTR's with Solid State Recorders (SSRs) on all future satellites. Delivery of the recorders is expected to support the August 1999 launch.

The 607th Weather Squadron in Yongsan, Korea and the 617th Weather Squadron in Tuzla, Bosnia received Small Tactical Terminal (STT) units in support of their operations in January 1996. On June 1, 1996, installation of the first Joint Task Force Satellite Terminal (JTFST) at Yongsan, Korea was completed. STT units have been delivered to Keesler AFB, Robins AFB, Panama, Saudi Arabia and other units in Southwest Asia. The Air Weather Service (AWS) fielding decision for STTs was made on December 18, 1996. The program office has procured 16 Lightweight STTs, 40 STT Workstations, 7 JTFSTs, and 120 production units for a total of 183 units.

On May 29, 1998, Air Force Space Command Director of Operations declared the transfer of Satellite Command Authority to the National Oceanic and Atmospheric Administration (NOAA). This action completes the Command and Control transition for the initial phase of the convergence of the polar weather satellite programs, DMSP and Polar-Orbiting Operational Environmental Satellite (POES) Television Infrared Orbiting Satellite (TIROS).

The DMSP program has currently delivered nine of the 10 satellites. The final satellite will be delivered by June 1999 (100% delivery). This will be the final SAR submittal for the DMSP program.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
SATELLITE			
Block 5D-2 Improved Production Start (S-11)	SEP 83	SEP 83	SEP 83
S-15 Design Contract Award	NOV 85	N/A	JUL 86
Satellite Delivery			
S-11	JUL 87	DEC 88	DEC 88
S-12	N/A	NOV 89	OCT 89
S-13	N/A	AUG 90	AUG 90
S-14	N/A	NOV 90	NOV 90
S-15 (Block 5D-3)	N/A	SEP 91	DEC 91
Satellite Availability			
S-11	N/A	DEC 89	DEC 88
S-12	N/A	SEP 90	OCT 89
S-13	N/A	JUN 91	AUG 90
S-14	N/A	JUN 92	NOV 90
S-15 (Block 5D-3)	N/A	SEP 93	DEC 91
Award of Block 5D-3 Multiyear Procurement	N/A	MAY 89	JUN 89
Initial Titan II Capability IOC	N/A	OCT 90	OCT 90
Block 5D-2 Improved (S-11)	TBD	N/A	DEC 91
Block 5D-3 (S-15)	TBD	N/A	SEP 99 (Ch-1)
PRIMARY SENSOR			
Design Contract Award (S-11)	SEP 82	SEP 82	SEP 82
Production Contract Award (S12-S15)	JAN 84	JAN 84	JAN 84

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

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Production Contract Award (S16-S20)	N/A	SEP 88	SEP 88
S-16 Primary Sensor Delivery	N/A	SEP 92	FEB 93
GROUND SYSTEMS			
Thule Command Readout Station			
(1) Operational	SEP 87	N/A	FEB 88
(2) Deactivate Loring CRS	SEP 88	N/A	APR 90
Fairchild Satellite Operations Center (FSOC) Operational	SEP 87	MAY 89	AUG 89
Award Mark IVB Contract	N/A	OCT 88	OCT 88
Mark IVB IOT&E	N/A	OCT 91	MAR 92
Begin Mark IVB Production	N/A	JAN 92	JUN 92
Final Mark IVB Delivery	N/A	SEP 97	APR 95
SYSTEM			

(U) Note: Block 5D-2 Improved/Block 5D-3 IOC will occur 30 days after launch (completion of on-orbit checkout). As DMSP launches on demand, no firm estimate is currently available.

b. Current Change Explanations --

(U) (Ch-1) Block 5D-3 current estimate changed from TBD to September 1999. The launch of S-15 is projected for August of 1999. Block 5D-3 IOC will occur 30 days after launch. Therefore, Block 5D-3 IOC will occur in September 1999.

10. (U) Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Satellite				
Altitude (+/-20 nm)	450	N/A / N/A	450	450
Inclination (+/-15 degrees)	98.7	N/A / N/A	98.7	98.7
Mean Mission				
Duration (months)				
5D-2 Improved	33	48 / 30	48	39
5D-3	42	60 / 30	N/A	42
Early Orbit				
Checkout (days)				
5D-2 Improved	30	30 / 30	19	30
5D-3	30	30 / 30	N/A	30
Primary Sensor				
Global Resolution (km)	2.78	2.78 / 2.78	2.78	2.78
Theater Resolution (km)	.56	.56 / .56	.56	.56

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10a. (U) Performance Characteristics (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Mark IVB Tactical Terminals				
Mean Time Between Corrective Maintenance Actions (MTBCMA) (hrs)	720	705 / 705	N/A	705
Mean Time to Repair (MTTR) (hrs)	1	1 / 1	.37	1
Mean Time Between False Alarm (MTBFA) (hrs)	20000	20000 / 20000	N/A	20000
Mean Time Between Critical Failures (MTBCF) (hrs)	2000	1945 / 1945	N/A	1945
Maintenance Manhours per Operating Hour (MMH/OH)	.0233	.0233 / .0233	N/A	.0233
Inherent Availability	.9995	.9995 / .9995	N/A	.9995
Fraction of Failures Isolated by Built-In Test (%)	90	90 / 90	N/A	90
Survivability				
(b)(1)				
Autonomous Operation (days)	N/A	60 / 7	N/A	7

(U) Note: The Altitude parameter is 450 nautical miles with a difference between apogee and perigee of no more than 30 nautical miles.

The current estimate for the technical parameters represents anticipated values based on current on-orbit satellite performance. Mean mission duration for both the 5D-2 Improved and 5D-3 spacecraft represent anticipated values and are based on current on-orbit performance of similar satellites.

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10b. (U) Performance Characteristics (Cont'd):

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

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	224.5	266.7	268.3
Procurement	491.6	616.9	639.8
Launch Vehicle	(26.0)		(7.2)
Spacecraft	(201.3)		(269.9)
Primary Sensor	(79.6)		(106.0)
Mission Sensors	(57.1)		(93.4)
Support	(48.9)		(75.9)
Total Flyaway	(412.9)		(552.4)
Ground System	(58.0)		(73.7)
Field Level Support	(19.8)		(0.0)
Total Other Wpn Sys	(77.8)		(73.7)
Peculiar Support	(0.0)		
Initial Spares	(0.9)		(13.7)
Construction (MILCON)	2.6	3.0	2.7
Acquisition O&M	0.0	0.0	0.0
Total FY 75 Base-Year \$	718.7	886.6	910.8
Escalation	1160.3	1484.2	1513.1
Development (RDT&E)	(318.1)	(392.6)	(388.4)
Procurement	(839.1)	(1088.3)	(1121.7)
Construction (MILCON)	(3.1)	(3.3)	(3.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	1879.0	2370.8	2423.9
b. (U) Quantity --			
Development (RDT&E)	1	1	1
Procurement	8	9	9
Total	9	10	10

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

	UCR Baseline (Feb 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 75 BY\$)	886.6	910.8	
(2) Quantity	10	10	
(3) Unit Cost	88.660	91.080	+2.73
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 75 BY\$)	616.9	639.8	
(2) Quantity	9	9	
(3) Unit Cost	68.544	71.089	+3.71

13. (U) Cost Variance Analysis:

a. (U) 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	-37.8	-154.4	-0.2	-192.4
Quantity	-	+190.2	-	+190.2
Schedule	-	+1.9	-	+1.9
Engineering	-13.6	-70.4	-	-84.0
Estimating	+125.7	+415.8	-	+541.5
Other	-	-	-	-
Support	+37.1	+65.8	+0.2	+103.1
Subtotal	+111.4	+448.9	0.0	+560.3
Current Changes:				
Economic	-2.5	-6.4	-	-8.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+5.2	+4.9	-	+10.1
Other	-	-	-	-
Support	-	-16.6	-	-16.6
Subtotal	+2.7	-18.1	-	-15.4
Total Changes	+114.1	+430.8	0.0	+544.9
Current Estimate	656.7	1761.5	5.7	2423.9

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

(U) Summary (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	-5.2	-24.8	-	-30.0
Estimating	+33.6	+102.8	-	+136.4
Other	-	-	-	-
Support	+13.8	+12.0	+0.1	+25.9
Subtotal	+42.2	+151.2	+0.1	+193.5
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.6	+0.3	-	+1.9
Other	-	-	-	-
Support	-	-3.3	-	-3.3
Subtotal	+1.6	-3.0	-	-1.4
Total Changes	+43.8	+148.2	+0.1	+192.1
Current Estimate	268.3	639.8	2.7	910.8

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-2.5
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.7
Revised estimate due to general and congressional reductions (Estimating)	-1.6	-4.8
Reprogramming of funds to support Airborne Polarimetric Microwave Imaging Radiometer (APMIR) and Radar Calibration Transponder Integration study. (Estimating)	+0.6	+1.5
Revised estimate to support Special Sensor Calibration/Validation (Estimating)	+1.7	+4.7
Revised estimate to adjust for Small Tactical Terminal Software Mods (Estimating)	+0.8	+3.1
RDT&E Subtotal	+1.6	+2.7
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-8.1
Economic adjustment for negative program change. (Economic)	N/A	+1.7
Adjustment for Current and Prior Inflation. (Estimating)	+0.5	+1.8

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised estimate due to general, omnibus, and congressional adjustments (Estimating)	-1.9	-3.0
Revised estimate due to cost growth on Lockheed Martin Support Missiles and Space Support and Services contract (Estimating)	+0.8	+2.4
Reprogramming of FY95 funds to support Titan requirement (Estimating)	-1.3	-3.6
Reprogramming of funds to support Global Positioning System (GPS) program requirements (Estimating)	-0.5	-1.1
Revised estimate for Special Sensor Microwave Imager/Sounder (SSMIS) retrofit and On Orbit incentive requirements (Estimating)	+2.7	+8.4
Adjustment for Current and Prior Inflation. (Support)	+0.5	+0.7
Revised estimate due to general and congressional reductions (Support)	-4.3	-18.0
Revised estimate of initial spares (Support)	+0.5	+0.7
Procurement Subtotal	-3.0	-18.1

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
208.78	-20.13	-1.86	+0.19	-8.40	+55.16	--	+8.65	+33.61	242.39

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
166.34	-17.87	+2.65	+0.21	-7.82	+46.74	--	+5.47	+29.38	195.72

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14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	TBD	DEC 91
Total Cost	N/A	N/A	1879	2423.9
Total Quantity	N/A	N/A	9	10
Prog Acq Unit Cost	N/A	N/A	208.78	242.39

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

a. Procurement --

(U) 5D-3 SPACECRAFT:
Lockheed Martin, Princeton, NJ
F04701-89-C-0029, FPIF/AF
Award: June 30, 1989
Definitized: June 30, 1989

Initial Contract Price		
Target	Ceiling	Qty
\$252.3	\$274.3	3

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$303.4	\$329.4	5	\$317.5	\$320.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-21.7	\$-1.1
Cumulative Variances To Date (12/28/98)	\$-22.3	\$-1.2
Net Change	\$-0.6	\$-0.1

Explanation of Change:

(U) The increase to the current contract target and ceiling prices over the original values is due to contract modifications for mission sensor integration, the advanced flight vehicle simulation facility, real-time data smooth transmitters, Special Sensor Microwave Imager Sounder (SSMIS) integration work-arounds and an Equitable Price Adjustment (EPA) modification.

The Initial Contract Price, Current Contract Price, and the Estimated Price At Completion include applicable performance and award fees. The Program Manager's estimate at completion exceeds the contractor's estimate based upon Cost Performance Report (CPR) indicators, a four month delivery delay of the first production unit (S-16), continuing problems with solar array production, and test delays on S-17 and S-18 caused by the siphoning of test personnel and equipment needed to support Air Force directed launch of

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

S-14 satellite. Also included in the estimated price at completion is \$8.9M in award fees earned, \$0.3M in potential award fees, and \$16.9M in potential on-orbit performance incentives.

The increase in cost variance continues to be caused by problems associated with solar array fabrication, rate increases, UHF transmitter manufacturing delays, the extension of the contract from June 1998 to June 1999 (required to complete the rework efforts), and the transition from the East Windsor facility in New Jersey to the Sunnyvale facility in California.

The negative schedule variance is a result of continuing solar array problems and a delay in UHF transmitter fabrication, assembly, and test.

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

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

<u>Appropriation</u>	<u>Prior Years (FY82-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	561.7	21.5	25.9	47.6	656.7
Procurement	1464.2	39.9	59.5	197.9	1761.5
MILCON	5.7	-	-	-	5.7
O&M	-	-	-	-	-
Total	2031.6	61.4	85.4	245.5	2423.9

b. Annual Summary -- 5D2 IMP/5D-3 SPACECRAFT

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY75 Dollars Nonrec</u>	<u>Flyaway FY75 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1982				8.4	15.5
1983				8.7	16.8
1984				9.8	19.6
1985				18.4	37.9
1986				24.1	50.9
1987				26.6	58.8
1988				16.0	36.3
1989				19.0	45.3
1990				17.9	44.0
1991				18.5	47.2

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				13.3	35.0
1993				7.3	19.6
1994				9.2	25.1
1995				10.9	29.6
1996				10.4	28.9
1997				8.0	22.4
1998				4.3	12.3
1999				5.8	16.5
2000				7.4	21.5
2001				8.8	25.9
2002				4.7	14.0
2003				3.6	10.9
2004				3.6	11.2
2005				3.6	11.5
Subtotal	1			268.3	656.7

(U) Funding does not match the budget documentation because the SAR is limited to DMSP Blocks 5D-2 Improved and 5D-3. (Satellites 11-20)

Base year dollars were computed using DMSP peculiar indices for FY82-94 and OSD Standard Indices for FY95-05.

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1982				7.0	14.4
1983	2	3.8	77.1	68.8	150.6
1984		3.7		13.3	30.3
1985	2	4.2	94.7	54.3	127.6
1986		4.0	20.9	16.1	39.5
1987		3.6		6.9	17.5
1988		2.7		27.1	71.9
1989	1	2.6	53.2	60.0	166.4
1990	1	5.2	56.5	45.1	127.4
1991	1	5.2	67.0	57.5	167.8
1992	2	4.8	114.6	37.1	109.6
1993		3.1		10.1	30.8
1994		2.1		9.7	30.3
1995		1.8		13.6	40.9

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996		2.2		9.1	27.7
1997		2.4		9.9	30.5
1998		2.3		11.3	35.2
1999		2.2		11.2	35.5
2000		2.1		11.9	38.2
2001		2.0		18.1	59.2
2002		2.0		13.0	43.4
2003		2.1		15.6	53.1
2004		2.1		14.6	50.6
2005		2.2		14.1	49.9
Subtotal	9	68.4	484.0	555.4	1548.3

(U) FY86 recurring amount is for primary and mission sensors for the development spacecraft (S-15). The amount shown for non-recurring cost is associated with the Federally Funded Research and Development Center (FFRDC) support.

Funding does not match the budget documentation because the SAR is limited to DMSP Blocks 5D-2 Improved and 5D-3. (Satellites 11-20)

Base year dollars were computed using DMSP peculiar indices for FY82-94 and OSD standard Indices for FY95-05.

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1983				3.7	7.5
1984				6.3	13.1
1985				13.3	28.7
1986				4.1	9.3
1987				3.0	6.9
1988				4.3	10.4
1989				6.5	16.3
1990				0.5	1.2
1991				7.1	18.7
1992				2.8	7.7
1993				4.7	13.1
1994				3.8	10.8
1995				5.5	15.4

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

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				5.4	15.2
1997				4.1	11.8
1998				4.1	11.9
1999				4.2	12.3
2000				0.6	1.7
2001				0.1	0.3
2002				0.1	0.2
2003				0.1	0.3
2004					
2005				0.1	0.4
Subtotal				84.4	213.2

(U) Funding does not match the budget documentation because the SAR is limited to DMSP Blocks 5D-2 Improved and 5D-3.

Base year dollars were computed using DMSP peculiar indices for FY82-94 and OSD Standard Indices for FY95-05.

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985				2.7	5.7
Subtotal				2.7	5.7

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	10	68.4	484.0	910.8	2423.9

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	1	1
Procurement	9	8

(U) Percent Total Program Quantities Delivered: 90.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1900.5

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17b. (U) Delivery/Expenditure Information (Cont'd):

(U) Percent Total Program Expended: 78.4%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
Operations and support costs include all costs of operating, maintaining, and supporting the DMSP spacecraft from dedicated ground control centers at Fairchild AFB WA (Fairchild Satellite Operations Center) and Offutt AFB NE (Multi-Purpose Operations Center). Costs also include the costs for contractor support for sustaining engineering and the operations personnel at each of the operations centers. These costs do not include the unallocated costs associated with the shared use of remote tracking stations which are programmed and borne by the Air Force Satellite Control Network and the Consolidated Space Operations Center program elements. The estimate was done in December 1992.

No antecedent system for the Block 5D-2 Improved/5D-3 meteorological satellite exists.

b. (U) Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per 5D-2 Constellation	Avg Annual Cost Per (Antecedent)
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	11.2	0.0
Intermediate Maintenance	13.1	0.0
Depot Maintenance	2.4	0.0
Contractor Support	124.4	0.0
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	151.1	0.0

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~~SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)~~
PROGRAM: SBIRS

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Space Based Infrared System (SBIRS) Program
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:
SMC/MT Col Daniel L. Burkett II
185 Discoverer Blvd. Assigned: July 3, 1997
Suite 2512 DSN 833-1807; COMM (310) 363-1807
Los Angeles, CA 90245-4695
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0604441F
PROCUREMENT:
(U) APPN 3020 ICN MSSBIR (Air Force)
(U) APPN 3080 ICN MSSBIR (Air Force)
MILCON:
(U) PE 0604441F
O&M:
(U) PE 0305915F

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Declassify on: October 1, 2007~~

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DEPARTMENT OF DEFENSE

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5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Baseline (APB) dated March 19, 1998.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated March 19, 1998.

6. (U) Mission and Description:

(U) The Space Based Infrared System (SBIRS) program is intended to satisfy key requirements delineated in the SBIRS Operational Requirements Document dated August 15, 1996, with Annex 1 dated July 17, 1998, within the available budget and schedule. SBIRS is an integrated "system of systems", consisting of multiple space and ground elements, with incremental deployment phasing, simultaneously satisfying requirements in the following mission areas: Missile Warning, Missile Defense, Technical Intelligence, and Battlespace Characterization. The baseline architecture for SBIRS includes space elements in Highly Elliptical Orbits (HEO), Geosynchronous Earth Orbits (GEO), and Low Earth Orbits (LEO), in addition to the following ground elements: a CONUS-based Mission Control Station (MCS) and backup (MCSB), overseas Remote Ground Stations (RGSS), Multi-Mission Mobile Processor (M3P), and associated communication links. The High Component consists of four satellites in GEO, two hosted sensors in HEO (platforms provided by another organization), and associated ground elements. The Low Component will consist of TBD satellites and will be integrated with the High Component through the SBIRS ground segment.

7. (U) Executive Summary:

(U) This SAR reports on SBIRS High as in previous SARs. However, certain SBIRS Low information is included in sections 7 and 9, and other related narratives and footnotes. The SBIRS Low financial, unit cost, contract, and related information will not be reported until after the SBIRS Low Milestone I Defense Acquisition Board (DAB) review.

(U) SBIRS HIGH EMD CONTRACT AWARD ACTIVITIES/REVIEWS: The SBIRS High Engineering and Manufacturing Development (EMD) contract was awarded on November 8, 1996. Development and design contract work progressed in accordance with the Integrated Master Plan. As of December 1998, the contract is 34% complete; schedule and cost variances are only at -1% and -2%, respectively. However, in January 1999, as a result of software development and testing difficulties, the contractor allocated 4 of the 6 weeks of contractor schedule slack to complete Increment 1 System Certification. Increment 1 Initial Operational Capability (IOC) is scheduled for October 1999, which is in accordance with the original baseline. During this period of EMD, Lockheed Martin Missile and Space (LMMS) has successfully completed several significant milestones on both the ground and space segments. On the ground segment these milestones included Increment 2 Software Interim Design Review (IDR). For the Space segment, LMMS successfully completed testing of the

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7. (U) Executive Summary (Cont'd):

starer payload Engineering Test Model (ETM). A second program Integrated Baseline Review (IBR) was completed in January 1999.

(U) SBIRS HIGH: SBIRS High EMD progress has been excellent, although key issues still exist that need attention for continued success of the program. The FY98 funding shortfalls were resolved by a Special Terminations Contract Clause (\$25.9M) and Above Threshold Reprogramming to SBIRS High of DSP Missile Procurement funds (\$21.6M) issued on May 15, 1998, and June 5, 1998, respectively, as well as the 4-month schedule deferral contract modifications. The ground and space segments continued to make excellent progress toward achieving all milestones. The Mission Control Station (MCS) building was completed and furnished for occupancy in May 1998. The Test and Evaluation Master Plan was approved by OSD on June 17, 1998. The contract modification for satellites GEO 4 and GEO 5 breakout was completed on September 8, 1998.

All Increment 1 hardware has been delivered to the MCS and was fully integrated as of October 1998. All Increment 1 software was integrated into the ground segment hardware. Crew training and Technical Order validation are high risk areas that are being monitored closely; maximum resources are being applied to ensure success. As a result of delays in software verification for all ground elements, a 4-week delay in Operational Test and Evaluation was approved at the request of LMMS. In order to preserve an October 1999 IOC, AFSPC is evaluating the option to compress its review and coordination cycle. The SBIRS High Ground Segment Increment 2 Software Interim Design Review was held December 1-3, 1998.

(U) In the Space segment, the starer sensor ETM completed testing in the thermal vacuum chamber. The starer ETM completed radiometric performance testing on December 21, 1998. Preliminary test data indicates the starer payload sensitivity and line-of-sight repeatability is better than the payload specification requirements. Final analysis of the test data will be completed in February 1999. Spacecraft bus is under LMMS' Independent Research and Development (IR&D) and Product Development; the development effort is approximately 2 months behind schedule. The delays are driven by software development, and manufacturing of the command and data handling engineering unit circuit cards. These delays have been accommodated by the 2-month delay to the space segment Critical Design Review (CDR) from April 15, 1999, to June 15, 1999.

(U) As part of the IBR, we completed a bottom up Estimate at Complete to determine if the program was funded adequately to meet the contract baseline and an FY02 first GEO launch. The contractor is now reporting a Variance At Completion (VAC) of -\$33M at the end of the contract, while the System Program Office (SPO) estimated a VAC of -\$98M. The SPO's assessment tends to be more conservative, while the contractor has a high incentive with Award Fee and Corporate Commitment to complete on or below target.

During the formulation of the FY 2000 budget, the Air Force recommended, and OSD and the Joint Staff approved, a two year slip of the launch of the first geosynchronous satellite from FY 2002 to FY 2004. This schedule change was

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7. (U) Executive Summary (Cont'd):

implemented for three reasons: (1) to take advantage of the coverage which will be provided by the current constellation of DSP satellites, five of which have yet to be launched, (2) to synchronize the SBIRS High program with the new schedules for the National and Theater Missile Defense programs, and (3) to free up FY 2000 funds.

(U) SBIRS LOW COMPONENT ISSUES: The Demonstrations experienced significant cost growth in 1998. The SBIRS Low program office is preparing for the start of the Program Definition effort.

(U) SBIRS LOW FLIGHT DEMONSTRATION SYSTEM (FDS). Significant technical progress occurred in 1998, including partial buildup of both space vehicles; delivery of all sensors to payload integration; fit check of the booster/satellite interface. Drafts of critical test documentation are in coordination. Two major cost overruns were identified this year, caused by underestimation of effort required to integrate key sensors and processors. The first was resolved with a fee share agreement in July 1998, bringing up to \$23M of fee to mitigate cost growth. The second overrun was identified based on the results of an internal bottom up review in December 1998. This overrun exceeds the program's ability to fund by over \$40M and delays the launch 11 months to October 2000. The government options range from rebaselining the effort (using "new" funds from other government programs) to an option to terminate the contract. [NOTE: The Air Force took action on February 5, 1999, to terminate the FDS program for the convenience of the government.]

(U) SBIRS LOW ALTITUDE DEMONSTRATION SYSTEM (LADS). The majority of the flight hardware was delivered in 1998, and buildup and integration of the sensors and space vehicle are ongoing. Boeing identified a major cost growth and submitted a cost overrun proposal in July 1998. The government evaluation found an additional \$21M in technical risk; discussions are ongoing. The \$35M of contractual effort originally allocated for a ground demonstration was eliminated to offset a portion of the cost growth. Boeing agreed to put all fee at risk in December 1998, and a cost share agreement is in negotiation. [NOTE: The Air Force took action on February 5, 1999, to terminate the LADS program for the convenience of the government.]

(U) SBIRS LOW OPERATIONAL SYSTEM DEVELOPMENT. The Acquisition Decision Memorandum was signed June 11, 1998, and the operational requirements were validated by the Joint Requirements Oversight Council on July 16, 1998. The Request for Proposal (RFP) for the Program Definition contracts was released July 23, 1998, with proposals received September 2, 1998. The source selection evaluation phase was completed in November 1998, and the Source Selection Authority is awaiting the successful completion of Milestone I to announce the winners. [NOTE: SBIRS Low re-entered source selection. The amended RFP will reflect revised Program Definition Risk Reduction strategy, which added enhanced risk reduction efforts and extended the period of performance.]

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	Yes
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Schedule milestones breached due to Air Force two year delay to SBIRS High and SBIRS Low. Updated APB for SBIRS Low will be provided for the DAB Milestone I review. The same APB will be updated for SBIRS High 180 days after USD(A&T) direction to implement the two year delay contractually.

Procurement cost breached due to the decision to fund satellite GEO 3 in the Missile Procurement appropriation rather than the RDT&E appropriation. This will be updated during the SBIRS High APB submission.

MILCON cost breached due to addition of funds for Mission Control Station Backup (MCSB) construction.

A Program Deviation Report (PDR) will be provided.

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
High Component Milestone II	OCT 96	OCT 96	OCT 96	
High Component PDR (Space and Ground Increment 2)	DEC 97	DEC 97	DEC 97	
High Component CDR (Space and Ground Increment 2)	SEP 99	SEP 99	DEC 01	(Ch-1)
Low Component FDS CDR	DEC 96	DEC 96	DEC 96	
Low Component FDS Launch	SEP 99	SEP 99	N/A	(Ch-2)
Low Component Dem/Val Launch	TBD	TBD	N/A	(Ch-2)
Ground Segment Increment 1 Certification	AUG 99	AUG 99	OCT 99	(Ch-3)

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

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Low Component Pre-EMD Start	OCT 99	OCT 99	JUN 99 (Ch-4)
Low Component Milestone II	DEC 00	DEC 00	AUG 02 (Ch-5)
HEO Sensor 1 Delivery	SEP 01	SEP 01	MAY 02 (Ch-6)
Ground Segment Increment 2 Certification	JAN 02	JAN 02	OCT 05 (Ch-7)
GEO Satellite 1 Launch	N/A	JUN 02	SEP 04 (Ch-8)
GEO Satellite 2 Launch	JUN 03	JUN 03	SEP 05 (Ch-9)
HEO Sensor 2 Delivery	SEP 03	SEP 03	MAR 03 (Ch-10)
SBIRS IOC	DEC 03	DEC 03	MAR 06 (Ch-11)
GEO Satellite 3 Launch	JUN 04	JUN 04	SEP 06 (Ch-12)
GEO Satellite 4 Launch	JUN 05	JUN 05	SEP 07 (Ch-13)

(U) NOTE: GEO Satellite Launch dates, Ground Segment Increment 2 Certification, and ultimately SBIRS IOC, will be definitized when the System Program Office (SPO) develops a cost estimate for a restructured program and determines executability of funds provided. This information will be available 180 days after USD(A&T) direction to implement the two year delay contractually.

b. Current Change Explanations --

(U) (Ch-1) High Component (Space and Ground Increment 2) CDR Current Estimate was changed from Apr 99 to Dec 01 due to 2-year delay of SBIRS High first launch from FY02 to FY04.

(Ch-2) Low Component FDS Launch Current Estimate and Low Component Dem/Val (or LADS) Launch Current Estimate have been terminated for the convenience of the Government on February 5, 1999. These Milestones are no longer being tracked.

(Ch-3) Ground Segment Increment 1 Certification Current Estimate was changed from Aug 99 to Oct 99 due to software development and testing difficulties.

(Ch-4) Low Component Pre-EMD Start Current Estimate was changed from Nov 98 to Jun 99 due to ongoing Milestone I slip.

(Ch-5) Low Component Milestone II Current Estimate was changed from Dec 00 to Aug 02 due to 2-year delay of SBIRS Low first launch from FY04 to FY06 and delay in award to program definition.

(Ch-6) HEO Sensor 1 Delivery Current Estimate was changed from Sep 01 to May 02 due to FY99 work deferral.

(Ch-7) Ground Segment Increment 2 Certification Current Estimate was changed from Jan 02 to Oct 05 due to 2-year delay of SBIRS High first launch from FY02 to FY04.

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

(Ch-8) GEO Satellite 1 Launch Current Estimate was changed from Jun 02 to Sep 04 due to 2-year delay of SBIRS High first launch from FY02 to FY04.

(Ch-9) GEO Satellite 2 Launch Current Estimate was changed from Jun 03 to Sep 05 due to 2-year delay of SBIRS High first launch from FY02 to FY04.

(Ch-10) HEO Sensor 2 Delivery Current Estimate was changed from Sep 03 to Mar 03 due to deferral of GEO payload work, allowing contractor to focus on HEO Sensor 2.

(Ch-11) SBIRS IOC Current Estimate was changed from Dec 03 to Mar 05 due to 2-year delay of SBIRS High first launch from FY02 to FY04.

(Ch-12) GEO Satellite 3 Launch Current Estimate was changed from Jun 04 to Sep 06 due to 2-year delay of SBIRS High first launch from FY02 to FY04.

(Ch-13) GEO Satellite 4 Launch Current Estimate was changed from Jun 05 to Sep 07 due to 2-year delay of SBIRS High first launch from FY02 to FY04.

10. (U) Performance Characteristics:

a. Performance --

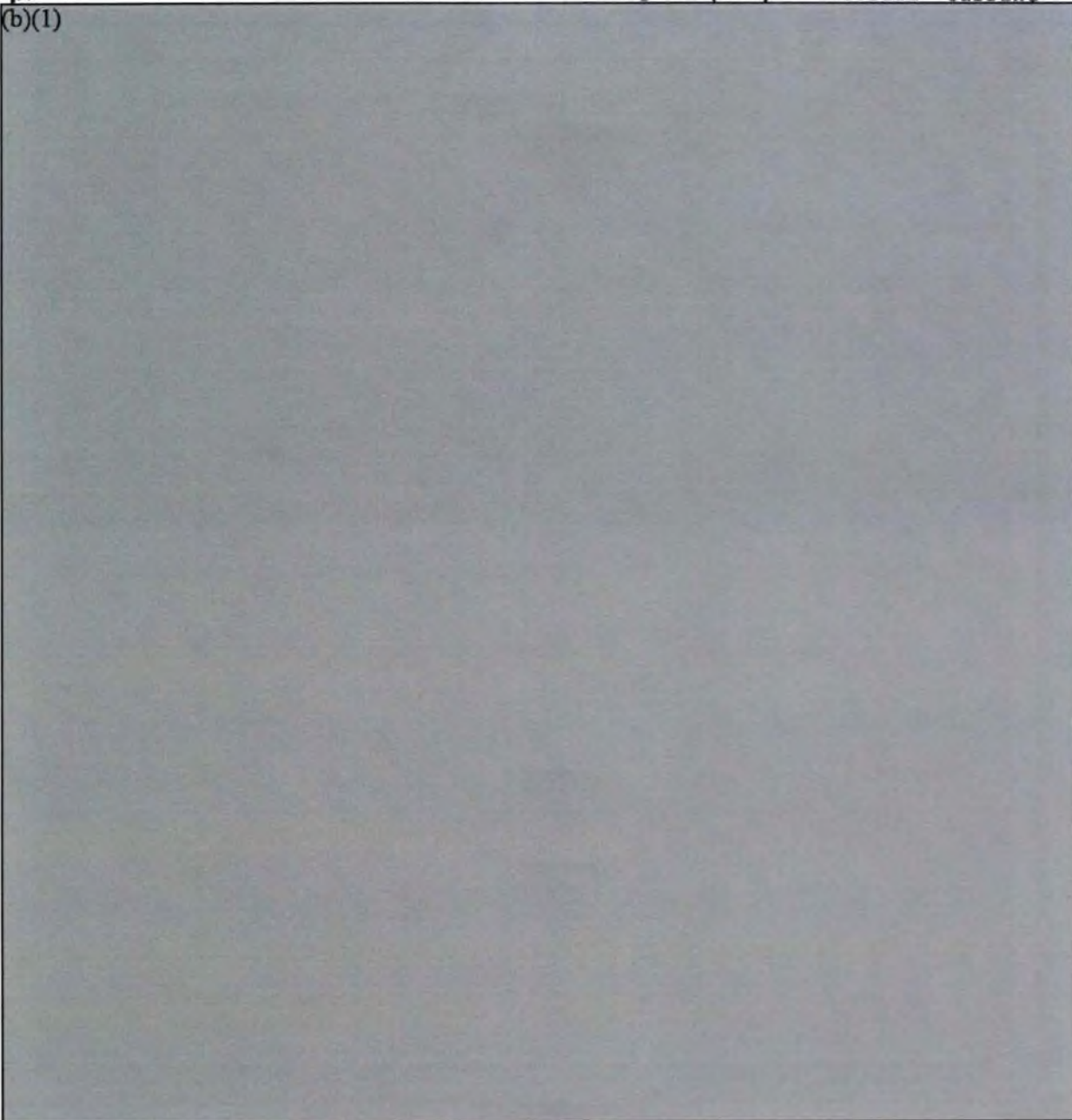
	Development Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
(S) Coverage North America Missile Warning	(b)(1)			
(S) Theater Msl Warning (Focused Areas)				

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10a. (U) Performance Characteristics (Cont'd):

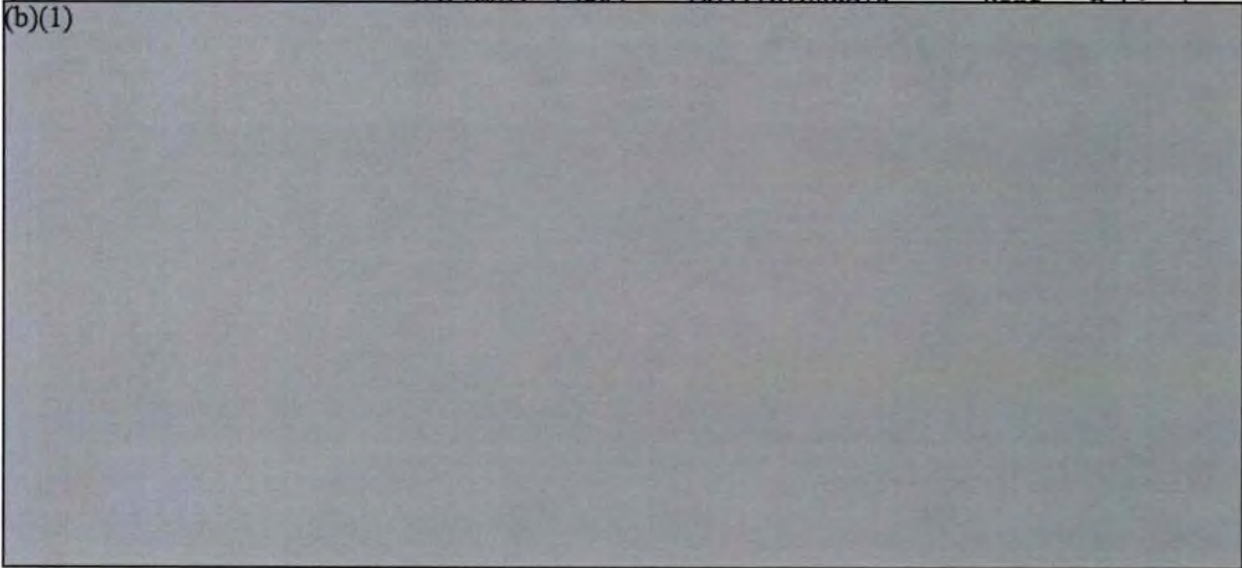
	Development	Approved Program (APB)	Demon- strated	Current
(b)(1)				

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10a. (U) Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Prof	Current Estimate
(b)(1)				

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SBIRS, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

Development Estimate (SAP)	Approved Program (APB) Obj/Threshold	Demon- strated Proof	Current Estimate
-------------------------------	--	----------------------------	---------------------

(b)(1)

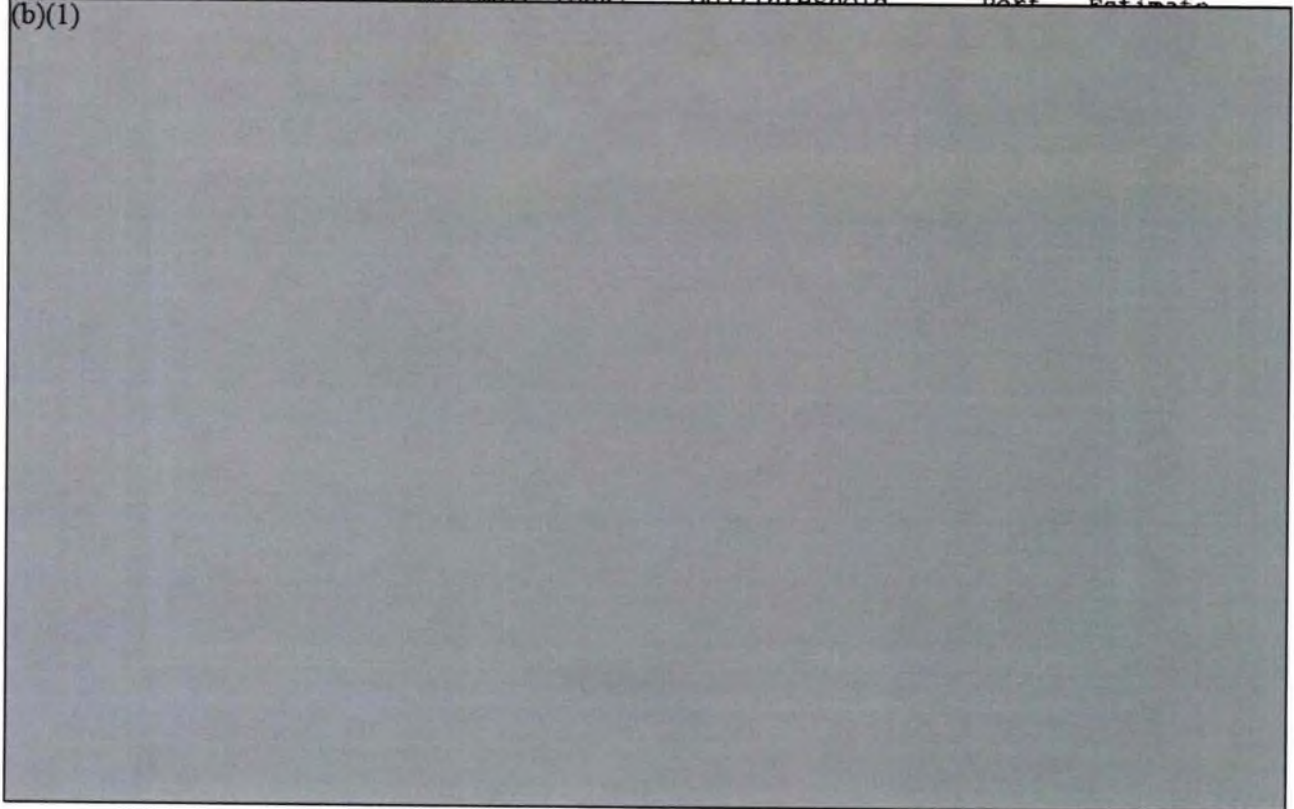


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[*** ~~SECRET~~ ***]

SBIRS, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

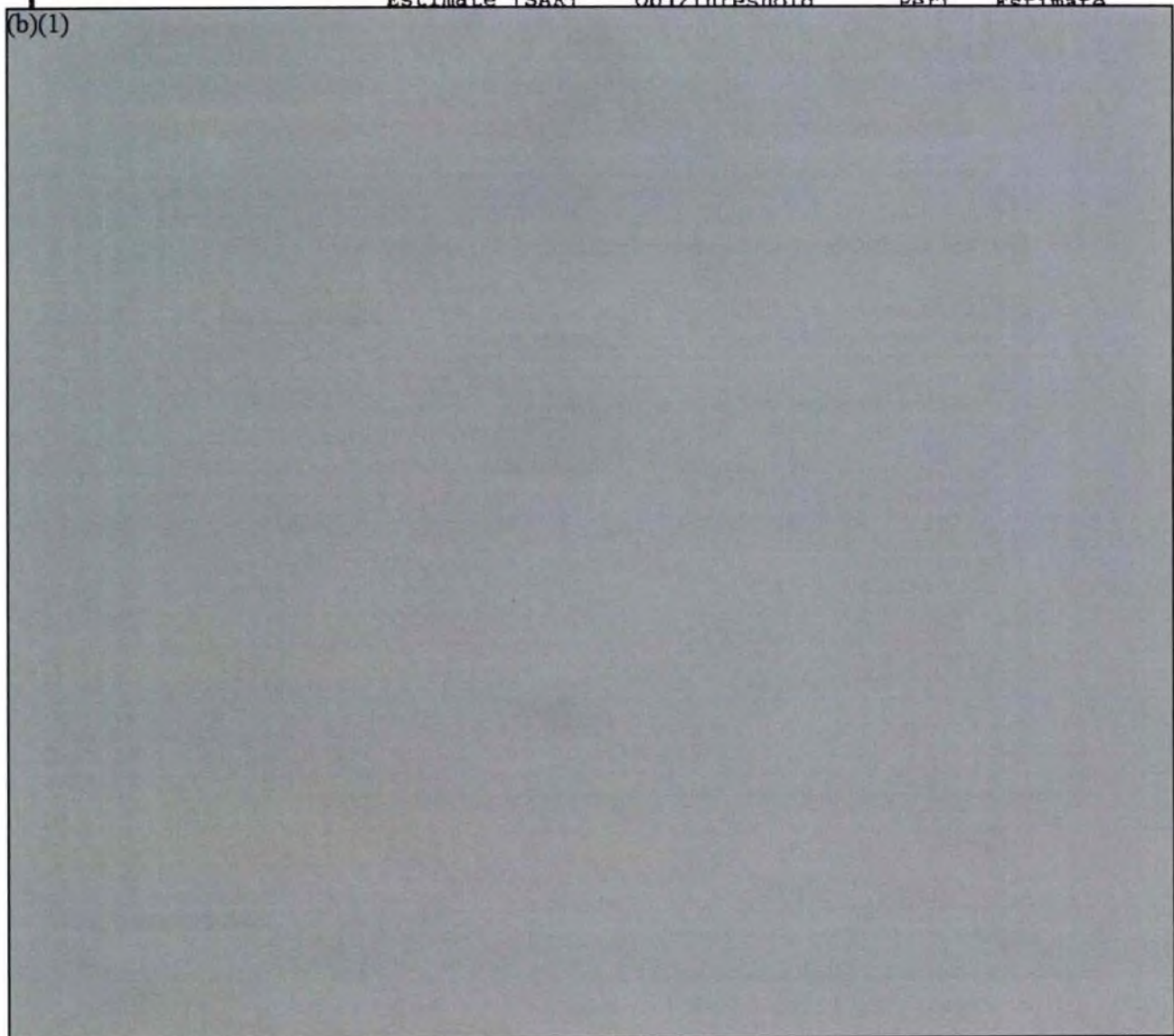
	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(b)(1)				

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10a. (U) Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(b)(1)				

(U) ACRONYMS:

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SBIRS, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

CFLOS - Cloud-Free Line of Sight
 FA - Focused Area
 RV - Re-entry Vehicle
 MTR - Major Threat Region
 MRC - Major Regional Conflict
 MSLs - Missiles
 Pw - Probability of Warning
 Pc - Probability of Collection
 NLT - Not Later Than

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

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	3016.6	3016.6	2926.9
Procurement	496.7	496.7	564.3
Flyaway	(496.7)		(537.1)
Other Weapon Systems			(27.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	26.0	26.0	42.7
Acquisition O&M	140.2	140.2	76.4
Total FY 95 Base-Year \$	3679.5	3679.5	3610.3
Escalation	467.8	467.8	392.0
Development (RDT&E)	(369.9)	(369.9)	(275.4)
Procurement	(87.8)	(87.8)	(103.7)
Construction (MILCON)	(2.5)	(2.5)	(3.9)
Acquisition O&M	(7.6)	(7.6)	(9.0)
Total Then Year \$	4147.3	4147.3	4002.3

(U) The Current Estimate totals include Pre-EMD and EMD costs for SBIRS High through FY08. It also includes Missile Procurement funds for Geosynchronous Satellites GEO 3 thru GEO 5. Mission Control Station Backup (MCSB) reflects funded Military Construction and Other Procurement effort.

b. (U) Quantity --

Development (RDT&E)	3	3	2
Procurement	2	2	3
Total	5	5	5

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

	UCR Baseline (MAR 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	3679.5	3610.3	
(2) Quantity	5	5	
(3) Unit Cost	735.900	722.060	-1.88
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	496.7	564.3	
(2) Quantity	2	3	
(3) Unit Cost	248.350	188.100	-24.26

(U) NOTE: Funding requirement will be definitized when the System Program Office (SPO) develops a cost estimate for a restructured program and determines executability of funds provided. This information will be available 180 days after USD(A&T) direction to implement the two year delay contractually.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	3386.5	584.5	28.5	147.8	4147.3
Previous Changes:					
Economic	-60.8	-18.7	-0.5	-2.1	-82.1
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-513.5	-106.5	+0.5	-66.6	-686.1
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	-574.3	-125.2	-	-68.7	-768.2
Current Changes:					
Economic	-34.5	-9.3	-0.2	-0.7	-44.7
Quantity	-152.7	+180.1	-	-	+27.4
Schedule	+485.1	+9.1	-	-	+494.2
Engineering	-	-	-	-	-
Estimating	+92.2	-2.4	+18.3	+7.0	+115.1
Other	-	-	-	-	-
Support	-	+31.2	-	-	+31.2
Subtotal	+390.1	+208.7	+18.1	+6.3	+623.2
Total Changes	-184.2	+83.5	+18.1	-62.4	-145.0
Current Estimate	3202.3	668.0	46.6	85.4	4002.3

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

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	3016.6	496.7	26.0	140.2	3679.5
Previous Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-450.0	-105.4	+0.5	-69.0	-623.9
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	-450.0	-105.4	+0.5	-69.0	-623.9
Current Changes:					
Quantity	-128.4	+155.6	-	-	+27.2
Schedule	+416.6	-	-	-	+416.6
Engineering	-	-	-	-	-
Estimating	+72.1	-9.8	+16.2	+5.2	+83.7
Other	-	-	-	-	-
Support	-	+27.2	-	-	+27.2
Subtotal	+360.3	+173.0	+16.2	+5.2	+554.7
Total Changes	-89.7	+67.6	+16.7	-63.8	-69.2
Current Estimate	2926.9	564.3	42.7	76.4	3610.3

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) RDT&E

Revised escalation indices. (Economic)	N/A	-42.7
Economic adjustment for negative program change. (Economic)	N/A	+8.2
GEO 3 will be procured with Missile Procurement funds which results in one less RDT&E satellite buy. (Quantity)	-128.4	-152.7
Impact of slipping GEO 1st launch from FY02 to FY04. Reflects addition of FY06-08 funding. (Schedule)	+416.6	+485.1
Adjustment for Current and Prior Inflation. (Estimating)	+12.4	+14.1
Reflects change of Mission Control Station Backup funding from RDT&E to Other Procurement funds. (Estimating)	-33.7	-36.7
Congressionally approved Above Threshold Reprogramming to correct funding shortfalls. (Estimating)	+20.5	+21.6
Congressionally directed Space and Atmospheric Burst Reporting System (SABRS) on SBIRS. (Estimating)	+3.3	+3.5

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

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
Satellite GEOs 4 and 5 changed from RDT&E appropriation to Missile Procurement appropriation. (Estimating)		-115.3	-128.0
Block II requirement added. (Estimating)		+182.8	+214.6
Adjustment for miscellaneous program change. (Estimating)		+2.1	+3.1
RDT&E Subtotal		+360.3	+390.1
(2)	<u>Procurement</u>		
Revised escalation indices. (Economic)		N/A	-9.3
GEO 3 will be procured with Missile Procurement funds which result in one less buy for RDT&E funds. (Quantity)		+155.6	+180.1
Impact of slipping GEO first launch from FY02 to FY04. (Schedule)		0.0	+9.1
Learning curve adjustment. (Estimating)		-19.5	-14.7
Addition of launch and flight support for GEO 4 and 5. (Estimating)		+9.7	+12.3
Mission Control Station Backup change from RDT&E to Other Procurement funds. (Support)		+27.2	+31.2
Procurement Subtotal		+173.0	+208.7
(3)	<u>MILCON</u>		
Revised escalation indices. (Economic)		N/A	-0.2
Adjustment for Current and Prior Inflation. (Estimating)		+0.2	+0.2
MILCON added for Mission Control Station Backup. (Estimating)		+16.0	+18.1
MILCON Subtotal		+16.2	+18.1
(4)	<u>O&M</u>		
Revised escalation indices. (Economic)		N/A	-1.1
Adjustment for Current and Prior Inflation. (Economic)		N/A	+0.4
DSP and SBIRS High transition of personnel. (Estimating)		-16.7	-18.7
Additional O&M requirement for FY07 and FY08. (Estimating)		+7.4	+9.2
Revised estimate of O&M requirements. (Estimating)		+14.5	+16.5
O&M Subtotal		+5.2	+6.3

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
829.46	-25.36	+5.48	+98.84	--	-114.20	--	+6.24	-29.00	800.46

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
292.25	-9.33	-37.38	+3.03	--	-36.30	--	+10.40	-69.58	222.67

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	OCT 96	N/A	OCT 96
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	DEC 03	N/A	MAR 06
Total Cost	2670.3	4147.3	N/A	4002.3
Total Quantity	N/A	5	N/A	5
Prog Acq Unit Cost	N/A	829.46	N/A	800.46

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

a. RDT&E --

(U) SBIRS High EMD Mod:

Lockheed-Martin Msl Sys, Sunnyvale CA
F04701-95-C-0017, CPAF
Award: October 31, 1995
Definitized: October 31, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$80.0	\$80.0	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$1944.6	N/A	3	\$1943.4	\$1990.4

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$4.2	\$-4.9
Cumulative Variances To Date (12/31/98)	<u>\$-12.6</u>	<u>\$-4.2</u>
Net Change	\$-16.8	\$0.7

Explanation of Change:

(U) The major contributors for the cost variance change were the additional activities associated with weight/power reduction, retroactive overhead rate changes and increased amount of hardware required. Increased staffing and higher skill mix was required to complete Increment 1 tasks. In addition, overruns resulted due to single board computer effort and higher than anticipated effort resolving preliminary design review and critical design review issues. The major contributors for the schedule variance change were due to early receipt of material.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY95-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-08)	<u>Total</u>
RDT&E	1347.3	328.7	475.3	1051.0	3202.3
Procurement	-	-	12.0	656.0	668.0
MILCON	28.5	-	4.0	14.1	46.6
O&M	30.0	6.6	8.6	40.2	85.4
Total	1405.8	335.3	499.9	1761.3	4002.3

(U) Note:

b. Annual Summary -- SBIR (High)

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY95 Dollars Nonrec</u>	<u>Flyaway FY95 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1995				111.3	113.0
1996				158.8	164.0
1997				184.3	193.0
1998				320.6	337.9
1999				506.0	539.4
2000				303.8	328.7
2001				432.1	475.3
2002				336.5	376.2
2003				217.6	247.6

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2004				105.9	123.1
2005				80.9	95.9
2006				81.1	98.2
2007				45.6	56.4
2008				42.4	53.6
Subtotal	2			2926.9	3202.3

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001				10.7	12.0
2002				21.1	24.0
2003	1		151.8	150.0	174.4
2004	1		196.7	190.3	225.9
2005	1		188.6	155.3	188.2
2007				5.5	6.9
2008				4.2	5.4
Subtotal	3		537.1	537.1	636.8

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002				27.2	31.2
Subtotal				27.2	31.2

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				13.6	14.5
1998				13.1	14.0
2001				3.6	4.0
2002				12.4	14.1
Subtotal				42.7	46.6

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SBIRS, December 31, 1998

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

Appropriation: 3400 - Operation & Maintenance, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				9.9	10.4
1999				18.4	19.6
2000				6.1	6.6
2001				7.8	8.6
2002				7.1	7.9
2003				7.5	8.5
2004				4.9	5.7
2005				3.7	4.4
2006				3.7	4.5
2007				3.7	4.6
2008				3.6	4.6
Subtotal				76.4	85.4

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	5		537.1	3610.3	4002.3

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 885.9

(U) Percent Total Program Expended: 22.1%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
 These Operations and Maintenance funds support the activation of new SBIRS High Component ground operating and training facilities at four sites worldwide. SBIRS High Component Increment 1 consolidates operations from three Defense Support Program sites into one CONUS-based site. These funds support the procurement of temporary facilities, minor construction, office equipment, furniture, travel, supplies, and communication links necessary for the activation of the SBIRS Mission Control Station, two OCONUS Remote Ground Stations, and Initial Qualification Training facility in FY99. Also supported

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

with these funds are the repair and transportation of Government Furnished Equipment and TDY for training of the initial cadre of operators.

Annual cost based on SPO IPRG (Intelligence Program Review Group) estimate, as of 11 August 1998.

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per SBIR (High) system	Avg Annual Cost Per DSP System
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	6.9	12.3
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	6.9	12.3

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A-4 ATACMS-APAM

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: Army TACMS/APAM

AS OF DATE: December 31, 1998

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ATACMS-APAM

1. (U) Designation and Nomenclature (Popular Name): Army TACMS/APAM
2. (U) DoD Component: Army
3. (U) Responsible Office and Telephone Number:
Project Manager, COL R. Kelley Griswold
Army TACMS-BAT Project Office Assigned: September 2, 1998
ATTN: SFAE-MSL-AB DSN 746-1141; COMM 256-876-1141
Redstone Arsenal, AL 35898-5650 Kelley.Griswold@msl.redstone.army.mil
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 064324A Project D302
(U) PE 23802A Project D2MT, D304
PROCUREMENT:
(U) APPN 2032 ICN C98500 (Army)
(U) APPN 2032 ICN C98501 (Army)
(U) APPN 2032 ICN C98502 (Army)
(U) APPN 2032 ICN C98510 (Army)
(U) APPN 2032 ICN CA0261 (Army)
MILCON:
(U) PE 024030

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

AS AMENDED

Classified by: ~~ATACMS BlkI/IA SCG dtd 28 Aug 1997, Army TACMS-BAT PO,~~
~~PEO Tac Msl~~
Downgrade instructions:
Declassify on: Y2

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Army TACMS/APAM, December 31, 1998

5. (U) References:

SAR Baseline (Production Estimate):

(U) Decision Change Paper (DCP), dated 15 Sep 90, subject: "Army Tactical Missile System Block I," based on Milestone III (DAB) decision.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated July 1, 1998.

6. (U) Mission and Description:

(U) The Army Tactical Missile System (Army TACMS/APAM) Block I is a ground-launched missile system consisting of a surface-to-surface guided missile with an anti-personnel/anti-materiel (APAM) warhead. The Improved Army TACMS (Block IA) integrates global positioning system (GPS) components and increases range of the Block I missile. The inherent GPS accuracies will be achievable independent of range. Army TACMS missiles are fired from the Multiple Launch Rocket System (MLRS) M270 family of launchers and are being deployed within the ammunition loads of corps MLRS battalions and/or division artillery MLRS batteries. Army TACMS includes: Guided Missile and Launching Assembly; Test Set, Guided Missile System; Training Set, Guided Missile System: M165; Trainer, Test Device, Guided Missile: M70; M270 family of launchers; and the Army TACMS Missile Facilities. The Army TACMS provides a deep fires missile system that operates in near all-weather conditions, day or night. It is used to attack tactical surface-to-surface missile sites, air defense missile sites, logistics elements and command/control/communication complexes. The Block IA missile will destroy high value targets at ranges approximately twice that of the current Block I missile. The Block IA missile is especially suited for destroying enemy surface-to-surface missile system launchers.

Army TACMS Block I replaces the conventional Lance system and the Army TACMS Block IA does not replace another defense system.

7. (U) Executive Summary:

(U) The Army TACMS Block I resulted from a requirement to engage high priority targets at ranges beyond those of existing weapons. The Required Operational Capability (ROC) was approved in May 1985. The Army TACMS Block I entered Full-Scale Development (FSD) in March 1986 and proceeded to Full-Rate Production (FRP) in 1991. The Army TACMS Block IA Program was approved for Engineering and Manufacturing Development in February 1994. Army TACMS Block IA entered Low-Rate Initial Production in 1996 and proceeded to FRP in 1998.

The first 20 Army TACMS Block IA missiles were delivered to Korea on January 21, 1998. User training was completed on January 30, 1998. The Initial Operational Capability was achieved in February 1998 as planned.

An Acquisition Decision Memorandum was signed on May 1, 1998, providing FRP approval of the Army TACMS Block IA missile. The FRP-1 production contract was awarded on May 15, 1998. The Army TACMS Block IA Follow-on Production Test #2 was successfully launched at White Sands Missile Range on May 26, 1998. The

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Army TACMS/APAM, December 31, 1998

7. (U) Executive Summary (Cont'd):

FRP-II production contract was awarded on December 15, 1998.

Delivery of 72 Army TACMS Block I variant missiles for the Turkey Foreign Military Sales case was completed in April 1998. The delivery of the first 40 missiles for Greece was completed in November 1998. Delivery of 111 missiles for Korea began in September 1998.

Production is progressing satisfactorily and missile deliveries have remained 3 ahead of schedule for more than 100 consecutive months.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Assault Breaker Tech			
Demonstration			
Start	APR 78	APR 78	APR 78
Complete	DEC 82	DEC 82	DEC 82
Special Task Force Initiated	MAR 81	N/A	MAR 81
Mission Element Need	APR 81	N/A	APR 81
Statement Approval			
Joint (Army/AF) Program	JUN 82	JUN 82	JUN 82
Directed			

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Army TACMS/APAM, December 31, 1998

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

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
ROC Approved	MAY 85	MAY 85	MAY 85
Request For Proposal (RFP) Released	JUN 85	N/A	JUN 85
Milestone II (ASARC)	DEC 85	N/A	DEC 85
Milestone II (DSARC)	FEB 86	FEB 86	FEB 86
FSD Contract Award	MAR 86	MAR 86	MAR 86
EDT-C			
Start	MAR 86	MAR 86	MAR 86
Complete	FEB 89	FEB 89	FEB 89
Depot Service Support	N/A	JUN 87	JUN 87
Long Lead Time Items Contract Option Award	MAY 88	MAY 88	MAY 88
DA Program Review (ASARC IIIA)	FEB 89	JAN 89	JAN 89
LRIP Contract Option Award	FEB 89	FEB 89	FEB 89
DT II Flight Test			
Start	MAR 89	MAR 89	MAR 89
Complete	DEC 89	DEC 89	DEC 89
OT Readiness Review	MAR 90	MAR 90	MAR 90
First LRIP Delivery	MAR 90	MAR 90	MAR 90
IOTE Flight/Ground Test			
Start	MAR 90	MAR 90	MAR 90
Complete	JUN 90	JUN 90	JUN 90
Confirmatory Test Complete (if required)	JUL 90	JUN 90	JUN 90
First Unit Equipped	AUG 90	AUG 90	AUG 90
Initial Operational Capability (IOC)	OCT 90	AUG 90	AUG 90
Milestone III (DAB)	OCT 90	NOV 90	NOV 90
Organic Support Capability	N/A	NOV 90	NOV 90
Full-Rate Production Contract Award	NOV 90	NOV 90	NOV 90
Prod Verification Test (if required)			
Start	NOV 90	NOV 90	NOV 90
Complete	MAY 91	JAN 91	JAN 91
First Full Rate Production Delivery	OCT 91	MAY 91	MAY 91
Full-Rate Production-II Contract Award	N/A	DEC 91	DEC 91
First Full-Rate Production-II Delivery	N/A	SEP 92	SEP 92
Milestone IV-Preplanned Product Improvement (P3I) Anti-Personnel/ Anti-Materiel (APAM)	N/A	FEB 94	FEB 94
P3I APAM Engineering and Manufacturing Development (EMD) Contract Award	N/A	FEB 94	MAR 94
Critical Design Review	N/A	JUN 95	JUN 95

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Army TACMS/APAM, December 31, 1998

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

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Production Prove-Out			
Test (PPT)			
Start	N/A	JUN 95	JUL 95
Complete	N/A	JAN 96	MAR 96
Pre-Production Qualification			
Tests (PPQT)			
Start	N/A	JAN 96	MAY 96
Complete	N/A	JUN 96	OCT 96
LRIP Decision	N/A	MAR 96	MAY 96
Operational Test & Evaluation			
Start	N/A	MAR 96	AUG 96
Complete	N/A	JUN 96	SEP 96
LRIP II Contract Award	N/A	APR 97	APR 97
Production Decision	N/A	MAR 98	MAR 98
Full-Rate Production (FRP)	N/A	MAR 98	MAY 98 (Ch-1)
Contract Award			
LRIP Delivery	N/A	AUG 97	JUL 97
Organic Support Capability	N/A	SEP 97	SEP 97
Depot Service Support	N/A	SEP 97	SEP 97
Initial Operational Capability (IOC)	N/A	FEB 98	FEB 98
LRIP II Delivery	N/A	JUN 98	MAY 98
First FRP Delivery	N/A	MAY 99	MAY 99

b. Current Change Explanations --

(U) (CH-1) Full-rate production contract award was changed from Apr 98 to May 98 to reflect the actual date.

10. (U) Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
BLOCK I				
Range (km)	130	130 / 130	172@WSMR	165@Sea Level
Payload (kg)	454	454 / 454	567	567
Accuracy				
Min range to 107km (m)	(b)(1)			
MILS at ranges greater than 107 km				
M/LPA Weight (NTE kg)				
Off-Axis Launch (+/- deg)				
Reliability				

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Army TACMS/APAM, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Launcher MTBOMF (hr)	54	54 / 54	58.8	58.8
Missile PVT/FUE	.85	.85 / .82	.935	.935
System Availability (As)	.75	.75 / .75	.75	.75
BLOCK IA				
Range (km)-Maximum	N/A	330 / 300	316@WSMR	300@Sea Level
Range (km)-Minimum	N/A	50-70 / <130	93.4	70.0
Payload (kg)	N/A	158 / 158	173	173
Accuracy				
Min range to 107 km but w/o GPS aiding (m)				
Mils at ranges beyond 107 km but w/o GPS aiding				
Meters w/GPS but w/o counter- measures				
Meters w/GPS but w/countermeasures				
M/LPA (NTE kg)				
Off-Axis Launch (+/- deg)				
Reliability Guided Missile and Launching Assembly:				
M39 (GMLA) End PPQT				

(b)(1)

b. Current Change Explanations -- None

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Army TACMS/APAM, December 31, 1998

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	650.6	735.6	732.7
Procurement	846.4	1500.5	1499.3
Flyaway	(821.2)		(1471.1)
Nonrecurring			(7.7)
Total Flyaway	(821.2)		(1478.8)
Other Weapon Systems	(22.9)		(11.1)
Peculiar Support	(0.0)		(5.5)
Initial Spares	(2.3)		(3.9)
Construction (MILCON)	9.6	9.9	9.9
Acquisition O&M	0.0	0.0	0.0
Total FY 91 Base-Year \$	1506.6	2246.0	2241.9
Escalation	1.6	95.9	86.4
Development (RDT&E)	(-89.3)	(-78.1)	(-78.7)
Procurement	(90.0)	(173.4)	(164.5)
Construction (MILCON)	(0.9)	(0.6)	(0.6)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	1508.2	2341.9	2328.3
b. (U) Quantity --			
Development (RDT&E)	15	18	18
Procurement	1542	2299	2299
Total	1557	2317	2317

Note: Excludes 35 RDT&E prototypes from the SAR Baseline and 42 from the Current Estimate that are not considered fully configured.

(U) The current estimate for the Development quantity includes 15 Block I and 3 Block IA missiles. The current estimate for the Procurement quantity includes 1647 Block I and 652 Block IA missiles.

The ATACMS/APAM ADM, March 4, 1994, approved the Block IA Low Rate Initial Production (LRIP) quantity of 100 missiles (which exceeded 10 percent). As a result of funding reductions in FY 96, the Block IA LRIP quantity was reduced to 70 missiles which was below 10 percent. The current Block IA LRIP quantity of 167 missiles exceeds 10 percent of the total planned buy because a second LRIP buy of 97 missiles was approved in order to allow the Army time to respond to the effectiveness and reliability issues raised by the Operational Test Community during pre-ASARC reviews.

c. (U) Foreign Military Sales --
Commitments to date for Army TACMS missiles are 72 for the government of Turkey for a total of \$61.4M; 111 for the government of Korea for a total of \$94.2M; and 71 for the government of Greece for a total of \$65.2M.

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Army TACMS/APAM, December 31, 1998

11d. (U) Total Program Cost and Quantity (Cont'd):

d. (U) Nuclear Costs --
None.

12. (U) Unit Cost Summary:

	UCR Baseline (JUL 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 91 BY\$)	2246.0	2241.9	
(2) Quantity	2317	2317	
(3) Unit Cost	0.969	0.968	-0.10
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 91 BY\$)	1500.5	1499.3	
(2) Quantity	2299	2299	
(3) Unit Cost	0.653	0.652	-0.15

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	561.3	936.4	10.5	1508.2
Previous Changes:				
Economic	-1.6	-81.5	-0.3	-83.4
Quantity	-	+390.2	-	+390.2
Schedule	-	+56.2	-	+56.2
Engineering	+96.7	-87.4	-	+9.3
Estimating	+1.1	+477.8	+0.3	+479.2
Other	-	-	-	-
Support	-	-17.7	-	-17.7
Subtotal	+96.2	+737.6	0.0	+833.8
Current Changes:				
Economic	-0.1	-8.2	-	-8.3
Quantity	-	+4.3	-	+4.3
Schedule	-	-0.1	-	-0.1
Engineering	-	-0.6	-	-0.6
Estimating	-3.4	-5.2	-	-8.6
Other	-	-	-	-
Support	-	-0.4	-	-0.4
Subtotal	-3.5	-10.2	-	-13.7
Total Changes	+92.7	+727.4	0.0	+820.1
Current Estimate	654.0	1663.8	10.5	2328.3

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

(U) Summary (FY 1991 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	650.6	846.4	9.6	1506.6
Previous Changes:				
Quantity	-	+304.2	-	+304.2
Schedule	-	+42.6	-	+42.6
Engineering	+83.4	-66.8	-	+16.6
Estimating	+1.7	+378.9	+0.3	+380.9
Other	-	-	-	-
Support	-	-4.3	-	-4.3
Subtotal	+85.1	+654.6	+0.3	+740.0
Current Changes:				
Quantity	-	+3.5	-	+3.5
Schedule	-	+0.3	-	+0.3
Engineering	-	-0.5	-	-0.5
Estimating	-3.0	-4.6	-	-7.6
Other	-	-	-	-
Support	-	-0.4	-	-0.4
Subtotal	-3.0	-1.7	-	-4.7
Total Changes	+82.1	+652.9	+0.3	+735.3
Current Estimate	732.7	1499.3	9.9	2241.9

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-0.1
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
Revised estimate due to reprogramming of funds. (Estimating)	-3.1	-3.5
RDT&E Subtotal	-3.0	-3.5
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-8.7
Economic adjustment for negative program change. (Economic)	N/A	+0.5
Total Quantity Variance associated with increase of 9 missiles from 2290 to 2299.	+6.0	+7.3
Quantity increase of 9 units. (Quantity)	+3.5	+4.3
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	+0.3	+0.4
Allocation to Engineering variance resulting from Quantity Change. (Engineering)	-0.5	-0.6
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	+2.7	+3.2

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Increase of 9 missiles in FY 98 annual procurement buy. (Schedule)	0.0	-0.5
Adjustment for Current and Prior Inflation. (Estimating)	+4.1	+5.0
Revised Estimate due to reprogramming of funds. (Estimating)	-9.8	-11.7
Revised Estimate due to Budget Adjustments (Estimating)	-1.6	-1.7
Refinement of estimate for data, training, support equipment, and transportation. (Support)	-0.4	-0.4
Procurement Subtotal	-1.7	-10.2

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.16	-0.05	-0.10	+0.03	+0.14	-1.23	--	+0.02	-1.19	0.97

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.97	-0.04	-0.14	+0.02	--	+0.20	--	-0.01	+0.03	1.00

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.55	--	--	--	--	-0.01	--	--	-0.01	0.54

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14b. (U) Unit Cost and Other History (Cont'd):

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.61	-0.04	-0.03	+0.02	-0.04	+0.21	--	-0.01	+0.11	0.72

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	FEB 86	FEB 86	FEB 86	FEB 86
Milestone III	N/A	SEP 89	OCT 90	NOV 90
FUE/IOC	JUN 90	JUN 90	AUG 90	AUG 90
Total Cost	3585.8	1222.3	1508.2	2328.3
Total Quantity	N/A	1050	1557	2317
Prog Acq Unit Cost	N/A	1.16	0.97	1

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

a. Procurement --

(U) P3I EMD (IA) Missiles:
Vought Systems, Dallas, TX
DAAH01-94-C-0002, CPIF
Award: March 31, 1994
Definitized: March 31, 1994

Initial Contract Price		
Target	Ceiling	Qty
\$52.4	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$53.2	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$54.1	\$54.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-3.0	\$-1.2
Cumulative Variances To Date (12/31/97)	\$-3.0	\$-1.2
Net Change	\$0.0	\$0.0

Explanation of Change:

None.

(U) Contract Comments:

This contract has been completed.

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Army TACMS/APAM, December 31, 1998

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

(U) LRIP I (Block IA): Vought Systems, Dallas, TX DAAH01-92-C-0038, FFP Award: June 14, 1996 Definitized: February 28, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$45.8	N/A	70

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$45.8	N/A	70	\$45.8	\$45.8

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:
This contract has been completed.

(U) LRIP II (Block IA): Vought Systems, Dallas, TX DAAH01-92-C-0038, FFP Award: April 23, 1997 Definitized: N/A	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$62.9	N/A	97

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$62.9	N/A	97	\$62.9	\$62.9

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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

(U) FRP I (Block IA):
Vought Systems, Dallas, TX
DAAH01-98-C-0093, FFP
Award: May 15, 1998
Definitized: N/A

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$104.2	N/A	179

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$104.2	N/A	179

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$104.2	\$104.2

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) FRP II (Block IA):
Vought Systems, Dallas, TX
DAAH01-98-C-0093, FFP
Award: December 15, 1998
Definitized: June 30, 1999

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$65.0	N/A	96

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$65.0	N/A	96

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$65.0	\$65.0

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years (FY80-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-03)</u>	<u>Total</u>
RDT&E	654.0	-	-	-	654.0
Procurement	1452.4	95.6	90.8	25.0	1663.8
MILCON	10.5	-	-	-	10.5
O&M	-	-	-	-	-
Total	2116.9	95.6	90.8	25.0	2328.3

b. Annual Summary -- GUIDED MSL&LNCH ASSY: M39

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY91 Dollars Nonrec</u>	<u>Flyaway FY91 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1980				14.6	9.4
1981				19.9	14.0
1982				15.8	11.8
1983				7.7	6.0
1984				62.6	50.2
1985				92.3	76.4
1986				125.2	106.6
1987				87.1	76.5
1988				109.6	100.1
1989				77.7	73.8
1990				36.9	36.4
1991					
1992					
1993					
1994				23.3	25.4
1995				32.6	36.3
1996				22.4	25.4
1997				5.0	5.7
Subtotal	18			732.7	654.0

Appropriation: 2032 - Missile Procurement, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY91 Dollars Nonrec</u>	<u>Flyaway FY91 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1988				3.7	3.5
1989	66	0.3	60.5	72.9	72.4
1990	104	3.2	94.8	100.6	103.0

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Army TACMS/APAM, December 31, 1998

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

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY91 Dollars Nonrec	Flyaway FY91 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991	373		211.3	219.0	229.7
1992	300		153.6	160.7	172.3
1993	351		174.1	174.3	190.5
1994	255		147.4	128.3	142.8
1995	148		96.9	97.9	110.8
1996	120	4.2	99.5	105.6	120.6
1997	167		110.1	111.1	128.2
1998	109		76.3	77.7	90.8
1999	96		73.8	74.0	87.8
2000	110		79.2	79.4	95.6
2001	100		93.6	74.2	90.8
2002				12.2	15.2
2003				7.7	9.8
Subtotal	2299	7.7	1471.1	1499.3	1663.8

Appropriation: 2050 - Military Construction, Army

Fiscal Year	Qty	Flyaway FY91 Dollars Nonrec	Flyaway FY91 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991				4.8	5.0
1992				5.1	5.5
Subtotal				9.9	10.5

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	2317	7.7	1471.1	2241.9	2328.3

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	18	18
Procurement	1781	1784

(U) Percent Total Program Quantities Delivered: 77.8%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1859.1

(U) Percent Total Program Expended: 79.8%

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17. (U) Delivery/Expenditure Information (Cont'd):

(U) The fully configured end items for RDT&E are 15 Block I and 3 Block IA RDT&E units. The remaining RDT&E units will be used for testing as non-fully configured items.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
Army TACMS is fired from the MLRS M270 family of launchers within the MLRS organizational units. Army TACMS Operating and Support (O&S) general support costs, including manning and crew support, are included in the O&S section of the MLRS SAR. Army TACMS is a certified round. Maintenance support is determined on the basis of periodic surveillance tests.

The average annual cost reflects average annual cost for total Army TACMS Block I and Block IA missiles (2299).

There was no antecedent system for the Army TACMS/APAM. The date of the O&S cost estimate is February 3, 1999.

b. (U) Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost For Total Block I/IA Qty	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	2.8	N/A
Unit Level Consumption	0.7	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	2.2	N/A
Contractor Support	0.0	N/A
Sustaining Support	4.0	N/A
Indirect Costs	0.0	N/A
Total	9.7	0.0

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

PROGRAM: V-22 (OSPREY)

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): V-22 JOINT SERVICES ADVANCED VERTICAL LIFT AIRCRAFT (OSPREY)

2. DoD Component: Navy

Joint Participants:
USMC, USN, USSOCOM, USAF

3. Responsible Office and Telephone Number:

PROGRAM EXECUTIVE OFFICE (PMA-275) COL NOLAN SCHMIDT
AIR ASW ASSAULT AND SPECIAL MISSION Assigned: June 4, 1997
47123 BUSE ROAD UNIT IPT DSN 757-5161; COMM (301) 757-5161
PATUXENT RIVER, MD 20670-1547 SCHMIDTND@NAVAIR.NAVY.MIL

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0603203N Project (SUNK)
PE 0603256N (Shared) Navy Proj. W1557SUNK Project 642973
PE 0604222A Project (SUNK)
PE 0604262N (Shared) Navy MLR Proj. W2088 Project H1425
PE 1110011F (Shared) Proj. 643752 (SUNK)
PE 1160404BB (Shared) Proj. 643752

PROCUREMENT:

APPN 1506 ICN 016300 (Navy)
APPN 1506 ICN 016400 (Navy)
APPN 0300 ICN 1160404BB (DCA/DNA)
APPN 3010 ICN 41318F (Air Force)

MILCON:

PE M62470

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DEPARTMENT OF DEFENSE

99-C-0794
MAR 17 1999
NOLAN SCHMIDT
Chief of Staff
Naval Air Station
Patuxent River, MD

99-C-0794

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V-22 (OSPREY), December 31, 1998

5. References:

SAR Baseline (Development Estimate):
FY 1988/89 President's Budget.

Approved Program:
NAE Approved Acquisition Program Baseline (APB) dated July 16, 1998.

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 takeoff 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 strike rescue needs of the Navy, and the special operations needs of the Air Force and USSOCOM. The V-22 will replace the CH-46E and CH-53A/D in the Marine Corps, supplement the H-60 in the Navy, and will supplement H-53, H-60, and C-130 in the Air Force and USSOCOM. The V-22 will be capable of flying over 2100 nautical miles with a single refueling, giving the services the advantage of a VSTOL aircraft that can rapidly self-deploy to any location in the world.

7. Executive Summary:

(U) An Acquisition Decision Memorandum (ADM) was signed on February 10, 1995 authorizing an integrated MV-22/CV-22 program with the Navy as the lead service. ASN(RDA) held a V-22 Program Review on March 26, 1998 and an ADM dated March 27, 1998 approved full funding of LRIP lot 2 (FY98) and advanced procurement for LRIP lot 3 (FY99).

(U) The Program Manager reported an APBA MILCON Cost Breach in the December 1997 SAR. The breach resulted from site surveys for the current MV/HV-22 basing plan and more detailed requirements definition. On July 16, 1998, ASN(RDA) authorized an APBA revision which negated the breach. The APBA revision has been incorporated into this SAR.

(U) During 1998, four MV-22 EMD aircraft were in flight test at NAS Patuxent River, MD, with temporary offsite testing at MCAS New River, NC, Eglin AFB, FL and Fort Huachuca, AZ. As of January 26, 1999, EMD aircraft have flown 499 flights for a total of 996 flight hours. The aircraft is currently 632 lbs. under specification weight and is meeting or exceeding all Key Performance Parameters. Recent accomplishments include envelope expansion, fast roping, soft duck (boat and swimmers off ramp into water), external loads up to 10,000 lbs, operations up to 60,500 lbs. gross weight, aerial refueling (dry plugs), operations up to 25,000 ft., and completion of OT-IID. MV-22 Sea Trials were initiated with an underway period aboard USS Saipan in Jan - Feb 1999. Various technical issues, including mission computer switchovers, wheel brakes and brake housing, landing gear trunnion, and reliability growth (mean time between failure) have been analyzed and design changes are being incorporated as required. First delivery of Low Rate Initial Production (LRIP) aircraft will occur in May 99.

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7. Executive Summary (Cont'd):

(U) CV-22 Program Management Reviews were held in July and November, which defined aircraft configurations, identified flight testing concerns associated with efforts planned at Edwards AFB, and training and logistics issues. CV-22 Critical Design Review (CDR) was successfully completed December 16, 1998.

(U) Programmatic or cost estimating changes include: the addition of a defensive weapon system (beginning in FY01), to meet Operational Requirements Document (ORD) requirements; reflection of projected savings for a MV-22 multiyear procurement contract in FY03-07; increase in FY03 MV-22 procurement quantity to 30 aircraft; and reflection of significant, projected savings associated with various cost reduction initiatives. The Program Office Team continues to aggressively pursue Total Ownership Cost Reduction efforts.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (\$AR)	Approved Program (APB)	Current Estimate
Milestone 0 (DEPSECDEF MEMO)	DEC 81	DEC 81	DEC 81
Milestone I (DSARC I)	DEC 82	DEC 82	DEC 82
Preliminary Design Contract Award	APR 83	APR 83	APR 83
Milestone II (DSARC II)	APR 86	APR 86	APR 86
FSD Contract Award	MAY 86	MAY 86	MAY 86
Production Contract Award (Long Lead AAC)	JAN 89	JAN 89	MAR 89
Operational Testing IIA	AUG 89	N/A	N/A
Milestone IIIA (USMC Pil Prod)	DEC 89	N/A	N/A

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9a. Schedule (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Operational Testing IIB	AUG 90	N/A	N/A
Milestone IIB (All Serv Ltd Prod)	DEC 90	N/A	N/A
Operational Testing IIIC (OPEVAL)	AUG 91	N/A	N/A
Operational Testing IID (AF OPEVAL)	AUG 91	N/A	N/A
First Fleet Deliveries	DEC 91	N/A	N/A
Milestone IIIC (USN/MC/A Full Production)	DEC 91	N/A	N/A
USMC IOC (5 Acft Trng Det)	SEP 92	N/A	N/A
USAF IOC (6 Acft Mission Capable)	SEP 94	N/A	N/A
USA IOC (First Operational Company Equipped)	SEP 95	N/A	N/A
EMD Airframe Contract Award	N/A	OCT 92	OCT 92
EMD Engine Contract Award	N/A	DEC 92	DEC 92
SRR Complete	N/A	AUG 93	AUG 93
EMD Trade Studies Complete	N/A	N/A	JAN 94
PDR Complete	N/A	APR 94	APR 94
MS II Plus Program Review	N/A	SEP 94	SEP 94
CDR Complete	N/A	DEC 94	DEC 94
DAB LRIP REVIEW	N/A	FEB 97	APR 97
MV-22 TECHEVAL			
Start	N/A	FEB 99	JUL 99
Complete	N/A	APR 99	SEP 99
MV-22 OPEVAL			
Start	N/A	MAY 99	OCT 99
Complete	N/A	DEC 99	MAY 00
LRIP 1 Contract Award (Long lead \$)	N/A	FEB 96	JUN 96
LRIP 1 First Delivery	N/A	APR 99	MAY 99
LRIP 2 Contract Award (Long lead \$)	N/A	FEB 97	APR 97
LRIP 2 First Delivery	N/A	FEB 00	APR 00
LRIP 3 Contract Award (Long Lead \$)	N/A	FEB 98	MAR 98
LRIP 3 First Delivery	N/A	NOV 00	MAR 01
LRIP 4 Contract Award (Long Lead \$)	N/A	FEB 99	MAR 99
LRIP 4 First Delivery	N/A	OCT 01	NOV 01
Full Rate Production Contract Award (Long lead \$)	N/A	FEB 00	FEB 00
Physical Configuration Audit (PCA)	N/A	DEC 99	DEC 99
MS III	N/A	DEC 00	DEC 00
MV-22 IOC	N/A	APR 01	JAN 01
GSD	N/A	MAR 07	MAR 07
Modification to EMD Contract to Include CV-22 Efforts	N/A	JUN 95	AUG 95
CV-22 SRR	N/A	AUG 96	AUG 96
CV-22 PDR	N/A	FEB 98	DEC 97
CV-22 CDR	N/A	DEC 98	DEC 98
CV-22 Production Contract Award (Long lead \$)	N/A	FEB 00	FEB 00
CV-22 Flight Test			
Start	N/A	OCT 99	DEC 99 (Ch-1)

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9a. Schedule (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Complete	N/A	FEB 02	FEB 02
CV-22 IOT&E			
Start	N/A	MAR 02	MAR 02
Complete	N/A	SEP 02	SEP 02
CV-22 First Production Delivery	N/A	MAR 03	MAR 03
IOC-CV	N/A	OCT 05	OCT 05

Milestone 0 through USA IOC (First Operational Company Equipped) reflects the FSD program which was terminated in April 1989.

b. Current Change Explanations --

(Ch-1) CV-22 Flight Test start date has been delayed from Oct 99 to Dec 99 as a result of MV-22 flight test delays. Completion of CV-22 flight test and all other CV-22 milestones remain on schedule.

10. Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Folded				
Length (ft)	62.24	N/A / N/A	N/A	N/A
Width (ft)	18.42	N/A / N/A	N/A	N/A
Height (ft)	17.98	N/A / N/A	N/A	N/A
Unfolded				
Length (ft)	57.33	N/A / N/A	N/A	N/A
Width (ft)	83.83	N/A / N/A	N/A	N/A
Height (ft)	21.73	N/A / N/A	N/A	N/A
Empty Weight (lbs)	31786	N/A / N/A	N/A	N/A
Readiness, Msn	70	N/A / N/A	N/A	N/A
Capability Rate (% MC)				
Mission Complete Probability, Rate (MFHBMA Design Controllable) (%)	98	N/A / N/A	N/A	N/A
Direct Maintenance Manhours per Flight Hour, Design	N/A	N/A / N/A	TBD	
Controllable:				
Org Level, Unscheduled (corrective)	7.0	N/A / N/A	N/A	N/A
Org Level, Scheduled (preventive)	2.5	N/A / N/A	N/A	N/A

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10a. Performance Characteristics (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>		Demon- strated <u>Perf</u>	Current <u>Estimate</u>	
World-wide	2100	N/A	/ N/A	N/A	N/A	
Self-Deployment (nm) (minimum distance)						
Continuous Cruise	250	N/A	/ N/A	N/A	N/A	
Speed (kts)						
Dash Speed (kts)	275	N/A	/ N/A	N/A	N/A	
Instantaneous						
G-Loading						
Plus	4.0	N/A	/ N/A	N/A	N/A	
Minus	-1.0	N/A	/ N/A	N/A	N/A	
Troop Capacity	24	N/A	/ N/A	N/A	N/A	
External Cargo (lbs)	10000	N/A	/ N/A	N/A	N/A	
MV-22						
Cruise Speed (kts)	N/A	270	/ 240	TBD	267	(Ch-1)
			/			
Mission Radius (NM)						
Land Trooplift	N/A	200X1	/ 200X1	TBD	236X1	(Ch-2)
Land External	N/A	110X1	/ 50X1	TBD	55X1	(Ch-2)
Sea Trooplift	N/A	110X2	/ 50X2	TBD	93X2	(Ch-2)
Sea External	N/A	110X1	/ 50X1	TBD	117X1	(Ch-2)
Payload						
Troops	N/A	24	/ 24	TBD	24	
External Lift (lbs)	N/A	15,000	/ 10,000	TBD	10,000	
Aerial Refuel Capable	N/A	yes	/ yes	TBD	yes	
Self-Deployment (nm)	N/A	2100 w/ no	/ 2100 w/1 aerial	TBD	2273 w/1 aerial	(Ch-2)
		refuel	/ refuel		refuel	
Shipboard	N/A	yes	/ yes	TBD	yes	
Compatible						
V/STOL Capable	N/A	yes	/ yes	TBD	yes	
Survivability (mm API @90%vel)	N/A	14.5	/ 12.7	TBD	12.7	
Reliability						
MTBF	N/A	>=2.0	/ >=1.4	TBD	1.4	
Mission (%)	N/A	>=85	/ >=85	TBD	85	
CV-22						
Cruise Speed (kts)	N/A	250	/ 230	TBD	252	
Mission Radius (nm)	N/A	750	/ 500	TBD	509	(Ch-2)
Payload - Troops	N/A	24	/ 18	TBD	18	
Aerial Refuel Capable	N/A	yes	/ yes	TBD	yes	
Self-Deployment (nm)	N/A	2100 w/0/ aerial	/ 2100 w/1 aerial	TBD	2414 w/1 aerial	(Ch-2)
		refuel	/ refuel		refuel	

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10a. Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold		Demon- strated Perf	Current Estimate
Shipboard Compatible Operational Environment	N/A	yes	/ yes	TBD	yes
	N/A	100'	/ 300'	TBD	300'
		TF/TA, /	TF/TA,		TF/TA,
		Day/Nig/	Day/Nig		Day/Nig
		h t, /	h t,		t,
		VMC/IMC/	VMC/IMC		VMC/IMC
Precision Naviga- tion (diameter @ MAX Combat Radius)	N/A	Locate /	Locate	TBD	Locate
		LZ W/IN/	LZ W/IN		LZ W/IN
		1 Rotor /	2X		2X
		/ Rotor			Rotor
Reliability					
MTBF	N/A	>=2.0	/ >=1.4	TBD	1.4
Weapon System (%)	N/A	>=84	/ >=77	TBD	77

NOTE: Performance characteristics "Folded through External Cargo" with the Current Estimate as N/A were for the FSD program cancelled in 1989 and will be deleted at Milestone III.

(U) Above performance characteristics have not been fully demonstrated to date. Performance demonstration is scheduled for 2nd Qtr - 3rd Qtr FY99.

b. Current Change Explanations --

(Ch-1) MV-22 Cruise Speed (kts) increase from 255 kts to 267 kts reflects latest analysis of flight test data.

(Ch-2) MV-22 Mission Radius (NM)

Sea Trooplift change from 94x2 to 93x2
Land Trooplift change from 248x1 to 236x1
Land External change from 58x1 to 55x1
Sea External change from 102x1 to 117x1
Self-Deployment (nm) change from 2414 to 2273

CV-22 Mission Radius (nm) from 500 to 509

Self-Deployment (nm) from 2527 to 2414

Current estimates for mission radius and self deployment reflect incorporation of hover performance test data.

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11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	2443.7	5562.5	5783.5
Procurement	20493.1	21441.7	18093.6
Flyaway	(15517.1)		(0.0)
Recurring Flyaway			(14161.7)
Nonrecurring Flyaway			(666.2)
Total Flyaway	(15517.1)		(14827.9)
Other Weapon Systems Co	(3299.6)		(0.0)
Other Weapon System			(2319.2)
Total Other Wpn Sys	(3299.6)		(2319.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(1676.4)		(946.5)
Construction (MILCON)	136.2	34.5	31.8
Acquisition O&M	0.0	0.0	0.0
Total FY 86 Base-Year \$	23073.0	27038.7	23908.9
Escalation	6589.3	25923.2	12311.4
Development (RDT&E)	(181.5)	(1388.5)	(1365.8)
Procurement	(6371.1)	(24515.2)	(10928.2)
Construction (MILCON)	(36.7)	(19.5)	(17.4)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	29662.3	52961.9	36220.3
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	913	523	458
Total	913	523	458

Note: Excludes 6 RDT&E prototypes from the SAR Baseline and 10 from the Current Estimate that are not considered fully configured.

An approved APB revision deleted the eleven (11) development aircraft from the baseline because they are not fully configured. The MV-22 LRIP quantities are as follows: 5 (FY97), 7 (FY98), 7 (FY99), and 10 (FY00). This does not represent more than 10% of the planned program buy.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

	UCR Baseline (JUL 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 86 BY\$)	27038.7	23908.9	
(2) Quantity	523	458	
(3) Unit Cost	51.699	52.203	+0.97
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 86 BY\$)	21441.7	18093.6	
(2) Quantity	523	458	
(3) Unit Cost	40.998	39.506	-3.64

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	2625.2	26864.2	172.9	29662.3
Previous Changes:				
Economic	-134.0	-5119.0	-12.1	-5265.1
Quantity	-77.0	+12024.2	-	+11947.2
Schedule	+28.2	-3317.2	+7.8	-3281.2
Engineering	-	-	-	-
Estimating	+4559.2	-136.2	-115.1	+4307.9
Other	-	-	-	-
Support	-	-36.7	-	-36.7
Subtotal	+4376.4	+3415.1	-119.4	+7672.1
Current Changes:				
Economic	-23.7	-518.9	-0.2	-542.8
Quantity	-	-	-	-
Schedule	-	-278.7	-	-278.7
Engineering	+66.8	+374.3	-	+441.1
Estimating	+104.6	-451.7	-4.1	-351.2
Other	-	-	-	-
Support	-	-382.5	-	-382.5
Subtotal	+147.7	-1257.5	-4.3	-1114.1
Total Changes	+4524.1	+2157.6	-123.7	+6558.0
Current Estimate	7149.3	29021.8	49.2	36220.3

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

Summary (FY 1986 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	2443.7	20493.1	136.2	23073.0
Previous Changes:				
Quantity	-72.9	-149.3	-	-222.2
Schedule	+16.9	-322.8	-	-305.9
Engineering	-	-	-	-
Estimating	+3278.2	-188.4	-102.0	+2987.8
Other	-	-	-	-
Support	-	-1579.3	-	-1579.3
Subtotal	+3222.2	-2239.8	-102.0	+880.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+46.6	+220.1	-	+266.7
Estimating	+71.0	-248.8	-2.4	-180.2
Other	-	-	-	-
Support	-	-131.0	-	-131.0
Subtotal	+117.6	-159.7	-2.4	-44.5
Total Changes	+3339.8	-2399.5	-104.4	+835.9
Current Estimate	5783.5	18093.6	31.8	23908.9

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Navy & USSOCOM) (Economic)	N/A	-23.7
Increase to fully fund the development of a defensive weapons system (V-22 gun). (Navy) (Engineering)	+46.6	+66.8
Adjustment for Current and Prior Inflation. (Navy) (Estimating)	+11.0	+15.2
Decrease to reflect SBIR and other fact of life adjustments. (Navy) (Estimating)	-14.0	-19.6
Addition results from refinement of costs for Pre-planned Product Improvement (P3I) upgrade development. (USSOCOM) (Estimating)	+74.0	+109.0
RDT&E Subtotal	+117.6	+147.7
(2) <u>Procurement</u>		
Revised escalation indices. (Navy/Air Force/USSOCOM) (Economic)	N/A	-771.8
Economic adjustment for negative program change. (Navy/Air Force/USSOCOM) (Economic)	N/A	+252.9

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Acceleration of annual procurement buy profile. Procurement shortened 4 years, from FY18 to FY14. (Navy) (Schedule)	0.0	-278.7
Increase to add Gun & Ground Proximity Warning System. (Navy) (Engineering)	+200.2	+342.5
Increase for Gun & Ground Proximity Warning System. (Air Force) (Engineering)	+19.9	+31.8
Adjustment for Current and Prior Inflation. (Navy) (Estimating)	+19.9	+34.3
Multi Year contract projected savings. (Navy) (AR) (Estimating)	-175.4	-283.2
Multi Year contract projected savings. (Air Force) (AR) (Estimating)	-47.9	-77.4
Multi Year contract projected savings. (USSOCOM) (AR) (Estimating)	-10.2	-16.2
Flat Panel Display cost reduction initiative projected savings. (Navy) (AR) (Estimating)	-247.1	-407.5
Flat Panel Display cost reduction initiative projected savings. (Air Force) (AR) (Estimating)	-35.6	-55.2
Definitized engine contract savings. (Navy) (AR) (Estimating)	-105.0	-188.8
Definitized engine contract savings. (Air Force) (AR) (Estimating)	-12.1	-18.9
Increase in flyaway estimate to reflect change in inflation assumptions. (Navy) (Estimating)	+218.0	+371.3
Increase in flyaway estimate to reflect change in inflation assumptions. (Air Force) (Estimating)	+35.7	+56.4
Increase in flyaway estimate to reflect change in inflation assumptions. (USSOCOM) (Estimating)	+4.6	+7.1
Increase in miscellaneous Government Furnished Equipment (GFE) pricing, tooling, and Cost Reduction Initiative investments. (Navy) (Estimating)	+79.0	+94.1
Increase in miscellaneous GFE and other pricing. (Air Force) (Estimating)	+27.2	+26.8
Increase in GFE and other miscellaneous pricing. (USSOCOM) (Estimating)	+0.1	+5.5
Reduction due to refinement of Initial Spares requirements. (USSOCOM) (Support)	-49.1	-80.5
Change in Other Weapon Systems Cost due to increase in funding for logistics support requirements. (USSOCOM) (Support)	+20.2	+27.1

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Increase due to refinement of Initial Spares requirements. (Navy) (Support)	+70.7	+79.3
Change in Other Weapon Systems Cost due to reduction in logistics support funding. (Navy) (Support)	-90.1	-254.1
Adjustment for Current and Prior Inflation. (Navy) (Support)	+3.4	+6.4
Reduction due to refinement of Initial Spares requirements. (Air Force) (Support)	-110.3	-190.0
Change in Other Weapon Systems Cost due to increase in funding for logistics support requirements. (Air Force) (Support)	+23.8	+28.7
Adjustment for Current and Prior Inflation. (Air Force) (Support)	+0.4	+0.6
Procurement Subtotal	-159.7	-1257.5

(3) MILCON

Economic adjustment for negative program change. (Navy) (Economic)	N/A	+1.7
Revised escalation indices. (Navy & USSOCOM) (Economic)	N/A	-1.9
Change due to refinement of estimate. (USSOCOM) (Estimating)	+1.2	+2.3
Site surveys conducted in 1998 resulted in revised requirements. (Navy) (Estimating)	-3.6	-6.4
MILCON Subtotal	-2.4	-4.3

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
32.49	-12.68	+58.36	-7.77	+0.96	+8.64	--	-0.92	+46.59	79.08

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14b. Unit Cost and Other History (Cont'd):

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
29.42	-12.31	+55.49	-7.85	+0.82	-1.28	--	-0.92	+33.95	63.37

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	DEC 82	DEC 82	N/A	DEC 82
Milestone II	MAY 85	APR 86	N/A	APR 86
Milestone III	JUL 89	DEC 00	N/A	DEC 00
FUE/IOC	DEC 91	APR 01	N/A	JAN 01
Total Cost	24467	46599.7	N/A	36220.3
Total Quantity	609	523	N/A	458
Prog Acq Unit Cost	40.18	89.1	N/A	79.08

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

a. RDT&E --

EMD (Airframe):

Bell-Boeing JPO, Patuxent River MD
N00019-93-C-0006, CPAF
Award: October 22, 1992
Definitized: May 3, 1994

Initial Contract Price		
Target	Ceiling	Qty
\$2650.0	N/A	4

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$3367.7	N/A	4	\$3497.8	\$3497.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-89.3	\$-37.3
Cumulative Variances To Date (11/30/98)	\$-10.8	\$-12.1
Net Change	\$78.5	\$25.2

Explanation of Change:

Target Price increased \$9.8M, from \$3,357.9M to \$3,367.7M (since the last SAR), due to addition of contract modifications to include additional Affordability Studies and Logistics efforts. Previous changes included the addition of new scope for efforts such as: fatigue test article; CV-22 development; logistics; and icing.

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V-22 (OSPREY), December 31, 1998

15. Contract Information (Cont'd):

Estimated Price at Completion reflects an overrun of \$130M (unchanged since the last SAR). The overrun is attributable to increased effort expended to achieve first flight and ferry flight of aircraft 7-10 to Patuxent River; subcontractor cost growth; and slower start in performing flight test activities than anticipated. An MV-22 Over Target Baseline (OTB) of \$130M was authorized in February 1998 and fully implemented in the April 1998 Cost Performance Report.

The decrease in both the cost and schedule variance was a direct result of implementing the over-target-baseline.

<u>NAMTS:</u>			Initial Contract Price		
Bell Boeing JPO, Patuxent River MD	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
N0001993C0006/1, CPIF	\$41.1	N/A	1		
Award: March 17, 1997					
Definitized: March 17, 1997					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$41.1	N/A	1	\$41.1	\$41.1	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (11/30/98)			\$0.0	\$0.0	
Net Change			\$0.2	\$0.3	
			\$0.2	\$0.3	

Explanation of Change:

First report submittal.

b. Procurement --			Initial Contract Price		
<u>FY-97 LRIP 1 (AIRFRAME):</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Bell-Boeing JPO, Patuxent River MD			\$419.5	N/A	4
N0001996C0054/1, CPIF					
Award: May 30, 1996					
Definitized: May 30, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$513.4	N/A	5	\$513.4	\$513.4	

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V-22 (OSPREY), December 31, 1998

15b. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$5.1	\$-0.5
Cumulative Variances To Date (11/30/98)	<u>\$10.0</u>	<u>\$-2.0</u>
Net Change	\$4.9	\$-1.5

Explanation of Change:

Target Price increase of \$9.8M from \$503.6M to \$513.4M (since the last SAR), is due to addition of contract modifications. Major changes included the addition of the Pitot Static Probe, fiber placement, Supplier Outreach Program, and miscellaneous configuration changes. Previous changes included the addition of one aircraft.

Cumulative favorable cost variance continued to increase due to lower actual rates in overhead and G&A than expected.

The primary schedule driver is delays in resin qualification due to late delivery of test parts. The first wing/fuselage mate occurred in September 1998. The cumulative schedule variance is less than 1 percent with a schedule performance index of 0.99.

V-22 Engine:	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Allison Engine Co., Indianapolis IN N00019-95-C-0209, FFP Award: N/A Definitized: May 8, 1998	\$19.5	N/A	10

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$101.8	N/A	38	\$101.8	\$101.8

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

FY98 LRIP 2 (AIRFRAME):	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Bell-Boeing JPO, Patuxent River MD N0001996C0054/2, CPIF Award: April 28, 1997 Definitized: April 28, 1997	\$418.9	N/A	5

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>

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V-22 (OSPREY), December 31, 1998

15. Contract Information (Cont'd):

\$601.7	N/A	7	\$601.7	\$601.7
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			\$0.0	\$0.1
Cumulative Variances To Date (11/30/98)			<u>\$1.3</u>	<u>\$3.1</u>
Net Change			\$1.3	\$3.0

Explanation of Change:

Target Price increased \$182.8M due to 2 aircraft plus up, addition of Internal Cargo Handling System, and miscellaneous configuration changes.

Cumulative favorable cost variance increased, primarily due to lower actual overhead and G&A rates than expected.

Cumulative favorable schedule variance increased, primarily due to early receipt of materials.

V-22 LRIP SIMULATOR-FFS:
 Bell-Boeing JPO, Patuxent River MD
 N0001996C0054/0, CPIF
 Award: November 25, 1997
 Definitized: November 25, 1997

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$34.2	N/A	2

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$47.3	N/A	2

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$47.3	\$47.3

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (11/30/98)	<u>\$1.2</u>	<u>\$0.0</u>
Net Change	\$1.2	\$0.0

Explanation of Change:

First report submittal. Target Price increased \$13.1M from initial contract price due to the addition of Flight Training Device, and configuration changes.

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V-22 (OSPREY), December 31, 1998

15. Contract Information (Cont'd):

<u>FY99 LRIP 3 (AIRFRAME):</u>			<u>Initial Contract Price</u>		
Bell Boeing JPO, Patuxent River MD	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
N0001996C0054/3, CPIF	\$528.5	N/A	7		
Award: March 27, 1998					
Definitized: March 27, 1998					

<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>
\$535.4	N/A	7	\$535.4	\$535.4

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.1
Cumulative Variances To Date (11/30/98)	\$0.0	\$0.0
Net Change	\$0.0	\$-0.1

Explanation of Change:

First Report submittal.

Target Price increased \$6.9M due to Internal Cargo Handling System and miscellaneous configuration changes.

No cost/schedule performance measurement reported to date (Actual to date of \$2.5M).

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

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

<u>Appropriation</u>	<u>Prior Years (FY82-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-15)</u>	<u>Total</u>
RDT&E	6493.9	199.0	190.1	266.3	7149.3
Procurement	2404.1	989.4	1701.3	23927.0	29021.8
MILCON	4.8	0.8	4.0	39.6	49.2
O&M	-	-	-	-	-
Total	8902.8	1189.2	1895.4	24232.9	36220.3

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V-22 (OSPREY), December 31, 1998

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

b. Annual Summary -- V-22 OSPREY

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991				6.3	7.7
1992				11.3	14.1
1993					
1994				11.3	14.7
1995					
1996					
1997					
1998					
1999					
2000				11.4	16.1
2001				27.0	38.8
2002				27.0	39.5
2003				23.2	34.6
2004				6.8	10.4
2005				6.3	9.8
Subtotal				130.6	185.7

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1982				1.5	1.3
1983				37.2	34.4
1984				88.7	85.0
1985				174.4	172.4
1986				516.4	525.1
1987				402.8	421.7
1988				375.0	405.8
1989				239.4	269.9
1990				174.0	204.2
1991				174.5	212.2
1992				606.1	758.3
1993				558.2	714.6
1994				7.0	9.1
1995				340.6	452.7
1996				530.6	717.2
1997				442.6	605.6
1998				353.5	487.6
1999				247.9	345.8
2000				129.1	182.9

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V-22 (OSPREY), December 31, 1998

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001				105.1	151.3
2002				67.5	98.7
2003				29.1	43.3
2004				12.9	19.6
2005				6.7	10.4
Subtotal				5620.8	6929.1

NOTE: FY 1983 \$'s reflect \$29.9M of Army funds (PE 0604222A).

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985				0.6	0.6
1986				2.2	2.2
1987				2.8	2.9
1988				23.1	25.0
1989				3.4	3.8
Subtotal				32.1	34.5

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999				2.8	4.0
2000				2.5	3.6
2001		1.6		5.9	8.6
2002		7.2	22.3	67.5	100.5
2003		17.7	27.5	81.4	123.7
2004		24.8	25.9	91.7	142.3
2005		40.1	24.6	106.0	167.9
2006		45.8	23.5	92.9	150.2
2007		14.4	10.9	36.3	60.0
Subtotal		151.6	134.7	487.0	760.8

Quantities for the CV-22 are shown under appropriation 3010. In accordance with the approved program plan, the Air Force is funding the majority of the procurement cost for the CV-22. USSOCOM is funding delta costs above the baseline (MV-22) aircraft for SOF unique equipment.

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V-22 (OSPREY), December 31, 1998

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989		196.7		196.7	231.4
1990					
1991					
1992					
1993					
1994					
1995					
1996				33.9	46.4
1997	5	46.3	380.4	514.3	709.9
1998	7	14.6	435.5	500.1	698.0
1999	7	12.7	404.2	488.8	692.1
2000	10	13.5	472.0	650.8	936.3
2001	16	55.4	639.5	895.7	1310.3
2002	20	46.5	713.0	1041.4	1551.0
2003	30	28.6	925.7	1206.8	1833.7
2004	30	7.1	891.2	1157.4	1795.6
2005	30	6.8	849.9	1100.1	1742.6
2006	30	6.5	819.5	950.8	1537.6
2007	30	6.4	802.5	912.6	1506.9
2008	30	6.6	825.5	934.3	1575.2
2009	30	6.5	811.2	912.8	1571.2
2010	32	6.8	850.9	1019.1	1790.9
2011	32	6.7	837.9	936.0	1679.4
2012	30	6.2	781.2	914.0	1674.5
2013	30	6.3	792.6	827.5	1547.9
2014	9	2.3	256.1	285.8	545.8
2015					
2016					
2017					
2018					
Subtotal	408	482.5	12488.8	15478.9	24976.7

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999				15.7	22.3
2000				34.4	49.5
2001	4	5.3	177.8	261.4	382.4
2002	6	18.0	212.7	328.3	489.0
2003	9	8.8	276.9	356.8	542.2
2004	9		266.1	353.4	548.3

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

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2005	9		253.7	343.0	543.3
2006	9		244.6	306.0	494.8
2007	4		106.4	128.7	212.5
Subtotal	50	32.1	1538.2	2127.7	3284.3

Appropriation: 0500 - Military Construction, Defense Agencies

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000				0.1	0.2
2001				0.2	0.3
2002				3.8	5.6
2003				0.3	0.5
2004				3.7	5.7
2005				3.5	5.5
Subtotal				11.6	17.8

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990				4.0	4.8
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000				0.4	0.6
2001				2.5	3.7
2002				0.7	1.1
2003					
2004				4.5	7.0
2005					
2006				0.7	1.2
2007				2.8	4.6
2008				0.8	1.3

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V-22 (OSPREY), December 31, 1998

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

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2009					
2010				2.3	4.1
2011					
2012					
2013					
2014					
2015				1.5	3.0
Subtotal				20.2	31.4

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD		151.6	134.7	629.2	964.3
Navy	408	482.5	12488.8	21119.9	31937.2
USAF	50	32.1	1538.2	2159.8	3318.8
Grand Total	458	666.2	14161.7	23908.9	36220.3

17. Delivery/Expenditure Information:

a. Deliveries To Date - None.

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 6261.3

Percent Total Program Expended: 17.3%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

(U) The following are the Assumptions and Ground Rules:

	MV-22	HV-22	CV-22
Aircraft Service Life	10,000 hrs	10,000 hrs	10,000 hrs
Aircraft Attrition Rate	1%	1%	0.6%
Aircraft Pipeline Rate	0	10%	13%
Total Aircraft in the Inventory	360	48	50
Total Operational Aircraft	322	32	43
Aircraft per Operating Squadron	12(18squad)	16(2squad)	0
Aircraft per Operating Squadron CONUS			6(1squad)
Aircraft per Operating Squadron CONUS			7(1squad)
Aircraft per Operating Squadron OVERSEAS			7(4squad)

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

A/C per Training Squadron (FRS)	35	0	0
A/C per Training Squadron (AETC)	0	0	6
Aircraft per Special Squadron	23	0	0
Aircraft per Reserve Squadron	12 (4squad)	0	0
Flight Hours per Month	35	35	36
Flight Hours per Year	420	420	432
JP-5 Cost per Gallon (FY99)	\$0.93	\$0.93	\$0.93
JP-5 Cost per Barrel (42 gal)	\$39.06	\$39.06	\$39.06
Consumption Rate	402 gal/hr	402 gal/hr	402 gal/hr
Lubricating Oil Cost per Gallon	\$2.19	\$2.19	\$2.19
Lube Oil Consumption Rate	0.16 gal/hr	0.16 gal/hr	0.16 gal/hr
Flyaway cost (FY94\$)	\$39.2M	\$34.0M	\$42.2M
Airframe Unit Weight (AUW) lbs	29433 lbs	29433	29433
Weight Empty lbs.	33140 lbs	33601	34062
Average Operating Years	39 (FY99-FY37)	51 (FY12-FY62)	30 (FY03-FY32)
Complexity Factor	1.5	1.3	1.8

The average annual operating and support cost is per aircraft.

Date of estimate: December 1998.

b. Costs -- (FY 1986 Constant (Base-Year) Dollars in Thousands)

V-22		
Cost Element		
Mission Pay & Allowances	908.2	N/A
Unit Level Consumption	381.8	N/A
Intermediate Maintenance	77.2	N/A
Depot Maintenance	118.1	N/A
Contractor Support	184.0	N/A
Sustaining Support	157.1	N/A
Indirect Costs	33.0	N/A
Total	1859.4	N/A

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N-12 LHD 1

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

PROGRAM: LHD - 1

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): LHD 1 Amphibious Assault Ship

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:

AMPHIBIOUS WARFARE PROGRAM OFFICE	CAPT. T.H. GORSKI
PROGRAM EXECUTIVE OFFICE,	Assigned: June 21, 1996
EXPEDITIONARY WARFARE	DSN 332-8511; COMM (703) 602-8511
ARLINGTON, VA 22242-5171	GORSKITH@NAVSEA.NAVY.MIL

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

RDT&E:

(U) PE 0603564N (Shared) (SUNK) Project 0408

(U) PE 0604567N (Shared) (SUNK) Project 01803, S0857

PROCUREMENT:

(U) APPN 1611 ICN 3035 (Navy)

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AS AMENDED AS AMENDED
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5. (U) References:

SAR Baseline (Development Estimate):

(U) SECNAV Memo dated 2 December 1982, subject "LHD 1 Class Amphibious Assault Ship SAIP"; LHD 1 Class NDCP dated 15 August 1985.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated February 11, 1994.

6. (U) Mission and Description:

(U) The ship's 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. The LHD is a modification of the LHA Class design, with significant upgrades in combat systems, medical spaces, chemical biological radiological defense, aviation ordnance handling, and landing craft handling capabilities. The LHD will partially offset the loss in lift capacity resulting from block retirements of aging amphibious ships in the 1990's.

7. (U) Executive Summary:

(U) 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. In June 1981, SECNAV proposed that the LHD have a convertible sea control mission; and, in November, directed that the Program be a modified LHA design.

A sole-source detail design and construction contract was awarded to Ingalls Shipbuilding Incorporated (ISI) in February 1984 for LHD 1. The ship was delivered in May 1989. A competitive contract for LHD 2, with options for LHD 3 and 4 was awarded to ISI in September 1986. The options for LHD 3 and 4 were exercised November 1987 and October 1988, respectively. LHD 2, 3 and 4 were delivered to the Navy July 1992, August 1993 and November 1994, respectively. A competitive contract for the LHD 5, with unevaluated and undefinitized options for LHD 6 and 7, was awarded to ISI in December 1991. LHD 5 was delivered to the Navy in June 1997. The options for LHD 6 and 7 were exercised on a sole source basis on 11 December 92 and 28 December 95, respectively.

LHD 5 Final Contract Trials were completed on 11 March 1998 and Post Shakedown Availability (PSA) completed 25 September 1998. The LHD 6 was delivered to the Navy on 12 May 1998 and commissioned on 15 August 1998.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I	OCT 81	OCT 81	OCT 81
Milestone II SAIP	JUL 82	JUL 82	JUL 82
Start Contract Design	AUG 82	AUG 82	AUG 82
Milestone IIIA Production-Decision	JUN 83	JUN 83	JUN 83
Award Lead Ship Contract	DEC 83	FEB 84	FEB 84
Milestone IIIB Production-Decision	JUL 85	AUG 85	AUG 85
Approve Full-Production (AFP)	AUG 85	AUG 85	AUG 85
Launch First Ship	AUG 87	AUG 87	AUG 87
Acceptance Trials (Lead Ship)	FEB 89	FEB 89	MAR 89
Lead Ship Delivery	MAR 89	MAR 89	MAY 89
Material Support Date	MAR 89	MAR 89	JUL 89
Naval Support Date	MAY 90	MAR 93	MAR 93
IOC	MAY 90	MAY 90	NOV 90

(U) IOC - Reflects date the lead ship was ready for operational deployment.

b. Current Change Explanations --

(U) NONE

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10. (U) Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Troops	1873	1873 / 1873	1894	1894
Vehicle Square (ft^2)	22900	22900 / 22900	22900	22900
Cargo Cube (ft^3)	109000	109000 / 109000	109000	109000
LCAC	3	3 / 3	3	3
Length (ft)	840	844 / 844	844	844
Beam (ft)	106	106 / 106	106	106
Draft (full load) (ft/inches)	26'	26'8" / 26'8"	26'8"	26'8"
Displacement (full load)	39400	40533 / 40533	40533	40533
Offload Capability (tons/hr)	300	300 / 300	300	300
Propulsion	Steam	Steam / Steam	Steam	Steam
Shaft Horsepower	70000	70000 / 70000	70000	70000
No. of Screws	2	2 / 2	2	2
Medical Facilities (operating rooms)	6	6 / 6	6	6
Speed (knots)	22	22 / 22	22	22
Endurance at 22 knots (NM)	(b)(1)			
Armament:				
Close in Weapon System	3	3 / 3	3	3
Self Defense Missile System	2	2 / 2	2	2

b. Current Change Explanations --

(U) NONE

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11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	39.9	48.9	42.3
Procurement	2891.9	6432.1	5999.9
Sailaway	(2872.5)		(5977.7)
Total Other Wpn Sys			(0.0)
Peculiar Support	(10.1)		(11.5)
Initial Spares	(9.3)		(10.7)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 82 Base-Year \$	2931.8	6481.0	6042.2
Escalation	1519.2	1943.2	1784.1
Development (RDT&E)	(3.7)	(6.0)	(5.4)
Procurement	(1515.5)	(1937.2)	(1778.7)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	4451.0	8424.2	7826.3
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>3</u>	<u>7</u>	<u>7</u>
Total	3	7	7

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline <u>(FEB 94 APB)</u>	Current Estimate <u>(Dec 98 SAR)</u>	Percent <u>Change</u>
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 82 BY\$)	6481.0	6042.2	
(2) Quantity	7	7	
(3) Unit Cost	925.857	863.171	-6.77
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 82 BY\$)	6432.1	5999.9	
(2) Quantity	7	7	
(3) Unit Cost	918.871	857.129	-6.72

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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	43.6	4407.4	-	4451.0
Previous Changes:				
Economic	-0.4	-1344.2	-	-1344.6
Quantity	-	+5552.1	-	+5552.1
Schedule	+4.5	-332.7	-	-328.2
Engineering	-	+14.3	-	+14.3
Estimating	-	-500.0	-	-500.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+4.1	+3389.5	-	+3393.6
Current Changes:				
Economic	-	-11.4	-	-11.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+21.8	-	+21.8
Estimating	-	-28.7	-	-28.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-18.3	-	-18.3
Total Changes	+4.1	+3371.2	-	+3375.3
Current Estimate	47.7	7778.6	-	7826.3

(U) Summary (FY 1982 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	39.9	2891.9	-	2931.8
Previous Changes:				
Quantity	-	+3395.2	-	+3395.2
Schedule	+3.4	+80.7	-	+84.1
Engineering	-	+9.0	-	+9.0
Estimating	-1.0	-378.5	-	-379.5
Other	-	-	-	-
Support	-	+2.8	-	+2.8
Subtotal	+2.4	+3109.2	-	+3111.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+14.8	-	+14.8
Estimating	-	-16.0	-	-16.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-1.2	-	-1.2
Total Changes	+2.4	+3108.0	-	+3110.4
Current Estimate	42.3	5999.9	-	6042.2

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>	0.0	0.0
RDT&E Subtotal	<u>0.0</u>	<u>0.0</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-16.8
Economic adjustment for negative program change. (Economic)	N/A	+5.4
New GFE Electronic Systems for LHD 7 (Engineering)	+14.8	+21.8
Adjustment for Current and Prior Inflation. (Estimating)	+11.1	+16.3
Recision and transfer of funds for FY88 and 89 programs (Estimating)	-4.5	-5.7
Actual cost on completed portion of program (Estimating)	+0.5	+0.7
Escalation reduction to FY91, 94 and 96 programs (Estimating)	-19.1	-27.5
Reduction based on revised shipbuilding estimate (Estimating)	-3.2	-4.3
Revised cost estimate for GFE requirements and miscellaneous contractor support services on LHD 5, 6 & 7 (Estimating)	+4.8	+6.9
Increase based on deferred work until after LHD 7 delivery (Estimating)	+1.8	+2.6
Installation cost for new GFE Requirements for LHD 7 (Estimating)	+1.6	+2.3
Increase for special studies (Gas Turbine and MV22 integration) on LHD 7 (Estimating)	+0.9	+1.3
Revised outfitting and post delivery cost estimates for FY02 and prior (Estimating)	-9.9	-15.9
TY\$ Program Adjustment for Negative Program Change (Estimating)	0.0	-5.4
Procurement Subtotal	<u>-1.2</u>	<u>-18.3</u>

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1483.67	-193.71	-54.66	-46.89	+5.16	-75.53	--	--	-365.63	1118.04

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1469.13	-193.66	-46.34	-47.53	+5.16	-75.53	--	--	-357.90	1111.23

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	OCT 81	N/A	OCT 81
Milestone II	N/A	JUL 82	N/A	JUL 82
Milestone III	N/A	AUG 85	N/A	AUG 85
FUE/IOC	N/A	MAY 90	N/A	NOV 90
Total Cost	N/A	4451	N/A	7826.3
Total Quantity	N/A	3	N/A	7
Prog Acq Unit Cost	N/A	1483.67	N/A	1118.04

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

a. Procurement --

(U) LHD 6 CONSTRUCTION:
INGALLS SHIPBUILDING, INC, PASCAGOULA MS
N00024-92-C-2204, FPI
Award: December 11, 1992
Definitized: December 11, 1992

Initial Contract Price		
Target	Ceiling	Qty
\$760.9	\$779.2	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$814.6	\$833.7	1	\$790.0	\$785.4

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$47.0	\$-1.4
Cumulative Variances To Date (12/31/98)	<u>\$46.0</u>	<u>\$-4.2</u>
Net Change	\$-1.0	\$-2.8

Explanation of Change:

(U) Cost Variance: The majority of unfavorable variance reported by the Contractor is attributed to an increase in G&A.

Schedule Variance: The majority of unfavorable variance reported by the Contractor is primarily identified with construction labor and overhead.

The PM's Estimated Price at Completion takes these variances into consideration.

(U) Contract Comments:

The Program Manager's Estimated Price at Completion is based on the Government's share of a projected total underrun of \$-58.6M, which would result in a net contractor profit of \$147.3M.

The LHD 6 will not be reported future SARs as the ship was delivered 12 May 1998 and is over 90% complete.

(U) <u>LHD 7 CONSTRUCTION:</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
INGALLS SHIPBUILDING, INC, PASCAGOULA, MS	\$771.8	\$791.5	1
N00024-92-C-2204, FPI			
Award: December 28, 1995			
Definitized: December 28, 1995			

<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>
\$813.0	\$832.9	1	\$805.8	\$819.9

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-10.9	\$-46.4
Cumulative Variances To Date (12/31/98)	<u>\$-9.4</u>	<u>\$-45.9</u>
Net Change	\$1.5	\$0.5

Explanation of Change:

(U) Cost Variance: The majority of favorable variance reported by the contractor is primarily identified with efficiencies achieved in vessel labor and receipt of delinquent material.

Schedule Variance: The majority of favorable variance reported by the contractor is attributed to receipt of delinquent material.

The PM's Estimated Price at Completion takes these variances into

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

consideration.

(U) Contract Comments:

The Program Manager's Estimated Price at Completion is based on the Government's share of a projected total overrun of \$13.8M which would result in a net contractor profit of \$118.3M.

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

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

<u>Appropriation</u>	<u>Prior Years (FY81-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02)</u>	<u>Total</u>
RDT&E	47.7	-	-	-	47.7
Procurement	7744.4	15.0	17.5	1.7	7778.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	7792.1	15.0	17.5	1.7	7826.3

b. Annual Summary -- LHD

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY82 Dollars Nonrec	Flyaway FY82 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1981				0.9	0.9
1982				11.0	11.3
1983				17.9	19.2
1984				0.8	0.9
1985				1.8	2.1
1986				0.3	0.4
1987				0.5	0.6
1988				0.7	0.9
1989				2.8	3.7
1990				4.9	6.7
1991				0.7	1.0
Subtotal				42.3	47.7

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

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY82 Dollars Nonrec	Flyaway FY82 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1982				41.3	45.0
1983				48.4	53.7
1984	1	150.0	1111.0	1159.2	1310.1
1985				34.0	39.2
1986	1		766.5	705.9	832.8
1987				29.8	35.9
1988	1		631.8	610.2	757.8
1989	1		605.7	583.0	745.9
1990				35.8	47.1
1991	1		913.5	876.6	1186.2
1992				20.5	28.5
1993				240.9	338.2
1994	1		853.6	655.1	942.3
1995				44.2	64.3
1996	1		945.6	863.1	1271.3
1997				5.1	7.6
1998				11.9	18.0
1999				13.3	20.5
2000				9.6	15.0
2001				11.0	17.5
2002				1.0	1.7
Subtotal	7	150.0	5827.7	5999.9	7778.6

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	7	150.0	5827.7	6042.2	7826.3

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	6	6

(U) Percent Total Program Quantities Delivered: 85.7%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 6890.5

(U) Percent Total Program Expended: 88.0%

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18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
O&S costs for LHD 1 Class ships were developed from historical (VAMOSOC) data for the antecedent LHA 1 Class as well as limited data that has come from the operations of LHD 1. Greater emphasis is still being placed on LHA 1 data for two reasons: the limited size of the LHD 1 data, and a belief that the first few years of operations of a lead ship are not representative of the ship's future, "normal" operating costs.

Personnel retirement costs are included as part of indirect costs and are based on 30.4 percent of officer and enlisted direct personnel costs.

Assumed service life is stated as 40 years for ships of the LHD 1 Class. All costs are in FY82 constant dollars, the year of the first construction contract for an LHD 1 Class ship.
(Cost estimate dated December 1998)

b. (U) Costs -- (FY 1982 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per LHD 1	Avg Annual Cost Per LHA 1 (Antecedent)
Mission Pay & Allowances	26.3	23.3
Unit Level Consumption	6.7	7.3
Intermediate Maintenance	0.3	0.3
Depot Maintenance	8.4	14.4
Contractor Support	0.0	0.0
Sustaining Support	4.1	6.7
Indirect Costs	1.4	1.2
Total	47.2	53.2

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A-6. ATIRCM-CMWS

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

PROGRAM: ATIRCM/CMWS

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Advanced Threat Infrared Countermeasure/Common Missile Warning System

2. (U) DoD Component: Army

Joint Participants:

U.S. Navy/U.S. Marine Corps, U.S. Air Force

3. (U) Responsible Office and Telephone Number:

PM ATIRCM/CMWS

Dr. Steven L. Messervy

ATTN: SFAE-AV-IR

Assigned: September 2, 1997

Redstone Arsenal, Bldg 5683

DSN 897-4650; COMM 256-313-4650

Huntsville, AL 35898-5000

MesservyS@PeoAvn.Redstone.Army.Mil

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

RDT&E:

(U) PE 64270A (Shared) Project 2VT, D665 (Shared), DL20

(U) PE 64270F

(U) PE 64270N

PROCUREMENT:

(U) APPN 3010 ICN 3010 (Air Force)

(U) APPN 2031 ICN AA0722 (Army)

(U) APPN 2031 ICN AA0980 (Army)

(U) APPN 1506 ICN 1506 (Navy)

(U) APPN 2031 ICN AZ3507 (Army)

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AND SECURITY REVIEW
DEPARTMENT OF DEFENSE**

~~Classified by: 302 for ATIRCM/CMWS dated 17 Jun 98~~

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~~Declassify on: X-3~~

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4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) APPN 2031 ICN AZ3507 (Army)

5. (U) References:

SAR Baseline (Development Estimate):

(U) Approved Acquisition Program Baseline dated March 29, 1996.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated June 12, 1997.

6. (U) Mission and Description:

(U) The ATIRCM/CMWS is a U.S. Army program to develop, test, and integrate defensive infrared (IR) countermeasures capabilities into existing, current generation host platforms for more effective protection against a greater number of IR guided missile threats than afforded by currently fielded IR countermeasures. The CMWS component system is a joint U.S. Army, U.S. Navy, U.S. Marine Corps, and U.S. Air Force program to develop, test, and integrate common missile warning system on tactical aircraft and rotorcraft for protection against IR guided missile threat (warning). The ATIRCM/CMWS is the core system of the U.S. Army's modular Suite of Integrated Infrared Countermeasures (SIIRCM).

For the Army, the current Infrared Countermeasure (IRCM) configuration for the fleet helicopter consists of the AN/ALQ-144A for the AH-64 and the UH/MH-60 and the AN/ALQ-156 missile detector and M-130 flare/chaff dispenser for the CH/MH-47 and the AN/ALQ-144A, AND/ALQ-156 and M-130 on the EH-60. The ATIRCM/CMWS will selectively replace the AN/ALQ-144A, AN/ALQ-156 or AN/AAR-47, and the M-130. For the Navy and the Air Force, no existing equivalent systems exist.

7. (U) Executive Summary:

(U) In January 1995, the Undersecretary of Defense for Acquisition and Technology (USD(A&T)), approved: (1) the recommendation from the Service Acquisition Executives to jointly develop a CMWS as a component system of the U.S. Army ATIRCM program, and (2) the proposed streamlined joint program acquisition strategy. The USD(A&T) designated the U.S. Army as the lead Service, and designated the U.S. Army Acquisition Executive as the Milestone Decision Authority, in consultation with the other Service Executives.

The Milestone II decision review occurred on June 23, 1995. The Operational Requirements Document(ORD)was approved in September 1995, and the Test and Evaluation Master Plan (TEMP) was Integrated Product Team (IPT) coordinated in December 1995. The Milestone II Engineering, Manufacturing and Development (EMD)contract was awarded to Sanders, a Lockheed-Martin company on September 27, 1995. The Critical Design Review (CDR) was completed February 1997. The

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7. (U) Executive Summary (Cont'd):

most recent program milestone, First Prototype Delivery, was April 1998.

Sanders' demonstrated the First System Integrated at the April 1998 Quarterly Program Review. This was a major milestone for the program. By demonstrating the end-to-end operation of the system, they have eliminated a major system risk and have increased confidence to deliver compliant hardware to start developmental testing. The demonstration also showed the efficiency of the System Integration Laboratory (SIL) with regards to being able to utilize scenarios from both LMIRIS and Georgia Tech.

Several meetings have occurred to align the test resource requirements within the available budget. Resources are being scrutinized for potential reduction and/or combination through tighter integration between developmental and operational test requirements. The areas being scrutinized are the quantity of full up QF-4 drones, quantity of instrumented threat missiles and their associated cost, and fixed wing test instrumentation package requirements. The comments received from the Test and Integration Working Group (TIWG) members were reviewed at a February 12-13, 1998 TIWG for incorporation into the updated TEMP. The updated TEMP reflects a more integrated test program plan, while maintaining the overall test strategy, thereby allowing the test program to be executed within the available budget.

The Suite of Integrated Infrared Countermeasures (SIIRCM)/CMWS TEMP was signed by DTSE&E November 19, 1998 and DOT&E November 30, 1998. Contractor Qualification Testing (CQT) began August 1998 with temperature shock, explosive atmosphere, and humidity testing on CMWS LRUs. Development of the Air Force Electronic Warfare Evaluation Simulator (AFEWES) Hardware-in-the-Loop (HITL) facility is progressing with the "Spot on the Wall" Proof of Concept (POC) Demonstration scheduled for March 1999. Resource Enhancement Project (REP) funding has been approved and received for both the HITL multi-projector capability and the second ATIRCM Test Instrumentation Package (TIP).

During the later half of 1998, contractor difficulties with the manufacturing and qualification testing of ATIRCM jam laser and CMWS sensor(s) have caused cost growth and schedule delays in the EMD program. The failure modes have been identified and corrective action is underway. Solutions and risk mitigation plans have been formulated and will be executed during the remainder of CQT. Although fixes have been identified, the cost and schedule impact is nonrecoverable. To avoid a complete shutdown, the Joint Program Office (JPO) restructured the program within available funding. The JPO and the contractor have developed a course of action to restructure the program resulting in significant slips to the APB major program milestones. The contractor will submit a detailed overrun proposal by March 31, 1999. A formal Integrated Baseline Review (IBR) and Estimate at Completion (EAC) technical evaluation will be completed in June 1999. Modification of the EMD contract is expected in early June 1999.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The program restructure combined with reprogramming action contributes to an APB breach in RDTE cost and schedule milestones. A Program Deviation Report (PDR) and a revised APB reflecting the proposed changes have been submitted.

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
	SEP 91	SEP 91	SEP 91	
DEMVAL Contract Award				
Technical Test				
Start	JUL 94	JUL 94	JAN 94	
Complete	DEC 95	DEC 95	JUN 94	
Milestone I/II	JUN 95	JUN 95	JUN 95	
EMD Contract Award	SEP 95	SEP 95	SEP 95	
Preliminary Design Review Complete	JUN 96	JUN 96	JUN 96	
Critical Design Review Complete	SEP 96	SEP 96	FEB 97	
First Prototype Delivery	JUL 97	JUN 98	APR 98	(Ch-1)
Developmental Testing				
Start	MAY 98	SEP 98	AUG 00	(Ch-2)
Complete	FEB 99	JUN 99	JAN 02	(Ch-2)
Operational Testing				
Start	JAN 99	AUG 99	OCT 01	(Ch-2)
Complete	JAN 00	DEC 00	NOV 02	(Ch-2)
Milestone III	FEB 00	MAR 01	MAR 03	(Ch-2)
Production Contract Award	APR 00	MAY 01	JAN 03	(Ch-2)
First Production Delivery	APR 01	MAY 02	DEC 03	(Ch-2)

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

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
First Unit Equipped without Obstacle Avoidance System	NOV 01	DEC 02	APR 04	(Ch-2)
Initial Operational Capability Organic Support Available	(b)(1)			(Ch-2)
Depot Level Maintenance Support Established	FEB 05	MAR 06	MAR 06	

b. Current Change Explanations --

(U) Schedule milestones have changed due to the following:

(Ch-1) Sanders demonstrated the first system integrated at the April 1998 Quarterly Program Review (QPR). By demonstrating the end-to-end operation of the system, the contractor have eliminated a major system risk and have increased confidence to deliver compliant hardware to start development test.

(Ch-2) Contractor difficulties with the manufacturing and qualification testing of the ATIRCM and CMWS have caused major cost growth and schedule delays in the EMD program. Solutions and risk mitigation plans have been formulated and will be executed during CQT. Although fixes have been identified, the cost and schedule impact cannot be recovered. To avoid a complete shutdown, the JPO has restructured the program within available funding. The JPO and the contractor have developed a course of action to restructure the program resulting in a significant delay in major program milestones.

Milestone:	FROM:	TO:
First Prototype Delivery	Jun 98	Apr 98
Developmental Testing		
Start	Sep 98	Aug 00
Complete	Jun 99	Jan 02
Operational Testing		
Start	Aug 99	Oct 01
Complete	Dec 00	Nov 02
Milestone III	Mar 01	Mar 03
Production Contract Award	May 01	Jan 03
First Production Delivery	May 02	Dec 03
First Unit Equipped without Obstacle Avoidance System	Dec 02	Apr 04

Initial Operational Capability

(b)(1)

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10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
(1) Minimum probability (in the aggregate for each type aircraft) of the host aircraft successfully countering the tier one missiles (Mistral desired) as listed in the CMWS attachment to the SIIRCM ORD (percent)	(b)(1)			
(2) ATIRCM/CMWS False Alarm Rate (per flight hour)				
ATIRCM/CMWS Jamming Capability System Weight (lb)	125	125 / 125	TBD	125
CMWS Missile Warning Sensor Weight (lbs)	3.5	3.5 / 3.75	TBD	3.5
CMWS Processor Weight (lbs)	22	22 / 22	TBD	22
CMWS Missile Warning Sensor Size (Length and diameter) (in)	4.25/ 4.75	4.25/ 4.75 / 4.75	TBD	4.25/ 4.75
CMWS Processor Size (in)	11x9.8x	11x9.8x / 11x9.8x	TBD	11x9.8x
(3) CMWS False Alarm Rate (per flight hour)	(b)(1)			
(4) CMWS Number of Simultaneous Missiles Declared and Number in Same Quadrant				
(5) CMWS Percent Declaration of Aggregate Valid Tier One Missiles within 3 seconds or 1/2 Time of Flight Time to Intercept				
CMWS Mission Reliability	99.0	99.0 / 97.5	TBD	99.0

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10b. (U) Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	516.4	516.4	631.5
Procurement	2112.0	2112.0	1871.7
Recurring Flyaway	(1772.2)		(1561.5)
Nonrecurring Flyaway	(142.6)		(74.4)
Total Flyaway	(1914.8)		(1635.9)
Other Wpn System Costs	(131.0)		(85.7)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(66.2)		(150.1)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	2628.4	2628.4	2503.2
Escalation	733.2	733.2	463.1
Development (RDT&E)	(43.4)	(43.4)	(40.8)
Procurement	(689.8)	(689.8)	(422.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3361.6	3361.6	2966.3
b. (U) Quantity --			
Development (RDT&E)	25	25	25
Procurement	3069	3069	2565
Total	3094	3094	2590

Note: Excludes 15 RDT&E prototypes from the SAR Baseline and 15 from the Current Estimate that are not considered fully configured.

(U) The unit of measure reflects the number of ATIRCM/CMWS units that will be installed on aircraft.

There are no LRIP quantities approved for this program.

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
None.

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12. (U) Unit Cost Summary:

	UCR Baseline (Jun 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	2628.4	2503.2	
(2) Quantity	3094	2590	
(3) Unit Cost	0.850	0.966	+13.65
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	2112.0	1871.7	
(2) Quantity	3069	2565	
(3) Unit Cost	0.688	0.730	+6.10

(U) The 13.65 percent change in the PAUC can be attributed to a significant increase of Army's RDTE funding in FY00-05 to support P3I upgrades and additional development requirements in the FY00 President's Budget.

The 6.10 percent change in the APUC is mostly attributed to increased procurement costs determined by revised estimating methodology for management costs and A-kit integration.

13. (U) Cost Variance Analysis:

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

	RDTE	PROC	MILCON	TOTAL
Development Estimate	559.8	2801.8	-	3361.6
Previous Changes:				
Economic	-13.9	-128.3	-	-142.2
Quantity	-	-415.1	-	-415.1
Schedule	-	-326.8	-	-326.8
Engineering	-	-	-	-
Estimating	-100.0	+18.9	-	-81.1
Other	-	-	-	-
Support	-	+37.8	-	+37.8
Subtotal	-113.9	-813.5	-	-927.4
Current Changes:				
Economic	0.0	-45.6	-	-45.6
Quantity	-	+0.6	-	+0.6
Schedule	-	+22.9	-	+22.9
Engineering	-	-	-	-
Estimating	+226.4	+302.6	-	+529.0
Other	-	-	-	-
Support	-	+25.2	-	+25.2
Subtotal	+226.4	+305.7	-	+532.1
Total Changes	+112.5	-507.8	-	-395.3
Current Estimate	672.3	2294.0	-	2966.3

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

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	516.4	2112.0	-	2628.4
Previous Changes:				
Quantity	-	-266.6	-	-266.6
Schedule	-	-245.2	-	-245.2
Engineering	-	-	-	-
Estimating	-85.2	+10.0	-	-75.2
Other	-	-	-	-
Support	-	+6.6	-	+6.6
Subtotal	-85.2	-495.2	-	-580.4
Current Changes:				
Quantity	-	+0.5	-	+0.5
Schedule	-	-0.1	-	-0.1
Engineering	-	-	-	-
Estimating	+200.3	+222.5	-	+422.8
Other	-	-	-	-
Support	-	+32.0	-	+32.0
Subtotal	+200.3	+254.9	-	+455.2
Total Changes	+115.1	-240.3	-	-125.2
Current Estimate	631.5	1871.7	-	2503.2

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-0.8
Economic adjustment for negative program change. (Economic)	N/A	+0.8
Navy Adjustment for Current and Prior Inflation. (Estimating)	+3.9	+5.1
Army Adjustment for Current and Prior Inflation. (Estimating)	+0.8	+0.8
Air Force Adjustment for Current and Prior Inflation. (Estimating)	-4.0	-4.0
Navy estimating change due to realignment of funding between programs. (Estimating)	-6.8	-8.9
Air Force cost increase due to program restructure. (Estimating)	+8.4	+9.1
Air Force P3I efforts required to address Tier II and Tier III threats (Estimating)	+20.3	+23.4
Army cost increase due to program restructure. (Estimating)	+74.2	+86.0
Army P3I efforts for required to address Tier II and Tier III threats. (Estimating)	+103.5	+114.9
RDT&E Subtotal	+200.3	+226.4

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-50.0
Economic adjustment for negative program change. (Economic)	N/A	+4.4
Total Quantity Variance associated with Navy CMWS decrease of 13 units from 678 to 665.	-6.3	-10.7
Total Quantity Variance associated with Air Force CMWS increase of 1 units from 852 to 853.	+0.4	+0.5
Air Force CMWS Quantity increase of 1 units from 852 to 853. (Quantity)	+0.5	+0.6
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	-0.1	-0.1
Navy CMWS Stretchout of annual procurement buy profile. (Schedule)	0.0	+8.0
Army ATIRCM Stretchout of annual of procurement buy profile. (Schedule)	0.0	+2.6
Air Force CMWS Stretchout of annual procurement buy profile. (Schedule)	0.0	+12.4
Navy Adjustment for Current and Prior Inflation. (Estimating)	+0.2	+0.2
Navy Estimating Change (Estimating)	+2.0	+1.5
Army Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
Army Estimating changes for system project management and increased aircraft installation costs. (Estimating)	+146.8	+211.5
Air Force Estimating Change for increased costs in production and aircraft installation. (Estimating)	+73.2	+89.1
Navy change in Initial Spares (Support)	+0.7	+1.0
Air Force Change in Other Wpn System Costs includes increase for data, training, contractor logistical support. (Support)	+0.1	+0.1
Army adjustment for Current and Prior Inflation. (Support)	-0.1	-0.1
Army Change in Initial Spares due to revised POE. (Support)	+82.7	+89.8
Army change in Other Wpn System Costs include proper categorizing of supports costs. (Support)	-51.5	-65.7
Air Force Change in Other Wpn System Costs (Support)	+0.1	+0.1
Procurement Subtotal	+254.9	+305.7

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.09	-0.07	+0.06	-0.12	--	+0.17	--	+0.02	+0.06	1.15

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.91	-0.07	+0.02	-0.12	--	+0.13	--	+0.02	-0.02	0.89

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	JUN 95	N/A	JUN 95
Milestone II	N/A	JUN 95	N/A	JUN 95
Milestone III	N/A	FEB 00	N/A	MAR 03
(b)(1)				
Total Cost	0	3361.6	0	2986.3
Total Quantity	0	3094	0	2590
Prog Acq Unit Cost	0	1.09	0	1.15

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

a. RDT&E --

(U) ATIRCM/CMWS Black Boxes:
Lockheed Sanders Inc, Nashua, NH
DAAB07-95-C-D606, CPAF
Award: September 27, 1995
Definitized: September 27, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$64.8	N/A	40

Current Contract Price		
Target	Ceiling	Qty
\$103.9	N/A	57

Estimated Price At Completion	
Contractor	Program Manager
\$165.0	\$171.1

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ATIRCM/CMWS, December 31, 1998

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-1.3	\$-0.2
Cumulative Variances To Date (12/25/98)	\$-11.7	\$-6.0
Net Change	\$-10.4	\$-5.8

Explanation of Change:

(U) Net change explanation:

The cost and schedule performance reflects seven months of performance measurement against an interim program re-baseline. The cost growth identified late 1997 was evaluated and defined in an interim baseline in February 1998 with a Budget at Completion (BAC) of \$116M. The further evaluation of this baseline increased the BAC to \$120M in June 1998. The variance to date is mainly attributed to manufacturing and qualification testing of the ATIRCM jam laser and the CMWS sensor(s). The jam laser manufacturing and testing has become the critical path for this program. The delivery of the laser has been significantly delayed because of burning of optical coatings during acceptance testing. The failure mode stemmed from poor electronic workmanship and deficient clean room and cleaning procedures. Corrective action has been taken. The contractor is making significant progress in this area and expects delivery of three lasers during March 1999 through May 1999.

The contractor incurred \$113.7M actual cost of work performed through December 1998. With the remainder of CQT and hardware deliveries still ahead, it is evident that the final EMD cost will be much greater than \$120M. The contractor's Latest Revised Estimate (LRE) was \$165M as of December 25, 1998. The contractor will submit a detailed overrun proposal by March 31, 1999. A formal IBR and EAC technical evaluation will be completed in June 1999. Modification of the EMD contract is expected in early June 1999.

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ATIRCM/CMWS, December 31, 1998

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

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

<u>Appropriation</u>	<u>Prior Years (FY90-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-14)</u>	<u>Total</u>
RDT&E	335.9	101.7	52.9	181.8	672.3
Procurement	16.4	-	9.6	2268.0	2294.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	352.3	101.7	62.5	2449.8	2966.3

b. Annual Summary -- ATIRCM/CMWS

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY96 Dollars Nonrec</u>	<u>Flyaway FY96 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				8.8	8.9
1997				16.0	16.4
1998				11.5	12.0
1999				1.5	1.6
2000				4.5	4.8
2001				7.4	8.1
2002				1.8	2.0
Subtotal	9			51.5	53.8

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY96 Dollars Nonrec</u>	<u>Flyaway FY96 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				0.7	0.6
1991				3.1	2.8
1992				15.6	14.6
1993				8.3	8.0
1994				7.7	7.5
1995				7.7	7.7
1996				15.6	15.8
1997				20.2	20.7
1998				31.5	32.6
1999				37.3	39.0
2000				44.6	47.4
2001				22.9	24.7
2002				13.6	14.9
2003				14.8	16.5

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ATIRCM/CMWS, December 31, 1998

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

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2004				8.9	10.2
2005				8.8	10.2
2006				32.8	39.0
2007				32.1	39.0
Subtotal	7			326.2	351.2

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				21.5	21.4
1996				35.7	36.2
1997				33.9	34.8
1998				22.6	23.4
1999				30.5	31.9
2000				46.6	49.5
2001				18.6	20.1
2002				14.0	15.3
2003				10.1	11.3
2004				10.2	11.6
2005				10.1	11.8
Subtotal	9			253.8	267.3

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002	58	1.0	18.1	20.6	23.4
2003	63	2.0	18.4	27.5	31.9
2004	87	0.2	23.4	32.0	38.0
2005	84	0.1	26.3	34.4	41.7
2006	101		30.1	37.7	46.7
2007	101		24.5	31.1	39.4
2008	78		17.2	20.8	26.9
2009	71		15.6	19.0	25.2
2010	22		4.7	7.6	10.3
2011				0.8	1.1
Subtotal	665	3.3	178.3	231.5	284.6

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ATIRCM/CMWS, December 31, 1998

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

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997		8.8		8.8	9.1
1998		7.0		7.0	7.3
1999					
2000					
2001	3	2.2	5.6	8.1	8.8
2002	12	11.4	23.0	37.4	41.3
2003	33	8.3	55.7	74.5	83.9
2004	78	6.4	97.4	120.3	138.4
2005	85	13.8	92.0	124.2	145.9
2006	100	1.7	92.6	108.2	129.7
2007	105		86.0	97.9	119.9
2008	105		93.1	105.8	132.2
2009	105	3.1	90.7	105.8	135.1
2010	105	4.6	89.4	105.8	137.9
2011	105		88.0	99.4	132.3
2012	104		86.3	95.9	130.3
2013	107		58.7	66.3	92.0
2014			5.3	7.4	10.5
Subtotal	1047	67.3	963.8	1172.8	1454.6

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001		0.6	0.1	0.7	0.8
2002	70	0.8	43.9	50.5	56.5
2003	150	2.0	62.0	72.7	83.1
2004	165	0.3	71.8	80.9	94.4
2005	165	0.1	75.4	83.3	99.2
2006	182		89.4	97.9	119.0
2007	121		53.1	57.5	71.4
2008			23.6	23.7	30.1
2009			0.1	0.2	0.3
Subtotal	853	3.8	419.4	467.4	554.8

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	674	3.3	178.3	283.0	338.4
Army	1054	67.3	963.8	1499.0	1805.8
USAF	862	3.8	419.4	721.2	822.1

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ATIRCM/CMWS, December 31, 1998

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

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	2590	74.4	1561.5	2503.2	2966.3

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RD&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 241.5

(U) Percent Total Program Expended: 8.1%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
Average of twenty year operational life of 3069 baseline quantity. Baseline quantity assumes system composite configuration for the sum of the airframes. Includes all O&M funded human resource requirements not identified in development or procurement. Based on a total ATIRCM system Mean Time Between Failure (MTBF) of 1000 hours. No airframe (group-A) operations and support costs are associated with the system (group-B).

Source of estimate is the methodology approved by the Army Cost Review Board, June 1995.

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per Aircraft Composite System	
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	5.9	0.0
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	5.9	0.0

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AF-6 C-130J

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: C-130J Hercules

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): C-130J Hercules

2. DoD Component: USAF

3. Responsible Office and Telephone Number:

WR-ALC/LB

Robins AFB, GA 31098-1647

Col Gerald J. Butler

Assigned: June 1, 1998

DSN 468-2322; COMM 912-926-2322

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0603852F

PROCUREMENT:

APPN 3010 ICN C-130J (Air Force)

SAF/PAS

99 - - 0136

CONGRESSIONAL

5. References:

SAR Baseline (Production Estimate):

AFAE Approved Acquisition Program Baseline dated October 25, 1996.

Approved Program:

AFAE Approved Acquisition Program Baseline (APB) dated February 8, 1999.

6. Mission and Description:

The C-130 Hercules is a medium-range, tactical airlift aircraft designed primarily for transport of cargo and personnel within a theater of operations. Variants of the C-130 perform other missions, including close-air support, rescue and recovery, special operations, and weather reconnaissance. Since 1954, over 1,000 C-130s have been delivered to the US Air Force, making it the

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99-C-0533

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C-130J Hercules, December 31, 1998

6. Mission and Description (Cont'd):

"workhorse of the Air Force".

The C-130 can carry more than 40,000 pounds of cargo (up to six pallets or a varied number of wheeled vehicles). The cargo area can be quickly adapted to accommodate any combination of passenger, cargo, or aeromedical airlift mission.

The C-130 can deliver personnel, equipment, or supplies either by landing or by various aerial delivery modes. The two primary methods of aerial delivery used for equipment delivery are parachutes pulling the load from the aircraft, and the Container Delivery system which uses the force of gravity to pull the supplies from the aircraft.

Each of four turboprop engines on the C-130J drive a six-blade, constant-speed, reversible-pitch propeller with feathering capability. The Hercules can operate on as little as 3,000 feet of dirt runway.

7. Executive Summary:

In 1992, Lockheed Martin began a C-130J development program funded by themselves and their supplier team. The C-130J design resulted from applying the latest technology and focusing on the wealth of experience in operating an already successful aircraft. The objective for the C-130J program was a cargo transport superior to earlier C-130s with substantial reduction of life cycle costs. Its upgrades include a modern flight station with modern displays and digital avionics, computerized management of aircraft functions, three-person flight crews (a two person reduction from the previous five-person crew), improved cargo handling and delivery system. The C-130J will provide performance improvements and improved operations efficiencies.

The C-130H was used extensively during Desert Shield/Storm and Bosnia because of its ability to operate on a short austere airfield; the C-130J is expected to continue this role.

The C-130J program provides a one-for-one replacement of C-130Es and C-130Hs. Qualification Operational Test and Evaluation (QOT&E), starting Oct 99, will be accomplished by HQ Air Force Operational Test and Evaluation Center (AFOTEC). The using commands will accomplish Follow-on test and Evaluation (FOT&E).

Congress adds aircraft to the Air Force program through the appropriation process. Of the 28 aircraft on contract through FY98, 25 were congressionally added: 2 EC-130Js (ANG) and 8 WC-130Js (AFRC) which were funded with Air Force funds, and 10 ANG and 5 USMC C-130J aircraft which were funded with their appropriations. Air Force designated the one aircraft in FY97 Air Force line to be a WC-130J, thereby making a total of 9 WC-130Js.

On 28 Jan 99, Air Force accepted its first six C-130J aircraft for Operational Test and Evaluation, Tech Order verification, and maintenance training purposes.

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C-130J Hercules, December 31, 1998

7. Executive Summary (Cont'd):

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Program Initiation	JUN 96	JUN 96	JUN 96
FY96 Basic Aircraft Contract	NOV 96	NOV 96	NOV 96
First Delivery	OCT 97	MAR 99	MAR 99 (Ch-1)

b. Current Change Explanations --

(CH 1) Lockheed Martin Aeronautical Systems failed to meet the delivery schedule. The schedule slipped from Oct 98 to Mar 99.

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C-130J Hercules, December 31, 1998

10. Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Cockpit Crew (All Missions)	2	2 / 2	TBD	2
Maximum Payload (lbs)	39311	39311 / 38910	TBD	38910
Normal Maximum Take-off Gross Weight (lbs)	155000	155000 / 155000	TBD	155000
Design Landing Gross Weight (lbs)	130000	130000 / 130000	TBD	130000
Take-off Distance at Max Take-off Weight over 50 ft Obstacle (ft)	4530	4530 / 5142	TBD	5142
Landing Distance at Design Landing Weight Over 50 ft Obstacle (ft)	2500	2500 / 2550	TBD	2550
Shortfield Capability Assault Take-off Distance (Take- off Ground Roll) (ft)	2700	2700 / 2700	TBD	2700
Assault Landing Distance (Ground Roll) (ft)	1800	1800 / 1800	TBD	1800
IMC Airdrop Accuracy - Total System Error (ft)	158	158 / 158	TBD	158
Cruising Speed at 100,000 lbs @25,000 ft (KTAS)	342	342 / 315	TBD	315
Max Range with 42,764 lbs fuel & 29,722 lbs Payload (NM)	3070	3070 / 2350	TBD	2350
Environmental Factors - Operational Ambient Temperature (deg F)	-40 - +120	-40 - +120 / +120	TBD	-40/+120
Sortie Reliability (SR) (%)	95.4	95.4 / 94.2	TBD	94.2
Mission Capable Rate (MC) (%)	84.0	84.0 / 81.0	TBD	81.0
Mean Repair Time (hrs)	6.3	6.3 / 7.4	TBD	7.4
Mean Time Between Repair (MTBR) (hrs)	4.6	4.6 / 3.8	TBD	3.8

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C-130J Hercules, December 31, 1998

10a. Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Mean-Time Between Maintenance Corrective Actions (MTBMC) (hrs)	1.2	1.2 / 1.0 /	TBD	1.0

b. Current Change Explanations -- None

11. Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	8.9	9.1	9.4
Procurement	721.8	2544.6	2615.4
Airframe	(540.1)		(2006.7)
OTHER COSTS	(122.2)		(516.3)
Peculiar Support	(9.4)		(23.1)
Initial Spares	(50.1)		(69.3)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	730.7	2553.7	2624.8
Escalation	109.0	305.9	234.8
Development (RDT&E)	(0.3)	(0.1)	(-0.2)
Procurement	(108.7)	(305.8)	(235.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	839.7	2859.6	2859.6

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	11	37	37
Total	11	37	37

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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C-130J Hercules, December 31, 1998

12. Unit Cost Summary:

	UCR Baseline (FEB 99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	2553.7	2624.8	
(2) Quantity	37	37	
(3) Unit Cost	69.019	70.941	+2.78
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	2544.7	2615.4	
(2) Quantity	37	37	
(3) Unit Cost	68.776	70.686	+2.78

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	9.2	830.5	-	839.7
Previous Changes:				
Economic	-0.5	-8.0	-	-8.5
Quantity	-	+400.7	-	+400.7
Schedule	-	-187.9	-	-187.9
Engineering	+0.4	-	-	+0.4
Estimating	+0.1	+55.6	-	+55.7
Other	-	-	-	-
Support	-	+98.8	-	+98.8
Subtotal	0.0	+359.2	-	+359.2
Current Changes:				
Economic	-	-45.0	-	-45.0
Quantity	-	+1165.1	-	+1165.1
Schedule	-	-33.7	-	-33.7
Engineering	-	-	-	-
Estimating	-	+200.7	-	+200.7
Other	-	-	-	-
Support	-	+373.6	-	+373.6
Subtotal	-	+1660.7	-	+1660.7
Total Changes	0.0	+2019.9	-	+2019.9
Current Estimate	9.2	2850.4	-	2859.6

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C-130J Hercules, December 31, 1998

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

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	8.9	721.8	-	730.7
Previous Changes:				
Quantity	-	+370.1	-	+370.1
Schedule	-	-165.7	-	-165.7
Engineering	+0.4	-	-	+0.4
Estimating	+0.1	+86.4	-	+86.5
Other	-	-	-	-
Support	-	+88.3	-	+88.3
Subtotal	+0.5	+379.1	-	+379.6
Current Changes:				
Quantity	-	+1017.1	-	+1017.1
Schedule	-	-21.9	-	-21.9
Engineering	-	-	-	-
Estimating	-	+180.6	-	+180.6
Other	-	-	-	-
Support	-	+338.7	-	+338.7
Subtotal	-	+1514.5	-	+1514.5
Total Changes	+0.5	+1893.6	-	+1894.1
Current Estimate	9.4	2615.4	-	2624.8

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-50.9
Economic adjustment for negative program change. (Economic)	N/A	+5.9
Quantity increased from 18 to 37 units. (Quantity)	+1017.1	+1165.1
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	-21.9	-23.9
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	+7.2	+7.1
Acceleration of annual procurement buy profile. (Schedule)	0.0	-9.8
Adjustment for Current and Prior Inflation. (Estimating)	+24.9	+25.2
Increased estimate for previously unfunded requirements. (Estimating)	+148.5	+168.4
Adjustment for Current and Prior Inflation. (Support)	+10.6	+10.8
Change in Initial Spares (Support)	-27.7	-28.7
Change in Peculiar Support (Support)	+9.7	+10.6

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C-130J Hercules, December 31, 1998

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

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

Change in Other Weapon Systems Costs to
include Interim Contractor Support, Training
Systems, Data, Tech Orders, and Interim
Supply Support programs (Support)

+346.1 +380.9

Procurement Subtotal

+1514.5 +1660.7

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
76.34	-1.45	-11.32	-5.99	+0.01	+6.93	--	+12.77	+0.95	77.29

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
75.50	-1.43	-10.74	-5.99	--	+6.93	--	+12.77	+1.54	77.04

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	N/A	N/A
Total Cost	N/A	N/A	839.7	2850.4
Total Quantity	N/A	N/A	11	37
Prog Acq Unit Cost	N/A	N/A	76.34	77.04

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C-130J Hercules, December 31, 1998

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

a. RDT&E --
Test Option:
Lockheed Martin, Marietta, GA
F33657-90-C-0071, FFP
Award: May 15, 1997
Definitized: May 15, 1997

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$0.3	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$0.7	N/A	0	\$0.7	\$0.7

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

C-130J - Production:
Lockheed Martin, Marietta, GA
F33657-95-C-2055, FFP
Award: November 6, 1996
Definitized: November 6, 1996

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$115.0	N/A	2

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1367.9	N/A	26	\$1367.9	\$1367.9

Explanation of Change:

Current contract price and Program Manager's estimated price increased by \$94.4M due to:

- Modified 6 WC-130J aircraft (\$46.9M)
- Modified 5 USMC KC-130J aircraft (\$22.3M)
- Received credit for accelerated cash payment (-\$2.0M).
- Exercised logistic support options (\$27.2M)

Cost and Schedule variance reporting is not required on this FFP contract.

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C-130J Hercules, December 31, 1998

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

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	9.2	-	-	-	9.2
Procurement	1023.9	32.4	32.1	1762.0	2850.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1033.1	32.4	32.1	1762.0	2859.6

b. Annual Summary -- C-130J

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY96 Dollars Nonrec</u>	<u>Flyaway FY96 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1995				5.3	5.1
1996				0.4	0.4
1997					
1998				3.7	3.7
Subtotal				9.4	9.2

Appropriation: 3010 - Aircraft Procurement, Air Force

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY96 Dollars Nonrec</u>	<u>Flyaway FY96 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996	5		219.7	234.7	236.1
1997	5		237.6	294.3	298.1
1998	3		142.3	233.9	238.6
1999	2		103.3	242.6	251.1
2000				30.9	32.4
2001				30.1	32.1
2002	2		118.3	159.2	173.4
2003	2		119.3	164.6	182.9
2004	8		473.6	536.9	608.8
2005	10		592.6	688.2	796.9
Subtotal	37		2006.7	2615.4	2850.4

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C-130J Hercules, December 31, 1998

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	37		2006.7	2624.8	2859.6

17. Delivery/Expenditure Information:

a. Deliveries To Date

	Plan	Actual
RDT&E		
Procurement	0	0

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 792.6

Percent Total Program Expended: 27.7%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --
The information for Operating and Support (O&S) costs is based on the June 1996 program office developed estimates for the C-130J life cycle costs which formed the basis for the Air Force Cost Analysis Improvement Group report:

- Estimates are based on commercial buy prices, as applicable.
- O&S costs are based on sustainment of 135 C-130J aircraft through FY 2043.
- Two level maintenance is planned.
- Interim Contractor Support (ICS) will be required for the first ten years after contract award.
- The depot will be fully activated by the end of the ICS period.
- Estimates do not include requirements for congressionally added C-130J aircraft or their support.

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	C-130J Hercules O&S Cost/Squadron per Year	None
Mission Pay & Allowances	18.3	N/A
Unit Level Consumption	12.2	N/A
Intermediate Maintenance	0.0	N/A
Depot Maintenance	1.8	N/A
Contractor Support	0.0	N/A
Sustaining Support	6.0	N/A
Indirect Costs	8.9	N/A

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C-130J Hercules, December 31, 1998

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

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	C-130J Hercules O&S Cost/Squadron per Year	None
Total	47.2	N/A

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: Airborne Laser

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): YAL-1A Attack Laser Aircraft (Airborne Laser)
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:
SMC/TM Col Michael Booen
3300 Target Rd Bldg 760 Assigned: December 31, 1996
Kirtland AFB DSN 246-2102; COMM 505-846-2102
Albuquerque, NM 87117-6612 booenm@plk.af.mil
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0603319F
(U) PE 0604350F

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Airborne Laser, December 31, 1998

5. (U) References:

SAR Baseline (Planning Estimate):

(U) DAE Approved Acquisition Program Baseline (APB) dated January 29, 1997.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated January 29, 1997.

6. (U) Mission and Description:

(U) The Airborne Laser (ABL) is an ACAT ID program which will provide a rapidly deployable airborne platform equipped with a long range laser weapon, capable of autonomously detecting, acquiring, tracking, and negating both liquid and solid-fueled Theater Ballistic Missiles (TBMs) during the boost phase of flight. The system will have a multi-megawatt Chemical Oxygen Iodine Laser (COIL) integrated into a Boeing 747 aircraft to kill TBMs at ranges in excess of several hundred kilometers. It will have an autonomous, 360 degree threat detection capability with on-board infrared sensors and a wide laser field of regard. The system will also have a salvo engagement capability and carry enough chemical fuel to destroy approximately 20 enemy missiles before refueling. The ABL does not replace any other defense system.

7. (U) Executive Summary:

(U) This is the third SAR for the ABL program; an RDT&E only SAR in accordance with Title 10, United States Code, Section 2432.

The ABL program leverages over 25 years of science, technology, and engineering experience in both the DoD and Department of Energy. Since 1992, a focused technology program has verified all required technologies needed for Program Definition and Risk Reduction (PDRR) and Engineering and Manufacturing Development (EMD) exist and warrant entry into PDRR.

During the PDRR program, several potential adjunct missions will be studied, to include: cruise missile defense, protection of high value airborne assets, suppression of enemy air defenses, command and control, post-boost missile tracking, and imaging surveillance. Should these missions prove practical and useful, they may be incorporated into the EMD design.

The PDRR phase culminates with lethality demonstrations against boosting TBM representative targets in late FY03. The PDRR phase will integrate and test all key technologies, allowing the Air Force to advance to EMD in the FY04 time frame. Operational Test and Evaluation is planned during EMD.

The ABL program placed the order and made the first payment for the first commercial 747-400F aircraft on schedule, January 5, 1998, using a new electronic process developed by the program office, the Defense Contract Management Command and the Defense Finance and Accounting Service. This innovative process is one of many acquisition reform initiatives on the ABL program. It allows interim commercial payments to be made in accordance with a

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Airborne Laser, December 31, 1998

7. (U) Executive Summary (Cont'd):

pre-established contract schedule electronically and without the submission of invoices. It is a first for the Department of Defense.

The ABL successfully completed the Preliminary Design Review (PDR) for the Program Definition and Risk Reduction (PDRR) system on April 28-30, 1998. This event was the culmination of numerous segment and subsystem level PDR's held earlier in the year and allows Team ABL to now focus on the critical design of the weapon system.

ABL participated in simulated operations in the Joint Project Optic Windmill (JPOW) exercise, May 11-20, 1998 at Missile Group DePeel in the Netherlands. ABL performed successfully as part of the integrated theater missile defense family of systems by engaging and destroying a majority of the missiles assigned to it according to the rules of engagement. This NATO exercise involved a fictitious aggressor nation, heavily armed with theater ballistic missiles, attacking the European continent from the north. It provided good lessons learned for refinement of the ABL CONOPS and requirements, and first-hand ABL orientation for EUCOM and NATO warfighters and planners.

Members of the GAO visited the SPO on May 8, 1998 to view the status and cost of the ABL, understand the technical challenges faced, and identify synergy among these laser systems: the ABL, the SBL, and the THEL. The GAO was briefed on our progress to ATP-1, the status of the FLM, and the results of the atmospheric data collection efforts. On July 22, 1998, members of the GAO visited the SPO again to obtain further clarification on our atmospheric data analysis and findings, to review and discuss ATP-1 supporting documentation, and to receive an update on the FLM testing.

AFOTEC completed the first Early Operational Assessment (EOA) directed by the Feb 96 Acquisition Strategy Panel (ASP). The EOA found, "overall, the ABL program is on track at this early design stage of the PDRR phase." Results were briefed to AF/TE, SAF/AQ, and OSD/DOT&E.

On June 26, 1998, Team ABL passed the first Authority-to-Proceed (ATP-1) decision point. The Air Force Acquisition Executive, with consent of the Defense Acquisition Executive, approved the ABL program to proceed with the remainder of the Phase I PDRR program and authorized the obligation of the remaining FY98 funding. In the Authority to Proceed Decision letter, the Air Force Acquisition Executive stated "As the approval authority for ATP-1, I have determined the intent of ATP-1 has been met." The next major decision point, ATP-2, is currently scheduled for August 2002.

The ABL is not assessed as being at risk for Y2K due to the ABL being in development and not operational until after the year 2000. Monitoring efforts are accomplished to modify the development software as needed to ensure Y2K compliance. The contractors are all aware of the Y2K compliance requirements in the ABL contract and are required to supply the SPO with copies of vendor Y2K certification documentation for all purchased computer hardware. In October 1998, the ABL contract was modified to require Y2K compliance with the delivered ABL system.

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Airborne Laser, December 31, 1998

7. (U) Executive Summary (Cont'd):

Congressional action mandated a \$25M cut to the FY99 ABL budget resulting in a restructure of the PDRR program. Team ABL has addressed the congressional concerns by increasing segment and system level testing and adding risk reduction efforts. The program restructure process is expected to be completed in April 1999, and will result in an overall one-year delay to the program.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Congress reduced FY99 funding by \$25 million and directed the Air Force to conduct additional risk reduction activities. The Authorization language directed an independent assessment of the technical and operational aspects of ABL and added risk reduction activities. The Congressional actions forced a restructure of the ABL program. This restructure resulted in a 12 month extension of the original PDRR program and subsequent acquisition and O&S phases. As a result of the Congressional \$25 million reduction, the Air Force rephased the required funding profile for PDRR, EMD and production, and OSD realigned ABL outyear funding to reflect the restructured program.

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Airborne Laser, December 31, 1998

9. (U) Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I	NOV 96	NOV 96	NOV 96
PDRR Contract Award	NOV 96	NOV 96	NOV 96
Authority To Proceed	SEP 98	SEP 98	JUN 98
(ATP)-1			
Authority To Proceed	SEP 01	SEP 01	AUG 02 (Ch-1)
(ATP)-2			
Lethal TBM Intercept	SEP 02	SEP 02	SEP 03 (Ch-1)
Demonstration			
Milestone II	MAR 03	MAR 03	MAR 04 (Ch-1)
Milestone III	MAR 05	MAR 05	MAR 06 (Ch-1)
IOC	SEP 06	SEP 06	SEP 07 (Ch-1)
FOC	SEP 08	SEP 08	SEP 09 (Ch-1)

(U) Authority To Proceed (ATP) decisions are made by the AFAE with the advice of the ABL Overarching Integrated Process Team (OIPT) and the consent of the DAE. The current estimate reflects the date for ATP-2 as shown in the contractor's current Integrated Master Schedule.

b. Current Change Explanations --

(U) (CH-1) As a result of the FY 99 Congressional cut, the PDRR program is being restructured. The restructure will result in a one year delay to the major schedule milestones shown above. ATP-2 has moved from Sep 01 to Aug 02. The Lethal TBM Intercept Demonstrations have moved from Sep 02 to Sep 03. Milestone II has moved from Mar 03 to Mar 04. Milestone III has moved from Mar 05 to Mar 06. IOC has moved from Sep 06 to Sep 07, and FOC has moved from Sep 08 to Sep 09. A new APB is being developed and will be submitted and coordinated for approval. The Air Force and OSD have adjusted the program funding consistent with the restructured program. No change was required for FY00.

10. (U) Performance Characteristics:

a. Performance --

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(b)(1)	(b)(1)		TBD	(b)(1)
			TBD	
			TBD	
			TBD	
			TBD	
(S) Probability of Kill			TBD	

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10a. (U) Performance Characteristics (Cont'd):

	Planning Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
Surveillance System	(b)(1)		TBD	(b)(1)
Range (km)				
Interoperability	JTIDS/ LINK-16	JTIDS/ / JTIDS/ LINK-16 / LINK-16	TBD	JTIDS/ LINK-16
On-Station Availability	90% of a 24hr CAP	90% of a/ 85% of a 24hr CAP/ 24hr CAP	TBD	87% of a 24hr CAP
MTBCF (hrs)	100	100 / 60	TBD	78
Lethality (J/cm2)	(b)(1)	(b)(1)	TBD	(b)(1)
Magazine Size (sec)			TBD	
Weapon Field of Regard				
Azimuth (deg)			TBD	
Elevation (deg)			TBD	

(b)(1)

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10b. ~~(S)~~ Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	2210.9	2210.9	2499.4
Procurement	0.0	N/A	
Total Flyaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 97 Base-Year \$	2210.9	2210.9	2499.4
Escalation	288.3	288.3	214.5
Development (RDT&E)	(288.3)	(288.3)	(214.5)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2499.2	2499.2	2713.9

b. (U) Quantity --

Development (RDT&E)	2	2	2
Procurement	N/A	N/A	N/A
Total	2	2	2

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2499.2	-	-	2499.2
Previous Changes:				
Economic	-77.4	-	-	-77.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-10.0	-	-	-10.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-87.4	-	-	-87.4
Current Changes:				
Economic	-46.5	-	-	-46.5
Quantity	-	-	-	-
Schedule	+364.7	-	-	+364.7
Engineering	-	-	-	-
Estimating	-16.1	-	-	-16.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+302.1	-	-	+302.1
Total Changes	+214.7	-	-	+214.7
Current Estimate	2713.9	-	-	2713.9

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

(U) Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2210.9	-	-	2210.9
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-9.3	-	-	-9.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-9.3	-	-	-9.3
Current Changes:				
Quantity	-	-	-	-
Schedule	+313.6	-	-	+313.6
Engineering	-	-	-	-
Estimating	-15.8	-	-	-15.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+297.8	-	-	+297.8
Total Changes	+288.5	-	-	+288.5
Current Estimate	2499.4	-	-	2499.4

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-46.5
PDRR restructure, One year delay to EMD	+313.6	+364.7
(Schedule)		
Adjustment for Current and Prior Inflation.	+7.2	+7.3
(Estimating)		
Funding Adjustment to support Atmospheric data	+2.1	+2.1
collection and Analysis (Estimating)		
FY99 Congressional Cut (Estimating)	-24.4	-25.0
Congressional/General Reductions (Estimating)	-1.5	-1.5
Refinement of In-house estimate (Estimating)	+0.8	+1.0
RDT&E Subtotal	+297.8	+302.1

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	NOV 96	N/A	N/A	NOV 96
Milestone II	MAR 03	N/A	N/A	MAR 04
Milestone III	MAR 05	N/A	N/A	MAR 06
FUE/IOC	SEP 06	N/A	N/A	SEP 07
Total Cost	2499.2	N/A	N/A	N/A
Total Quantity	2	N/A	N/A	N/A
Prog Acq Unit Cost	1249.6	N/A	N/A	N/A

(U) Total Cost, Total Quantity, and Program Acquisition Unit Cost are not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

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

a. RDT&E --

(U) ABL PDRR Contract:
Boeing Space & Comm. Grp., Seattle WA
F29601-97-C-0001, CPAF
Award: November 12, 1996
Definitized: November 12, 1996

Initial Contract Price		
Target	Ceiling	Qty
\$1118.0	N/A	1

Current Contract Price		
Target	Ceiling	Qty
\$1304.0	N/A	1

Estimated Price At Completion	
Contractor	Program Manager
\$1304.0	\$1373.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-0.3	\$-1.5
Cumulative Variances To Date (11/26/98)	\$-0.7	\$-0.6
Net Change	\$-0.4	\$0.9

Explanation of Change:

(U) The cumulative cost variance of -\$0.7M is the result of increased costs in the Flightweight Laser Module (FLM) hardware fabrication, integration, and test, and also the rate growth experienced with the Allied Signal subcontract. These overruns are partially offset by underruns in the

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

Program Management and AIT level of effort account.

The cumulative schedule variance of of -\$0.6M is caused by delays in the turbopump, the thermal management system heat exchanger, the illuminator detail design tasks, late definition of the mechanical bench interfaces, and slides to the Single Tube Ejector Test schedule at TRW.

The Current Contract Price of \$1304.0M is the projected contract value pending completion of the contract restructure process. This \$1304.0M represents an increase from the initial contract price of \$1118.0M. This increase is primarily attributed to four items: 1) an additional year of effort as a result of the FY 99 restructure, 2) added risk reduction to address congressional concerns, and addition of two efforts identified as risk items during the source selection period, Software Lines of Code, and Advanced Adaptive Optics.

The PM's estimate reflects the Program Office Estimate at Complete (EAC) based on the current evaluation of risk areas. The Program Office EAC includes funds budgeted for risk mitigation.

(U) Contract Comments:

The PDRR contract is a Cost Plus Award Fee (CPAF) contract with two fixed priced (subject to escalation) Contract Line Items (CLINS) for the acquisition of the commercial aircraft.

Of the \$1304.0M shown as the target price, \$299.1M represents the fixed price amount for the acquisition of the commercial aircraft, \$896.2M represents the contract budget baseline, and the remaining \$108.7M makes up the award fee pool, and the fixed fee portion of the PDRR EMD studies (CLIN 4). There is no ceiling price for a CPAF or fixed price contract; therefore, we have annotated ceiling price N/A.

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

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

Appropriation	Prior Years (FY94-99)	Budget Year (FY00)	Budget Year (FY01)	Balance To Complete (FY02-06)	Total
RDT&E	518.7	308.6	241.1	1645.5	2713.9
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	518.7	308.6	241.1	1645.5	2713.9

b. Annual Summary -- Airborne Laser

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994		1.9		1.9	1.8
1995		21.8		21.8	21.3
1996		20.6		20.6	20.4
1997		55.7		55.7	56.0
1998		151.7		151.7	153.5
1999		259.7		259.7	265.7
2000		297.0		297.0	308.6
2001		228.3		228.3	241.1
2002		200.1		200.1	214.7
2003		161.3		161.3	176.3
2004		370.8		370.8	413.8
2005		368.7		368.7	419.9
2006		361.8		361.8	420.8
Subtotal	2	2499.4		2499.4	2713.9

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	2	2499.4		2499.4	2713.9

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17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement		

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 315.9

(U) Percent Total Program Expended: 11.6%

18. (U) Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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A-23 SINCGARS

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: SINCGARS

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Single Channel Ground and Airborne Radio System (SINCGARS)
2. DoD Component: Army
3. Responsible Office and Telephone Number:
Project Manager, Tactical Radio Mr. John C. Perrapato
Communication Systems Assigned: November 24, 1997
ATTN: SFAE-C3S-TRC DSN 987-3063; COMM (908) 427-3063
Fort Monmouth, NJ 07703-5505 perrapat@doim6.monmouth.army.mil
4. Program Elements/Procurement Line Items:
RDT&E:
PE 63746 (Shared) Project D555 (Shared)
PE 64805 Project D098, D282
PROCUREMENT:
APPN 1109 ICN 043638 (Navy)
APPN 1810 ICN 068342 (Navy)
APPN 1810 ICN 068892 (Navy)
APPN 0350 ICN 101025 (NGRE)
APPN 0350 ICN 104000 (NGRE)
APPN 0350 ICN 104025 (NGRE)
APPN 0350 ICN 107000 (NGRE)
APPN 0350 ICN 222000 (NGRE) (Shared)
APPN 0350 ICN 230000 (NGRE)
APPN 1810 ICN 24163N (Navy)
APPN 3080 ICN 27423F (Air Force)
APPN 2031 ICN AA0974 (Army) (Shared)
APPN 2031 ICN AZ3500 (Army)
APPN 2035 ICN B00500 (Army)
APPN 2035 ICN B00508 (Army)
APPN 2035 ICN B45500 (Army) (Shared)
APPN 2035 ICN BA9102 (Army) (Shared)

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4a. Program Elements/Procurement Line Items (Cont'd):

APPN 2035 ICN BA9520 (Army) (Shared)
APPN 2035 ICN BA9722 (Army)
APPN 2035 ICN BS9722 (Army)
APPN 2035 ICN BW0006 (Army)
APPN 2035 ICN J30500 (Army)
APPN 2035 ICN MA9722 (Army)
APPN 2035 ICN T99500 (Army) (Shared)
APPN 2035 ICN Z16800 (Army)

5. References:

SAR Baseline (Production Estimate):

Draft Decision Coordinating Paper (DCP) #156, dated September 1983 for the Single Channel Ground and Airborne Radio System.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated August 18, 1993.

6. Mission and Description:

SINCGARS is a family of VHF-FM combat net radios which provides the primary means of command and control for Infantry, Armor and Artillery Units. The SINCGARS system is designed on a modular basis to achieve maximum commonality among the various ground and airborne system configurations. A common receiver-transmitter (RT) is used in the manpack and all vehicular configurations. The SINCGARS family of radios has the capability to transmit and receive voice, tactical data and record traffic messages and is consistent with NATO interoperability requirements. The system operates on any of the 2320 channels between 30-88 Megahertz and is designed to survive in a nuclear environment. The SINCGARS system is operable in a hostile environment through use of electronic counter-counter measures (ECCM). Communication Security (COMSEC) for the basic (non-ICOM) radio is provided by use of the VINSON device. An Integrated COMSEC (ICOM) version of the SINCGARS was introduced in FY85. The System Improvement Program (SIP) models were introduced in FY95, incorporating upgrades to enhance operational capability in the Tactical Internet (TI). The Advanced System Improvement Program (ASIP) models currently being produced was introduced in FY97 and are of a reduced size and weight and provide further enhancements to operational capability. SINCGARS is replacing the standard manpack and vehicular radios, the AN/PRC-77 and the AN/VRC-12 family, respectively. An airborne version of the SINCGARS radio is replacing the standard aircraft radios, the AN/ARC-114 and AN/ARC-131.

7. Executive Summary:

The Department of the Army approved the Single Channel Ground and Airborne Radio System (SINCGARS) Required Operation Capability (ROC) in Dec 74. The SINCGARS ground radio production hardware was type classified standard at ASARC III in Sep 83 and has been in production since Dec 83. The airborne version of the radio commenced production in May 85 with the acquisition objective being completed in FY97.

Dual-sourced production of the ground version of the SINCGARS radio commenced in

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7. Executive Summary (Cont'd):

FY88 as directed by Secretary of Defense Decision Memorandum (SDDM) to independently select and manage a second source which would be a form, fit, and function equivalent to the ITT A/CD Integrated COMSEC (ICOM) SINGGARS at the Line Replaceable Unit (LRU) level. On October 9, 1996, the Army Acquisition Executive (AAE) approved revision of the ground radio acquisition strategy from dual to single source commencing with the FY97 acquisition and continuing through completion of the program for the balance of the ground radio major components. The FY97 head-to-head competition between ITT and GD resulted in the down selection to a single source with ITT being the winner. ITT was awarded a new contract for a Basic production year and two Option years (FY97-FY99).

An increase in the Army Acquisition Objective (AAO) in April 98 took into account ongoing and projected force structure changes and reflected Active Army, Army Reserve, and Army National Guard units. A Congressionally directed program plus-up in FY99 permits procurement of approximately fifty-two percent of the delta between the revised AAO and the Army Procurement Objective (APO). Evolutionary enhancements of the SINGGARS ASIP radio and Internet Controller are envisioned to continue over the next several years, if funded.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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9. Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone 0 (ROC Approval)	DEC 74	N/A	DEC 74
ASARC I	OCT 75	N/A	OCT 75
Milestone I (DSARC I)	FEB 76	N/A	FEB 76
Award AD Contracts	APR 78	N/A	APR 78
Milestone IIIA	SEP 83	SEP 83	SEP 83
Complete DT/OT -- I/II	DEC 83	N/A	DEC 83
Complete Limited DT/OT	DEC 82	N/A	DEC 82
Complete Maturity DT/OT	DEC 83	N/A	DEC 83
Initial Ground (ITT) Production Contract Award	DEC 83	DEC 83	DEC 83
Initial Airborne Production Contract Award	N/A	MAY 85	MAY 85
JRMB - Level Program Review	N/A	DEC 86	DEC 86
Ground (ITT) FAT			
Complete	JUN 85	JAN 88	JAN 88
Ground (ITT) Production Delivery Begins	AUG 85	JAN 88	JAN 88
Airborne Option 1 Award	N/A	APR 88	APR 88
Ground (ITT) Option 1 Delivery Begins	N/A	MAY 88	MAY 88
Initial Ground (GD) Award	N/A	JUL 88	JUL 88
Airborne FAT			
Complete	N/A	SEP 88	SEP 88
Airborne Production Delivery Begins	N/A	NOV 88	NOV 88
ICOM EUT&E	N/A	NOV 88	NOV 88
Milestone IIIB -- ITT Full Rate Production (Non-ICOM)	N/A	MAR 89	MAR 89
Airborne Option 2 Award	N/A	APR 89	APR 89
Ground (ITT) Option 3 Award	N/A	JUN 89	JUN 89
Ground (ITT) Option 2 Delivery Begins	N/A	JUN 89	JUN 89
Airborne Option 1 Delivery Begins	N/A	AUG 89	AUG 89
Airborne Option 2 Delivery Begins	N/A	APR 90	APR 90
ICOM IOT&E (ITT)	N/A	JUN 90	JUN 90
Ground (ITT) Option 3 Delivery Begins	N/A	JUL 90	JUL 90
Milestone IIIB -- ITT Full Rate (ICOM) and GD Low Rate Option I	N/A	DEC 90	DEC 90
Ground (ITT) Option 4 Award	N/A	DEC 90	DEC 90
IOC (1st Div Equipped)	OCT 87	DEC 90	DEC 90
Airborne Option 3 Award	N/A	DEC 90	JAN 91
Ground (GD) Option 1 Award	N/A	DEC 90	MAR 91
Ground (GD) FAT			
Complete	N/A	DEC 91	JUN 92
Airborne Option 3 Delivery Begins	N/A	JAN 92	JAN 92
Ground (ITT) Option 4 Delivery Begins	N/A	JAN 92	JAN 92
Ground (GD) Production Delivery Begins	N/A	FEB 92	JUL 92
Ground (GD) Option 2 Award	N/A	JUN 92	NOV 92
Ground (GD) Option 1 Delivery Begins	N/A	DEC 92	DEC 92
ICOM FOT&E (GD)	N/A	FEB 93	FEB 93
ITT Sole-Source (Basic) Award	N/A	MAR 92	MAR 92
ITT Sole-Source (Basic) Delivery Begins	N/A	JUN 93	JUN 93
Second Source (GD) Full Rate Production	N/A	JUN 93	AUG 93
Program Review			

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9a. Schedule (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Organic Support Capability (ITT ICOM)	N/A	FEB 92	FEB 92
Depot Support Capability	N/A	N/A	
ITT	N/A	FEB 92	FEB 92
GD	N/A	MAR 94	MAR 94
ITT Sole-Source (Option) Award	N/A	MAR 93	MAR 93
Ground (GD) Option 3 Award	N/A	JUN 93	AUG 93
Organic Support Capability (GD ICOM)	N/A	JUL 93	JUL 93
Ground (GD) Option 2 Delivery Begins	N/A	NOV 93	NOV 93
ITT Competitive (Basic) Award	N/A	MAR 94	APR 94
GD Competitive (Basic) Award	N/A	MAR 94	APR 94
ITT Sole-Source (Option) Delivery Begins	N/A	JUN 94	JUN 94
Ground (GD) Option 3 Delivery Begins	N/A	OCT 94	OCT 94
ITT Competitive (Basic) Delivery Begins	N/A	JUN 95	JUN 95
GD Competitive (Basic) Delivery Begins	N/A	NOV 95	NOV 95

b. Current Change Explanations --
None

10. Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Frequency Band (MHz)	30 -	30 - / 30 -	30 -	30 -
	87.975	87.975 / 87.975	87.975	87.975
Number of Channels	2320	2320 / 2320	2320	2320
Channel Spacing (KHz)	25	25 / 25	25	25
Weight (Manpack + ICOM (lbs))	22.5	22.5 / 22.5	18.8	22.5
Power Requirements (Vdc)	28	28 / 28	28	28
Communications Range: (KM)				
(Voice & Analog Data)				
Manpack (above 40 MHz)	8	8 / 8	8	8
Vehicular	35	35 / 35	35	35
Airborne (@ 1000 ft)	N/A	35 / 35	60	35
(Data @ 16 kbps @ 10^-3 Ber)				
Manpack (above 40 MHz)	4.5	4 / 4	4	4
Vehicular	17.5	17 / 17	27	17
Mean Time Between Failure Operational Environment (MTBFOR) (Hrs)				

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10a. Performance Characteristics (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Ground					
Non-ICOM (less ECCM, DRA)	N/A	1250	/ 1250	7588	1250
ICOM	N/A	1250	/ 1250	8382	1250
Airborne	750	750	/ 750	7345	750
ECCM (Hrs)	3500	N/A	/ N/A	8382	3500
Mean Time To Repair (MTTR) (Min)					
Organizational Level	15	15	/ 15	2.9	15
Direct Support (DS)					
Non-ICOM	N/A	60	/ 60	52.2	45/60
ICOM	N/A	45	/ 45	16	45
General Support (GS) (Hrs)	2	N/A	/ N/A	1.78	2

PERFORMANCE CHARACTERISTICS AS DISPLAYED ARE SUBJECT TO THE FOLLOWING CONDITIONS:

- Data for specified performance characteristics demonstrated performance on production models is available from First Article Test and Follow-on Evaluations including operational testing.
- Performance characteristic parameters are point values not ranges.
- Measurement conditions for Communications Range: rolling plains, antenna not buried in foliage, average soil conditions, 10% bit error rate (ber).
- Since Manpack and Vehicular have the same value for MTBF, they have been combined and designated as Ground.
- The SINCGARS reliability requirement as approved in 1974 has no MTBF requirement or DCP threshold. This means that only radio hardware failures are counted, but under field test rather than in a lab. Demonstrated performance results are expressed on a point estimate basis on the AN/VRC-90 or 1477A airborne R/T system basis.
- Direct support Mean Time to Repair (MTTR) is not a cumulative requirement and does not include Organizational Level MTTR.

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10b. Performance Characteristics (Cont'd):

b. Current Change Explanations --
None.

11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	154.4	220.2	209.1
Procurement	4013.3	3089.8	2663.2
Major System Equipment	(3151.8)		(2389.0)
Ancillary Equipment	(431.8)		(123.0)
Total Flyaway	(3583.6)		(2512.0)
Total Other Weapon Syst	(25.9)		(126.9)
Airborne Retrofit Kits			(6.0)
Total Other Wpn Sys	(25.9)		(132.9)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(403.8)		(18.3)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 84 Base-Year \$	4167.7	3310.0	2872.3
Escalation	1444.0	1312.6	971.0
Development (RDT&E)	(-19.0)	(4.5)	(2.6)
Procurement	(1463.0)	(1308.1)	(968.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	5611.7	4622.6	3843.3
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	292853	246845	270384
Total	292853	246845	270384

Note: Excludes 123 RDT&E prototypes from the SAR Baseline and 123 from the Current Estimate that are not considered fully configured.

The unit of measure is the Receiver-Transmitter, the major component contained in the ground and airborne radio.

There was no Low Rate Initial Production (LRIP) on the SINCGARS program.

c. Foreign Military Sales --			
Recipient Country	Case ID	Quantity	*Estimated Cost
Bahrain	BA-B-JAT/JAH	73	1.2M
Finland	FI-B-YBG	6	.1M
SANG	SI-B-JBP	3,370	88.0M
SANG	SI-B-WFW	501	6.3M
SDAF	N/A	318	6.7M
Spain	SP-N-LDE	4	.1M

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11c. Total Program Cost and Quantity (Cont'd):

Kuwait (Army)	KU-B-JAT	575	10.3M
Kuwait (AF)	KU-B-UGO	61	1.0M
Hellenic Republic	GR-B-JAX	131	1.6M
Bahrain	BA-B-JBO	6	.1M
Taiwan MADSAvenger	N/A	126	5.9M
SHAPE Tech Ctr	A2-B-UBB	3	.03M

* Estimated cost includes Total Package Fielding services/supplies.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (AUG 93 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 84 BY\$)	3310.0	2872.3	
(2) Quantity	246845	270384	
(3) Unit Cost	0.013	0.011	-15.38
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 84 BY\$)	3089.8	2663.2	
(2) Quantity	246845	270384	
(3) Unit Cost	0.013	0.010	-23.08

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SINCGARS, December 31, 1998

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	135.4	5476.3	-	5611.7
Previous Changes:				
Economic	+0.5	-64.3	-	-63.8
Quantity	+11.6	-830.8	-	-819.2
Schedule	+2.2	+770.1	-	+772.3
Engineering	+46.4	+47.1	-	+93.5
Estimating	+15.6	-1480.2	-	-1464.6
Other	-	-	-	-
Support	-	-324.1	-	-324.1
Subtotal	+76.3	-1882.2	-	-1805.9
Current Changes:				
Economic	-	-11.3	-	-11.3
Quantity	-	+85.9	-	+85.9
Schedule	-	+9.9	-	+9.9
Engineering	-	+0.6	-	+0.6
Estimating	-	-26.4	-	-26.4
Other	-	-	-	-
Support	-	-21.2	-	-21.2
Subtotal	-	+37.5	-	+37.5
Total Changes	+76.3	-1844.7	-	-1768.4
Current Estimate	211.7	3631.6	-	3843.3

Summary (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	154.4	4013.3	-	4167.7
Previous Changes:				
Quantity	+9.7	-368.9	-	-359.2
Schedule	-	+50.0	-	+50.0
Engineering	+35.0	+30.8	-	+65.8
Estimating	+10.0	-831.6	-	-821.6
Other	-	-	-	-
Support	-	-263.0	-	-263.0
Subtotal	+54.7	-1382.7	-	-1328.0
Current Changes:				
Quantity	-	+57.2	-	+57.2
Schedule	-	+0.9	-	+0.9
Engineering	-	+0.6	-	+0.6
Estimating	-	-10.6	-	-10.6
Other	-	-	-	-
Support	-	-15.5	-	-15.5
Subtotal	-	+32.6	-	+32.6
Total Changes	+54.7	-1350.1	-	-1295.4
Current Estimate	209.1	2663.2	-	2872.3

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SINCGARS, December 31, 1998

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

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) Procurement

Revised escalation indices. (Economic)	N/A	-11.3
Total variance associated with increase of 5,879 units.	+43.3	+65.0
Increase to Army requirement of 5000 units, from 215,492 to 220,492. (Quantity)	+48.7	+73.2
Increase to Marine Corps requirement of 155 units, from 31,313 to 31,468. (Quantity)	+1.5	+2.2
Increase to Navy requirement of 724 units, from 3424 to 4148. (Quantity)	+7.0	+10.5
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	+0.9	+9.8
Allocation to Engineering variance resulting from Quantity Change. (Engineering)	+0.6	+0.6
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	-8.7	-21.3
Revised annual procurement buy profile. (Schedule)	0.0	+0.1
Revised unit cost based on actual option awards. (Estimating)	-1.9	-5.1
Revised estimate for Total Package Fielding (TPF) and New Equipment Training (NET) based on fielding upgraded version of radio. (Support)	-15.5	-21.2
Procurement Subtotal	+32.6	+37.5

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.02	--	--	--	--	-0.01	--	--	-0.01	0.01

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SINGARS, December 31, 1998

14b. Unit Cost and Other History (Cont'd):

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.02	--	--	--	--	-0.01	--	--	-0.01	0.01

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	FEB 76	FEB 76
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	SEP 83	SEP 83
FUE/IOC	N/A	N/A	OCT 87	DEC 90
Total Cost	0	0	5611.7	3843.3
Total Quantity	0	0	292853	270384
Prog Acq Unit Cost	0	0	0.02	0.01

Additional Milestone III information:

Milestone IIIB Non-ICOM Mar 89; Milestone IIIB ICOM Dec 90; and Milestone IIIB Second Source Aug 93.

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

a. Procurement --

SINGARS Ground PY6:
GENERAL DYNAMICS, Tallahassee, FL
DAAB07-95-C-C502, FPAF
Award: March 30, 1995
Definitized: March 30, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$128.5	N/A	15219

Current Contract Price		
Target	Ceiling	Qty
\$139.9	N/A	15219

Estimated Price At Completion	
Contractor	Program Manager
\$139.9	\$139.9

Explanation of Change:

The target price increase of \$2.5M from the Dec 1997 SAR is due to the incorporation of modifications for earned reliability award fees.

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SINGARS, December 31, 1998

15. Contract Information (Cont'd):

This is the last time this contract will appear in the SAR because deliveries are 90% completed.

Cost and Schedule variance reporting is not required on this FPAF contract.

<u>SINGARS Ground PY 9:</u> ITT CORPORATION, Fort Wayne, IN DAAB07-95-C-C503, FPAF Award: March 30, 1995 Definitized: March 30, 1995	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$145.8	N/A	18601

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$167.1	N/A	18601	\$167.1	\$167.1

Explanation of Change:

This is the last time this contract will appear in the SAR because deliveries are 90% completed.

Cost and Schedule variance reporting is not required on this FPAF contract.

<u>SINGARS Ground PY10:</u> ITT CORPORATION, Fort Wayne, IN DAAB07-96-C-C501, FPAF Award: April 19, 1996 Definitized: April 19, 1996	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$153.8	N/A	16501

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$167.1	N/A	16501	\$167.1	\$168.6

Explanation of Change:

The target price increase of \$5.7M from the Dec 1997 SAR is due to the incorporation of modifications for an Engineering Change Proposal (ECP) to permit System Improvement Program (SIP) reprogrammability and award of earned reliability award fees. The contractor's Estimate at Completion (EAC) does not include reliability award fee yet to be earned.

Cost and Schedule variance reporting is not required on this FPAF contract.

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SINCGARS, December 31, 1998

15. Contract Information (Cont'd):

<u>SINCGARS Ground PY7:</u> GENERAL DYNAMICS, Tallahassee, FL DAAB07-96-C-C502, FPAF Award: April 19, 1996 Definitized: April 19, 1996	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$107.0	N/A	11001

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$110.8	N/A	11001	\$110.8	\$112.9

Explanation of Change:

The target price increase of \$3.1M from the Dec 1997 SAR is due to the incorporation of modifications to procure the Red Baseband Processor and award of earned reliability award fees. The contractor's Estimate at Completion (EAC) does not include reliability award fee yet to be earned.

Cost and Schedule variance reporting is not required on this FPAF contract.

<u>SINCGARS Ground PY11:</u> ITT Corporation, Fort Wayne, IN DAAB07-97-C-C600, FFP Award: April 25, 1997 Definitized: August 13, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$190.0	N/A	35000

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$361.2	N/A	68973	\$361.2	\$361.2

Explanation of Change:

The target price increase of \$170.1M since the Dec 1997 SAR is due to the award of production Option year 1 and incorporation of an Engineering Change Proposal (ECP) for the Vehicular Amplifier Adaptor Internet Controller upgrade.

Cost and Schedule variance reporting is not required on this FFP contract.

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SINCGARS, December 31, 1998

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

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

<u>Appropriation</u>	<u>Prior</u> <u>Years</u> (FY76-99)	<u>Budget</u> <u>Year</u> (FY00)	<u>Budget</u> <u>Year</u> (FY01)	<u>Balance To</u> <u>Complete</u>	<u>Total</u>
RDT&E	211.7	-	-	-	211.7
Procurement	3615.4	13.2	3.0	-	3631.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3827.1	13.2	3.0	-	3843.3

b. Annual Summary -- SINCGARS

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal</u> <u>Year</u>	<u>Qty</u>	<u>Flyaway</u> <u>FY84</u> <u>Dollars</u> <u>Nonrec</u>	<u>Flyaway</u> <u>FY84</u> <u>Dollars</u> <u>Rec</u>	<u>Total</u> <u>Program</u> <u>Base-Year \$</u>	<u>Total</u> <u>Program</u> <u>Then-Year \$</u>
1976				0.7	0.4
1977				0.3	0.2
1978				3.2	2.0
1979				9.2	6.2
1980				16.6	12.4
1981				24.4	20.0
1982				27.3	24.4
1983				13.9	13.2
1984				12.0	11.8
1985				10.1	10.3
1986				9.9	10.4
1987				11.1	12.0
1988				13.2	14.6
1989				14.2	16.5
1990				7.6	9.2
1991				10.2	12.8
1992				2.1	2.7
1993				1.3	1.7
1994				5.3	7.2
1995				3.9	5.4
1996				3.0	4.2
1997				5.0	7.2
1998				4.6	6.7
Subtotal				209.1	211.7

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SINCGARS, December 31, 1998

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

Appropriation: 0350 - National Guard & Reserve Equipm, Defense

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991	1511		10.7	10.7	14.3
1992	2394		17.1	17.1	23.3
1993	4522		30.4	30.4	42.4
1994	3150		24.8	24.8	35.1
1995					
1996	400		3.0	2.9	4.2
1997				0.1	0.2
Subtotal	11977		86.0	86.0	119.5

Appropriation: 1109 - Procurement, Marine Corps

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989	2300		21.8	21.8	27.4
1990					
1991					
1992	4100		38.4	38.4	52.4
1993	5450		37.7	37.7	52.5
1994	4539		32.6	32.6	46.1
1995	7103		36.5	36.5	52.6
1996	3606		30.5	30.5	44.3
1997	4218		21.1	21.1	31.1
1998	155		1.5	1.5	2.2
Subtotal	31468		220.1	220.1	308.6

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985	332		1.8	1.8	2.0
1986					
1987					
1988					
1989	100		0.6	0.6	0.8
1990					
1991	586		4.3	4.3	5.7
1992	378		2.9	2.9	4.0
1993	948		8.3	8.3	11.6
1994	405		3.8	3.8	5.3
1995	221		1.5	1.5	2.2
1996	128		1.0	1.0	1.4
1997	128		0.7	0.7	1.1

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SINCGARS, December 31, 1998

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

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	47		0.1	0.1	0.2
1999	875		2.7	2.7	4.0
Subtotal	4148		27.7	27.7	38.3

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985	150	4.3	10.6	17.5	19.0
Subtotal	150	4.3	10.6	17.5	19.0

OPA inflation indices were used since the Airborne radios are Communications-Electronics equipment. All requirements for the Airborne radio are funded in the OPA appropriation beginning in FY88.

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1983	175	1.2	17.3	19.8	20.3
1984	1325	3.1	56.7	63.4	66.9
1985	10268	3.1	131.5	133.7	145.5
1986	400	0.4	76.8	76.5	85.6
1987				11.2	13.0
1988	720		29.1	26.7	32.2
1989	13599	3.1	155.4	179.2	225.6
1990	2925	5.4	64.7	62.2	80.8
1991	15328	1.0	200.2	201.3	269.1
1992	16580	5.5	179.1	200.2	273.4
1993	18157	0.6	135.1	148.9	207.4
1994	24219	0.1	229.8	243.6	344.1
1995	23850	0.1	223.5	240.6	346.6
1996	23797	0.1	221.1	245.2	356.4
1997	31302	0.1	177.6	212.5	312.6
1998	32847	0.1	193.1	183.0	272.0
1999	5000		36.9	38.8	58.4
2000				8.7	13.2
2001				1.9	3.0
Subtotal	220492	20.9	2127.9	2297.4	3126.1

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SINCGARS, December 31, 1998

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

Excluded from the FY98 program value is \$6.0M the applies specifically to the Frequency Hopping Multiplexer (FHMUX) program. Also excluded is \$13.8M in FY05 reflected in the President's Budget that is not part of the SINCGARS program.

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991	375		2.1	2.1	2.8
1992	974		5.6	5.6	7.7
1993	137		1.1	1.1	1.5
1994	485		4.1	4.1	5.8
1995	178		1.6	1.3	2.9
1996					
1997					
1998				0.3	0.4
Subtotal	2149		14.5	14.5	20.1

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Army	220642	25.2	2138.5	2524.0	3356.8
OSD	11977		86.0	86.0	119.5
Navy	35616		247.8	247.8	346.9
USAF	2149		14.5	14.5	20.1
Grand Total	270384	25.2	2486.8	2872.3	3843.3

17. Delivery/Expenditure Information:

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	195536	195536

Percent Total Program Quantities Delivered: 72.3%

b. Total Expenditures To Date (In Millions of Dollars): \$ 3324.6

Percent Total Program Expended: 86.5%

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SINGARS, December 31, 1998

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

SINGARS is the VHF-FM radio communication system which provides the primary means of command and control for infantry, artillery and armor units. Since SINGARS will be fielded to every type of unit in the Army, there is no "typical" division set; however, 4,500 receiver-transmitters (RTs) are used as an average division quantity. Ninety-eight per cent of the total buy will be fielded; costs shown are based on fielded divisions. SINGARS does not require a dedicated operator except for an average of 1200 retransmission operators needed for specific missions. Operating tempo (peacetime) varies depending on the theater in which the radio is deployed and ranges from 177 hours per year for Reserve Units to 1638 hours per year in Europe. No depot overhaul is scheduled. Operating and Maintenance (O&M) (consumable) repair parts includes batteries. Maintenance includes depot maintenance, civilian field maintenance labor, and interim contractor support. Other Operating and Support (O&S) costs include training, transportation, System/Project Management and other sustaining support costs. The operating life of SINGARS is 20 years. No operating and support cost data are currently available for the antecedent system, AN/PRC-77 and AN/VRC-12 family of radios.

SINGARS Program Life Cycle Cost Estimate validated April 5, 1993.

Total Operation and Sustainment cost for the life cycle of the program is \$2977.1M in Base Year FY84 Dollars, \$5714.5M in Then Year Dollars.

b. Costs -- (FY 1984 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Division (4500 RTs)	Avg Annual Cost Per (Antecedent)
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	2.6	0.0
Intermediate Maintenance	0.1	0.0
Depot Maintenance	0.1	0.0
Contractor Support	0.9	0.0
Sustaining Support	0.1	0.0
Indirect Costs	N/A	N/A
Total	3.8	0.0

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: STANDARD MISSILE-2

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): STANDARD Missile-2 MEDIUM RANGE/EXTENDED RANGE
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:
PMS422 CAPT C.M. BOURNE
PEO THEATER SURFACE COMBATANTS Assigned: December 23, 1998
2531 JEFFERSON DAVIS HIGHWAY DSN 332-0662; COMM (703) 602-0662
ARLINGTON, VA 22242-5170 BOURNECM@NAVSEA.NAVY.MIL
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0603318N Project U01632
(U) PE 0604366N Project K00439
PROCUREMENT:
(U) APPN 1507 ICN 2234 (Navy)
MILCON:
(U) PE 0702096N

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STANDARD MISSILE-2, December 31, 1998

5. (U) References:

SM-2 BLK I\II\III\A\B

SAR Baseline (Production Estimate):

(U) SM-2 Block II Milestone IIIIE NPDM of 17 December 1986. Block III Milestone IIIIB NAVY ARB of May 12, 1988.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated July 10, 1996.

SM-2 BLK IV

SAR Baseline (Development Estimate):

(U) NAE Approved Acquisition Program Baseline dated November 20, 1990.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated December 22, 1998.

6. ~~(S)~~ Mission and Description:

(U) The STANDARD Missile Medium Range (SM-2 MR) and Extended Range (SM-2 ER) are solid propellant, tail controlled surface-to-air missiles with mid-course guidance, semi-active homing guidance and home-on jam capability. The SM-2 Block I ER missile was produced in FY 76 thru FY 83. The SM-2 Block I MR missile was produced in FY 80 thru FY 83. Both missiles incorporated command guidance, inertial reference system and monopulse receiver to improve range, accuracy and electronic countermeasure (ECM) resistance over the SM-1 missile.

(U) Block II SM-2 is a variation of Block I SM-2. Block II Medium Range (MR) and Extended Range (ER) Missiles incorporate increased kinematics, new conventional warhead, improved fuzing, and improved guidance to provide enhanced capability against high flying, steep diving anti-ship missiles (ASMs). Due to the addition of a MK-104 Dual Thrust Rocket Motor, Block II MR missile range is double that of Block I MR missiles and approximates range of Block II ER missiles. The SM-2 Block II ER was deployed on all TERRIER Guided Missile Cruisers and Destroyers prior to their decommissioning. The SM-2 Block II MR is deployed on AEGIS CG-47/51 Cruisers and AEGIS DDG-51 Destroyers.

(U) The STANDARD Missile-2 Block III, IIIA and IIIB provide improved low altitude and guidance performance over SM-2 Block II. The SM-2 Block III

(b)(1)

SM-2 BLOCK IIIA IS A STANDARD MISSILE WITH A (b)(1)

(b)(1) coupled with a (b)(1) to provide improved lethality throughout the envelope. A moving target indicator (MTI) is also incorporated in the fuze design to permit engagement of (b)(1) cruise missiles. The SM-2 Block IIIB Missile Homing Improvement Program (MHIP) encompasses improvements to the Block IIIA for continued evolution in SM guidance capability with incorporation of a dual mode Infrared/RF guidance system.

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STANDARD MISSILE-2, December 31, 1998

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

These versions of STANDARD Missile will be employed on ships capable of firing SM-2 Block III. The SM-2 Block III missile achieved IOC in August, 1990. The SM-2 Block IIIA Missile achieved IOC in January, 1994. The SM-2 Block IIIB Missile achieved IOC in October 1997.

(U) STANDARD Missile-2 Block IV will provide dramatic increases in performance for AEGIS/VLS ships. Block IV incorporates a new separable booster with thrust vector control, a new guidance section, all digital autopilot, and the ordnance section and dual thrust rocket motor of Block IIIA. The Block IV missile will be capable of supporting the entire SPY 1B/D envelope and will have improved capability at very high altitudes and at large crossranges. Block IV will also retain the low altitude performance of Block III/IIIA. SM-2 Block IV will be introduced into the fleet in (b)(1). After five years of production it is anticipated that the Block IV will evolve into the Block IVA variant in FY 00.

7. (U) Executive Summary:

(U) The STANDARD Missile-2 Block I (RIM-67), 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.

(U) 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. The SM-2 BLK II MR and ER variants are no longer in production.

(U) Approval for production of the Block III, which includes a guidance section upgrade to increase capability against low altitude targets, was received May 12, 1988 by the Navy Acquisition Review Board. The Block III achieved IOC in August 1990. The Block IIIA which includes an upgraded ordnance section, completed OPEVAL in August 1991 with eleven out of twelve successful firings and achieved IOC in January, 1994 with the missile loadout of USS Vicksburg (CG 69).

(U) The new SM-2 Block IIIB TEMP was approved by OUSD(A&T) on April 26, 1994. A new APB for the SM-2 Block I/II/III/A/B was approved on June 28, 1994. On October 21, 1994, the first fully successful test flight of the SM-2 Block IIIB occurred. In July, 1994 the first at-sea firings of SM-2 Block IV were conducted, with 4 of the 5 flights successful. The unsuccessful mission was repeated on October 5, 1994 and was a success. The new TEMP for the SM-2 Block IV was approved by OUSD(A&T) on August 2, 1994. The SM-2 Block IV GTV series was completed in November, 1994 with 7 of 8 flights successful. On October 6, 1994, DT/IOT&E was completed for SM-2 Block IV onboard USS Lake Erie (CG 70) with 4 of 6 flights successful. The SM-2 Block IV ARE was held on January 9, 1995 and the program was certified to proceed to the NPDM.

(U) On June 15, 1995, the SM-2 Block IIIB completed its initial phase of flight testing at WSMR, with the successful intercept of a Vandal target simulating

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7. (U) Executive Summary (Cont'd):

the prime threat. On May 1, 1995 the SM-2 Block IV received DAB approval for LRIP. A new APB for the SM-2 Block IV was approved on May 4, 1995.

(U) On October 16, 1995, the SM-2 Block IIIB received approval to proceed to LRIP. A new APB for the SM-2 Block I/II/III/A/B was approved on October 31, 1995. On November 20, 1995 the ADM was signed. The at-sea DT for the SM-2 Block IIIB was successfully completed on December 8, 1995.

(U) The SM-2 Block IIIB at-sea OPEVAL was successfully completed on April 15, 1996, and full rate production was approved at a MSIII NPDM on July 15, 1996. The SM-2 Block IIIB ADM was signed September 19, 1996. SM-2 Block IIIB IOC was achieved on October 21, 1997. A new APB for the SM-2 Block I/II/III/A/B was approved on July 10, 1996. A new APB for the SM-2 Block IV was approved on December 22, 1998 revising the schedule for First Production Delivery and IOC.

(U) On January 16, 1997, Raytheon entered into definitive agreements with Hughes Electronics Corporation (parent of Hughes Missile Systems Company) to bring about the merger of the Hughes Electronics defense operation and Raytheon. On December 17, 1997 Raytheon completed its merger with Hughes to create Raytheon Systems Company (RSC).

(U) SM-2 Block IV achieved First Production Delivery in November 1998.

8. (U) Threshold Breaches:

SM-2 BLK I\II\III\A\B

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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8. (U) Threshold Breaches (Cont'd):

SM-2 BLK IV

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MII/CON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Due to hardware issues and the related fault isolation process following Production Qualification Round flight test 9 Dec 98, the IOC schedule has slipped beyond the current APB threshold (MAY 99) and caused a breach. A baseline change request and Program Deviation Report (PDR) are in process to address this issue.

Program Acquisition Unit Cost (PAUC) and Average Procurement Unit Cost (APUC) breaches are due to a decrease in total program quantity of Block IV Missiles from 184 to 162 units. A baseline change request and PDR are in process to address these breaches.

9. (U) Schedule:

SM-2 BLK I\II\III\A\B

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
BLOCK II MR			
First Flt Test (development test)	FEB 83	FEB 83	FEB 83
Pilot Production Approved	JUN 83	JUN 83	JUN 83
Lot 1 Approval for Limited Prod	FEB 84	FEB 84	FEB 84
DT/OT and OPEVAL	SEP 84	SEP 84	SEP 84
Lot 2 Approval for Limited Prod	JUN 85	JUN 85	JUN 85
FOT&E USS VINCENNES CG-49	NOV 85	NOV 85	NOV 85
Lot 3 ALP	APR 86	APR 86	APR 86

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

SM-2 BLK I\II\III\A\B

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone IIIE (AFP)	DEC 84	DEC 86	DEC 86
BLOCK II ER			
FOT&E Vertical Launch Cruiser CG 54	DEC 86	N/A	APR 88
USS Antietam (Blk II MR)			
OPEVAL Complete	MAR 83	MAR 83	MAR 83
Pilot Production Approved	APR 82	APR 82	APR 82
Lot 1 Approval for Limited Production	JUN 83	JUN 83	JUN 83
Lot 2 Approval for Limited Production	FEB 84	FEB 84	FEB 84
Lot 3 Approval for Limited Production	MAR 85	MAR 85	MAR 85
FOT&E USS MAHAN DDG 42	MAR 85	MAR 85	MAR 85
Lot 4 Approval for Limited Production	APR 86	APR 86	MAY 86
Milestone IIIE (AFP)	DEC 84	DEC 84	DEC 86
FOT&E USS Scott DDG 995 (Blk II ER)	DEC 86	N/A	DEC 89
BLOCK III			
Milestone II	JUN 85	JUN 85	JUN 85
Prelim Design Review	JUN 85	JUN 85	JUN 85
Critical Design Review	JUN 86	JUN 86	JUN 86
Developmental Test			
Start	SEP 87	SEP 87	SEP 87
Complete	JUN 88	JUN 88	JUN 88
Release to Production	JUN 88	JUN 88	JUN 88
IOC	SEP 90	SEP 90	AUG 90
BLOCK IIIA			
Milestone II	JUN 85	JUN 85	JUN 85
Prelim Design Review	DEC 87	DEC 87	DEC 87
Critical Design Review	MAR 90	MAR 90	MAR 90
Developmental Test	JUN 91	JUN 91	JUL 91
Operational Test	JUN 91	JUN 91	AUG 91
Milestone III	SEP 91	SEP 91	FEB 92
IOC	SEP 93	SEP 93	JAN 94
BLOCK IIIB			
Milestone II	JUN 89	JUN 89	JUN 89
Prelim Design Review	SEP 89	SEP 89	SEP 89
Critical Design Review	JUN 91	FEB 92	APR 92
Milestone IIIA	SEP 91	N/A	OCT 95
LRIP Program Decision	N/A	OCT 95	OCT 95
Developmental Test (WSMR)	DEC 91	DEC 93	JUN 94
ARB (Kit Release)	SEP 92	N/A	N/A
Developmental Test (at Sea)	MAR 93	DEC 95	DEC 95
Operational Test	JUN 93	FEB 96	APR 96
IOC	JUN 93	APR 97	OCT 97
Milestone IIIB	SEP 93	N/A	N/A
Milestone III (Full Rate Production)	N/A	JUN 96	JUL 96

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

SM-2 BLK I\II\III\A\B

b. Current Change Explanations -- None

SM-2 BLK IV

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone II	AUG 86	AUG 86	AUG 86
FSED Contract	JUL 87	JUL 87	JUL 87
Preliminary Design Review	DEC 88	DEC 88	DEC 88
Critical Design Review	JUL 89	AUG 89	AUG 89
Development Test	NOV 90	MAY 94	JUL 94
Milestone IIIA (NPDM) Pilot Production	DEC 90	N/A	N/A
Operational Test	SEP 91	JUL 94	OCT 94
Milestone IIIB (Full Production)	DEC 91	N/A	N/A
LRIP Program Decision	N/A	JAN 95	MAY 95
First Production Delivery	FEB 93	OCT 98	NOV 98 (Ch-1)
Milestone III (Full Rate Production)	N/A	TBD	TBD
IOC	MAR 93	NOV 98	JUL 99 (Ch-2)

b. Current Change Explanations --

~~(Ch-1)~~ (Ch-1) - First Production Delivery was achieved earlier than previous current estimate causing a change in dates from DEC 98 to NOV 98.

(Ch-2) - The Initial Operating Capability (IOC) has changed from FEB 99 to JUL 99 due to a failed Production Qualification Round test 9 Dec 98 at White Sands Missile Range. Booster operation was nominal, but the booster did not separate. A re-test is scheduled for 3rd Qtr FY99. This new date has caused a schedule breach. A Baseline Change Request and Program Deviation Report are in process to address this issue.

10. ~~(S)~~ Performance Characteristics:

SM-2 BLK I\II\III\A\B

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
BLOCK II MR	(b)(1)			
Max Range (nm)				
Min Range (nm)				
Max Alt (k ft)				
Miss Distance (ft)				
Prob of Successful Engagement (%)				
Flight Reliability				
Launch Reliability				
BLOCK II ER				

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10a. ~~(U)~~ Performance Characteristics (Cont'd):
SM-2 BLK I\II\III\A\B

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Max Range (nm)	(b)(1)			
Min Range (nm)				
Max Alt (k ft)				
Miss Distance (ft)				
Prob of Successful Engagement (%)				
Flight Reliability				
Launch Reliability				
BLOCK III				
Intercept Altitude (ft)				
Prob of Air Target Kill (%)				
Technical Reliability				
Flight Reliability				
Launch Availability (8 mon storage)				
Compatability				
BLOCK IIIA				
Intercept Altitude (ft)				
Warhead Fragment Velocity (ft per sec)				
(b)(1)				
Prob of Air Target Kill (%)				
Technical Reliability				
Flight Reliability				
Launch Availability (8 mon storage)				
Compatability				
BLOCK IIIB				
Unintegrated IR Seeker Sensitivity (pw/cm^2)				
Integrated IR Seeker Sensitivity (pw/cm^2)				

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10a. (U) Performance Characteristics (Cont'd):

SM-2 BLK I\II\III\A\B

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
1 Pointing Accuracy (deg)	(b)(1)			
2 Track Rate (deg per sec)				
3 Prob of Air Target Kill (%)				
4 Technical Reliability				
5 Flight Reliability				
6 Launch Availability (8 mon storage)				
7 Compatibility				

b. Current Change Explanations -- None

SM-2 BLK IV

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
1 Intercept Altitude (K ft)	(b)(1)			
2 Probability of Air Target Kill (%)				
3 Technical Reliability				
4 Flight Reliability				
5 Launch Availability (8 month storage)				
6 (Objective not tested until FOT&E)				
7 Compatibility				

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10b. (U) Performance Characteristics (Cont'd):

SM-2 BLK IV

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

SM-2 BLK I\II\III\A\B

a. (U) Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	648.4	770.6	781.8
Procurement	5923.2	6432.1	6477.6
AUR Hardware	(4510.5)		(4456.3)
Other Flyaway	(500.0)		(981.8)
Total Flyaway	(5010.5)		(5438.1)
Non-recurring Support	(388.9)		(493.3)
Fleet Support	(330.9)		(356.6)
Total Other Wpn Sys	(719.8)		(849.9)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(192.9)		(189.6)
Construction (MILCON)	0.0	34.0	34.2
Acquisition O&M	0.0	0.0	0.0
Total FY 84 Base-Year \$	6571.6	7236.7	7293.6
Escalation	1481.2	1536.0	1446.6
Development (RDT&E)	(53.2)	(86.6)	(80.4)
Procurement	(1428.0)	(1440.6)	(1357.6)
Construction (MILCON)	(0.0)	(8.8)	(8.6)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	8052.8	8772.7	8740.2

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	10778	11504	11505
Total	10778	11504	11505

(U) Excludes 88 RDT&E units that are not considered fully configured.

c. (U) Foreign Military Sales --

Commitments to date are: In FY88, Canada procured 22 SM-2 Block II missiles for \$8.5M. In FY89, Canada procured 74 SM-2 Block IIs for \$34.3M, and Japan 41 SM-2 Block IIs for \$15.8M. In FY92, Canada procured 10 SM-2 Block IIIs for \$5.6M, and Japan 85 SM-2 Block II and 19 Block III missiles for \$67.8M. In FY94, Japan purchased 22 SM-2 Block II and 65 Block III missiles for \$58.8M. In FY96, Canada ordered 21 SM-2 Block III missiles for \$11.9M, and Japan 87 Block III missiles for \$58.4M. In FY97, Canada ordered 12 SM-2 Block IIIA missiles and Japan ordered 26 SM-2 Block III missiles. In FY98 Canada ordered 10 SM-2 Block IIIA and Japan ordered 5 SM-2 Block III missiles. In FY99, we anticipate Canada to order 10 SM-2 Block IIIA missiles and Japan to procure 16 SM-2 Block III missiles.

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11d. (U) Total Program Cost and Quantity (Cont'd):

SM-2 BLK I\II\III\A\B

d. Nuclear Costs -- None.

SM-2 BLK IV

a. (U) Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	283.9	319.8	320.0
Procurement	1914.6	342.9	338.1
AUR Hardware	(1551.7)		(223.3)
Other Flyaway	(207.0)		(63.1)
Total Flyaway	(1758.7)		(311.5)
Fleet Support	(60.1)		(17.2)
Non-Recurring Support	(66.8)		(0.0)
Total Other Wpn Sys	(126.9)		(17.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(29.0)		(9.4)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 84 Base-Year \$	2198.5	662.7	658.1
Escalation	815.9	238.3	230.9
Development (RDT&E)	(56.2)	(72.1)	(71.9)
Procurement	(759.7)	(166.2)	(159.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3014.4	901.0	889.0
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	3000	184	162
Total	3000	184	162

(U) Note: At the LRIP Program Decision (4 May 95), a quantity of 106 was approved with a provision for additional quantities should the program not transition to the SM-2 Block IVA as planned. ASN (RD&A) Memo dtd 17 Oct 97 authorizes procurement of additional SM-2 BLK IV LRIP Missiles to a maximum quantity of 180.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

SM-2 BLK I\II\III\A\B

	UCR Baseline (JUL 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 84 BY\$)	7236.7	7293.6	
(2) Quantity	11504	11505	
(3) Unit Cost	0.629	0.634	+0.79
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 84 BY\$)	6432.1	6477.6	
(2) Quantity	11504	11505	
(3) Unit Cost	0.559	0.563	+0.72

SM-2 BLK IV

	UCR Baseline (DEC 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 84 BY\$)	662.7	658.1	
(2) Quantity	184	162	
(3) Unit Cost	3.602	4.062	+12.77
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 84 BY\$)	342.9	338.1	
(2) Quantity	184	162	
(3) Unit Cost	1.864	2.087	+11.96

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13. (U) Cost Variance Analysis:

SM-2 BLK I\II\III\A\B

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	701.6	7351.2	-	8052.8
Previous Changes:				
Economic	-33.4	-876.0	+1.6	-907.8
Quantity	-	+271.6	-	+271.6
Schedule	-	+572.0	-	+572.0
Engineering	+5.1	+202.1	-	+207.2
Estimating	+187.8	+209.3	+41.2	+438.3
Other	-	-	-	-
Support	-	-9.2	-	-9.2
Subtotal	+159.5	+369.8	+42.8	+572.1
Current Changes:				
Economic	-0.6	-32.2	-	-32.8
Quantity	-	-	-	-
Schedule	-	+21.2	-	+21.2
Engineering	-	-	-	-
Estimating	+1.7	+39.0	-	+40.7
Other	-	-	-	-
Support	-	+86.2	-	+86.2
Subtotal	+1.1	+114.2	-	+115.3
Total Changes	+160.6	+484.0	+42.8	+687.4
Current Estimate	862.2	7835.2	42.8	8740.2

(U) Summary (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	648.4	5923.2	-	6571.6
Previous Changes:				
Quantity	-	+289.6	-	+289.6
Schedule	-	+108.7	-	+108.7
Engineering	+16.1	+161.7	-	+177.8
Estimating	+116.5	-157.4	+34.2	-6.7
Other	-	-	-	-
Support	-	+77.8	-	+77.8
Subtotal	+132.6	+480.4	+34.2	+647.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.8	+25.0	-	+25.8
Other	-	-	-	-
Support	-	+49.0	-	+49.0
Subtotal	+0.8	+74.0	-	+74.8
Total Changes	+133.4	+554.4	+34.2	+722.0
Current Estimate	781.8	6477.6	34.2	7293.6

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

SM-2 BLK I\II\III\A\B

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RD&F</u>		
Revised escalation indices. (Economic)	N/A	-0.6
Adjustment for current and prior inflation. (Estimating)	+0.1	+0.2
Miscellaneous program cost changes. (Estimating)	+0.7	+1.5
RD&F Subtotal	+0.8	+1.1
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-32.2
Increase due to revised FY98-FY10 procurement profile; additional procurement year added. (Schedule)	0.0	+21.2
Adjustment for current and prior inflation. (Estimating)	+2.7	+4.0
Miscellaneous program cost changes. (Estimating)	-6.6	-10.5
Adjustment for current and prior inflation. (Support)	+0.9	+1.0
Increase due to additional support for additional procurement year (FY10). (Support)	+48.1	+85.2
Increase due to additional initial spare requirements (FY98-FY09). (Support)	+28.9	+45.5
Correction to align Flyaway and Support costs. (Estimating)	+28.9	+45.5
(Support)	-28.9	-45.5
Procurement Subtotal	+74.0	+114.2

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

SM-2 BLK IV

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	340.1	2674.3	-	3014.4
Previous Changes:				
Economic	+1.1	-8.6	-	-7.5
Quantity	-	-3014.2	-	-3014.2
Schedule	-	+1020.1	-	+1020.1
Engineering	-	+126.3	-	+126.3
Estimating	+50.7	-205.2	-	-154.5
Other	-	-	-	-
Support	-	-83.6	-	-83.6
Subtotal	+51.8	-2165.2	-	-2113.4
Current Changes:				
Economic	-	-3.7	-	-3.7
Quantity	-	-22.6	-	-22.6
Schedule	-	+10.0	-	+10.0
Engineering	-	+1.2	-	+1.2
Estimating	-	+6.9	-	+6.9
Other	-	-	-	-
Support	-	-3.8	-	-3.8
Subtotal	-	-12.0	-	-12.0
Total Changes	+51.8	-2177.2	-	-2125.4
Current Estimate	391.9	497.1	-	889.0

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STANDARD MISSILE-2, December 31, 1998

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

SM-2 BLK IV

(U) Summary (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	283.9	1914.6	-	2198.5
Previous Changes:				
Quantity	-	-1729.7	-	-1729.7
Schedule	-	+242.9	-	+242.9
Engineering	+41.2	-	-	+41.2
Estimating	-5.1	-24.9	-	-30.0
Other	-	-	-	-
Support	-	-60.0	-	-60.0
Subtotal	+36.1	-1571.7	-	-1535.6
Current Changes:				
Quantity	-	-14.2	-	-14.2
Schedule	-	+6.6	-	+6.6
Engineering	-	-	-	-
Estimating	-	+5.3	-	+5.3
Other	-	-	-	-
Support	-	-2.5	-	-2.5
Subtotal	-	-4.8	-	-4.8
Total Changes	+36.1	-1576.5	-	-1540.4
Current Estimate	320.0	338.1	-	658.1

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) Procurement

Revised escalation indices. (Economic)	N/A	-5.0
Economic adjustment for negative program change. (Economic)	N/A	+1.3
Quantity decrease of 22 units from 184 to 162. (Quantity)	-14.2	-22.6 ✓
Allocation to schedule variance due to revised procurement profile. (Schedule)	+6.6	+10.0 ✓
Allocation to engineering variance due to implementation of Guidance Section Fixes. (Engineering)	0.0	+1.2 ✓
Adjustment for current and prior inflation. (Support)	+0.5	+0.6
Reduced support requirements due to quantity decrease. (Support)	-3.0	-4.4 ✓
Allocation to estimating variance due to revised program quantity (184 to 162). (Estimating)	-20.9	-32.1 ✓
Adjustment for current and prior inflation. (Estimating)	+2.9	+4.4
Increase in hardware unit price due to quantity decrease. (Estimating)	+17.8	+26.5 ✓

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STANDARD MISSILE-2, December 31, 1998

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

SM-2 BLK IV

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

Miscellaneous program cost changes.
(Estimating)

+5.5 +8.1

Procurement Subtotal

-4.8 -12.0

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

SM-2 BLK I\II\III\A\B

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.75	-0.08	-0.03	+0.05	+0.02	+0.04	--	+0.01	+0.01	0.76

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.68	-0.08	-0.02	+0.05	+0.02	+0.02	--	+0.01	--	0.68

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	JUN 89	JUN 89
Milestone III	N/A	N/A	N/S	JUL 96
FUE/IOC	N/A	N/A	JUN 93	OCT 97
Total Cost	N/A	N/A	8052.8	8740.2
Total Quantity	N/A	N/A	10778	11505
Prog Acq Unit Cost	N/A	N/A	0.75	0.76

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STANDARD MISSILE-2, December 31, 1998

14a. (U) Unit Cost and Other History (Cont'd):

SM-2 BLK IV

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.00	-0.07	-1.14	+6.36	+0.79	-0.91	--	-0.54	+4.49	5.49

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.89	-0.08	-3.13	+6.36	+0.79	-1.22	--	-0.54	+2.18	3.07

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	AUG 86	N/A	AUG 86
Milestone III	N/A	N/A	N/A	TBD
FUE/IOC	N/A	MAR 93	N/A	JUL 99
Total Cost	N/A	3014.4	N/A	889
Total Quantity	N/A	3000	N/A	162
Prog Acq Unit Cost	N/A	1	N/A	5.49

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

a. Procurement --

(U) SM-2 IIIA FY95 AUR PROD:

SMCo, McLean, VA

N00024-96-C-5304, FFP/PI

Award: November 14, 1995

Definitized: September 27, 1996

Initial Contract Price		
Target	Ceiling	Qty
\$50.4	N/A	160

Current Contract Price		
Target	Ceiling	Qty
\$52.5	\$52.5	160

Estimated Price At Completion	
Contractor	Program Manager
\$52.5	\$52.5

Explanation of Change:

(U) This contract is over 90% complete. This will be the last time that this

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STANDARD MISSILE-2, December 31, 1998

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

contract will be reported in the SAR.

Cost and Schedule variance reporting is not required on this FFP/PI contract.

(U) SM-2 BLK IV FY95-96 LRIP:			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
Standard Missile Company, McLean VA					
N00024-96-C-5337, CPAW/FPIF	\$126.7	N/A	45		
Award: March 3, 1996					
Definitized: April 11, 1997					

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$258.2	N/A	117	\$264.5	\$273.7

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-2.0	\$-4.0
Cumulative Variances To Date	\$-12.2	\$-12.1
Net Change	\$-10.2	\$-8.1

Explanation of Change:

(U) Total quantity includes FY95/96/97/98 procurements.

Deterioration of cost and schedule variances caused primarily by cost growth and schedule erosion in relation to hardware issues surrounding the production of Guidance Sections, Autopilots, and MK 72 Boosters.

(U) SM2 BLK IIIB AUR:			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
Standard Missile Company, McLean VA					
N00024-97-C-5353, FPIF	\$85.9	N/A	80		
Award: April 4, 1997					
Definitized: N/A					

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$105.7	\$105.7	148	\$105.7	\$105.7

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FPIF contract.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY76-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	1238.4	1.1	1.2	13.4	1254.1
Procurement	6983.7	124.2	114.3	1110.1	8332.3
MILCON	42.8	-	-	-	42.8
O&M	-	-	-	-	-
Total	8264.9	125.3	115.5	1123.5	9629.2

SM-2 BLK I\II\III\A\B

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

<u>Appropriation</u>	<u>Prior Years (FY76-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	846.5	1.1	1.2	13.4	862.2
Procurement	6486.6	124.2	114.3	1110.1	7835.2
MILCON	42.8	-	-	-	42.8
O&M	-	-	-	-	-
Total	7375.9	125.3	115.5	1123.5	8740.2

SM-2 BLK IV

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

<u>Appropriation</u>	<u>Prior Years (FY87-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	391.9	-	-	-	391.9
Procurement	497.1	-	-	-	497.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	889.0	-	-	-	889.0

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STANDARD MISSILE-2, December 31, 1998

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

b. Annual Summary -- SM-2 BLK 1\II\III\A\B

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1982				324.1	305.0
1983				23.6	23.2
1984				17.0	17.3
1985				27.8	29.2
1986				56.8	61.4
1987				40.2	44.7
1988				27.3	31.4
1989				49.6	59.5
1990				47.3	59.0
1991				37.1	48.0
1992				27.6	36.7
1993				24.3	33.0
1994				38.5	53.3
1995				9.3	13.2
1996				14.3	20.6
1997				6.3	9.2
1998				0.3	0.5
1999				0.9	1.3
2000				0.7	1.1
2001				0.8	1.2
2002				0.8	1.3
2003				0.9	1.4
2004				0.9	1.4
2005				0.9	1.5
2006				0.9	1.5
2007				0.9	1.5
2008				0.9	1.6
2009				0.9	1.6
2010				0.9	1.6
Subtotal				781.8	862.2

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1976	22		88.0	92.4	48.4
1977	36		62.2	73.9	42.9
1978	40		66.5	74.2	48.2
1979	40		57.1	66.1	47.3

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STANDARD MISSILE-2, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
SM-2 BLK I\II\III\A\B

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1980	85		67.7	82.1	64.7
1981	345		156.2	198.2	174.3
1982	495		230.3	287.2	274.3
1983	500		294.1	399.5	403.5
1984	490		311.9	385.5	405.1
1985	730		394.4	443.5	479.7
1986	1271		589.2	659.9	738.4
1987	1194		471.2	583.2	676.2
1988	1310		414.2	472.7	569.6
1989	1310		435.7	474.7	594.4
1990	710		264.5	304.5	394.5
1991	405		185.8	228.4	303.4
1992	330		151.7	194.4	264.8
1993	330		162.7	180.3	250.1
1994	202		125.0	157.5	222.7
1995	160		92.3	113.9	163.6
1996					
1997	80		54.4	70.0	102.8
1998	68		64.2	76.1	113.1
1999	75		55.2	69.4	104.6
2000	75		52.8	81.1	124.2
2001	80		55.3	73.4	114.3
2002	80		50.5	63.6	100.9
2003	88		47.3	58.9	95.4
2004	90		43.4	53.0	87.6
2005	90		41.2	49.8	84.0
2006	114		50.0	59.1	101.8
2007	130		55.4	65.0	114.3
2008	130		61.8	73.0	131.1
2009	200		93.9	108.2	198.5
2010	200		92.0	104.9	196.5
Subtotal	11505		5438.1	6477.6	7835.2

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				23.6	29.3
1990				10.6	13.5
Subtotal				34.2	42.8

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

SM-2 BLK I\II\III\A\B

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	11505		5438.1	7293.6	8740.2

b. Annual Summary -- SM-2 BLK IV

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				25.2	28.0
1988				57.7	66.4
1989				85.9	102.9
1990				72.7	90.7
1991				33.2	42.9
1992				25.6	34.1
1993				12.6	17.1
1994				6.5	9.0
1995				0.6	0.8
Subtotal				320.0	391.9

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995	28	1.9	49.9	53.7	77.1
1996	22	15.1	64.9	91.6	133.2
1997	47	3.8	67.2	76.3	112.1
1998	20	1.3	39.6	43.1	64.1
1999	45	3.0	64.8	73.4	110.6
Subtotal	162	25.1	286.4	338.1	497.1

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	162	25.1	286.4	658.1	889.0

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17. (U) Delivery/Expenditure Information:

SM-2 BLK I/II/III/A/B

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	10005	10001

(U) Percent Total Program Quantities Delivered: 86.9%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 6765.7

(U) Percent Total Program Expended: 77.4%

SM-2 BLK IV

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	1	1

(U) Percent Total Program Quantities Delivered: 0.6%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 761.2

(U) Percent Total Program Expended: 85.6%

18. ~~(U)~~ Operating and Support Costs:

SM-2 BLK I/II/III/A/B

a. ~~(U)~~ Assumptions and Ground Rules --
Since the SM-2 is a wooden round, Personnel Costs are unnecessary for missile operation. The O&S Consumables include Range and Target Cost as well as Post Flight Analysis. The Direct Maintenance consists of Intermediate and Depot Maintenance. The Sustaining Investment Category includes Replenishment Spares and Support Equipment, Equipment Modification, Receipt, Segregation Storage and Issue (RSSI). Direct Support consists of Transportation and Technical Support. There is no Antecedent System.

~~(U)~~ Computation is based on an inventory objective of (b)(1) SM-2 BLK I/II/III/A/B missiles at the end of the FY 2005 funded delivery period. Operations & support cost estimate as of Feb 1999.*

NOTE: Other (2.7) = Other Direct Support (2.2) = Disposal (@ 24 years)

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

SM-2 BLK I/II/III/A/B

b. (U) Costs -- (FY 1984 Constant (Base-Year) Dollars in Millions)

Cost Element	SM-2 BLK I/II/III Avg Annual Cost Per	Avg Annual Cost Per N/A
Mission Pay & Allowances	(b)(1)	0.0
Unit Level Consumption	5.9	0.0
Intermediate Maintenance	4.9	0.0
Depot Maintenance	5.8	0.0
Contractor Support	0.0	0.0
Sustaining Support	1.4	N/A
Indirect Costs	0.0	N/A
Other	2.7	N/A
Other	2.2	N/A
Overhaul/Rework	8.1	N/A
Total	(b)(1)	(b)(1)

SM-2 BLK IV

a. (U) Assumptions and Ground Rules --

Since the SM-2 is a wooden round, Personnel Costs are unnecessary for missile operation. The O&S Consumables include Range and Target Cost as well as Post Flight Analysis. The Direct Maintenance consists of Intermediate and Depot Maintenance. The Sustaining Investment Category includes Replenishment Spares and Support Equipment, Equipment Modification, Receipt, Segregation Storage and Issue (RSSI). Direct Support consists of transportation and Technical Support. There is no Antecedent System.

(U) Computation is based on an inventory objective of 26 SM-2 BLK IV missiles at the end of the FY 2005 funded delivery period. Operations and support cost estimate as of Feb 1999.*

Note: Other (.02) = Other direct support; Other (.02) = Disposal (@ 24 years)

b. (U) Costs -- (FY 1984 Constant (Base-Year) Dollars in Millions)

Cost Element	SM-2 Block IV Avg Annual Cost Per	Avg Annual Cost Per N/A
Mission Pay & Allowances	(b)(1)	(b)(1)
Unit Level Consumption	(b)(1)	(b)(1)
Intermediate Maintenance	(b)(1)	(b)(1)
Depot Maintenance	(b)(1)	(b)(1)
Contractor Support	(b)(1)	(b)(1)
Sustaining Support	(b)(1)	(b)(1)
Indirect Costs	(b)(1)	(b)(1)
Overhaul/Rework	(b)(1)	(b)(1)

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18b. ~~(S)~~ Operating and Support Costs (Cont'd):
SM-2 BLK IV

b. ~~(S)~~ Costs -- (FY 1984 Constant (Base-Year) Dollars in Millions)

Cost Element	SM-2 Block IV	Avg Annual Cost Per	Avg Annual Cost Per
		(b)(1)	N/A
Other		0.0	N/A
Other		0.0	N/A
		N/A	N/A
Total		(b)(1)	(b)(1)

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AF-10 GBS

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: GBS

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Global Broadcast Service (GBS)

2. DoD Component: OSD

Joint Participants:

Army, Air Force, Navy

3. Responsible Office and Telephone Number:

GBS Joint Program Office

Skyline 5/Room 9095

5111 Leesburg Pike

Falls Church, VA 22041-3205

CAPT Joseph Delpino, USN

Assigned: October 1, 1996

DSN 761-0234; COMM 703-681-0234

delpinlj@ncr.disa.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0603854F (Shared) Project 2679

PROCUREMENT:

APPN 1810 ICN 33109N (Navy) (Shared)

APPN 2035 ICN BC4120 (Army)

APPN 3080 ICN 33601F (Air Force)

APPN 1109 ICN 463300 (Navy)

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99-C-0532

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5. References:

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline (APB) dated November 14, 1997.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated November 14, 1997.

6. Mission and Description:

GBS will augment other communications systems and provide a continuous high-speed, one-way information flow to deployed, mobile or garrisoned forces. GBS will support routine operations, training and military exercises, special activities, crisis, situational awareness, weapons targeting, reconnaissance, and the transition to and conduct of opposed operations short of nuclear war. Access will be near worldwide (65 degrees north latitude to 65 degrees south latitude), with constellation orbit positions selected to minimize requirements for overseas fixed broadcast injection sites.

The Joint Program Office (JPO) will procure, via a single contract, development of the transmit and receive suites, development of the transportable injection points, and performance of end-to-end system integration. The Navy has procured the space segment Ultra-High Frequency (UHF) Follow-On (UFO) satellite tertiary payloads, and will acquire the Navy-unique shipboard receive terminals (SRTs) which will be integrated with shipboard receive broadcast managers to form shipboard receive suites.

The GBS is a worldwide, high-throughput broadcast (one way) information transmission system that extends the Defense Information Infrastructure (DII). It is intended to consistently provide the warfighter with information that allows action inside the decision cycle-time of the adversaries. The full Joint Operational Requirements Document (Joint ORD) threshold performance requirements will be met with the fielding of the ground capabilities in support of UFO 10.

7. Executive Summary:

A March 27, 1996 Under Secretary of Defense Acquisition & Technology (USD (A&T)) Acquisition Decision Memorandum (ADM) designated GBS as an ACAT ID Joint Program with the United States Air Force (USAF) as executive agent to manage the joint service GBS program. GBS received ACAT ID Milestone II approval on November 14, 1997 as a result of a successful DAB Readiness Meeting on November 12, 1997. A competitive, performance-based source selection resulted in selection of Hughes Aircraft Company (now Raytheon Systems Company) on November 17, 1997.

An evolutionary acquisition strategy will be employed; it will allow the incorporation of incremental enhancements from the commercial marketplace resulting from the maturing requirements embodied in the GBS Joint ORD. As noted below, the Program achieved significant successes by fielding initial capability in less than one year after contract award. However, a Cost As an

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7. Executive Summary (Cont'd):

Independent Variable effort was initiated in the fall of 1998 to ensure continued alignment with commercial capabilities, to adjust for early commercial products that were inadequate (e.g., antennas installed in Korea), to drive the lessons learned from the early findings into the GBS Threshold design, and to keep the cost within the Program baseline.

The Pacific Primary Injection Point construction was initiated in January 1998, less than sixty days after contract award. The Primary Injection Point and the Satellite Broadcast Manager, which constitute the GBS ground station, completed construction in July 1998. Since July 1998 the GBS system has been conducting test and integration activities with the Defense Information Infrastructure and the information sources.

Site preparations for Korea began on August 28, 1998, and the Receive Broadcast Manager(RBM), computers and laptops were shipped to Korea on September 11, 1998. Installations in Korea are proceeding, with installations complete in Chinhae, Pohang, Tango, Camp Humphreys and Osan.

The Norfolk Primary Injection Point (PIP) installation began on October 7, 1998. The Ka/Ku antenna is complete, and there was a successful end-to-end transmission of a video signal from the PIP to a ground terminal over a commercial satellite.

The operation of the GBS Continental U.S. (CONUS) Testbed, including the satellite uplink, was successfully relocated in October 1998 from the Pentagon to the Joint Battle Center in Norfolk, Virginia.

The UHF-9 satellite was successfully launched on October 20, 1998. It is expected to be available for GBS test/integration beginning in March 1999.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

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8. Threshold Breaches (Cont'd):

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone II (DAE)	DEC 97	DEC 97	NOV 97
System Available for Operational Use	JUN 99	JUN 99	DEC 99
Initial Operational Capability (IOC)	DEC 99	DEC 99	JUN 00
Milestone III	DEC 99	DEC 99	JUN 00

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
System Coverage	65 deg South to 65 deg North	65 deg / 65 deg South to/ South to 65 deg / 65 deg North / North	65 deg South to 65 deg North (UFO-8)	65 deg South to 65 deg North
Spot Beams	Two 500nm steer- able, one 2000 nm steer- able	Two / Two 500nm / 500nm steer- / steer- able, / able, one / One 2000 nm / 2000 nm steer- / steer- able / able	Two 500nm steer- able, One 2000 nm steer- able	Two 500nm steer- able, One 2000 nm steer- able
Simultaneous Uplinks	One PIP and up to 3 TIPs simultan- eously	One PIP / One PIP and up / and one to 3 / TIP TIPs / simultan/ eously /	TBD	One PIP and one TIP
Security	Pass unclass- ified to TOP SECRET traffic	Pass / Pass unclass-/ unclass- ified to/ ified to TOP SECRET / TOP SECRET traffic / traffic	Pass unclassi- fied to TOP SECRET	Pass unclass- ified to TOP SECRET traffic

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GBS, December 31, 1998

10a. Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Receive Frequency Band	20.2-21. 2 GHz UFO GBS	20.2-21. / 20.2-21. 2 GHz / 2 GHz UFO GBS, / UFO GBS one or / more / commer- / cial / satell- / ite / frequen- / cy bands /	20.2-21. 2 GHz UFO GBS	20.2-21. 2 GHz UFO GBS
Support operations with multiple satellite beams and terminal types (i.e., Receive Variable Data Rates)	2000nm: add SSRT and ART 500nm: Add ART	2000nm: / 2000nm: add SSRT/ FGRT, and ART / TGRT 500nm: / and Add ART / SRT / 500nm: / FGRT, / TGRT, / SRT and / SSRT	Video and data over 2000nm and 500nm beams to FGRT and SRT	2000nm: FGRT, TGRT and SRT 500nm: FGRT, TGRT, SRT and SSRT
Pointing of Steerable Spot Beam Antenna	Frequent	Frequent / Frequent	TBD	Frequent
Steerable Antenna Tasking	SBM Primary means	SBM / SBM Primary / Primary Means / Means	SBM Primary Means: Less than one minute to accompli sh full range movement	SBM Primary Means

ACRONYMS:

ART -Airborne Receive Suite Terminal
 FGRT -Fixed Ground Receive Suite Terminal
 GBS -Global Broadcast Service
 PIP -Primary Injection Point
 SBM -Satellite Broadcast Manager
 SRT -Shipboard Receive Suite Terminal
 SSRT -Sub-surface (submarine) Receive Suite Terminal
 TGRT -Transportable Ground Receive Suite Terminal
 TIP -Theater Injection Point

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10a. Performance Characteristics (Cont'd):

UFO -UHF Follow-on Satellite

NOTE: System coverage; number of spot beams; security; receive frequency band; support operations with multiple satellite beams and terminal types; and steerable antenna tasking performance characteristics changed from TBD to the new demonstrated performances using the Wahiawa site and the GBS payload on UHF Follow-On Eight (UFO-8). Factory testing has verified UFO-9 and UFO-10 have the same performance characteristics.

b. Current Change Explanations --
None.

11. Total Program Cost and Quantity (Dollars in Millions):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	397.5	397.5	383.6
Procurement	53.9	53.9	50.5
Flyaway	(48.5)		(45.0)
Other Wpn System Costs	(4.3)		(5.5)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(1.1)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 97 Base-Year \$	451.4	451.4	434.1
Escalation	45.7	45.7	23.6
Development (RDT&E)	(41.7)	(41.7)	(21.2)
Procurement	(4.0)	(4.0)	(2.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	497.1	497.1	457.7
b. Quantity --			
Development (RDT&E)	221	221	221
Procurement	125	125	272
Total	346	346	493

For the current estimate, the Development Quantity includes 218 Fixed and Transportable Ground Receive Suites, Shipboard Receive Suites and 3 Primary Injection Points; the Procurement Quantity includes 265 Fixed and Transportable Ground Receive Suites and Shipboard Receive Suites, and 2 Theater Injection Points.

NOTE: A Low Rate Initial Production (LRIP) quantity of up to 500 receive suites and 140 shipboard antennas was approved at MSII by the DAE. The LRIP quantity exceeds 10% of the total program quantities to provide production

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11b. Total Program Cost and Quantity (Cont'd):

representative articles for operational test and evaluation. This quantity will also permit an orderly increase in the fielding (production) rate sufficient to lead to a full-rate fielding (production) of the receive suite hardware.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (Nov 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 97 BY\$)	451.4	434.1	
(2) Quantity	346	493	
(3) Unit Cost	1.305	0.881	-32.49
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 97 BY\$)	53.9	50.5	
(2) Quantity	125	272	
(3) Unit Cost	0.431	0.186	-56.84

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13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	439.2	57.9	-	497.1
Previous Changes:				
Economic	-13.8	-0.6	-	-14.4
Quantity	-2.7	-	-	-2.7
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+3.5	-26.6	-	-23.1
Other	-	-	-	-
Support	-	-3.9	-	-3.9
Subtotal	-13.0	-31.1	-	-44.1
Current Changes:				
Economic	-4.6	-0.2	-	-4.8
Quantity	-	+17.9	-	+17.9
Schedule	-	+0.2	-	+0.2
Engineering	-	-	-	-
Estimating	-16.8	+4.2	-	-12.6
Other	-	-	-	-
Support	-	+4.0	-	+4.0
Subtotal	-21.4	+26.1	-	+4.7
Total Changes	-34.4	-5.0	-	-39.4
Current Estimate	404.8	52.9	-	457.7

Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	397.5	53.9	-	451.4
Previous Changes:				
Quantity	-2.6	-	-	-2.6
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.9	-24.4	-	-22.5
Other	-	-	-	-
Support	-	-3.8	-	-3.8
Subtotal	-0.7	-28.2	-	-28.9
Current Changes:				
Quantity	-	+16.9	-	+16.9
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-13.2	+4.0	-	-9.2
Other	-	-	-	-
Support	-	+3.9	-	+3.9
Subtotal	-13.2	+24.8	-	+11.6
Total Changes	-13.9	-3.4	-	-17.3
Current Estimate	383.6	50.5	-	434.1

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RD&E</u>		
Revised escalation indices. (Economic)	N/A	-6.3
Economic adjustment for negative program change. (Economic)	N/A	+1.7
Adjustment for Current and Prior Inflation. (Estimating)	+1.9	+2.1
Budget Reduction for system development, integration, test and evaluation; and Application and Support Software. (Estimating)	-15.1	-18.9
RD&E Subtotal	-13.2	-21.4
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-0.3
Economic adjustment for negative program change. (Economic)	N/A	+0.1
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
Total Quantity variance associated with a net increase of 149 units (from 123 to 272 units).	+17.8	+18.8
Quantity increase of 15 Army units, consisting of 14 Receive suites and 1 TIP. (Quantity)	+5.2	+5.5
Quantity decrease of 20 Navy units, consisting of receive suites. (Quantity)	-7.0	-7.4
Addition of 105 Marine Corps receive suites. (Quantity)	+11.9	+12.6
Addition of Air Force quantities consisting of 49 receive suites. (Quantity)	+6.8	+7.2
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	+0.9	+0.9
Revised estimate for addition of non-recurring cost (Estimating)	+2.1	+2.3
Refinement of estimate for service unique changes. (Estimating)	+0.7	+0.7
Schedule change to reflect delay of LRIP procurement. (Schedule)	0.0	+0.2
Refinement of estimate for initial spares. (Support)	-0.4	-0.4
Refinement of estimate for Other Weapons System cost associated with data and training. (Support)	+4.3	+4.4
Procurement Subtotal	+24.8	+26.1

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14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.44	-0.04	-0.40	--	--	-0.07	--	--	-0.51	0.93

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.46	--	-0.19	--	--	-0.08	--	--	-0.27	0.19

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	DEC 97	N/A	NOV 97
Milestone III	N/A	DEC 99	N/A	JUN 00
FUE/IOC	N/A	DEC 99	N/A	JUN 00
Total Cost	N/A	497.1	N/A	457.7
Total Quantity	N/A	346	N/A	493
Prog Acq Unit Cost	N/A	1.44	N/A	0.93

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

a. RDT&E --

Terminals:

Raytheon Systems, Reston, VA

F04701-97-C-0044, CPAF

Award: November 17, 1997

Definitized: November 17, 1997

Initial Contract Price		
Target	Ceiling	Qty
\$84.8	N/A	344

Current Contract Price		
Target	Ceiling	Qty
\$86.9	N/A	344

Estimated Price At Completion	
Contractor	Program Manager
\$100.3	\$127.0

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15a. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-11.0	\$-6.7
Cumulative Variances To Date (12/26/98)	<u>\$-13.8</u>	<u>\$-0.4</u>
Net Change	\$-2.8	\$6.3

Explanation of Change:

The cumulative schedule variance reduction is the result of a joint Government/contractor decision to restructure the Integrated Master Schedule (IMS) being used to acquire the GBS system. The contractor closed out reporting against the old IMS at the end of their fiscal month November 1998, and began reporting near-term tasks against the new IMS for fiscal December data, which is reflected here.

Contract Comments:

This contract will be funded with RDT&E, Procurement and Operations and Support funds by the Air Force, Army and Navy.

The Procurement quantity on contract is 123 and the R&D quantity is 221. An additional 149 units will be placed on contract in FY99.

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

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

<u>Appropriation</u>	<u>Prior Years (FY96-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-13)</u>	<u>Total</u>
RDT&E	191.5	48.4	39.6	125.3	404.8
Procurement	20.2	32.7	-	-	52.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	211.7	81.1	39.6	125.3	457.7

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

b. Annual Summary -- Global Broadcast Service

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				14.1	14.0
1997				37.7	37.9
1998				69.4	70.2
1999				67.8	69.4
2000				46.6	48.4
2001				37.5	39.6
2002				27.1	29.1
2003				20.3	22.2
2004				15.7	17.5
2005				14.2	16.2
2006				11.7	13.6
2007				5.6	6.7
2008				5.4	6.5
2009				2.1	2.6
2010				2.1	2.6
2011				2.1	2.7
2012				2.1	2.8
2013				2.1	2.8
Subtotal	221			383.6	404.8

Appropriation: 1109 - Procurement, Marine Corps

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	105		11.9	11.9	12.6
Subtotal	105		11.9	11.9	12.6

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997	12		0.9	0.9	0.9
1998	13	1.9	1.0	2.9	3.0
1999	21	1.4	1.5	3.0	3.1
2000	24		1.7	1.9	2.0
Subtotal	70	3.3	5.1	8.7	9.0

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

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	1	2.1	2.9	7.1	7.3
1999	6		4.0	5.7	5.9
2000	41		8.9	10.3	10.9
Subtotal	48	2.1	15.8	23.1	24.1

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	49		6.8	6.8	7.2
Subtotal	49		6.8	6.8	7.2

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
USAF	270		6.8	390.4	412.0
Navy	175	3.3	17.0	20.6	21.6
Army	48	2.1	15.8	23.1	24.1
Grand Total	493	5.4	39.6	434.1	457.7

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 75.5

Percent Total Program Expended: 16.5%

AF FY97 31.3M
FY98 42.7M

Army FY98 1.1M

Navy FY97 0.4M

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DoD-4 NPOESS

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: NPOESS

AS OF DATE: December 31, 1998

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- Designation and Nomenclature (Popular Name): National Polar-orbiting Operational Environmental Satellite System
- DoD Component: USAF
- Responsible Office and Telephone Number:
Centre Building, Suite 1450 SES Mr Robert S. Winokur (Acting SPD)
8455 Colesville Road Assigned: October 1, 1998
Silver Spring, MD 20910-3320 DSN N/A; COMM 301-427-2070, x168
- Program Elements/Procurement Line Items:
RDT&E:
PE 0603434 F

NPOESS is a presidentially directed Tri-agency program composed of Department of Defense (DoD), Department of Commerce (DOC) and National Aeronautic and Space Administration personnel. Per the Tri-agency Memorandum of Agreement (MOA), funding is provided jointly by the DoD (through the Air Force) and the DOC (through the National Oceanic and Atmospheric Administration). Currently, the DoD funds NPOESS with RDT&E via PE 0603434F.

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5. References:

SAR Baseline (Planning Estimate):

DAE Approved Acquisition Program Baseline (APB) dated March 17, 1997. The NPOESS Executive Committee Acquisition Decision Memorandum (ADM), dated March 17, 1997, served as the approval.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated March 17, 1997.

6. Mission and Description:

The NPOESS Program is required to provide, for a period of at least 10 years, a remote sensing capability to acquire, receive at ground terminals, and disseminate to processing centers, global and regional environmental imagery and specialized meteorological, climatic, terrestrial, oceanographic, solar-geophysical and other data supporting DOC/NOAA mission requirements, and DoD peacetime and wartime missions.

7. Executive Summary:

In 1998, the NPOESS Integrated Program Office (IPO) prepared two reports for Congress in response to the FY98 budget language. The NPOESS Strategic Plan for Technology Transition, dated February 17, 1998, was submitted by the Acting Deputy Under Secretary of Defense (Space) to the House Committee on National Security, the House Committee on Appropriations, the Senate Committee on Appropriations and the Senate Committee on Armed Services on February 27, 1998. The NPOESS report on Polar Convergence Operational Benefits and Cost Savings was provided by the Secretary of Commerce to the House Committee on Science, the House Appropriations Committee for Commerce, Justice, State, the Judiciary, and Related Agencies, the Senate Appropriations Committee for Commerce, Justice, State, the Judiciary, and Related Agencies, and the Senate Committee on Commerce, Science, and Transportation on March 20, 1998.

During calendar year 1998, all the Sensor and Payload and Algorithm Developments except the Visible/Infrared Imager Radiometer Suite effort completed at least one major review. The Global Positioning System Occultation Sensor (GPSOS) contractor held and completed both its System Functional Review (SFR) and Preliminary Design Review (PDR). The two Ozone Mapping and Profiler Suite contractors held and completed their SFRs. The two Cross Track Infrared Sounder contractors held and completed both their System Requirements Review (SRR) as well as their SFRs. The two Conical Microwave Imager Sounder contractors held and completed their SRRs. The remaining contractors held various Technical Interchange Meetings with the government in support of the NPOESS development.

In response to President Clinton's direction to merge the existing military and civilian weather satellite operations, Satellite Control Authority for the Defense Meteorological Satellite Program (DMSP) was transferred from Air Force Space Command to the NPOESS IPO on May 29, 1998. The National Oceanic and Atmospheric Administration (NOAA), which operates polar-orbiting environmental

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7. Executive Summary (Cont'd):

satellites of its own, will operate DMSP satellites from the Satellite Operations Control Center (SOCC) Suitland, Maryland. Per the DMSP Operations Funding MOA, the Air Force will continue to fund DMSP operations from DMSP's current program elements. In October 1998, the 6th Space Operations Squadron (6 SOPS) at Schriever AFB, Colorado successfully completed Initial Operational Test and Evaluation (IOT&E) as the back-up DMSP satellite control facility.

Also, as part of the convergence of the existing polar environmental satellites, the first of three multi-mission 13-meter antennas at NOAA's Command and Data Acquisition Station in Fairbanks, Alaska was declared operationally available on July 20, 1998 in support of DMSP for the anticipated Thule Remote Tracking Station downtime. The NPOESS IPO completed the installation and testing of the remaining two 13-meter antennas in November 1998. These antennas will receive data from NOAA's Polar-orbiting Operational Environmental Satellites (POES), as well as command, receive, and relay data from DMSP. Finally, these antennas will be used to operate NPOESS.

During the formulation of the FY 2000 budget, the NPOESS IPO was directed to develop a modification to the program which was approved by the NPOESS Executive Committee (EXCOM) on December 18, 1998. This revised program delays the system development and the delivery of the first NPOESS satellite by one year from July 2007 to July 2008. As part of the new program, the EXCOM also approved: the deletion of the POES N' modifications; completion of a study of a joint NASA/IPO NPOESS Preparatory Project (NPP) as a risk reduction demonstration effort to replace the N' modification effort; and investigation and selection of the GPSOS alternative procurement approach.

Also, at the end of September 1998, Mr. James Mannen resigned from his position as NPOESS System Program Director (SPD). Mr. Robert S. Winokur, the Assistant Administrator for Satellite and Information Services in the National Oceanic and Atmospheric Administration (NOAA), assumed the duties as the Acting NPOESS SPD. Efforts are continuing to recruit a replacement for the SPD position. Per the NPOESS MOA, the NPOESS SPD must be approved by the NPOESS EXCOM.

As part of the National Performance Review (NPR) recommendation, NPOESS was expected to save the U.S. Government up to an estimated \$300 million in FY94-FY99 with additional savings after FY99. The NPOES IPO currently estimates the FY94-FY99 savings to be over \$650 million.

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8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

During the formulation of the FY 2000 budget, the NPOESS IPO was directed to develop a modification to the program which was approved by the NPOESS Executive Committee (EXCOM) on December 18, 1998. The Current Estimate column reflects the schedule approved by the EXCOM on December 18, 1998. The IPO is working with the pertinent organizations to update the NPOESS Acquisition Program Baseline to accurately reflect the EXCOM approved schedule.

9. Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I	MAR 97	MAR 97	MAR 97
Payload Contract Awards	JUL 97	JUL 97	JUL 97
Pre-Total System Performance Responsibility (pre-TSPR) Contract Award	MAY 99	MAY 99	NOV 00 (Ch-1)
Milestone II	SEP 00	SEP 00	FEB 02 (Ch-1)
Total System Responsibility (TSPR) Contract Award	OCT 00	OCT 00	MAR 02 (Ch-1)
Initial Operational Capability (IOC)	DEC 10	DEC 10	JUL 11 (Ch-1)
Milestone III	DEC 11	DEC 11	FEB 02 (Ch-1)

Schedule Milestone Footnotes

As of December 1998, the EXCOM redesignated Milestone II as Milestone II/III.

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9a. Schedule (Cont'd):

IOC is met when the IOC criteria are satisfied per paragraph 8.1 of the IORD-1, dated March 28, 1996.

b. Current Change Explanations --

(Ch-1) During the formulation of the FY 2000 budget, the NPOESS IPO was directed to develop a modification to the program which was approved by the NPOESS Executive Committee (EXCOM) on December 18, 1998. The Current Estimate column reflects the schedule approved by the EXCOM on December 18, 1998. The IPO is working with the pertinent organizations to update the NPOESS Acquisition Program Baseline to accurately reflect the EXCOM approved schedule.

10. Performance Characteristics:

a. Performance --

Key EDR Parameters	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate (1)
Atmospheric Verti- cal Moisture Profile				
Measurement	+/- 10%	+/- 10% / +/- 20%	TBD	+/- 20%
Accuracy (Clear: Surface - 600mb)				
Measurement	+/- 10%	+/- 10% / +/- 20%	TBD	+/- 20%
Accuracy (Cloudy: Surface - 600mb)				
Atmospheric Verti- cal Temperature Profile				
Measurement	+/- 0.5K	+/- 0.5K/ +/- 1.6K	TBD	+/- 1.0K
Accuracy (Clear: Surface - 300mb)		/ per 1 km / layer		per 1 km layer
Measurement	+/- 0.5K	+/- 0.5K/ +/- 2.5K	TBD	+/- 2.5K
Accuracy (Cloudy: Surface 700mb)		/ per 1 km / layer		per 1 km layer
Imagery				
Horizontal Resolution				
Global at Nadir	.65 km	.65 km / 1.0 km	TBD	1.0 km (2)
Regional at Nadir	0.1 km	0.1 km / 0.4 km	TBD	0.4 km (3)

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10a. Performance Characteristics (Cont'd):

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Refresh Visible and IR bands				
Average Revisit Time	1 hour	1 hour / 4 hours / or less	TBD	4 hours or less (4)
Maximum Revisit Time	1 hour	1 hour / 6 hours / or less	TBD	6 hours or less
Sea Surface Temperature				
Horizontal Resolution				
Regional at Nadir	0.25 km	0.25 km / 1.0 km	TBD	1.0 km (3)
Measurement Accuracy	+/- 0.1°C	+/- / +/- 0.1°C / 0.5°C	TBD	+/- 0.5 °C
Sea Surface Winds (Speed)	greater of ±1 m/s or ±10%	greater / greater of ±1 / of ±2 m/s or / m/s or ±10% / ±20%	TBD	greater of +/- 2 m/s or +/- 20%
Soil Moisture (Surface) Sensing Depth	Surface to -80cm	Surface / Surface to / (skin -80cm / layer: / -0.1cm)	TBD	Surface (skin layer: -0.1cm) (1)
Key System Parameters				
Data Access	Select. denial of all U.S. data (ARGOS and SARSAT ex- cepted)	Select. / Select. denial / denial of all / of all U.S. / U.S. data / data (ARGOS / (ARGOS and / and SARSAT / SARSAT ex- / ex- cepted) / cepted)	TBD	Select. denial of all U.S. data (ARGOS and SARSAT ex- cepted)

Performance Characteristics Footnotes:

1. Ref: NPOESS IORD dated March 28, 1996.
2. Low resolution mode for real time transmission plus a full orbit of stored data.
3. High resolution mode for real time transmission plus 1/2 orbit of selected stored data.
4. At least 75% of revisit time will be 4 hours or less.

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10a. Performance Characteristics (Cont'd):

Acronyms:

C - Celsius
EDR - Environmental Data Record
K - Kelvin
km - kilometer
m/s - meters per second
mb - millibars

b. Current Change Explanations -- None

11. Total Program Cost and Quantity (Dollars in Millions):

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. Cost --			
Development (RDT&E)	4314.2	4314.2	4182.3
Procurement	0.0	N/A	
Flyaway	(0.0)		(0.0)
Total Other Wpn sys			(0.0)
Total Flyaway	(0.0)		(0.0)
New Cost	(0.0)		(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	4314.2	4314.2	4182.3
Escalation	1014.8	1014.8	747.0
Development (RDT&E)	(1014.8)	(1014.8)	(747.0)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	5329.0	5329.0	4929.3

Cost and Quantity Footnotes:

Per the Tri-Agency MOA, the Departments of Defense and Commerce jointly provide funding for NPOESS. The Planning Estimate (PE) and APB reflect the total estimated program, excluding Operating and Support, presented at Milestone I in March 1997. The numbers listed above in the Current Estimate column reflect the December 18, 1998 EXCOM approved program. These funds include the total DoD and DOC funds required to obtain the five NPOESS satellites and ground activities, NPOESS launch vehicles, NPOESS launch support, NPOESS Government Program Office Support, satellite and ground modifications to put the Multi-spectral Operational Linescan System on 3 DMSP satellites, the IPO share of the NASA/IPO NPP, payload sets for 2 Meteorological Operational (METOP) satellites, and installation of dual capable antennas at Fairbanks, Alaska. Development costs and quantities include amount that will be shifted to Procurement when the APB is updated at Milestone II/III.

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11b. Total Program Cost and Quantity (Cont'd):

b. Quantity --	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	5	5	5
Procurement	<u>0</u>	<u>N/A</u>	<u>0</u>
Total	5	5	5

Development quantities include amounts that will be shifted to Procurement when the APB is updated at Milestone II/III.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

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13. Cost Variance Analysis:

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

	RD&E	PROC	MILCON	TOTAL
Planning Estimate	5329.0	-	-	5329.0
Previous Changes:				
Economic	-185.9	-	-	-185.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-69.2	-	-	-69.2
Estimating	-91.2	-	-	-91.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-346.3	-	-	-346.3
Current Changes:				
Economic	-114.7	-	-	-114.7
Quantity	-	-	-	-
Schedule	+58.0	-	-	+58.0
Engineering	-	-	-	-
Estimating	+3.3	-	-	+3.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-53.4	-	-	-53.4
Total Changes	-399.7	-	-	-399.7
Current Estimate	4929.3	-	-	4929.3

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Planning Estimate	4314.2	-	-	4314.2
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-58.2	-	-	-58.2
Estimating	-79.2	-	-	-79.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-137.4	-	-	-137.4
Current Changes:				
Quantity	-	-	-	-
Schedule	+2.3	-	-	+2.3
Engineering	-	-	-	-
Estimating	+3.2	-	-	+3.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+5.5	-	-	+5.5
Total Changes	-131.9	-	-	-131.9
Current Estimate	4182.3	-	-	4182.3

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

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-114.7
Adjustment for Current and Prior Inflation. (Estimating)	+3.2	+3.3
The NPOESS IPO was directed to delay the system development and delivery of the first NPOESS satellite by one year from July 2007 to July 2008. (Schedule)	+2.3	+58.0
RDT&E Subtotal	+5.5	-53.4

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with
Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with
Section 2433, Title 10, USC.

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	MAR 97	N/A	N/A	MAR 97
Milestone II	SEP 00	N/A	N/A	FEB 02
Milestone III	DEC 11	N/A	N/A	FEB 02
FUE/IOC	DEC 10	N/A	N/A	JUL 11
Total Cost	5329	N/A	N/A	4929.3
Total Quantity	N/A	N/A	N/A	N/A
Prog Acq Unit Cost	N/A	N/A	N/A	N/A

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

Section 15 is not applicable. Currently, no NPOESS contracts exceed the \$40M contract reporting threshold.

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

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-18)</u>	<u>Total</u>
RDT&E	288.7	156.8	221.3	4262.5	4929.3
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	288.7	156.8	221.3	4262.5	4929.3

Program Funding Summary Footnotes:

The funding summary reflects the total program funding profile, excluding Operating and Support, required for the EXCOM approved December 1998 revised program. The total dollars listed consists of funding provided jointly by DoD and DOC. RDT&E costs include amounts that will be shifted to Procurement at Milestone II/III.

b. Annual Summary -- Weather Satellite System

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY96 Dollars Nonrec</u>	<u>Flyaway FY96 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1995				23.7	23.6
1996				29.0	29.4
1997				55.8	57.3
1998				63.9	66.0
1999				107.6	112.4
2000				147.8	156.8
2001				205.3	221.3
2002				320.3	351.1
2003				399.6	446.0
2004				546.5	622.5
2005				483.2	562.0
2006				360.2	427.6
2007				261.2	316.6
2008				286.3	354.5
2009				163.8	207.0
2010				261.9	337.9

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2011				178.4	235.1
2012				101.3	136.2
2013				41.3	56.7
2014				52.7	73.9
2015				27.3	39.1
2016				39.3	57.4
2017				16.4	24.4
2018				9.5	14.5
Subtotal	5			4182.3	4929.3

The total dollars listed in the table in Section 16b consist of funding provided jointly by DoD and DOC. RDT&E costs include amounts that will be shifted to Procurement at Milestone II/III.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	5			4182.3	4929.3

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 77

Percent Total Program Expended: 1.6%

The amount reflects Air Force expenditures only as of February 1, 1999.

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18. Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: T45TS

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): T45TS - Naval Undergraduate Jet Flight Training System (GOSHAWK)
2. DoD Component: Navy
3. Responsible Office and Telephone Number:
PEOASWASM (PMA-273) CAPT T. L. HEELY
PATUXENT RIVER, MD 20670-1547 Assigned: February 28, 1997
DSN 757-5203; COMM 301-757-5203
HEELYTL@NAVAIR.NAVY.MIL
4. Program Elements/Procurement Line Items:
RDT&E:
PE 0603208N Project H1142
PROCUREMENT:
APPN 1506 ICN 0015/0016 (Navy)
APPN 1506 ICN 0018/0019 (Navy)
MILCON:
PE 0805796N

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MAR 17 1999
M. Newell
Chief of the Office of
Naval Operations
Dept. of the Navy

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5. References:

SAR Baseline (Production Estimate):

DAE Approved Acquisition Program Baseline dated January 19, 1995.

Approved Program:

NAE Approved Acquisition Program Baseline (APB) dated February 21, 1997.

6. Mission and Description:

The T45TS is the Navy's strike pilot training system designed to replace both the T-2C and TA-4J and to produce 325 Strike and 36 E2/C2 pilots each year through FY 2035 at two sites, NAS Kingsville and NAS Meridian. The system includes: 234 production aircraft (of two type/model/series: the T-45A, equipped with an analog cockpit; and T-45C, equipped with the "Cockpit-21" digital cockpit and avionics suite); 17 simulators; academic material, training aids, & equipment; a computer based Training Integration System (TIS) at both NAS Kingsville and NAS Meridian to achieve total system efficiencies; and contractor logistics support of all system elements.

(U) The T-45A is a derivative of the British Aerospace Hawk that has been adapted to provide the capability for carrier catapult take-offs and arrested landings. 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 scheduling and tracking of training events in order to achieve required training efficiency. Contractor logistics 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 system is currently up and operating at both NAS Kingsville and NAS Meridian. NAS Kingsville continues to produce winged Naval Aviators; NAS Meridian began training students in the T-45C in July 1998.

7. Executive Summary:

Development of the T45TS was initiated in 1975 when the Navy perceived that both the T-2B/C and TA-4J aircraft should be replaced during the mid 1980's because of age and attrition. After extensive program strategy reviews the program was approved by SECNAV after a DNSARC on August 31, 1984. The subsequent DSARC review resulted in DOD approval on September 24, 1984.

The first production T45C successfully completed DT-IIIB testing on February 9, 1998 at Naval Air Warfare Center (Aircraft Division), NAS Patuxent River. This aircraft subsequently joined three additional T45C production aircraft at NAS Meridian, MS where operational testing (OT-IIIB) commenced February 18, 1998. The T45C aircraft, Training Integration System (TIS), and academics completed operational testing on June 5, 1998. The final component that was operationally tested was the Operational Flight Trainer (OFT) Simulator. The OFT (unit #7) was slowed by some software maturity issues, but corrections were made during the summer that allowed student training to begin

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7. Executive Summary (Cont'd):

at NAS Meridian on August 24, 1998. Upon installation of the production baseline OFT (OFT#9) at NAS Meridian in April 1999, the final Systems Operational Testing will be conducted.

During 1998 16 T-45 aircraft were manufactured and delivered. Two T-45A aircraft were delivered to NAS Kingsville and 14 T-45C aircraft were delivered to NAS Meridian. There are currently 16 T-45C aircraft at Nas Meridian.

Aircraft contract deliveries had been approximately two weeks late during most of 1998, but returned to being on schedule at the end of 1998. Parts availability and component quality issues had been the main contributors to these delays. The program continues to aggressively monitor aircraft operational performance, as well as Boeing/Rolls Royce production performance. Program focus continues on correction of engine surge, ground directional control, and Boeing/Rolls Royce production quality issues.

Congress did not approve a multiyear aircraft procurement for FY99. Since the President's Budget was based on a FY99 start of Multiyear procurement, the budget was substantially under funded. Funding was added so the President's FY00 Budget submission now reflects fully funded annualized procurement of aircraft.

The FY99 production contract was awarded to Boeing in September 1998.

Preparations are underway to compete the Contractor Logistics Support (CLS) contract for the FY00 period of performance. The competitive CLS Request for Proposal for the FY00 period of performance was released to industry on November 9, 1998. Additionally, a Pre-Proposal Conference was held at Naval Air Station Meridian on November 18, 1998 for all interested industry participants. The current competition schedule calls for a contract award by July 1999, with a contract start date of October 1, 1999.

A government/industry team is working to establish an achievable road map to ensure the T45TS will provide effective and efficient jet pilot training through 2035. The team is concentrating on keeping pace with the evolving Operational Advisory Group (OAG) requirements and capabilities of both the fleet replacement squadrons and primary flight trainer systems. Obsolescence avoidance, increasing airframe life, O&S cost reduction and avionics advances are considered top priorities.

The program successfully completed a record number of monthly flight hours [5,165.3(hrs)], (4,115 sorties) at NAS Kingsville in April 1998. As of Dec 1998, the Training Command had flown over 199,300 T-45A flight hours and 5600 T-45C flight hours.

The program has received CNO approval of an Inventory Objective increase from 187 to 234 aircraft. Utilization rates to date indicate that the T45 aircraft can be operated an additional 15 years, or until 2035 with the additional 47 aircraft being required to account for attrition. The FY00 President's Budget submission reflects the increased Inventory Objective by funding additional

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7. Executive Summary (Cont'd):

aircraft in the FYDP.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Program Initiated	JUL 75	JUL 75	JUL 75
Requirements Validation Study	MAR 78	MAR 78	MAR 78
MENS Approved	JUN 79	JUN 79	JUN 79
RFQ For Concept Definition	DEC 79	DEC 79	DEC 79
Project Charter Approved	AUG 80	AUG 80	AUG 80
ASE Studies Completed	MAR 81	MAR 81	MAR 81
Sustain Engr Contract Award	NOV 81	NOV 81	NOV 81
DEM/VAL Contract Award (Pre FSED)	SEP 82	SEP 82	SEP 82
Program Redirect (All Carrier Qual)	NOV 83	NOV 83	NOV 83
Advance Development Contract Award	JUL 84	JUL 84	JUL 84
Milestone I/II (DSARC)	SEP 84	SEP 84	SEP 84
FSED Letter Contract	SEP 84	SEP 84	SEP 84
Milestone IIIA Approval Pilot Prod (APP)	SEP 87	SEP 87	SEP 87
T45A First Flight	MAR 88	MAR 88	APR 88
Pilot Lot II FY 89	DEC 89	DEC 89	DEC 89
Milestone IIIA (ALRIP) FY92	NOV 91	NOV 91	APR 92
Complete Navy Tech Eval (NTE)	AUG 93	AUG 93	NOV 93
Complete OPEVAL	DEC 93	DEC 93	APR 94
Initial Operational Capability	NOV 92	NOV 92	APR 93

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9a. Schedule (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone III Authorized Full Production	JAN 95	JAN 95	JAN 95
Contractor Logistics Support (CLS) Competition	OCT 97	OCT 99	OCT 99

b. Current Change Explanations --
N/A

10. Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Aircraft				
Wing Span (ft)	30.81	30.81 / 30.81	N/A	30.81
Length (ft)	39.26	39.26 / 39.26	N/A	39.26
Height (ft)	13.42	13.42 / 13.92	N/A	13.92
Flight Design Weight (lbs)	13725	13725 / 14000	13868	13868
Specific Range @ 30,000 ft (takeoff less 40% useable fuel) (nm/lb)	.33	.33 / .32	.359	.359
Endurance @ 5000 ft (takeoff less 80% useable fuel) (lb/hr)	1130	1130 / 1160	940	940
Waveoff (altitude loss ft)	50	50 / 70	<70	<70
Bolter (ground roll distance ft @ 15 kts WOD)	325	325 / 425	310-375	310-375
Lateral Directional Stability (sideslip excursion approach configuration) (deg)	4	4 / 6	6	6
Roll Off at Stall (approach configuration) (deg)	<30	<30 / 30	15-20	15-20
"G" Excursion Speed Brake Extension (Gs)	.25	.25 / .40	.35	.35

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10a. Performance Characteristics (Cont'd):

	<u>Production Estimate (\$AR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Longitudinal	.45	.45 / .25	.30	.30
Stability (stick free damping ratio 10,000 ft & .86 IMN)				
Simulator				
Total Time Lag Error (ms)	124	124 / 155	155	155
Digital				
Computational System				
Main Memory with spare (MB)	4.0/2.75	4.0/2.75/ 4.0/2.0	4.0/2.0	4.0/2.0
Processing Capacity (ms)	16.05	16.05 / 16.67	<16.67	<16.67
Visual System Luminance (ft-l)	2.0	2.0 / 1.5	2.16	2.16
Academics				
Memory/Spare (K/MB)	640/80	640/80 / 640/40	640 / 80	640 / 80
Terminal Response Time (sec avg)	<3	<3 / 3	<3	<3
Training Integration System				
Memory (RAM) (MB)	256	256 / 192	192	192
I/Os per second	210	210 / 75	75	75
Terminal Response Time (sec avg)	<3	<3 / 3	<3	<3
Aircraft				
Speed				
Max Level Flt (Mach)	.84	.84 / .83	.845	.845
Approach (kts)	125	125 / 125	124.4	124.4
Sustain G's @ 15,000 ft	3.4	3.4 / 3.2	3.3	3.3
Mean Flight Hours Between Failure (MFHBF)	3.2	3.2 / 2.0	3.2	3.2
Direct Maintenance Man Hours/Flight Hour (DMMH/FH)	10	10 / 10	8.33	8.33
Availability (%)	85	85 / 75	76	76
Simulator				
Availability (%)				
Instrument Flight Trainer (IFT)	95	95 / 80	90	90

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10a. Performance Characteristics (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Operational Flight Trainer (OFT)	95	95 / 80	90	90
Academics				
Computer Aided Instruction (CAI)	95	95 / 85	100	100
System Availability (% Sched)				
Training Integration System (TIS)				
Availability (% Sched)	95	95 / 85	85	100
Pilot Training Rate	450	N/A / N/A	N/A	N/A

b. Current Change Explanations -- None

11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	898.9	1086.0	1054.6
Procurement	4595.2	4832.2	5707.9
Airframe/CFE	(2738.5)		(3538.7)
Engines	(184.3)		(333.6)
GFE	(137.8)		(146.5)
Change Allowance/ECO	(62.6)		(26.0)
Nonrecurring flyaway	(198.6)		(264.6)
Total Flyaway	(3321.8)		(4309.4)
Training Equipment	(337.1)		(227.0)
Other	(651.3)		(897.8)
Total Other Wpn Sys	(988.4)		(1124.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(285.0)		(273.7)
Construction (MILCON)	34.0	34.0	33.9
Acquisition O&M	0.0	0.0	0.0
Total FY 95 Base-Year \$	5528.1	5952.2	6796.4
Escalation	71.4	30.8	74.3
Development (RDT&E)	(-167.1)	(-186.8)	(-174.7)
Procurement	(241.4)	(220.5)	(251.8)
Construction (MILCON)	(-2.9)	(-2.9)	(-2.8)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	5599.5	5983.0	6870.7

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11b. Total Program Cost and Quantity (Cont'd):

b. Quantity --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	2	2	2
Procurement	<u>174</u>	<u>187</u>	<u>234</u>
Total	176	189	236

The percentage of LRIP units has adjusted proportionately to the total quantity aircraft (300 to 234). The original program planned 48 LRIP (FY89/90) units or 16% of 300 total. Due to delays in completing development, OSD directed procurement of 60 LRIP units (FY89 thru FY94). Subsequent adjustments have lead to the current 234 aircraft and the resulting present 26% ratio to the total.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (Mar 99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	6827.9	6796.4	
(2) Quantity	236	236	
(3) Unit Cost	28.932	28.798	-0.46
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	5707.9	5707.9	
(2) Quantity	234	234	
(3) Unit Cost	24.393	24.393	0.00

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13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	731.8	4836.6	31.1	5599.5
Previous Changes:				
Economic	+5.5	-90.4	+0.1	-84.8
Quantity	-	+276.6	-	+276.6
Schedule	-	-174.6	-	-174.6
Engineering	-19.6	+34.9	-	+15.3
Estimating	+162.2	-151.3	-0.1	+10.8
Other	-	-	-	-
Support	-	-93.8	-	-93.8
Subtotal	+148.1	-198.6	+0.0	-50.5
Current Changes:				
Economic	-	-38.2	-	-38.2
Quantity	-	+919.9	-	+919.9
Schedule	-	-51.2	-	-51.2
Engineering	-	+10.2	-	+10.2
Estimating	-	+228.6	-	+228.6
Other	-	-	-	-
Support	-	+252.4	-	+252.4
Subtotal	-	+1321.7	-	+1321.7
Total Changes	+148.1	+1123.1	+0.0	+1271.2
Current Estimate	879.9	5959.7	31.1	6870.7

Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	898.9	4595.2	34.0	5528.1
Previous Changes:				
Quantity	-	+216.1	-	+216.1
Schedule	-	-90.1	-	-90.1
Engineering	-20.3	+38.0	-	+17.7
Estimating	+176.0	-110.3	-0.1	+65.6
Other	-	-	-	-
Support	-	-83.2	-	-83.2
Subtotal	+155.7	-29.5	-0.1	+126.1
Current Changes:				
Quantity	-	+772.3	-	+772.3
Schedule	-	-39.7	-	-39.7
Engineering	-	+16.7	-	+16.7
Estimating	-	+184.6	-	+184.6
Other	-	-	-	-
Support	-	+208.3	-	+208.3
Subtotal	-	+1142.2	-	+1142.2
Total Changes	+155.7	+1112.7	-0.1	+1268.3
Current Estimate	1054.6	5707.9	33.9	6796.4

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-38.2
Total change associated with quantity increase of 47 T-45A aircraft.	+700.8	+834.6
Quantity increase of 47 (from 187 to 234 T-45A aircraft). (Quantity)	+772.3	+919.9
Allocation to schedule resulting from quantity change. (Schedule)	-39.7	-51.2
Allocation to engineering resulting from quantity change. (Engineering)	+16.7	+10.2
Allocation to estimating resulting from quantity change. (Estimating)	-48.6	-44.4
Adjustment for Current and Prior Inflation. (Estimating)	+12.9	+13.6
Increase for Foreign Exchange Rate (FER) from \$1.56 to \$1.70 British pounds, and ECO estimating. (Estimating)	+68.5	+81.0
Increase from loss of savings due to cancellation of Multi Year contract by Congress (FY99-FY04), and change in pricing assumptions from Multi Year to annual procurement pricing for outyears. (Estimating)	+75.6	+86.4
Increase for Nonrecurring & ancillary equipment. (Estimating)	+76.2	+92.0
Adjustment for Current and Prior Inflation. (Support)	+3.9	+3.9
Reduction in Initial Spares. (Support)	-2.2	-1.8
Increase in Training Equipment. (Support)	+0.3	+0.3
Increase in Other Weapons Support provides for expanded requirements in logistics support due to addition of 47 T-45 aircraft. (Support)	+206.3	+250.0
Procurement Subtotal	+1142.2	+1321.7

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14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
17.97	-1.31	+4.06	+0.44	+4.34	+5.01	--	+1.31	+13.85	31.82

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
31.82	-0.52	-3.02	-0.96	+0.11	+1.01	--	+0.67	-2.71	29.11

b. Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
13.73	-1.20	+0.97	+4.00	+3.70	+4.68	--	+1.92	+14.07	27.80

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
27.80	-0.55	-2.02	-0.96	+0.19	+0.33	--	+0.68	-2.33	25.47

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	JUL 75	N/A	JUL 75	JUL 75
Milestone II	N/A	N/A	SEP 84	SEP 84
Milestone III	N/A	N/A	JAN 95	JAN 95
FUE/IOC	MAY 91	N/A	NOV 92	APR 93
Total Cost	5462	N/A	5599.5	6870.7
Total Quantity	304	N/A	176	236
Prog Acq Unit Cost	17.97	N/A	31.82	29.11

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

a. Procurement --

		Initial Contract Price		
		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>T-45A GFE ENGINES:</u>				
ROLLS ROYCE, plc, Bristol, England				
N00019-93-C-0100, FFP		\$2.7	N/A	12
Award: November 30, 1993				
Definitized: March 23, 1995				

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$137.3	N/A	78	\$173.1	\$173.1

Explanation of Change:

The Current Target Price has been revised to include the FY-99 advance acquisition award. Total reflects the definitization of the GFE engines (FY-94 thru FY-98, and FY-99 (AAC option), plus the price of modules, and spare engines awarded to date.

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

(U)The Program Managers Price at Completion reflects the total contract estimate for the GFE engines for the eight (8) option years.

(U)The Basic contract was awarded to Rolls Royce (Nov 93) and contains eight options, FY-94 through FY01.

(U)The Initial Target Price reflects the Termination Liability funding (initially) awarded on the Advanced Acquisition contract prior to definitization.

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15. Contract Information (Cont'd):

			Initial Contract Price	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
<u>T45TS FY97 PROD:</u> MCDONNELL DOUGLAS, ST. LOUIS, MO N00019-96-C-0029, FFP Award: September 30, 1996 Definitized: March 25, 1997	\$16.0	N/A	12	

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$227.5	N/A	12	\$227.5	\$227.5

Explanation of Change:

The Current Target Price reflects the Mar 97 contract definitization price modified to include Cockpit 21 ECP. Additional funding awarded procures T45TS simulators systems and support items, support equipment, logistics support items, non recurring, and ancillary costs.

Cost and Schedule variance reporting is not required on this FFP contract.

			Initial Contract Price	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
<u>T45TS FY98 PROD:</u> McDonnell Douglas, ST. LOUIS, MO N00019-97-C-0059, FFP Award: September 15, 1997 Definitized: December 10, 1997	\$23.2	N/A	15	

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$249.8	N/A	15	\$249.8	\$249.8

Explanation of Change:

The Current Target Price reflects the Dec 97 contract definitization price modified to include Cockpit 21. Additional funding awarded procures T45TS simulators systems and support items, support equipment, logistics support items, non recurring costs, and ancillary equipment.

Cost and Schedule variance reporting is not required on this FFP contract.

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15. Contract Information (Cont'd):

T45TS FY99 PRODUCTION:
MCDONALD DOUGLAS CORP, ST. LOUIS MO
N00019-98-C-0114, FFP
Award: September 30, 1999
Definitized: February 16, 1999

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$3.1	N/A	15

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$215.6	N/A	15	\$215.6	\$215.6

Explanation of Change:

The Current Target price reflects the Mar 99 contract definitization price. Additional funding awarded procures structure fatigue life tracking, engine monitoring, and sustaining support.

Memo: Production contracts N00019-94-C-0058 (FY-95) and N00019-95-C-0164 (FY-96) have been deleted from this report since both contracts are over 90% completed. This SAR report is expected to be the last report for the production contract N00019-96-C-0164 (FY-97) since the contract is expected to be over 90% completed by the Dec 99 SAR.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY80-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-06)	<u>Total</u>
RDT&E	879.9	-	-	-	879.9
Procurement	3592.5	357.9	332.3	1677.0	5959.7
MILCON	31.1	-	-	-	31.1
O&M	-	-	-	-	-
Total	4503.5	357.9	332.3	1677.0	6870.7

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

b. Annual Summary -- T45TS

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1980			7.1	7.1	4.2
1981			2.5	2.5	1.6
1982			7.3	7.3	4.9
1983			11.1	11.1	7.8
1984			32.3	32.3	23.6
1985			89.6	89.6	67.5
1986			156.6	156.6	121.4
1987			178.6	178.6	142.5
1988			120.5	120.5	99.4
1989			106.0	106.0	91.1
1990			216.6	216.6	193.8
1991			15.6	15.6	14.5
1992			50.3	50.3	48.0
1993			30.4	30.4	29.7
1994			28.1	28.1	27.9
1995			0.6	0.6	0.6
1996			1.3	1.3	1.3
1997			0.1	0.1	0.1
Subtotal	2		1054.6	1054.6	879.9

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				78.8	65.1
1988	12	55.9	274.4	481.3	414.9
1989	24	9.1	428.9	418.6	375.3
1990		15.4	2.4	137.1	127.2
1991		39.9		159.5	152.2
1992	12	25.9	220.3	367.3	358.3
1993	12	8.3	225.2	281.7	279.9
1994	12	8.2	247.6	316.2	320.1
1995	12	5.2	219.0	257.2	264.5
1996	12	2.3	206.7	306.6	319.8
1997	12	3.5	204.9	288.5	303.5
1998	15	5.2	236.8	278.0	295.7
1999	15	2.5	236.4	292.8	316.0
2000	15	2.6	244.0	326.3	357.9
2001	15	2.7	241.0	298.1	332.3
2002	15	2.7	242.4	294.0	333.8

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2003	15	12.5	239.6	303.1	351.1
2004	15	12.6	237.4	297.3	351.6
2005	15	8.9	234.6	286.9	346.4
2006	6	41.2	103.2	238.6	294.1
Subtotal	234	264.6	4044.8	5707.9	5959.7

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				10.8	9.2
1989					
1990				12.9	11.8
1991					
1992					
1993				10.2	10.1
Subtotal				33.9	31.1

MILCON claimant is Chief of Naval Education and Training (CNET).

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	236	264.6	5099.4	6796.4	6870.7

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	2	2
Procurement	99	99

Percent Total Program Quantities Delivered: 42.8%

b. Total Expenditures To Date (In Millions of Dollars): \$ 3476

Percent Total Program Expended: 50.6%

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18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The concept of operations of the T45TS is for total contractor logistic support (CLS), where the Navy provides the appropriate operational military personnel and flightline consumables, and the remainder is a turn key contractor operation. This program was specifically scoped to a 361 pilot training rate (PTR) per year, spread over two sites (NAS Meridian, and NAS Kingsville, TX). In order to meet this PTR, 147 aircraft are required to fly approximately 719 flight hours each aircraft per year. The steady state quantity of flight hours is 105,689 per year. These quantities reflect the incorporation of JPATS into the T45TS program, and were used in the calculation of Mission Personnel, Unit-Level Consumption, Contractor Logistics Support, Sustaining Support and Indirect Support. In section b costs, Mission Personnel costs include the costs for pay and allowances for enlisted personnel and officers. Contractor personnel involved in the maintenance of the T-45 are not included in the element, but within the CLS portion of the O&S.

(U) Unit-Level Consumption costs include the cost for Petroleum, Oil & Lubricants (POL) required for peacetime operations, and Training Ordnance costs. The 36 PTR for E2/C2 aircraft have no ordnance requirements, and therefore are not included in the estimate. Consumables/Repair Part and Depot Level Repairables are included in CLS, as maintenance is performed by the contractor.

(U) CLS costs include the following elements: the costs for Aircraft Maintenance; Ground Training System (GTS Maintenance, Replenishment Spares, ROR, Simulator Maintenance, and Operations Costs); Training Support Center Maintenance; Program & Administrative Mgt; Off Site Repair (Engine Depot ROR, Aircraft ROR, SE ROR, and Airframe Rework); Detachment Support; Travel & Per Diem; and other Direct Charges. Sustaining Support Costs include the costs for modification kits needed to achieve acceptable levels of safety, overcome mission capability deficiencies, maintain/enhance reliability, and reduce maintenance costs. Support Equipment Replacement is performed by the contractor, and is included in CLS under ROR. Sustaining Engineering Support, Software Maintenance, and Simulator Operations costs are also included in the cost for CLS.

(U) Indirect costs include pipeline Naval Aviators and include the costs for Student Aviators and Installation Support. Installation Support includes costs for personnel and infrastructure at the host installations where the training is performed.

(U) Date of estimate: January 28, 1997.

(U) The T-45A/C was designed to replace the T-2C, TA-7 and TA-4J aircraft. The Average Annual Cost Per Steady State reflects the current T-45A/C aircraft estimate. The cost of antecedent (T-2C, TA-7 and TA-4J) systems were not available for this SAR.

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

b. Costs -- (FY 1995 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per T-45/YEAR	Avg Annual Cost Per Steady State
Mission Pay & Allowances	129.0	104.8
Unit Level Consumption	154.1	125.2
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	1100.9	897.4
Sustaining Support	79.2	64.4
Indirect Costs	242.1	197.9
Total	1705.3	1389.7

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A-3 ASAS

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

PROGRAM: ASAS

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): All Source Analysis System (ASAS)
2. DoD Component: Army
3. Responsible Office and Telephone Number:
Intelligence Fusion PMO COL Lawrence G Arrol
1616 Anderson Road Assigned: May 14, 1996
McLean, VA 22102-1616 DSN 235-8110; COMM (703)-275-8110
 larrol@asaspmo.belvoir.army.mil
4. Program Elements/Procurement Line Items:
RDT&E:
 PE 64321A Project DB19
PROCUREMENT:
 APPN 2035 ICN BS9704 (Army)
 APPN 2035 ICN K28801 (Army)

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5. References:

Block IIA

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline dated December 1991.

Approved Program:

Approved Acquisition Program Baseline (APB) dated February 2, 1999.

Block IIB/III

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline dated December 1991.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated February 2, 1999.

6. Mission and Description:

As the Intelligence and Electronic Warfare (IEW) sub-system of the Army Tactical Command and Control System (ATCCS), the All Source Analysis System (ASAS) provides all source intelligence fusion to gain a timely and comprehensive understanding of enemy deployments, capabilities, and potential courses of action. With this knowledge, battle managers will be able to view the battlefield and more effectively conduct the land battle. ASAS is a tactically deployable ADP system used to receive and correlate data from strategic and tactical intelligence sensors/sources; produce ground battle situation displays; rapidly disseminate intelligence information; provide target nominations; help manage organic IEW assets; and assist in providing operational security (OPSEC) support. The system is theater independent and designed to operate in peace-time, supporting contingency and crisis operations during low, mid, and high intensity conflicts, and during restoration and return to peace stabilization periods. ASAS has been designated by Congress as the Army's only tactical intelligence fusion project.

ASAS is being produced and fielded in two hardware configurations and three software versions. The current configuration, Block I, was formerly planned for procurement and fielding to corps and active divisions in the years 1992 through 1997. This configuration was restructured in FY91 to include Hawkeye, an OSD-sponsored balanced technology initiative. Because of the restructuring, Block I was fielded to the above units in the FY93-95 timeframe without having to go into full rate production.

Block I is made up of the Communications Control Set AN/TYQ-40 which receives and transmits information from multiple sensor systems; the Data Processor Set AN/TYQ-36 which processes intelligence data; the Workstation, Computer Graphics AN/TYQ-37 which is the primary user interface with the system; and Workstation, Computer Graphics AN/TYQ-52(V) which processes intelligence data. Block I has

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6. Mission and Description (Cont'd):

been fielded to the entire active force and the (15) enhanced National Guard Brigades.

Block II is made up of objective hardware modules using ATCCS Common Hardware/Software (CHS) components. ASAS Block II hardware procurement will begin in FY99 and full fielding to the Army's force structure will begin in FY00. ASAS Block III is a software development effort which will bring ASAS to its full objective capabilities. It will operate on the same hardware architecture as the Block II ASAS. There is no Block I antecedent system. ASAS Block II replaces ASAS Block I equipment with improved functionality and common hardware and software. The ASAS acquisition strategy maximizes the use of government and commercial Non-Developmental Item software, OSD directed Common Operating Environment software, incremental phased deliveries, and continuous user test and evaluation.

7. Executive Summary:

PM Intel Fusion remains committed to the First Digitized Division (FDD) efforts. The ASAS program has been restructured to implement FDD requirements by replanning the existing schedule baseline, changing existing contract scope and adding new scope. Negotiated contract extension through FDD with prime contractor.

PMO Intelligence Fusion completed mission critical Y2K System Interface Agreements for the All Source Analysis System (ASAS).

Completed Phase I of the Remote Workstation (RWS) V4.1 Limited User Test (LUT) concurrently with the III Corps Warfighter Exercise at Ft. Hood, TX. Phase II will be conducted in Mar 99, also at Ft. Hood, TX. The cumulative data indicates that the majority of the requirements passed, for a rate of over 96%. These figures include 27 LAN Interface testing requirements and 105 Inspections and Analysis.

Completed a successful FCA/PCA which resulted in DCMC and PM Intel Fusion co-signing the DD-250 by which the Government formally accepted the ASAS RWS v.4.

PM Intel Fusion Test IPT initiated weekly teleconference meetings on 30 Jul 98, to continue discussions regarding test schedules and events for the Remote Workstation (RWS).

The All Source Analysis System (ASAS) has been recommended for Level 6 Defense Information Infrastructure (DII) Common Operating Environment (COE) certification. The ASAS program is the first program in the Army to achieve this level of software interoperability. The ASAS program has 81 functional segments, the highest number in the Department of Defense. Many are being provided to other developers, along with lessons learned, to simplify their development efforts and conserve their resources for use on increased software functionality which will directly benefit the soldier on the battlefield.

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7. Executive Summary (Cont'd):

The upgraded Communications Control Set (CCS) and Compartmented ASAS Message Processing System (CAMPS) successfully passed all security certification criteria and were certified for worldwide operations.

Provided ASAS Remote Workstation (RWS) (v3) demonstrations to US Navy SPAWAR and USMC Extended Littoral Battlespace (on ASAS ground intelligence fusion system capabilities and functionalities), and to US Army INSCOM and DISA (on the RWS V3 capabilities and initiatives successfully utilized at the DIV AWE and Rapid Force Projection Initiative (RFPI)).

The ASAS Remote Workstation (RWS) software continues to be tailored to meet functional requirements of Force XXI initiatives. Software deliveries continue to be timely and to successfully meet interoperability requirements with other BFA systems supporting the First Digitized Division (FDD).

The current foundation development baseline, Remote Workstation (RWS), continues to demonstrate success at a number of exercises. While these do not constitute test events, they continue to be utilized as excellent opportunities to gather data and collect user feedback on newly developed enhancements.

The ASAS continues to successfully provide support to troops in Bosnia in both communications and intelligence processing arenas.

PM Intel Fusion is currently utilizing the ASAS Trusted Workstation (TWS) in III Corps units at Ft. Hood, TX. The ASAS TWS provides critical functional and interoperability capabilities within the ~~Sec~~, ~~Sec~~ Collateral, and ~~Sec~~ Rel environments. The ASAS TWS provides necessary interoperability links between the Navy, Air Force, Marines and allies, and the ACE. The ASAS TWS has been accredited by DIA to communicate with 13 different LANS ~~(222)~~, ~~Sec~~ collateral, and 11 ~~Sec~~ Rel) from one workstation. The ASAS TWS system was given a 180 day interim accreditation, and the III Corps units and 1 CD ASAS TWS accreditation has been extended indefinitely by the US Army Accreditor.

The All Source Analysis System (ASAS) became the first Army system to be integrated into the Joint C4ISR Battle Center (JBC) at the Joint Training, Analysis and Simulation Center (JTASC) in Suffolk, VA. The JBC facilitates training and experimentation with the Service's migration systems to promote interoperability for the JTF commander. Marine students were impressed with the ASAS functionality, ease of use, and trainability, and suggested that it would be beneficial for the Marines to have ASAS Remote Workstations. The two Marines, along with six soldiers, were the first operators to be trained on any of the systems in the JBC, and were all complimentary of RWS' utility.

PM Intel Fusion provided two RWS V3s and support personnel to the US Marine Corps for use during the Limited Objective Experiment 3 (LOE3) at Camp Lejeune, NC. The Marines used one Remote Workstation (RWS) V3 in the fusion cell of their Littoral Warfare Training Center. The operations officers in the Experimental Combat Operations Center used the enemy ground picture developed by the RWS V3. Interoperability with the Joint Maritime Command Information System (JMCIS) included web-based access of databases, as well as message

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ASAS, December 31, 1998

7. Executive Summary (Cont'd):

exchanges and world-wide dissemination of vital information. The Marine Corps UAV Flight Operations at Cherry Point Air Station employed the second RWS V3 to process full motion video. Focused on urban warfighting skills, LOE 3 included a Command Post Exercise followed by a Military Operation in Urban Terrain (MOUT). The Marines used ASAS to communicate, annotate imagery and disseminate products. They found the RWS to be user friendly and, with only a few days of training, were able to create overlays to depict flight routes and enemy positions.

The ASAS Remote Workstation (RWS) demonstrations drew positive attention from attendees at the AUSA conference 09-14 Oct 98. Soldiers from 4ID demonstrated the system and offered an objective, real-world view of the RWS to guests such as the Chief of Staff Army, Sergeant Major of the Army, and Secretary of the Army, as well as the CG OPTEC.

The ASAS system was installed in the Sea-Based Battle Lab aboard the USS Coronado and is participating in the Extended Littoral Battlespace (ELB) Advanced Concept Technology Demonstration (ACTD).

This may be the final SAR for this program since Block IIA is more than 90% complete, and Block IIB/III is below major defense acquisition program thresholds.

8. Threshold Breaches:

Block IIA

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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8. Threshold Breaches (Cont'd):

Block IIB/III

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

Block IIA

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Joint Oversight Group (ASARC Authority Approves Block II)	NOV 87	NOV 87	NOV 87
DAB Program Review	AUG 93	AUG 93	AUG 93
Block II RDT&E Contract Award (EMD)	SEP 93	SEP 93	OCT 93
Phase 2 (TSE Functionality) Prototype Delivery	JUL 95	N/A	N/A
Phase 3 (EAC Functionality) Prototype Delivery	MAR 96	N/A	N/A
Preliminary Design Review	MAR 96	N/A	N/A
Critical Design Review	AUG 96	N/A	N/A
DT&E			
Start	JAN 98	N/A	N/A
Complete	FEB 98	N/A	N/A
IOT&E			
Start	JUL 98	N/A	N/A
Complete	SEP 98	N/A	N/A
First Article Test	FEB 00	N/A	N/A
Organic Support Capability	OCT 98	N/A	N/A
Depot Support Capability	NOV 98	N/A	N/A
Block II Milestone III	APR 99	N/A	N/A

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9a. Schedule (Cont'd):

Block IIA

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Block II Prod Contract Award	MAY 99	N/A	N/A
Block II Milestone III/ Block III Milestone II	N/A	FEB 00	MAR 00
Op Eval, Del 2 (RWS)	N/A	MAR 98	AUG 98

b. Current Change Explanations --

Note: Milestones with N/A's in CE were to have been removed from APB approved April 21, 1997. This will be done through an administrative change after the SAR cycle.

Block IIB/III

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Block II Milestone III/Block III Milestone II	N/A	FEB 00	AUG 00 (Ch-1)
Initial Operational Capability	DEC 99	JUN 00	DEC 00 (Ch-1)
Block III EMD Contract Award	JUN 99	MAR 00	SEP 00
Block III FOT&E	OCT 02	APR 03	OCT 03 (Ch-1)
Block III Milestone III	JUL 03	NOV 03	MAY 04 (Ch-1)
Op Eval, Del 3 (ACE)	N/A	DEC 98	JUN 99 (Ch-1)
Op Eval, Del 4 (Advanced Capability)	N/A	SEP 99	MAR 00 (Ch-1)
Block II First Digitized Division Delivery	N/A	SEP 00	MAR 01 (Ch-2)
Block II First Digitized Corps Delivery	N/A	APR 04	OCT 04 (Ch-2)

b. Current Change Explanations --

(Ch-1) The following milestones were revised to reflect the recently approved realignment strategy for the five ATCCS program schedules:

- Block II Milestone III/Block III Milestone II from MAR 00 to AUG 00
- Initial Operational Capability from SEP 00 to DEC 00
- Block III FOT&E from APR 03 to OCT 03
- Block III Milestone III from NOV 03 to MAY 04
- Op Eval, Del 3 (ACE) from MAY 99 to JUN 99
- Op Eval, Del 4 (Advanced Capability) from OCT 99 to MAR 00

(Ch-2) The following two milestones have been added to reflect the recently approved realignment strategy for the five ATCCS program schedules.

- Block II First Digitized Division Delivery, SEP 00
- Block II First Digitized Corps Delivery, APR 04

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10. Performance Characteristics:

Block IIA

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Message Volume	Process 29,000 combined I/O msgs w/ peak =>4,350 per hour in 24 hours at Division	Process / Process 29,000 / 21,000 combine/ d I/O / d I/O msgs w// msgs w/ peak => / peak => 4,350 / 2,100 per / per hour in/ hour in 24 hours/ 24 hours at / at Divisio/ Divisio n / n	TBD	Process 29,000 combined I/O msgs w/peak => 4,350 per hour in 24 hours at Division
Maintainability (ACE)				
MTTR - DS (hr)	3.0	3.0 / 3.0	TBD	3.0
MTTR - Unit (hr)	1.0	1.0 / 1.0	TBD	1.0
Operational Availability (Ao)	0.8	0.8 / 0.8	TBD	0.8
Intelligence Development	All Source corre- lated database auto-IPB product, receive, manipu- late, display, & store secon- dary/UAV imagery	All / All Source / Source corre- / corre- lated / lated database/ databas auto-IPB/ e & auto product,/ IPB receive,/ products manipu- / late, / display,/ & store / secon- / dary/UAV/ imagery./	TBD	All Source corre- lated database auto-IPB product, receive, manipu- late, display, & store secon- dary/UAV imagery

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10a. Performance Characteristics (Cont'd):

Block IIA

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Target Development	Auto genera- tion of target nomina- tion msg w/i 30 sec of receipt of info meeting preset criteria in 90% of all cases.	Auto / Genera- tion of / target target / nomina- tion msg/ w/i 2 w/i 30 / min of sec of / receipt receipt / of info of info / meeting meeting / analyst preset / preset criteria/ criteria in 90% / in 85% of all / of all cases. / cases.	TBD	Auto genera- tion of target nomina- tion msg w/in 30 seconds of receipt of info meeting preset criteria in 90% of all cases.
Collection Management	Integra- tion of DoD Std Collect- ion Mgt Systems.	Integra-/ Integra- tion of / tion of DoD Std / Army Collect-/ Std. ion Mgt / Collect- Systems./ ion / Mgt. / Systems	TBD	Integra- tion of DoD Std Collec- tion Mgt Systems.
Interoperability with ATCCS (SCI/ Collateral)	Auto Sanitize	Auto / Manual Sanitize/ Sanitize	TBD	Auto- Sanitize
Interoperability with DIA MIIDS/IDB	Auto Data Base Exchange	Auto / Bulk Data / Load Base / Updates Exchange/	TBD	Auto Database Exchange
Direct transmission/ receipt of SCI/Non- SCI Message Traffic	Computer to Computer File Exchange	Computer/ Process to / All ASAS Computer/ Required File / DoD Std. Exchange/ MTF / Messages / Automa- / tically / in 95% / of all / trials.	TBD	Computer to Computer File Exchange
DIA Accreditation for Operation	Multi- Level Security	Multi- / System Level / High Security/	TBD	Multit- Level Security

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10a. Performance Characteristics (Cont'd):

Block IIA

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Continuity of	Process	Process / Process	TBD	Process
operations during	=>2,828	=> / =>		=>2,828
tactical redeploy-	I/O msgs	2,828 / 1,365		I/O msgs
ment	combined	I/O / I/O		combined
	during	msgs / msgs		during
	peak	combine/ combine		peak
	hour.	d during/ d during		hour
		peak / peak		
		hour. / hour.		

ACRONYMS:

USMTF - US Message Text Format
TSE - Tactical Operations Center Support Element
TCAE - Technical Control and Analysis Element
FSIC - Forward Sensor Interface and Control
ENSIT - Enemy Situation
CCS - Communications Control Set
G2-TOC - Assistant Chief of Staff, Intelligence (General Staff)
Tactical Operations Center
EAC - Echelons Above Corps

b. Current Change Explanations --
None.

Block IIB/III

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Mean Time To Repair				
(MTTR) (Unit				
Level) (hr)				
MTTR - DS	3.0	3.0 / 3.0	TBD	3.0 (Ch-1)
MTTR - Unit	1.0	1.0 / 1.0	TBD	1.0 (Ch-1)
Operational	0.8	0.8 / 0.8	TBD	.8 (Ch-1)
Availability				

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10a. Performance Characteristics (Cont'd):

Block IIB/III

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Intelligence	All	All / All	TBD	All (Ch-1)
Development	Source	Source / Source		Source
	correlat	correlat/ correlat		correlat
	ed	ed / ed		ed
	database	database/ database		database
	auto-IPB	auto-IPB/ and		auto-IPB
	product,	product,/ auto		product,
	receive,	receive,/ assisted		receive,
	manipula	manipula/ IPB		manipula
	te,	te, / products		te,
	display	display /		display
	and	and /		and
	store	store /		store
	secondar	secondar/		secondar
	y UAV	y UAV /		y UAV
	imagery	imagery /		imagery
Target Development	Autogene	Autogene/ Generati	TBD	Auto-gen(Ch-1)
	ration	ration / on of		erati
	of	of / target		on of
	target	target / nominati		target
	nominati	nominati/ on msg		nominati
	on msg	on msg / w/in 2		on msg
	w/in 30	w/in 30 / minutes		w/in 30
	seconds	seconds / of		seconds
	of	of / receipt		of
	receipt	receipt / of info		receipt
	of info	of info / meeting		of info
	meeting	meeting / analyst		meeting
	preset	preset / preset		preset
	criteria	criteria/ criteria		criteria
	in 90%	in 90% / in 85%		in 90%
	of all	of all / of all		of all
	cases	cases / cases		cases
Collection Management	Integrat	Integrat/ Integrat	TBD	Integrat(Ch-1)
	ion of	ion of / ion of		ion of
	DoD std	DoD std / Army std		DoD std
	collecti	collecti/ collecti		collecti
	on mgt	on mgt / on mgt		on mgt
	systems	systems / systems		systems
Interoperability with	Auto	Auto / Manual	TBD	Auto- (Ch-1)
ABCS (SCI/	sanitize	sanitize/ sanitize		Sanitize
Collateral)				
Interoperability with	Auto	Auto / Bulk	TBD	Auto (Ch-1)
DIA MIDB	database	database/ load		Database
	Exchange	Exchange/ updates		Exchange

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10a. Performance Characteristics (Cont'd):

Block IIB/III

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Direct Transmission/ Receipt of SCI/non- SCI message traffic	Computer to computer file exchange	Computer/ Process to / all ASAS computer/ required file / DoD std exchange/ MTF / messages / automati / cally in / 95% of / all / trials	TBD	Computer(Ch-1) to Computer File Exchange
Message Volume	Process 29,000 combined I/O msgs w/peak =>4,350 per hour in 24 hrs at Division	Process / Process 29,000 / 21,000 combined/ combined I/O msgs/ I/O msgs w/peak / w/peak =>4,350 / =>2,100 per hour/ per hour in 24 / in 24 hrs at / hrs at Division/ Division	TBD	Process (Ch-1) 29,000 combined I/O msgs w/peak =>4,350 per hour in 24 hrs at Division
DIA Accreditation for Operation	Multi- Level security	Multi- / System Level / High security/	TBD	Multi- (Ch-1) Level security
Continuity of operations during tactical redeploy- ment	Process => 2,828 I/O msgs combined during peak hour	Process / Process => 2,828/ => I/O msgs/ 1,365 combined/ I/O msgs during / combined peak / during hour / peak / hour	TBD	Process (Ch-1) => 2,828 I/O msgs combined during peak hour

b. Current Change Explanations --

Ch 1. Block IIB/III was added during SAR cycle; it has same performance characteristics as Block IIA.

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11. Total Program Cost and Quantity (Dollars in Millions):

Block IIA

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	162.7	124.1	157.8
Procurement	66.2	30.3	38.8
Flyaway	(64.1)		(33.2)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.2)		(0.3)
Initial Spares	(1.9)		(5.3)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 86 Base-Year \$	228.9	154.4	196.6
Escalation	78.9	98.2	67.5
Development (RDT&E)	(43.1)	(85.8)	(52.1)
Procurement	(35.8)	(12.4)	(15.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	307.8	252.6	264.1

Block IIA is more than 90% complete and will no longer be reported.

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	N/A	N/A	0
Total	0	0	0

ASAS unit of measure consists of a system being fielded to 28 Army Contingency units in Force Packages I through III. These units are Army priority units identified in Division, Corps, and Echelons-Above-Corps.

c. Foreign Military Sales --
Not Applicable.

d. Nuclear Costs --
None.

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11a. Total Program Cost and Quantity (Cont'd):

Block IIB/III

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. Cost --			
Development (RDT&E)	96.6	123.4	172.9
Procurement	213.6	430.1	430.1
Flyaway	(192.2)		(407.5)
Other Weapons Systems			(0.0)
Peculiar Support	(0.3)		(0.5)
Initial Spares	(21.1)		(22.1)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 86 Base-Year \$	310.2	553.5	603.0
Escalation	191.8	355.7	335.4
Development (RDT&E)	(65.1)	(12.8)	(80.9)
Procurement	(126.7)	(342.9)	(254.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	502.0	909.2	938.4
b. Quantity --			
Development (RDT&E)	N/A	0	0
Procurement	<u>N/A</u>	<u>28</u>	<u>N/A</u>
Total	N/A	28	0

ASAS unit of measure consists of a system being fielded to 28 Army Contingency units in Force Packages I through III. These units are Army priority units identified in Division, Corps, and Echelons-Above-Corps.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

Block IIA

	UCR Baseline (FEB 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 86 BY\$)	154.4	196.6	
(2) Quantity	0	0	
(3) Unit Cost	N/A	N/A	N/A
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 86 BY\$)	30.3	38.8	
(2) Quantity	0	0	
(3) Unit Cost	N/A	N/A	N/A

Block IIA is more than 90% complete and will no longer be reported.

Block IIB/III

	UCR Baseline (FEB 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 86 BY\$)	553.5	603.0	
(2) Quantity	28	28	
(3) Unit Cost	19.768	21.536	+8.94
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 86 BY\$)	430.1	430.1	
(2) Quantity	28	28	
(3) Unit Cost	15.361	15.361	0.00

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13. Cost Variance Analysis:

Block IIA

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

	RD&E	PROC	MILCON	TOTAL
Development Estimate	205.8	102.0	-	307.8
Previous Changes:				
Economic	-19.9	-46.0	-	-65.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+8.9	+92.7	-	+101.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-11.0	+46.7	-	+35.7
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+15.1	-99.4	-	-84.3
Other	-	-	-	-
Support	-	+4.9	-	+4.9
Subtotal	+15.1	-94.5	-	-79.4
Total Changes	+4.1	-47.8	-	-43.7
Current Estimate	209.9	54.2	-	264.1

Summary (FY 1986 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	162.7	66.2	-	228.9
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+2.9	+38.8	-	+41.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+2.9	+38.8	-	+41.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-7.8	-69.7	-	-77.5
Other	-	-	-	-
Support	-	+3.5	-	+3.5
Subtotal	-7.8	-66.2	-	-74.0
Total Changes	-4.9	-27.4	-	-32.3
Current Estimate	157.8	38.8	-	196.6

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

Block IIA

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised Program Estimates (Estimating)	-7.8	+15.1
RDT&E Subtotal	-7.8	+15.1
(2) <u>Procurement</u>		
Adjustment for Current and Prior Inflation. (Estimating)	+0.5	+0.7
Revised Program Estimates (Estimating)	-70.2	-100.1
Revised estimate for initial spares. (Support)	+3.5	+4.9
Procurement Subtotal	-66.2	-94.5

Block IIB/III

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	161.7	340.3	-	502.0
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	+4.2	-	+4.2
Engineering	+3.0	-	-	+3.0
Estimating	+20.6	+336.7	-	+357.3
Other	-	-	-	-
Support	-	-2.7	-	-2.7
Subtotal	+23.6	+338.2	-	+361.8
Current Changes:				
Economic	-2.5	-13.8	-	-16.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+61.2	-	-	+61.2
Estimating	+9.8	+15.6	-	+25.4
Other	-	-	-	-
Support	-	+4.3	-	+4.3
Subtotal	+68.5	+6.1	-	+74.6
Total Changes	+92.1	+344.3	-	+436.4
Current Estimate	253.8	684.6	-	938.4

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

Block IIB/III

Summary (FY 1986 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	96.6	213.6	-	310.2
Previous Changes:				
Quantity	-	-	-	.
Schedule	-	+3.2	-	+3.2
Engineering	+2.2	-	-	+2.2
Estimating	+9.3	+179.3	-	+188.6
Other	-	-	-	-
Support	-	-1.5	-	-1.5
Subtotal	+11.5	+181.0	-	+192.5
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+57.8	-	-	+57.8
Estimating	+7.0	+32.8	-	+39.8
Other	-	-	-	-
Support	-	+2.7	-	+2.7
Subtotal	+64.8	+35.5	-	+100.3
Total Changes	+76.3	+216.5	-	+292.8
Current Estimate	172.9	430.1	-	603.0

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-2.5
Adjustments to fund functionality to ORD requirements (Engineering)	+57.8	+61.2
Adjustment for Current and Prior Inflation. (Estimating)	+0.4	+0.6
Plus up for IBIS Phase II (Estimating)	+2.3	+3.2
Plus up for Multi-Adaptive Single Source (Estimating)	+4.3	+6.0
RDT&E Subtotal	+64.8	+68.5
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-16.0
Economic adjustment for negative program change. (Economic)	N/A	+2.2
Adjustment for Current and Prior Inflation. (Estimating)	+0.2	+0.3
Plus up for Warfighter Rapid Acquisition Program (WRAP) Initiative (Estimating)	+6.0	+7.7
Adjustments to fund revised hardware density (Estimating)	+45.6	+56.8

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13b. Cost Variance Analysis (Cont'd):
Block IIB/III

b. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Revised Program Estimates (Estimating)	-19.0	-49.2
Revised estimate for initial spares. (Support)	+2.7	+4.3
Procurement Subtotal	+35.5	+6.1

14. Unit Cost and Other History (Then-Year Dollars in Millions):
Block IIA

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A	--	--	--	--	--	--	--	--	N/A

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A	--	--	--	--	--	--	--	--	N/A

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	SEP 93	N/A	OCT 93
Milestone III	N/A	JUL 03	N/A	NOV 03
FUE/IOC	N/A	DEC 99	N/A	SEP 00
Total Cost	0	307.8	0	252.6
Total Quantity	0	28	0	0
Prog Acq Unit Cost	0	10.99	0	0

No Milestone I because program originated out of a joint service testbed and was managed outside traditional acquisition milestones as the Joint Tactical Fusion Program Management Office which reported directly to the Army as lead service. In 1990, program was placed under traditional acquisition procedures

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14. Unit Cost and Other History (Cont'd):

Block IIA

and policies and became an Army Systems Acquisition Review Council (ASARC) Defense Acquisition Board (DAB) program.

No Initial Estimate for PAUC was possible because no unit of measure had been defined.

Block IIB/III

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A	--	--	--	--	--	--	--	--	33.51

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A	--	--	--	--	--	--	--	--	24.45

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	JUN 99	N/A	SEP 00
Milestone III	N/A	JUL 03	N/A	MAY 04
FUE/IOC	N/A	DEC 99	N/A	DEC 00
Total Cost	N/A	502	N/A	938.4
Total Quantity	N/A	0	N/A	28
Prog Acq Unit Cost	N/A	0	N/A	33.51

No Milestone I because program originated out of a joint service testbed and was managed outside traditional acquisition milestones as the Joint Tactical Fusion Program Management Office which reported directly to the Army as lead service. In 1990, program was placed under traditional acquisition procedures and policies and became an Army Systems Acquisition Review Council (ASARC) Defense Acquisition Board (DAB) program.

No Initial Estimate for PAUC was possible because no unit of measure had been defined.

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

a. RDT&E --

ASAS Block II:
Martin Marietta Astro, Littleton CO
DAAB07-94-C-A515, CPAF
Award: October 29, 1993
Definitized: October 29, 1993

Initial Contract Price		
Target	Ceiling	Qty
\$115.2	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$175.7	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$165.3	\$165.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$0.0	\$-1.5
Cumulative Variances To Date (12/31/98)	\$0.0	\$-0.9
Net Change	\$0.0	\$0.6

Explanation of Change:

Current cost and schedule variances are not considered significant.

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

Total Program

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

<u>Appropriation</u>	Prior <u>Years</u> (FY83-99)	Budget <u>Year</u> (FY00)	Budget <u>Year</u> (FY01)	Balance To <u>Complete</u> (FY02-17)	<u>Total</u>
RDT&E	258.4	46.0	44.6	114.7	463.7
Procurement	86.8	57.2	71.4	523.4	738.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	345.2	103.2	116.0	638.1	1202.5

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

Block IIA

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

<u>Appropriation</u>	<u>Prior Years (FY91-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	209.9	-	-	-	209.9
Procurement	54.2	-	-	-	54.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	264.1	-	-	-	264.1

Block IIA is more than 90% complete and will no longer be reported.

Block IIB/III

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

<u>Appropriation</u>	<u>Prior Years (FY97-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-17)</u>	<u>Total</u>
RDT&E	48.5	46.0	44.6	114.7	253.8
Procurement	32.6	57.2	71.4	523.4	684.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	81.1	103.2	116.0	638.1	938.4

b. Annual Summary -- Block IIA

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY86 Dollars Nonrec</u>	<u>Flyaway FY86 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1991				2.7	3.3
1992				15.2	19.1
1993				33.4	42.9
1994				6.4	8.4
1995				30.8	41.1
1996				36.7	49.9
1997				25.2	34.8
1998				7.4	10.4
Subtotal				157.8	209.9

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

Block IIA

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995			2.8	3.3	4.5
1996			4.7	9.8	13.5
1997			10.3	10.3	14.4
1998			15.4	15.4	21.8
Subtotal			33.2	38.8	54.2

Recurring costs occur without corresponding quantities due to incremental procurement of workstation upgrades.

Block IIA is more than 90% complete and will no longer be reported.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total			33.2	196.6	264.1

b. Annual Summary -- Block IIB/III

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				2.0	2.7
1998				10.7	14.8
1999				22.1	31.0
2000				32.4	46.0
2001				30.9	44.6
2002				29.6	43.4
2003				17.3	25.9
2004				10.5	16.1
2005				5.3	8.3
2006				1.9	3.0
2007				1.2	2.0
2008				1.8	3.0
2009				2.9	5.0
2010				0.6	1.0
2011				0.6	1.0
2012				0.6	1.0
2013				0.5	1.0
2014				0.5	1.0

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16b. Program Funding Summary (Cont'd):
Block IIB/III

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2015				0.5	1.0
2016				0.5	1.0
2017				0.5	1.0
Subtotal				172.9	253.8

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997					
1998			0.5	1.3	1.8
1999			15.4	21.8	30.8
2000	7		39.0	39.9	57.2
2001	7		48.1	49.0	71.4
2002	5		33.6	35.0	51.8
2003	5		43.4	44.5	67.2
2004	4		41.5	44.9	69.3
2005			33.2	33.7	53.1
2006			25.1	25.5	41.0
2007			30.5	31.1	51.0
2008			20.5	20.9	35.0
2009			5.6	5.8	10.0
2010			5.4	5.7	10.0
2011			8.3	8.4	15.0
2012			10.2	11.0	20.0
2013			9.9	10.7	20.0
2014			9.8	10.5	20.0
2015			9.5	10.3	20.0
2016			9.4	10.2	20.0
2017			8.6	9.9	20.0
Subtotal	28		407.5	430.1	684.6

Recurring costs occur without corresponding quantities due to incremental procurement of workstation upgrades from FY95-FY99. The FY05 recurring costs are associated with procurement of Block III workstations which are outside the system quantity description.

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

Block IIB/III

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	28		407.5	603.0	938.4

17. Delivery/Expenditure Information:

Block IIA

a. Deliveries To Date - None.

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 0.0

Percent Total Program Expended: 0.0%

Expenditures represent Block II/III.

Block IIB/III

a. Deliveries To Date - None.

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 0.0

Percent Total Program Expended: 0.0%

18. Operating and Support Costs:

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

Block IIA

a. Assumptions and Ground Rules --
(Reference: Army Cost Position (ACP), July 1993) The concept of operation for ASAS is a mobile battlefield automated data processing system operating on a peacetime scenario using an operating tempo of 2160 hours per year (HPY) (except Military Pay which is based on a wartime scenario with an operating tempo of 7555.5 HPY). The system employs a three tier maintenance concept. At the Organizational level, system malfunctions will be analyzed down to the Line Replaceable Unit (LRU); at the Intermediate (DS/GS) level, repair and replacement of unserviceable assemblies and sub-assemblies will be accomplished; and major overhaul and rebuilding will occur at the Depot.

The costs to operate and support the system include personnel costs of operators, maintainers, and support personnel. Permanent change of station costs are included. The sustaining materiel cost consists primarily of replenishment spares and repair parts, POL, and Modifications Kits.

There is no antecedent system.

b. Costs -- (FY ASAS Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Block II	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Direct Depot Maintenance	0.4	0.0
Sustaining Investment	0.2	0.0
Other Direct Costs	0.2	0.0
Personnel	1.7	0.0
Total	2.5	0.0

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

Block IIB/III

a. Assumptions and Ground Rules -- None.

b. Costs -- (FY ASAS Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Block II	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Direct Depot Maintenance	0.4	N/A
Sustaining Investment	0.2	N/A
Other Direct Costs	0.2	N/A
Personnel	1.7	N/A
	N/A	N/A
Total	2.5	N/A

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PROGRAM: Minuteman III PRP

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Minuteman III Propulsion Replacement Program (MM III PRP)
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:
OO-ALC/LMP Maj Chris Terry
6031 Gum Lane Assigned: July 17, 1998
Hill AFB, UT 84056-5826 DSN 775-5541; COMM (801)775-5541
terryc@hillwpos.hill.af.mil
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0604851F
PROCUREMENT:
(U) APPN 3020 ICN LGM30G (Air Force)

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5. (U) References:

SAR Baseline (Development Estimate):

(U) Acquisition Decision Memorandum dated June 30, 1994, Subject: Milestone II

Approved Program:

(U) AFAE Approved Acquisition Program Baseline (APB) dated December 23, 1996.

6. (U) Mission and Description:

(U) The Propulsion Replacement Program (PRP) extends the life, maintains the performance, and improves the reliability of the Minuteman (MM) III operational force by replacing the solid propellant propulsion subsystems prior to the onset of ageout. The solid propulsion systems now in the force are projected to begin aging out in 2002 and must be replaced in order to support current force planning. The PRP will be executed in two phases, Technology Insertion (TI) and Remanufacture. During the TI phase, new materials and manufacturing processes will be qualified to replace unavailable or environmentally prohibited materials. Additionally, known failure modes and design weaknesses will be corrected by incrementally inserting and qualifying current rocket motor technologies. The PRP will reuse existing components to the greatest extent possible. Another goal of TI is to maintain the industrial base so that rocket motor production capability is available when needed for motor remanufacture. During remanufacture, the solid rocket motors and interstage hardware and ordnance will be recycled from the force and remanufactured at a rate up to eight motors per month during the period FY 2000 through FY 2008.

Software changes must be incorporated because of material changes incorporated in stage manufacturing. Because both the stage 2 liquid injection thrust vector control injectant and stage 3 motor case must be replaced, the missile control dynamics, mass properties, and propulsion characterization programs must also be modified to ensure a controlled flight.

7. (U) Executive Summary:

(U) During the previous year, PRP has focused on completing the development phase and transitioning into the qualification phase of the program. PRP successfully established the technical baseline for the current program by closing out the Stage 1, 2, and 3, software and ordnance Critical Design Reviews (CDRs).

At present, the program is actively engaged in qualification testing. This includes qualification motor fabrication and testing, software formal qualification testing (FQT), and ordnance qualification testing. During the past year, PRP successfully static tested 12 Change Verification Motors (CVM) and 2 Qualification Motors (QM).

In addition, in June 1998, all PRP development and production efforts were successfully transitioned to the ICBM Prime Integration Contract (IPIC), which was competitively awarded to TRW. This competition saved \$336M for PRP (see 13a (2)). In 1999, PRP objectives include completing motor qualification and

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7. (U) Executive Summary (Cont'd):

preparing for the Low Rate Initial Production (LRIP) effort which is scheduled to start in FY00. In addition, the program will prepare for its two flight tests scheduled for FY00.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
Milestone II AFSARC	JUN 94	JUN 94	JUN 94	
DT&E Phase Start	APR 95	APR 95	APR 95	
PDR Close-out	FEB 98	FEB 98	JAN 98	
CDR Close-out	AUG 98	AUG 98	NOV 98	(Ch-1)
LRIP Contract Award	OCT 99	OCT 99	OCT 99	
DT&E Phase Complete	JUN 99	JUN 99	JUN 99	
IOT&E Phase Start	JUL 99	JUL 99	JUL 99	
IOT&E Phase Complete	MAR 00	MAR 00	MAR 00	
PCA Close-out	SEP 00	SEP 00	SEP 00	
Milestone III Review	SEP 00	SEP 00	SEP 00	
LRIP Booster FAD	MAR 01	MAR 01	MAR 01	
IOC	JAN 02	JAN 02	JAN 02	

(U) ACRONYMS:

CDR- Critical Design Review
 DT&E- Developmental Test and Evaluation
 IOC- Initial Operational Capability

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

IOT&E- Initial Operational Test and Evaluation
 LRIP- Low Rate Initial Production
 PCA- Physical Configuration Audit
 PDR- Preliminary Design Review

b. Current Change Explanations --

(U) (Ch-1) Actual date of completion as follows:

CDR Close-out From "Aug 98" to "Nov 98"

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
(1) Countdown & Flight Reliability (CD&FR) (Boost Reliability) (1) Range (System) (NM)	(b)(1)			
Nuclear Hardness and Survivability (NH&S) (Each Stage)	MMIII wpm sys spec hardness levels	Silo: / Peace- / keeper / In / Flight: / SICBM / Hardness/ Levels / wpm sys / spec / hardness/	TBD	MMIII wpm sys spec hardness levels
(1) Alert Readiness Rate (Stages 1,2,3) Service Life (Each Stage) (yrs)	(b)(1)			
(1) Mean Time Between Maintenance (MTBM) (Each Stage) (hrs)	17	30 / 17	TBD	17
(1) Accuracy (System) (ft) (1) Guidance Update Program (GUP) (1) GUP plus FS	(b)(1)			

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10b. (U) Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	340.0	336.8	311.0
Procurement	1911.4	1750.0	1523.4
Flyaway	(1864.7)		(1440.1)
			(0.0)
Total Flyaway	(1864.7)		(1440.1)
Other Wpn System Costs	(46.7)		(83.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 94 Base-Year \$	2251.4	2086.8	1834.4
Escalation	567.9	514.0	342.0
Development (RDT&E)	(30.6)	(30.5)	(20.7)
Procurement	(537.3)	(483.5)	(321.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2819.3	2600.8	2176.4
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	607	607	607
Total	607	607	607

(U) The planned LRIP quantities at Milestone III are 9 (FY2000/first year).

This does not represent more than 10% of the planned program buy.

The unit of measure is a reassembled fully integrated Minuteman III with remanufactured solid propellant stages.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

	UCR Baseline (Dec 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 94 BY\$)	2086.8	1834.4	
(2) Quantity	607	607	
(3) Unit Cost	3.438	3.022	-12.10
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 94 BY\$)	1750.0	1523.4	
(2) Quantity	607	607	
(3) Unit Cost	2.883	2.510	-12.94

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	370.6	2448.7	-	2819.3
Previous Changes:				
Economic	-3.9	-77.4	-	-81.3
Quantity	-	-	-	-
Schedule	-	+13.0	-	+13.0
Engineering	-	-	-	-
Estimating	-33.8	-219.4	-	-253.2
Other	-	-	-	-
Support	-	+48.2	-	+48.2
Subtotal	-37.7	-235.6	-	-273.3
Current Changes:				
Economic	-3.0	-30.4	-	-33.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.8	-336.2	-	-334.4
Other	-	-	-	-
Support	-	-1.8	-	-1.8
Subtotal	-1.2	-368.4	-	-369.6
Total Changes	-38.9	-604.0	-	-642.9
Current Estimate	331.7	1844.7	-	2176.4

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

(U) Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	340.0	1911.4	-	2251.4
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-30.8	-155.3	-	-186.1
Other	-	-	-	-
Support	-	+37.8	-	+37.8
Subtotal	-30.8	-117.5	-	-148.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.8	-269.3	-	-267.5
Other	-	-	-	-
Support	-	-1.2	-	-1.2
Subtotal	+1.8	-270.5	-	-268.7
Total Changes	-29.0	-388.0	-	-417.0
Current Estimate	311.0	1523.4	-	1834.4

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RD&E</u>		
Revised escalation indices. (Economic)	N/A	-3.0
Adjustment for Current and Prior Inflation. (Estimating)	+2.3	+2.5
Congressional/SAF Reductions (Estimating)	-0.5	-0.7
RD&E Subtotal	+1.8	-1.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-47.3
Economic adjustment for negative program change. (Economic)	N/A	+16.9
Prime Savings through competition (AR)(Estimating)	-269.3	-336.2
Change in Other Wpn System Costs (Change Orders and Data) (Support)	-1.2	-1.8
Procurement Subtotal	-270.5	-368.4

AR = Acquisition Reform related changes.

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
--	--	--	--	--	--	--	--	--	--

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.64	-0.19	+0.01	+0.02	--	-0.97	--	+0.08	-1.05	3.59

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
--	--	--	--	--	--	--	--	--	--

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.03	-0.18	+0.01	+0.02	--	-0.92	--	+0.08	-0.99	3.04

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	JUN 94	N/A	JUN 94
Milestone III	N/A	SEP 00	N/A	SEP 00
FUE/IOC	N/A	JAN 02	N/A	JAN 02
Total Cost	N/A	2819.3	N/A	2176.4
Total Quantity	N/A	607	N/A	607
Prog Acq Unit Cost	N/A	4.64	N/A	3.59

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- Minuteman III PRP, December 31, 1998

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

a. RDT&E --
 (U) MMIII PRP STAGE 3:
 TRW, SAN BERNARDINO, CA
 F42610-98-C-0001, CPAF
 Award: December 22, 1997
 Definitized: December 22, 1997

Current Contract Price			Initial Contract Price	
Target	Ceiling	Qty	Target	Ceiling
\$102.5	N/A	0	\$112.4	N/A

Estimated Price At Completion	
Contractor	Program Manager
\$104.5	\$102.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	\$1.8	\$-1.2
Net Change	\$1.8	\$-1.2

Explanation of Change:

(U) This contract has no previous variances because it was transferred from six associated contractors to one prime integrated contractor in Jun 98.

The variances have no impacts on the contract or the program.

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

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

Appropriation	Prior Years (FY94-99)	Budget Year (FY00)	Budget Year (FY01)	Balance To Complete (FY02-07)	Total
RDT&E	301.6	30.1	-	-	331.7
Procurement	-	93.7	140.7	1610.3	1844.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	301.6	123.8	140.7	1610.3	2176.4

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Minuteman III PRP, December 31, 1998

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

b. Annual Summary -- Minuteman III PRP

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994				14.7	14.9
1995				25.0	25.8
1996				61.9	65.2
1997				64.7	69.0
1998				61.5	66.0
1999				55.9	60.7
2000				27.3	30.1
Subtotal				311.0	331.7

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	9		81.3	83.5	93.7
2001	33		117.6	123.3	140.7
2002	86		208.5	219.4	254.9
2003	96		208.5	221.2	262.1
2004	96		209.3	222.8	269.6
2005	96		201.0	214.2	264.5
2006	96		207.8	220.5	278.0
2007	95		206.1	218.5	281.2
Subtotal	607		1440.1	1523.4	1844.7

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	607		1440.1	1834.4	2176.4

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 181.2

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Minuteman III PRP, December 31, 1998

17b. (U) Delivery/Expenditure Information (Cont'd):

(U) Percent Total Program Expended: 8.3%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
The concept of operations is based on 500 deployed boosters. With the possible exception of changes resulting from the Technology Insertion (TI) portion of the program of PRP, Integrated Logistics Support areas/requirements mentioned herein will remain the same as those required for the existing MM III weapon system. Maintenance planning will involve two level maintenance; Organizational, and Depot. There will be no new support equipment, training, logistics/supply support, computer systems, and operational facilities resources necessary to support the new motors beyond those already in place. Existing technical data will govern all work to be performed unless a specific technical order, drawing, or work specification is revised to reflect a new process and/or material as a result of the TI effort. Since the PRP was designed to interface seamlessly with existing MM III support functions, there are no delta costs associated with implementing the PRP.

b. (U) Costs -- (FY Constant (Base-Year) Dollars in Thousands)

Cost Element		
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	N/A	N/A

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: Comanche (RAH-66)

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Comanche Program (RAH-66)

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:

Comanche Program Manager's Office	BG Joseph L. Bergantz
ATTN: SFAE-AV-RAH, Building 5681	Assigned: June 16, 1997
Redstone Arsenal	DSN 897-0846; COMM 205-313-0846
Huntsville, AL 35898-5000	

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

RDT&E:

(U)	PE 63220	Project D325
(U)	PE 64216	Project DC72
(U)	PE 64223	Project D327, D397, DC72
(U)	PE 64810	Project D327, DC72

(U) NOTE: PE 64810 Project D327/DC72 (FY 88 Only)

~~Derived From: Comanche SCG
Declassify On: ~~TOP SECRET~~
Date of Source: 11 Nov 95~~

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AS AMENDED
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Comanche (RAH-66), December 31, 1998

5. (U) References:

SAR Baseline (Planning Estimate):

(U) AMC Approved Acquisition Strategy (December 16, 1985).

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated February 5, 1997.

6. (U) Mission and Description:

(U) This program provides for the development of the RAH-66 Comanche. The Army requires an aviation system capable of performing aerial reconnaissance on the modern battlefield. Combat lessons learned and mission analysis have repeatedly supported a critical combat requirement for an aviation reconnaissance system capable of 24 hour combat operations, responsive to the battlefield commander in night and adverse weather conditions and able to survive on the 21st century battlefield. This air cavalry helicopter system will be self-deployable with highly improved sustainability and availability to support continuous combat operations in any world trouble spot. Comanche will be able to find the enemy with a low probability of self-detection and either engage or hand-off the target based on the battle commander's decision. The air cavalry system will be able to operate effectively in the close, deep or rear battles. Comanche incorporates emerging technologies to provide a leap-ahead air cavalry system, field a world-wide deployable, air cavalry reconnaissance helicopter; operate with minimal logistical burden, serve as the command and control node for the commander to win the knowledge war. This system will provide three dimensional battlefield situational awareness with greater depth and breadth than currently possible. This picture of the battlefield will be overlaid on digital maps that consolidate all real time data. The system will display friend or foe discrimination and will avoid detection and survive by reducing signature and incorporating low observable technology. The Comanche helicopter will replace the current light fleet of tactically obsolescent AH-1, OH-6 and OH-58A/C helicopters. The Comanche system will be integrated with the Army aviation force structure to complement the AH-64 Apache helicopter.

7. (U) Executive Summary:

(U) In March 1982, the Army Aviation Mission Area Analysis (AAMAA) was endorsed by senior Army leadership at the Army Aviation Systems Program Review. From that review, the Comanche emerged as the most viable concept to meet fleet needs. A Comanche Justification for Major Systems New Start (JMSNS) was submitted in June 1983. The Comanche was further developed and refined during FY 1984. In December 1985, a Defense Science Board (DSB) Task Force was established to review the Comanche program. The task force reported the Army had a need for a new light helicopter and that technology existed which could support the design of a weapon system of much greater performance than the existing fleet. As the result of the June 9, 1988, Comanche Milestone I Defense Acquisition Board (DAB) review, an Acquisition Decision Memorandum (ADM) dated June 17, 1988, approved the Comanche program to proceed with Demonstration/ Validation (Dem/Val). In 1988, the Light Helicopter Turbine Engine Company (LHTEC) was

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Comanche (RAH-66), December 31, 1998

7. (U) Executive Summary (Cont'd):

announced the winner of the competitive T800 engine program. The Comanche program was restructured in August 1990. The restructure deferred the Engineering and Manufacturing Development (EMD) and extended the Dem/Val phase by an additional two years. In 1991, the Boeing Sikorsky team was declared the winner of the competitive Comanche air vehicle program and was awarded a contract for the Dem/Val Prototype phase. The Comanche program was again restructured in January 1992, as a result of the Defense Acquisition Executive Guidance and the FY 1993 President's budget reductions. The restructured contract modifications were issued to Boeing Sikorsky and LHTEC in January 1993. In December 1994, the Comanche Program was restructured as a prototype industrial/ technology base program with two flyable prototypes. As a result of the Defense Acquisition Board review of the Comanche restructured program, an Acquisition Decision Memorandum was issued in March 1995, to continue the Demonstration/Validation phase with two flyable prototypes and add six aircraft within the FYDP for user evaluation. The Comanche successfully completed first flight on January 4, 1996. Boeing Sikorsky was awarded a contract modification in December 1996 for the completion of the Comanche Demonstration/Validation Program. A change to the EOC program plan was proposed in June 1998. The significant improvements were the acceleration of the Fire Control Radar (FCR) by 5 years so it would be available to support the initial fielding of the RAH-66 in December 2006 and the increased capability of the EOC test aircraft to the full production configuration. The Defense Acquisition Executive approved the initiation of the Pre-Production Prototype (PPP) Program on July 27, 1998. This is an RDT&E only SAR.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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Comanche (RAH-66), December 31, 1998

8c. (U) Threshold Breaches (Cont'd):

c. (U) Explanation of Breach:

Due to the implementation of the Pre-Production Program the following milestones have changed from the APB. The Limited User Test (LUT) Start (from Jul 03 to Jan 05) and Complete (from Sep 03 to Feb 05) dates will be delayed 18 months, and the IOTE Complete date will be delayed 8 months (from Nov 05 to Jul 06). Revised Acquisition Program Baseline has been submitted.

Nunn-McCurdy unit cost reporting is not required for this pre-milestone II program in accordance with Title 10, United States Code, Section 2433.

9. (U) Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate	
T800 Engine FSD Contract Award	JUL 85	JUL 85	JUL 85	
Milestone I (ASARC)	FEB 87	MAY 88	MAY 88	
Milestone I (DAB)	MAR 87	JUN 88	JUN 88	
Award Air Vehicle Phase I Dem/Val	OCT 87	OCT 88	OCT 88	
Contracts				
T800 FSD Downselection	SEP 88	OCT 88	OCT 88	
USD(A) Program Review	N/A	JAN 91	JAN 91	
Award Dem/Val Prototype Phase Contract	N/A	APR 91	APR 91	
Critical Design Review	N/A	OCT 93	DEC 93	
Milestone II (ASARC)	FEB 87	N/A	N/A	
Milestone II	MAR 87	OCT 01	MAR 00	(Ch-1)
Award EMD Contract	JUL 89	N/A	APR 00	(Ch-1)
First Flight	SEP 91	NOV 95	JAN 96	
Initiate Assembly of EOC Aircraft	N/A	NOV 99	N/A	(Ch-1)
T800 Engine Production Contract Award	JAN 93	N/A	N/A	
LUT				
Start	N/A	JUL 03	JAN 05	(Ch-1)
Complete	NOV 93	SEP 03	FEB 05	(Ch-1)
Updated to Preproduction Configuration	N/A	SEP 04	N/A	(Ch-1)
LRIP Program Review (IPR)/Contract	N/A	NOV 04	FEB 05	(Ch-1)
Award				
IOT&E				
Start	N/A	SEP 05	MAR 06	(Ch-1)
Complete	N/A	NOV 05	JUL 06	(Ch-1)
First Air Vehicle Production Delivery	JUL 95	N/A	N/A	
First Unit Equipped	MAY 96	N/A	N/A	
Production Contract	JAN 94	NOV 06	DEC 06	(Ch-1)
Milestone III	JAN 94	JUL 06	DEC 06	(Ch-1)
IOC	N/A	DEC 06	DEC 06	
Depot Support Date	N/A	JUL 06	DEC 06	(Ch-1)
Organic Support Date	N/A	JUL 09	DEC 09	(Ch-1)

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Comanche (RAH-66), December 31, 1998

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

b. Current Change Explanations --

(U) (Ch-1) The following dates have changed to reflect the Comanche Pre-Production Prototype Program.

	FROM	TO
Milestone II	Oct 01	Mar 00
Award EMD Contract	N/A	Apr 00
Initiate Assembly of EOC A/C	Nov 99	N/A
LUT		
Start	Jul 03	Jan 05
Complete	Sep 03	Feb 05
LRIP Program Rev Contract Awd	Nov 04	Feb 05
IOT&E		
Start	Sep 05	Mar 06
Complete	Nov 05	Jul 06
Milestone III	Jul 06	Dec 06
Depot Supt Date	Jul 06	Dec 06
Organic Supt Date	Jul 09	Dec 09
Production Contract	Nov 06	Dec 06
Updated to Pre-Production Configuration	Sep 04	N/A

10. (U) Performance Characteristics:

a. Performance --

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Flight Performance (Primary Mission):				
RAH				
Vertical Rate of Climb (VROC) (Feet per Minute (FPM), @4000 ft, 95 F & PMGW & 97.5% MRP)	500	750 / 500	TBD	500

(b)(1)

Battlefield Information to Joint & Combined Arms Forces

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Comanche (RAH-66), December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Multifunctional Launch Stations ATGM, ATAM, Rockets (Internal)/ Turret Gun System Operational Availability (Ao) (percent):	N/A	6/1 / 6/1	TBD	6/1
Wartime	N/A	78 / 75	TBD	78
Reliability:				
Mean Time Between Essential Main- tenance Actions (MTBEMA) (hrs)	4.5	4.5 / 4.5	TBD	4.5
Maintainability:				
Mean Time To Repair (MTTR) (hrs)	1.0	0.86 / 1.0	TBD	.86
Mean Time Between Mission Affecting Failure (MTBMAF) (hrs)	8.4	/ N/A	TBD	8.5
Maintenance Manhours per flight hr (MMH/FH) @ User Level	2.8	2.6 / 2.6	TBD	2.6
Self Deployable (NM) w/ 30 min. reserve	1260	N/A / N/A	TBD	N/A

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

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Comanche (RAH-66), December 31, 1998

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	1756.2	5344.2	5629.4
Procurement	0.0	N/A	
Total Flyaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 84 Base-Year \$	1756.2	5344.2	5629.4
Escalation	376.8	2632.4	2539.1
Development (RDT&E)	(376.8)	(2632.4)	(2539.1)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2133.0	7976.6	8168.5
b. (U) Quantity --			
Development (RDT&E)	0	6	8
Procurement	0	N/A	0
Total	0	6	8

Note: Excludes 2 RDT&E prototypes from the SAR Baseline and 6 from the Current Estimate that are not considered fully configured.

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
None.

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Comanche (RAH-66), December 31, 1998

12. (U) Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

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

	RDTE&E	PROC	MILCON	TOTAL
Planning Estimate	2133.0	-	-	2133.0
Previous Changes:				
Economic	-213.4	-	-	-213.4
Quantity	+753.2	-	-	+753.2
Schedule	+265.4	-	-	+265.4
Engineering	+1154.8	-	-	+1154.8
Estimating	+4466.6	-	-	+4466.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+6426.6	-	-	+6426.6
Current Changes:				
Economic	-85.6	-	-	-85.6
Quantity	-104.1	-	-	-104.1
Schedule	-62.2	-	-	-62.2
Engineering	-	-	-	-
Estimating	-139.2	-	-	-139.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-391.1	-	-	-391.1
Total Changes	+6035.5	-	-	+6035.5
Current Estimate	8168.5	-	-	8168.5

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Comanche (RAH-66), December 31, 1998

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

(U) Summary (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1756.2	-	-	1756.2
Previous Changes:				
Quantity	+459.1	-	-	+459.1
Schedule	+145.2	-	-	+145.2
Engineering	+685.6	-	-	+685.6
Estimating	+2752.9	-	-	+2752.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+4042.8	-	-	+4042.8
Current Changes:				
Quantity	-61.5	-	-	-61.5
Schedule	+0.0	-	-	+0.0
Engineering	-	-	-	-
Estimating	-108.1	-	-	-108.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-169.6	-	-	-169.6
Total Changes	+3873.2	-	-	+3873.2
Current Estimate	5629.4	-	-	5629.4

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-93.2
Economic adjustment for negative program change. (Economic)	N/A	+7.6
Decrease (from 10 to 8) 2 fully configured aircraft due to conversion to PPP Program (Quantity)	-61.5	-104.1
Acceleration of Comanche radar by 5 years due to conversion to PPP Program (Schedule)	0.0	-62.2
Adjustment for Current and Prior Inflation. (Estimating)	+7.5	+11.3
Change due to revision of estimate for PPP Program Aircraft (Estimating)	+109.6	+218.9
The net of undistributed reductions (PBD 604) (Estimating)	-71.4	-116.5
Exercise related to Corps04/Division02 (First Digitized Corps) (Estimating)	+36.2	+57.8
Change in Estimate due to Technological Breakthrough for Comanche radar (Estimating)	-190.0	-310.7
RDT&E Subtotal	-169.6	-391.1

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Comanche (RAH-66), December 31, 1998

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	MAR 87	N/A	N/A	JUN 88
Milestone II	MAR 87	N/A	N/A	MAR 00
Milestone III	JAN 94	N/A	N/A	DEC 06
FUE/IOC	N/A	N/A	N/A	DEC 06
Total Cost	2133	0	0	8168.5
Total Quantity	0	0	0	0
Prog Acq Unit Cost	0	0	0	0

(U) The Comanche Program is pre-Milestone II program and reports only RDT&E costs.

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

a. RDT&E --

(U) Dem/Val Prototype:
Boeing Sikorsky JPO, Philadelphia PA
DAAJ09-91-C-A004, CPIF/AF
Award: April 12, 1991
Definitized: April 12, 1991

Initial Contract Price		
Target	Ceiling	Qty
\$1956.2	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$3773.4	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$3773.4	\$3785.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-2.7	\$-8.1
Cumulative Variances To Date (11/30/98)	\$1.2	\$-10.8
Net Change	\$3.9	\$-2.7

Explanation of Change:

(U) No significant change in schedule and cost performance. The Program Manager's Estimated Price at Completion has been reduced due to accomplishment of work for less than anticipated cost.

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Comanche (RAH-66), December 31, 1998

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

(U) T800 Growth AVS: LHTEC, Indianapolis, IN DAAJ09-92-C-0453, CPFF Award: April 13, 1992 Definitized: January 5, 1993	<table border="0"> <tr> <th colspan="3">Initial Contract Price</th> </tr> <tr> <th>Target</th> <th>Ceiling</th> <th>Qty</th> </tr> <tr> <td>\$208.3</td> <td>N/A</td> <td>0</td> </tr> </table>	Initial Contract Price			Target	Ceiling	Qty	\$208.3	N/A	0						
Initial Contract Price																
Target	Ceiling	Qty														
\$208.3	N/A	0														
<table border="0"> <tr> <th colspan="3">Current Contract Price</th> </tr> <tr> <th>Target</th> <th>Ceiling</th> <th>Qty</th> </tr> <tr> <td>\$291.4</td> <td>N/A</td> <td>0</td> </tr> </table>	Current Contract Price			Target	Ceiling	Qty	\$291.4	N/A	0	<table border="0"> <tr> <th colspan="2">Estimated Price At Completion</th> </tr> <tr> <th>Contractor</th> <th>Program Manager</th> </tr> <tr> <td>\$302.3</td> <td>\$295.0</td> </tr> </table>	Estimated Price At Completion		Contractor	Program Manager	\$302.3	\$295.0
Current Contract Price																
Target	Ceiling	Qty														
\$291.4	N/A	0														
Estimated Price At Completion																
Contractor	Program Manager															
\$302.3	\$295.0															
<table border="0"> <tr> <th colspan="2">Previous Cumulative Variances</th> </tr> <tr> <td>Cumulative Variances To Date (11/30/98)</td> <td></td> </tr> <tr> <td>Net Change</td> <td></td> </tr> </table>	Previous Cumulative Variances		Cumulative Variances To Date (11/30/98)		Net Change		<table border="0"> <tr> <th>Cost Variance</th> <th>Schedule Variance</th> </tr> <tr> <td>\$-3.0</td> <td>\$-3.7</td> </tr> <tr> <td>\$-7.8</td> <td>\$-10.8</td> </tr> <tr> <td>\$-4.8</td> <td>\$-7.1</td> </tr> </table>	Cost Variance	Schedule Variance	\$-3.0	\$-3.7	\$-7.8	\$-10.8	\$-4.8	\$-7.1	
Previous Cumulative Variances																
Cumulative Variances To Date (11/30/98)																
Net Change																
Cost Variance	Schedule Variance															
\$-3.0	\$-3.7															
\$-7.8	\$-10.8															
\$-4.8	\$-7.1															

Explanation of Change:

(U) Schedule performance has decreased due to hardware availability for System Test. Cost performance has decreased due to higher than anticipated costs in System Test and the development of the T801 engine.

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

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

<u>Appropriation</u>	<u>Prior Years (FY84-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-06)</u>	<u>Total</u>
RDT&E	4213.0	427.1	565.8	2962.6	8168.5
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	4213.0	427.1	565.8	2962.6	8168.5

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Comanche (RAH-66), December 31, 1998

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

b. Annual Summary -- COMANCHE (RAH-66)

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984				1.0	1.0
1985				67.8	71.3
1986				98.8	107.0
1987				123.2	137.6
1988				109.4	127.1
1989				146.4	177.0
1990				215.3	270.2
1991				259.8	338.3
1992				382.2	509.3
1993				291.3	397.3
1994				262.9	365.2
1995				335.3	474.9
1996				197.1	284.1
1997				223.1	325.3
1998				178.6	262.6
1999				245.2	364.8
2000				282.7	427.1
2001				368.5	565.8
2002				493.7	770.6
2003				468.3	744.9
2004				474.1	770.0
2005				229.1	379.9
2006				175.6	297.2
Subtotal	8			5629.4	8168.5

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	8			5629.4	8168.5

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date - None.

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 3877.8

(U) Percent Total Program Expended: 47.5%

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Comanche (RAH-66), December 31, 1998

18. (U) Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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N-18 SSN21 / AN/BSY-2

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: SSN 21 CLASS/BSY-2

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): HIGH SPEED NUCLEAR ATTACK
SUBMARINE & COMBAT SYSTEM

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:

SEAWOLF PROGRAM MANAGER
NATIONAL CENTER 3, ROOM 7N24
PMS350
ARLINGTON, VA 22242-5168

CAPT S. E. JOHNSON
Assigned: May 14, 1998
DSN 332-7200; COMM 703-602-7200

(U) AN/BSY-2 SCS PROGRAM MANAGER
National Center 3, Room 6E16
PMS425
Arlington, VA 22242-5168

CAPT T. J. O'CONNOR
Assigned: September 1998
AV 332-0021; COMM 703-602-0021

CLEARED
FOR OPEN PUBLICATION

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

RDT&E:

- (U) PE 0603561N
- (U) PE 0603562N
- (U) PE 0603569N
- (U) PE 0603570N
- (U) PE 0604524N (Shared) Project F1941, S1347
- (U) PE 0604561N
- (U) PE 0604567N

PROCUREMENT:

AS AMENDED

MAR 19 1999 9

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

**No Security Objection
to Open Publication
(AS AMENDED)**

99-C-0830
MAR 19 1999
**Office of the Chief of
Naval Operations
Dept. of the Navy**

~~Derived from OPNAVINST S5512-50-100 (90)
Downgrade instructions
Declassify on: OADR~~

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99-C-0830

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SSN 21 CLASS/BSY-2, December 31, 1998

4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) APPN 1611 ICN 0204281N (Navy)
(U) APPN 1810 ICN 0204282N (Navy)
(U) APPN 1810 ICN 0204283N (Navy) (Shared)
(U) APPN 1810 ICN 0804731N (Navy) (Shared)
MILCON:
(U) PE 0204896N
(U) PE 0804731N (Shared)

5. (U) References:

SAR Baseline (Production Estimate):

(U) Production Estimates: DCP, SEAWOLF (SSN21) Class Submarine dated 11 May 1988.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated May 4, 1998.

6. (U) Mission and Description:

(U) The SEAWOLF submarine is a multi-mission vessel that introduces unprecedented performance capabilities. It is the quietest, most heavily-armed attack submarine the Navy has ever built. The design of the SEAWOLF is based on an extensive research and development program and incorporates technological advancements to provide: order of magnitude improvement in ship quieting; improved acoustic sensors; more capable combat systems; greater weapon capacity and capability; quieter launch; weapon launch at high ship speed; advanced reactor; improved performance machinery program; an advanced propulsor; increased operating depth; improved ship control; and enhanced survivability.

The SEAWOLF has eight large-diameter torpedo tubes, and holds significantly more weapons than any other U.S. nuclear attack submarine. A stronger hull material enables deeper dives. In addition, the vessel is configured for operation in Arctic areas.

The AN/BSY-2 Submarine Combat System supports the SSN 21 mission to conduct prompt and sustained combat operations. The AN/BSY-2 Submarine Combat System improves upon existing combat systems to meet the expanded operational requirements of attack submarines in countering the future threat. The AN/BSY-2 Submarine Combat System provides combat control and acoustic functions to support the ship characteristics of the SSN-21. The warfare tasks supporting this mission are: Strike Warfare, Anti-Submarine Warfare (ASW), Surveillance/Indication and Warning, Anti-Surface Warfare, Mine Warfare, Special Warfare; Ocean Surveillance, Intelligence/Reconnaissance, Command, Control, and Communication (C3), Electronic Warfare, support of battle group operations, and Naval Special Warfare.

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7. (U) Executive Summary:

(U) The SEAWOLF Submarine Program is completing its production run with the final submarine of the class under construction. Two thirds of the class have been delivered under the Congressional Cost Cap and the last ship to be delivered, PCU JIMMY CARTER (SSN 23) is 54% complete and on track for delivery within budget. Although final acoustic trials will not be conducted until 2000 and the submarines are still in an interim condition (hull uncoated), the USS SEAWOLF (SSN 21) and USS CONNECTICUT (SSN 22) acoustic signature have been measured and both are quieter than any submarine ever put to sea.

The Secretary of the Navy (SECNAV) reviewed the New Design SSN Program and baseline design for the SSN 21 in December 1983, and approved the Single Sheet Ship Characteristics and Chief of Naval Operations (CNO) recommendation for initiating preliminary design. A Secretary of Defense (SECDEF) Program Review on December 21, 1983 served as the Defense System Acquisition Review Council (DSARC) Milestone I and authorized preliminary design. The Navy completed preliminary design in June 1985. Later in the month, the SEAWOLF Program was reviewed and approved by the DSARC at Milestone II. A Milestone IIIA decision was completed in June 1988, approving low rate initial production.

In December 1991, SEAWOLF construction profile was restructured in response to the reduced threat resulting from the end of the Cold War. The original 29 ship class was reduced to two hulls. The 1993 SECDEF Bottom Up review recommended the construction of a third SEAWOLF in an effort to bridge the production gap and preserve the Industrial Base until construction of a new submarine design in 1998. The third SEAWOLF, SSN 23, was authorized in FY96.

SSN 21

The SSN 21 crew took Operational Control (OPCON) of AN/BSY-2 in February 1996. In May 1996, the SSN 21 was declared In-Service. Successful completion of dock trials in June 1996 paved the way for successful completion of Alpha Sea Trials in July, during which the ship demonstrated operations up to maximum speed and maximum depth. During Bravo Sea Trials, the SSN 21 sustained damage to the Wide Aperture Array (WAA) which required a significant re-engineering effort. AN/BSY-2 System Design Certification Test (SDCT) 2 was installed in October 1996 and completed functionality testing. In October 1996, the Functional Configuration Audit was completed and the AN/BSY-2 Product Baseline was established. Charlie and Delta Sea Trials were successfully completed in March and June 1997 respectively. The SSN 21 delivered 1 July 1997. AN/BSY-2 became the first submarine-based Joint Maritime Command Information Systems (JMCIS) platform to obtain full interoperability certification. SSN 21 and AN/BSY-2 conducted Weapons Systems Accuracy Trials in February 1998. The SSN 21 entered the Post Shakedown Availability (PSA) period 03 August 1998 with scheduled completion in FY00. Operations evaluation trials will occur in FY00.

The ship and combat system have performed exceptionally well. As the post-delivery shakedown period progresses, deficiencies are being identified and corrected. Initial acoustic trials are complete. Although the ship is in an interim condition, (hull uncoated and unfaired, and with an interim

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SSN 21 CLASS/BSY-2, December 31, 1998

7. (U) Executive Summary (Cont'd):

propulsor), SEAWOLF is already quieter than any submarine ever put to sea. The USS SEAWOLF is receiving several important acoustic modifications during PSA to further reduce the acoustic signature. The Post PSA Configuration is predicted to be better than design objectives at slow speeds. The SEAWOLF's acoustic signature will not be known until the ship is tested in a final configuration in late 1999 or early 2000. There is a potential need for additional funding to upgrade the propulsor. Options are being developed, prioritized, and executed in concert with the sponsor.

SSN 22

In August 1998, the SSN 22 was declared In-Service. Alpha and Bravo Sea Trials were successfully completed in September 1998. The SSN 22 delivered 13 November 1998 and was commissioned as USS CONNECTICUT (SSN 22) on 11 December 1998. Technical Availabilities (TAVs) and trials (Acoustic and Weapons System Accuracy Trial) will be conducted until the start of PSA in September 1999 timeframe.

SSN 23

The contract for the SSN 23 was awarded in June 1996. Most key events are being met on time or ahead of schedule. For the next eighteen months, hull sections will be shipped from Quonset Point to Groton for hull erection and integration. PCU JIMMY CARTER (SSN 23) will be modified with additional volume and services to accommodate advanced technology for naval special warfare, tactical surveillance, and mine warfare operations. The details of this modification and the advanced technologies, while classified, will support the Defense Science Board (DSB) recommendation for improved payload capabilities and flexible interface with the undersea environment. This will be accomplished without sacrificing current SEAWOLF Class multi-mission warfighting capability. The modification will make the submarine longer than the first two SEAWOLF Class submarines. The submarine is scheduled to be delivered in 2003.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

None.

Note: The SEAWOLF program's revised Procurement Cost (Shipbuilding and Conversion, Navy (SCN) + Other Procurement, Navy (OPN); Base Year 90\$) of \$7819.4M exceeds the \$7636.9M (Base Year 90\$) threshold established in the program's Acquisition Program Baseline (APB). This is a result of two administrative changes to the program, and is not caused by any unplanned programmatic growth.

The FY 00/01 President's Budget contains an administrative error regarding additional SCN funding in the amounts of \$35.7M (BY 90) in FY 02 and \$110.7M (BY 90) in FY 03. The Navy Comptroller has committed to realign this funding from the SEAWOLF budget to the correct appropriated and authorized project during the summer review.

In February 1999 the sponsor allocated \$78.6M (BY 90) OPN funding to satisfy SEAWOLF class sparing requirements as delineated in Section 13. As a result the Procurement Cost exceeds the threshold established in the APB. The Office of the Under Secretary of Defense (Acquisition and Technology) (OUSD (A&T)) recognizes this to be an administrative action and is not caused by any unplanned programmatic growth. A Program Deviation Report and a revision to the APB are in process.

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SSN 21 CLASS/BSY-2, December 31, 1998

9. ~~(S)~~ Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
SSN-21 Submarine			
Program Initiated	JUL 82	N/A	JUL 82
Milestone I (DSARC I)	DEC 83	N/A	DEC 83
Milestone II (DSARC II)	JUN 85	N/A	JUN 85
FSD Contract Award	JUL 85	N/A	JUL 85
Milestone IIB (JRMB)	OCT 86	N/A	OCT 86
Milestone IIIA	JUN 88	JUN 88	JUN 88
First Production Contract Award	JAN 89	JAN 89	JAN 89
DAB Review	MAR 90	N/A	MAR 90
Delivery (First Ship)	MAY 95	MAY 97	JUL 97 (Ch-1)
Initial Operational Capability	MAY 95	MAY 97	JUL 97 (Ch-2)
Complete OPEVAL (OT-III)	N/A	(b)(1)	(Ch-3)
Intermediate Maintenance Activity (IMA) Ready for Operation	N/A	JUN 97	JUN 97
Depot Maintenance Activity Ready for Operation	N/A	DEC 98	DEC 98
Assign Homeport for 2 Ship Class	N/A	NOV 95	NOV 95
Assign Intermediate Activity(IMA)	N/A	NOV 95	NOV 95
Assign Depot Maintenance Activity	N/A	NOV 95	NOV 95
AN/BSY-2			
System Design Definition Contract Award	N/A	N/A	
RCA Corporation	JAN 86	N/A	JAN 86
IBM Corporation	MAR 86	N/A	MAR 86
Milestone I (JRMB)	JUN 86	N/A	JUN 86
Milestone II	NOV 87	FEB 88	FEB 88
FSD Contract Award	JAN 88	N/A	MAR 88
Authorization for Limited Production (DAB)	DEC 89	N/A	DEC 89
Authorization for Limited Production (DAB)	DEC 91	N/A	JAN 91
Material Support Date (AN/BQG-5)	NOV 92	N/A	OCT 93
TECHEVAL (AN/BQG-5)	AUG 93	N/A	N/A
Material Support Date (AN/BSY-2)	NOV 93	N/A	MAY 95
Authorization for Limited Production (DAB)	DEC 93	N/A	N/A
OPEVAL (AN/BQG-5)	MAR 94	N/A	N/A
Initial Operational Capability (AN/BQG-5)	(b)(1)	N/A	N/A
AN/BSY-2 TECHEVAL (DT IIE)	DEC 94	N/A	OCT 99
Complete TECHEVAL (DT III)	DEC 94	N/A	N/A
AN/BSY-2 OPEVAL (OT IIC)	JUN 95	N/A	N/A
Complete OPEVAL (OT III)	JUN 95	N/A	SEP 00 (Ch-4)
Navy Support Date	JUL 96	N/A	N/A
AN/BQG-5 Sys Design Certification Test Complete	N/A	(b)(1)	
1st System Delivered to Shipbuilder (Hardware & Thread 1-5 Software)	N/A		

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9a. ~~(S)~~ Schedule (Cont'd):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
(C) Final Software Delivery to Navy	N/A	(b)(1)	
(C) Initial Operational Capability	(b)(1)	MAY 96	OCT 96
(C) Complete OPEVAL (OT-II)	N/A	(b)(1)	
(C) Milestone III	(b)(1)	N/A	N/A
EMSP			
(C) Start Alpha Sea Trial	N/A	(b)(1)	
(C) SEM B First Tactical System Delivery	N/A		
CCAPS			
PROPULSION SYSTEM	N/A	N/A	
(C) Reactor Vessel in Yard	N/A	(b)(1)	
(C) Land Reactor Vessel	N/A		
(C) Load Primary Shield Tank Complex	N/A		
(C) Module			
(C) Start Pre Fill Testing	N/A		
(C) Power Unit Landed	N/A		

b. Current Change Explanations --

(b)(1)

Ch-4: Complete OPEVAL (OT-III) changed from Mar 00 to Sep 00 due to an extended Post Shakedown Availability. (b)(1)

(b)(1)
(b)(1) Additional PSA work was added to make necessary equipment changes identified during the shakedown period.

10. ~~(S)~~ Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
SSN-21 Submarine				
Length (ft)	353	N/A / N/A	353	353
Beam Max (ft)	40	N/A / N/A	40	40
Draft Nav (ft)	34	N/A / N/A	34	34
Displacement (tons)	9150	N/A / N/A	9150	9150
(C) Operational Depth (ft)	(b)(1)			
(C) Speed (knots)				
(C) Endurance				
(C) Fuel/Fuel				

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10a. ~~(S)~~ Performance Characteristics (Cont'd):

Production	Approved	Demon-	Current
Estimate (APB)	Program (APB)	strated	

(b)(1)

~~(S)~~ Stores/Stores
(days)

Propulsion

Type

~~(S)~~ Shaft Horsepower

Silencing:

~~(S)~~ Radiated Noise
(including
Propulsor)

~~(S)~~ Radiated Noise
(without Special
Hull Treatment)

~~(S)~~ Transients

Ship Control

~~(S)~~ Bow Plane Extension
and Operation
(kts)

~~(S)~~ Bow Plane
Retraction

Arctic Operations:

~~(S)~~ Ascent at zero
speed (from 200
ft) (ft/min)
Surface through
ice:

~~(S)~~ Routine (ft
thick)

~~(S)~~ Emergency (ft
thick)

Armament

Torpedo Tubes

Reloads

Weapons Handling:

~~(S)~~ Simultaneous Wire
Guide (weapons: 2
port, 2 starboard)
Minimum Launch
Interval: (sec)

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10a. ~~(U)~~ Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Same Bank	(b)(1)			
Alternate Bank				
Maximum Torpedo Launch				
Speed (kts)				
(C) Reload Time (min)				
Load				
Any mix conventional				
diameter weapons				
Large Diameter				
Weapon				
Mean Time Between				
Failure (MTBF) (hrs)				
Ship System				
External				
Communications				
System				
Electronic Warfare				
Support Measures				
Mean Time to Repair				
(MTTR) (hrs)				
Ship System				
External				
Communication				
System				
Electronic Warfare				
Support Measures				
Operational				
Availability (Ao)				
(%)				
Ship System				
External				
Communication				
System				
Electronic Warfare				
Support Measures				
(C) Officers Berths				
(C) Enlisted Berths				
Crew				
Total Billets				
Underway				
Combat Systems				
ESM				
AN/BSY-2				
(C) BBS Detection FOM				
(Spherical Array)				
(db)				

Ch-1)

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10a. ~~(S)~~ Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
(S) PNB Detection FOM (TB-12X) (db)	(b)(1)			
(S) Wide Aperture Array Acquisition FOM (Submarine) (db)				
(S) Average Solution Time for Torpedo Attack (>20 Kyd) (mins)				
(S) Time to Snapshot MK 48 ADCAP (sec)				
(S) Operational Availability (Ao) (%)				
(S) Mean Time Between Failure (MTBF) (hrs)				
(S) Mission Time Between Critical Failures (MTBCF) Hardware (hrs)				
(S) Full-up Configuration (hrs)				
(S) Self-Protect Configuration (hrs)				
Performance Monitoring/Fault Localization				
(S) Probability of Fault Detection (%)				Ch-2)
(S) Probability of Fault Localization (%)				Ch-3)
(S) PM False Alarms per 100 Alerts				Ch-4)
Fixed Barrier Mission Scenario				
(S) Probability of secure detection and classification (%)				Ch-5)
(S) Exchange ratio (initial attack)				
(S) Area Clearance Mission Scenario				

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10a. ~~(S)~~ Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(S) Probability of secure detection and classification (%)	(b)(1)			
(S) Secure search rate (NM2/hr)				
(S) Exchange ratio (initial attack)				
(S) Arctic Mission				
(S) Probability of Bastion				
(S) Penetration				
(S) Secure Sweep Rate (Nm2/Hr)				
(S) Probability of Secure Attack (given classification)				
(S) Probability of Kill (given classification)				
(S) Probability of Bastion Escape				
(S) Tactical Speed (kts)				

Ch-6)

b. Current Change Explanations --

(b)(1)

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10b. (U) ~~(S)~~ Performance Characteristics (Cont'd):

(b)(1)

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	4335.0	4594.1	4654.4
Procurement	15686.3	7273.2	7819.4
Basic Ship Costs	(8083.6)		(4843.2)
GFE	(5952.8)		(2308.5)
Other Sailaway	(111.0)		(87.4)
OF/PD	(570.2)		(256.0)
Total Sailaway	(14717.6)		(7495.1)
OPN	(0.0)		(0.0)
AN/BSY-2 OPN	(968.7)		(324.3)
Total Other Wpn Sys	(968.7)		(324.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	98.6	27.5	25.1
Acquisition O&M	0.0	0.0	0.0
Total FY 90 Base-Year \$	20119.9	11894.8	12498.9
Escalation	1619.2	884.4	910.3
Development (RDT&E)	(-125.0)	(-19.5)	(-8.4)
Procurement	(1735.1)	(901.4)	(916.5)
Construction (MILCON)	(9.1)	(2.5)	(2.2)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	21739.1	12779.2	13409.2
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	12	3	3
Total	12	3	3

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
\$1043.5M

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12. (U) Unit Cost Summary:

	UCR Baseline (May 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 90 BY\$)	11894.8	12498.9	
(2) Quantity	3	3	
(3) Unit Cost	3964.933	4166.300	+5.08
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 90 BY\$)	7273.2	7819.4	
(2) Quantity	3	3	
(3) Unit Cost	2424.400	2606.467	+7.51

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	4210.0	17421.4	107.7	21739.1
Previous Changes:				
Economic	-119.0	+422.4	+3.5	+306.9
Quantity	-	-15562.8	-	-15562.8
Schedule	+25.3	+6354.0	-	+6379.3
Engineering	+161.3	-	-	+161.3
Estimating	+378.5	+670.3	-83.9	+964.9
Other	-	-	-	-
Support	+54.6	-874.7	-	-820.1
Subtotal	+500.7	-8990.8	-80.4	-8570.5
Current Changes:				
Economic	-3.5	-18.4	-	-21.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-61.2	+253.0	-	+191.8
Other	-	-	-	-
Support	-	+70.7	-	+70.7
Subtotal	-64.7	+305.3	-	+240.6
Total Changes	+436.0	-8685.5	-80.4	-8329.9
Current Estimate	4646.0	8735.9	27.3	13409.2

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

(U) Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	4335.0	15686.3	98.6	20119.9
Previous Changes:				
Quantity	-	-12545.0	-	-12545.0
Schedule	+18.1	+4369.6	-	+4387.7
Engineering	+141.0	-	-	+141.0
Estimating	+157.1	+763.3	-73.5	+846.9
Other	-	-	-	-
Support	+52.3	-699.6	-	-647.3
Subtotal	+368.5	-8111.7	-73.5	-7816.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-49.1	+189.6	-	+140.5
Other	-	-	-	-
Support	-	+55.2	-	+55.2
Subtotal	-49.1	+244.8	-	+195.7
Total Changes	+319.4	-7866.9	-73.5	-7621.0
Current Estimate	4654.4	7819.4	25.1	12498.9

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) RDT&E

Revised escalation indices. (Economic)	N/A	-3.5
Adjustment for Current and Prior Inflation. (Estimating)	+1.8	+2.1
Eliminate Shock Program. (Estimating)	-47.4	-59.0
Prior Year Adjustment. (Estimating)	-3.1	-3.4
Increased Costs associated with shock testing at Aberdeen Proving Grounds. (Estimating)	+3.1	+3.5
Revised Program Estimate. (Estimating)	-3.5	-4.4
RDT&E Subtotal	-49.1	-64.7

(2) Procurement

Revised escalation indices. (Economic)	N/A	-18.4
Adjustment for Current and Prior Inflation. (Estimating)	+13.3	+16.3
Outfitting/Post Delivery. (Estimating)	+171.3	+233.2
Re-estimate for SSN 21 Class Ship Cost Adjustment. (Estimating)	+5.0	+3.5
Adjustment for Current and Prior Inflation. (Support)	+0.1	+0.1
Revised Program Estimate (Support)	-23.8	-29.4

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SSN 21 CLASS/BSY-2, December 31, 1998

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

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

Class Spares including but not limited to:
Propulsor, AN/BSY-2 Acoustic Rapid COTS
Insertion Units, Towed Array System Hardware,
and Portable Ship Control System (Support)

+78.9 +100.0

Procurement Subtotal

+244.8 +305.3

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1811.59	+95.00	+247.17	+2126.43	+53.77	+385.57	--	-249.80	+2658.14	4469.73

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1451.78	+134.67	-832.25	+2118.00	--	+307.77	--	-268.00	+1460.19	2911.97

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	DEC 83	DEC 83	DEC 83
Milestone II	N/A	MAY 85	JUN 85	JUN 85
Milestone III	N/A	MAR 90	JAN 89	JAN 89
FUE/IOC	N/A	NOV 94	MAY 95	JUL 97
Total Cost	0	3875	21739.1	13409.2
Total Quantity	0	1	12	3
Prog Acq Unit Cost	0	3875	1811.59	4469.73

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SSN 21 CLASS/BSY-2, December 31, 1998

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

a. Procurement --	Initial Contract Price		
(U) <u>SSN 23 CONSTRUCTION:</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
GENERAL DYNAMICS, GROTON, CT			
N00024-96-C-2108, FPIF	\$1220.0	\$1323.5	1
Award: June 28, 1996			
Definitized: June 28, 1996			
Current Contract Price	Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u> <u>Program Manager</u>
\$1209.7	\$1314.2	1	\$1220.2 \$1325.7
Previous Cumulative Variances	<u>Cost Variance</u>	<u>Schedule Variance</u>	
	\$-13.7	\$-11.3	
Cumulative Variances To Date (09/26/98)	<u>\$-3.5</u>	<u>\$-11.6</u>	
Net Change	\$10.2	\$-0.3	

Explanation of Change:

(U) All numbers include anticipated escalation.

The current contract prices are lower than the initial contract prices due to a change in escalation. The Current Contract Ceiling Price is lower than the Program Manager's Estimated Price At Completion (PMEPAC). The PMEPAC is set at maximum government liability in anticipation of cost increases associated with low rate of submarine production and also includes estimates for future contract changes which are not reflected in the current contract ceiling price. The change in cost variance is attributable to improved labor performance. Change in schedule variance is attributable to necessary manning on the SSN 21 and SSN 22.

The SSN 22 Construction Contract N00024-91-C-2902 is complete and is no longer reported.

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SSN 21 CLASS/BSY-2, December 31, 1998

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

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

<u>Appropriation</u>	<u>Prior Years (FY81-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	4582.3	38.5	10.1	15.1	4646.0
Procurement	8354.5	75.4	27.1	278.9	8735.9
MILCON	27.3	-	-	-	27.3
O&M	-	-	-	-	-
Total	12964.1	113.9	37.2	294.0	13409.2

b. Annual Summary -- SSN21 SUBMARINE

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1981				20.7	15.2
1982				30.7	23.7
1983				29.9	24.1
1984				157.4	131.6
1985				334.1	288.1
1986				457.4	405.7
1987				435.9	398.1
1988				470.0	443.6
1989				516.7	508.2
1990				516.4	528.7
1991				511.0	542.0
1992				404.6	441.6
1993				161.0	179.8
1994				160.5	182.6
1995				139.8	162.1
1996				101.8	120.1
1997				73.3	87.5
1998				55.3	66.5
1999				27.2	33.1
2000				31.2	38.5
2001				7.9	10.1
2002				9.4	12.2
2003				2.2	2.9
Subtotal				4654.4	4646.0

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SSN 21 CLASS/BSY-2, December 31, 1998

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

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				376.4	375.0
1988				251.2	257.6
1989	1		2469.4	2197.6	2322.2
1990		333.3		539.3	586.3
1991	1	119.9	2164.0	2016.7	2253.7
1992		192.7		676.0	775.0
1993				2.9	3.4
1994				1.4	1.7
1995				5.5	6.6
1996	1		2215.8	556.8	677.4
1997				531.1	654.9
1998				124.5	155.8
1999				18.5	23.5
2000				21.4	27.7
2001				1.5	2.0
2002				45.8	61.6
2003				128.5	176.4
Subtotal	3	645.9	6849.2	7495.1	8360.8

(U) Nonrecurring Flyaway includes \$645.9M (BY) for ships in FY 92, FY 93, and FY 94 which were not authorized. This amount changed from \$671.8M due to construction spares purchased with FY 90 and FY 91 funds being utilized on the SSN 23 as delineated in the DoDIG report date Mar 6, 1998.

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				0.6	0.6
1990				142.3	152.2
1991				17.7	19.3
1992					
1993				0.3	0.3
1994				3.3	3.8
1995				1.9	2.2
1996				4.0	4.8
1997				40.4	48.5
1998				5.2	6.3
1999				19.1	23.4
2000				38.3	47.7

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SSN 21 CLASS/BSY-2, December 31, 1998

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

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001				19.8	25.1
2002				18.1	23.3
2003				13.1	17.2
2004				0.1	0.2
2005				0.1	0.2
Subtotal				324.3	375.1

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991				25.1	27.3
Subtotal				25.1	27.3

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	3	645.9	6849.2	12498.9	13409.2

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	2	2

(U) Percent Total Program Quantities Delivered: 66.7%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 11338

(U) Percent Total Program Expended: 84.6%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
The O&S cost driving characteristics for the SEAWOLF Class are that each ship has a 30 year service life, displaces 9150 tons, has a crew of 134 officers/enlisted and a maintenance cycle which has 2 overhauls and 6 SRAS. There are 42 months between depot level availabilities. (The source for the cost information PMS350 Total Ownership Cost Plan dated December 1998.)

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SSN 21 CLASS/BSY-2, December 31, 1998

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

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per SHIP	Avg Annual Cost Per SHIP
Mission Pay & Allowances	5.6	N/A
Unit Level Consumption	3.6	0.0
Intermediate Maintenance	3.1	0.0
Depot Maintenance	11.5	0.0
Contractor Support	1.2	0.0
Sustaining Support	12.8	0.0
Indirect Costs	5.0	N/A
Total	42.8	0.0

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A-21 MLRS UPGRADE

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: MLRS Upgrade Program

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): MLRS Upgrade Program
2. (U) DoD Component: Army
3. (U) Responsible Office and Telephone Number:
PROGRAM EXECUTIVE OFFICE COL Barry M. Ward
TACTICAL MISSILES Assigned: August 21, 1997
ATTN: SFAE-MSL-ML DSN 746-1195; COMM 256-876-1195
RSA, AL 35898-5700 WARD-BM@REDSTONE.ARMY.MIL
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 63778 Project 093, 784
PROCUREMENT:
(U) APPN 2032 ICN C65402 (Army)
(U) APPN 2032 ICN C65900 (Army)
(U) APPN 2032 ICN CA0257 (Army)

~~Classified by: MLRS SCG, 8 October 1998
Downgrade instruction:
Declassify on: X3~~

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MLRS Upgrade Program, December 31, 1998

5. (U) References:

Launcher

SAR Baseline (Development Estimate):

(U) Operational Requirements Document dated January 26, 1998.

AAE Approved Acquisition Program Baseline dated March 23, 1998.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated March 23, 1998.

Tactical Rocket

SAR Baseline (Development Estimate):

(U) Operational Requirements Document dated January 26, 1998.

AAE Approved Acquisition Program Baseline dated March 23, 1998.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated March 23, 1998.

6. (U) Mission and Description:

(U) The Multiple Launch Rocket System (MLRS) Upgrade Program satisfies the need for a non-nuclear, all-weather, indirect, area fire weapon system to strike counterfire, air defense, armored formations, and other high-payoff targets at all depths of the tactical battlefield. Initial Operational Capability (IOC) of the basic system occurred in 1983. Primary missions of MLRS include the suppression, neutralization and destruction of threat fire support and forward area air defense targets. The MLRS launcher is a full-tracked, self propelled launcher/loader designed to launch the entire MLRS Family of Munitions (MFOM) tactical rocket/missile variants. The Improved Fire Control System (IFCS) and the Improved Launcher Mechanical System (ILMS) are modifications to the launch platform to produce the upgraded launcher. These two synchronized programs are the centerpieces of the next generation of the MLRS Weapon System. In concert with the application of these kits, the remanufacture of all carrier vehicles will convert the MLRS launcher fleet to the M270A1. The IFCS will correct present and future supportability problems in the current MLRS Fire Control System resulting from electronic component obsolescence in the existing design. The effort will result in reduced operation and support costs and will provide growth capabilities for existing and future MFOM weapon systems. The ILMS will decrease the slow to aim point time line, enhance effectiveness in engaging and supporting the force, and increase MLRS platform survivability.

The system is designed for quick reaction with the capability of firing the first round within minutes of receiving a fire mission and firing the complete load of 12 rounds in 60 seconds or less.

Simultaneously, MLRS rockets evolved as a result of the need for greater range and technological advances making guidance feasible. The Extended Range MLRS (ER-MLRS) rocket will enhance the capability of the existing rocket inventory by providing improvements in range, accuracy, effectiveness, and maneuver force safety. The Guided Multiple Launch Rocket System (GMLRS) will provide longer

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MLRS Upgrade Program, December 31, 1998

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

range and improve accuracy with lower submunition hazardous dud rate. Utilizing various components of the ER-MLRS, GMLRS will transform the ER-MLRS free flight rocket into a missile through the incorporation of a guidance and control package, provide greater accuracy and reduce the number of rockets required to defeat targets at maximum range, reduce the number of launchers required per fire mission, and directly contribute to reducing the logistics burden. The MLRS launcher will have the capability to support all future ATACMS versions, to include Block IA and Block II systems.

7. (U) Executive Summary:

(U) The MLRS Upgrade Program consists of several distinct product improvements for both launcher and rocket. The current M270 launcher will be modified to an improved launcher designated the M270A1. This new baseline launcher configuration will enhance the MLRS weapon system performance and incorporate technologies that allow continued MFOM growth, Joint Technical Architecture- Army (JTA-A) compliance, and reduction of Operation and Support Costs. All product improvements have been incorporated in the MLRS Upgrade Program and authenticated in the Acquisition Program Baseline in March 1998.

Significant accomplishments with the MLRS M270A1 launcher program began with restructuring of ILMS completion tasks after successful completion of IFCS development. IFCS Extended System Integration Test (ESIT) was completed in April 1998 and Reliability, Availability and Maintainability scoring data proved the IFCS hardware far exceeded not only the threshold, but the established objective. The first M270A1 developmental launcher completed checkout and started system integration testing in May 1998.

A successful IFCS/ILMS Low Rate Initial Production (LRIP) Decision Review was conducted May 1998. This authorized low rate kit procurement for IFCS and ILMS. The contract for IFCS and ILMS kits was awarded in July 1998.

System integration testing successes on the M270A1 launcher continued through 1998 culminating in successful firing of all MFOM to include Army Tactical Missiles (ATACMS) Block IA which occurred January 1999.

Much progress was also experienced in the evolution of the rocket portion of the MLRS Upgrade Program during 1998. In February 1998, production of ER-MLRS rockets loaded with M77 grenades began in response to an urgency of need requirement from the Commander in Chief U.S. Forces, Korea. A release to preposition the M26A2 ER-MLRS was granted and the first shipment of pods were made to Korea in September 1998. The final material release is expected by February 1999.

The capability to meet a stated requirement for a Self Destruct Fuze (SDF) to achieve a one percent or less hazardous to maneuver grenade dud rate was confirmed in January 1999 based on test conducted in December 1998. The capability demonstrated during the SDF Design Verification Test in March and April 1998 confirmed a one percent dud rate can be exceeded.

The GMLRS program experienced significant progress during 1998. Through much negotiation among the International Partners i.e., the United Kingdom of Great

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MLRS Upgrade Program, December 31, 1998

7. (U) Executive Summary (Cont'd):

Britain and Northern Ireland, the Federal Republic of Germany, the French Republic, the Italian Republic and the United States, a Memorandum of Understanding (MOU) was finalized in September 1998.

A successful Milestone II Decision Review was executed in June 1998 approving the program's entry into Engineering and Manufacturing Development (EMD). Prior to MOU approval, an "Alpha Contracting" Integrated Product Team concept was executed which included all partner nations and the prime contractor. This produced EMD contract requirements and provisions for which negotiations were completed in July 1998.

The culmination of all GMLRS efforts resulted in a November 1998 EMD contract award for the international development program. The GMLRS program represents a prime example of international cooperation to produce a common product while sharing and minimizing costs and risks.

8. (U) Threshold Breaches:

Launcher

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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MLRS Upgrade Program, December 31, 1998

8. (U) Threshold Breaches (Cont'd):

Tactical Rocket

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The total procurement dollars increased due to increase in additional years of production and increase in total rocket quantities. A Program Deviation Report and Revised APB will be submitted.

9. (U) Schedule:

Launcher

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
M270A1 ESIT	JUL 98	JUL 98	JAN 99 (Ch-1)
Modified LRIP Review	OCT 98	OCT 98	MAY 98 (Ch-2)
M270A1 Operational Test (OT)			
Start	JAN 99	JAN 99	JAN 99
Complete	MAY 99	MAY 99	SEP 99 (Ch-3)
MS III	AUG 99	AUG 99	JAN 00 (Ch-3)
FUE	SEP 00	SEP 00	SEP 00

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MLRS Upgrade Program, December 31, 1998

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

Launcher

b. Current Change Explanations --

(U) Ch-1 The current estimate changes from July 1998 to January 1999 to reflect actual start of Extended System Integration Test (ESIT) activity.

Ch-2 The current estimate for the Modified Low Rate Initial Production (LRIP) Review was changed from October 1998 to May 1998 to reflect the actual date the review was held.

Ch-3 The M270A1 Operational Test (OT) current estimate completion date changed from May 1999 to September 1999 due to late completion of the Improved Fire Control System (IFCS) Program. For the same reason, The MS III changed from August 1999 to January 2000. IFCS was completed in November 1998.

Tactical Rocket

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
ER-MLRS IOC	SEP 99	SEP 99	MAR 99 (Ch-1)
GMLRS MS II EMD	MAR 98	MAR 98	JUL 98 (Ch-2)
GMLRS LRIP Review	AUG 01	N/A	N/A
GMLRS OT	JUL 03	JUL 03	JUL 03
GMLRS MS III	OCT 03	OCT 03	OCT 03
GMLRS IOC	APR 04	APR 04	APR 04

b. Current Change Explanations --

(U) Ch-1 The IOC date was accelerated from September 1999 to March 1999 due to an urgency of need request from the Commander in Chief of U.S. Forces Command, Korea.

Ch-2 MS II EMD current estimate changed from March 1998 to July 1998 to reflect the actual milestone review date.

10. (U) Performance Characteristics:

Launcher

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Technical Development Characteristics:	(b)(1)			
Reaction Time				
Total Mission Cycle (Min)				
Mission Reliability				
MTBOMF (Hrs)	56	56 / 37	TBD	56

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MLRS Upgrade Program, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):
Launcher

(U) Mean Time Between Operational Mission Failure (MTBOMF)

b. Current Change Explanations -- None

Tactical Rocket

a. Performance --

Technical Development Characteristics: Accuracy Range	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(U) ER-MLRS at Range 30-40 Km	(b)(1)			
ER-MLRS Range Max (Km)	50	50 / 45	TBD	50
ER-MLRS Range Min (Km)	10	10 / 15	TBD	10
GMLRS Range Max	70	70 / 60	TBD	70
GMLRS Range Min	10	10 / 15	TBD	10
Effectiveness				
GMLRS Expected Fractional Damage	30%	30% / 30%	TBD	30%
Reliability				
ER-MLRS	0.97	0.97 / 0.95	TBD	.97
GMLRS	0.95	0.95 / 0.92	TBD	.95
Hazardous Dud Rate	0%	0% / <1%	TBD	<1%

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(Ch-1)

b. Current Change Explanations --

(U) (Ch-1)- The Hazardous Dud Rate was incorrectly reported in the previous SAR; the rate changed from 0 to <1%.

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MLRS Upgrade Program, December 31, 1998

11. (U) Total Program Cost and Quantity (Dollars in Millions):

Launcher

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	19.5	19.5	4.6
Procurement	1930.3	1930.3	1983.9
Launcher	(1759.2)		(1740.4)
Other Weapon System	(15.0)		(31.9)
Peculiar Support	(56.8)		(82.1)
Initial Spares	(99.3)		(129.5)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 98 Base-Year \$	1949.8	1949.8	1988.5
Escalation	262.0	262.0	253.9
Development (RDT&E)	(1.4)	(1.4)	(0.1)
Procurement	(260.6)	(260.6)	(253.8)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2211.8	2211.8	2242.4
b. (U) Quantity --			
Development (RDT&E)	N/A	0	0
Procurement	<u>857</u>	<u>857</u>	<u>857</u>
Total	857	857	857

c. (U) Foreign Military Sales --
There are no current FMS cases for the M270A1 Launcher.

d. Nuclear Costs -- None.

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MLRS Upgrade Program, December 31, 1998

11a. (U) Total Program Cost and Quantity (Cont'd):

Tactical Rocket

a. (U) Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	81.9	81.9	92.4
Procurement	1313.8	1313.8	2068.2
Tactical Rocket	(1313.8)		(2068.2)
			(0.0)
			(0.0)
Total Flyaway	(1313.8)		(2068.2)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 98 Base-Year \$	1395.7	1395.7	2160.6
Escalation	292.9	292.9	530.9
Development (RDT&E)	(3.4)	(3.4)	(3.6)
Procurement	(289.5)	(289.5)	(527.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	1688.6	1688.6	2691.5
b. (U) Quantity --			
Development (RDT&E)	N/A	0	0
Procurement	<u>43182</u>	<u>43182</u>	<u>62166</u>
Total	43182	43182	62166

c. (U) Foreign Military Sales --
There are no current FMS cases for the GMLRS rocket.

d. Nuclear Costs -- None.

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MLRS Upgrade Program, December 31, 1998

12. (U) Unit Cost Summary:

Launcher

	UCR Baseline (N/A)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 98 BY\$)	1949.8	1988.5	
(2) Quantity	857	857	
(3) Unit Cost	2.275	2.320	+1.98
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 98 BY\$)	1930.3	1983.9	
(2) Quantity	857	857	
(3) Unit Cost	2.252	2.315	+2.80

Tactical Rocket

	UCR Baseline (Mar 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 98 BY\$)	1395.7	2160.6	
(2) Quantity	43182	62166	
(3) Unit Cost	0.032	0.035	+9.38
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 98 BY\$)	1313.8	2068.2	
(2) Quantity	43182	62166	
(3) Unit Cost	0.030	0.033	+10.00

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MLRS Upgrade Program, December 31, 1998

13. (U) Cost Variance Analysis:

Launcher

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	20.9	2190.9	-	2211.8
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	0.0	-32.1	-	-32.1
Quantity	-	-	-	-
Schedule	-	+21.6	-	+21.6
Engineering	-	-	-	-
Estimating	-16.2	-35.0	-	-51.2
Other	-	-	-	-
Support	-	+92.3	-	+92.3
Subtotal	-16.2	+46.8	-	+30.6
Total Changes	-16.2	+46.8	-	+30.6
Current Estimate	4.7	2237.7	-	2242.4

(U) Summary (FY 1998 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	19.5	1930.3	-	1949.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-14.9	-18.8	-	-33.7
Other	-	-	-	-
Support	-	+72.4	-	+72.4
Subtotal	-14.9	+53.6	-	+38.7
Total Changes	-14.9	+53.6	-	+38.7
Current Estimate	4.6	1983.9	-	1988.5

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MLRS Upgrade Program, December 31, 1998

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

Launcher

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-0.2
Economic adjustment for negative program change. (Economic)	N/A	+0.2
Adjustment for Current and Prior Inflation. (Estimating)	0.0	+0.1
Funding realigned to meet Joint Technical Architecture-Army requirements for M270A1 LRIP launchers. (Estimating)	-14.9	-16.3
RDT&E Subtotal	-14.9	-16.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-32.1
Stretchout of annual procurement buy profile. (Schedule)	0.0	+21.6
Adjustment for Current and Prior Inflation. (Estimating)	-0.7	+1.7
Transfer of Missile Procurement funding to other appropriations to accommodate force structure changes. (Estimating)	-18.1	-36.7
Increased Other Weapon Systems and Peculiar Support costs due to new training requirements associated with force structure changes. (Support)	+42.2	+56.2
Revised estimate to fully fund future Initial Spares. (Support)	+30.2	+36.1
Procurement Subtotal	+53.6	+46.8

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MLRS Upgrade Program, December 31, 1998

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

Tactical Rocket

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	85.3	1603.3	-	1688.6
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-0.8	-28.1	-	-28.9
Quantity	-	+1017.0	-	+1017.0
Schedule	-	+3.1	-	+3.1
Engineering	-	-	-	-
Estimating	+11.5	+0.2	-	+11.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+10.7	+992.2	-	+1002.9
Total Changes	+10.7	+992.2	-	+1002.9
Current Estimate	96.0	2595.5	-	2691.5

(U) Summary (FY 1998 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	81.9	1313.8	-	1395.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	+754.2	-	+754.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+10.5	+0.2	-	+10.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+10.5	+754.4	-	+764.9
Total Changes	+10.5	+754.4	-	+764.9
Current Estimate	92.4	2068.2	-	2160.6

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MLRS Upgrade Program, December 31, 1998

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

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-0.8
Adjustment for Current and Prior Inflation. (Estimating)	+0.2	+0.2
Estimating Change associated with development of program to accommodate Multinational performance requirements. (Estimating)	+10.3	+11.3
RDT&E Subtotal	+10.5	+10.7
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-28.1
Variance associated with increase of 18984 rockets from 43182 to 62166. (Quantity)	+556.6	+759.5
Stretchout of annual procurement buy profile. (Schedule)	0.0	+3.1
Adjustment for Current and Prior Inflation. (Estimating)	+0.2	+0.2
Procurement of Reduced Range Practice Rockets to meet future training requirements. (Quantity)	+197.6	+257.5
Procurement Subtotal	+754.4	+992.2

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):
Launcher

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.58	-0.04	--	+0.03	--	-0.06	--	+0.11	+0.04	2.62

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.56	-0.04	-0.01	+0.03	--	-0.04	--	+0.11	+0.05	2.61

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MLRS Upgrade Program, December 31, 1998

14c. (U) Unit Cost and Other History (Cont'd):
Launcher

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	AUG 99	AUG 99	JAN 00
FUE/IOC	N/A	SEP 00	SEP 00	SEP 00
Total Cost	N/A	2211.8	2211.8	2242.4
Total Quantity	0	857	857	857
Prog Acq Unit Cost	N/A	2.58	2.58	2.62

Tactical Rocket

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.04	--	--	--	--	--	--	--	--	0.04

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.04	--	--	--	--	--	--	--	--	0.04

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	MAR 98	N/A	MAR 98
Milestone III	N/A	OCT 03	N/A	OCT 03
FUE/IOC	N/A	APR 04	N/A	APR 04
Total Cost	N/A	1688.6	N/A	2691.5
Total Quantity	0	43182	0	62166
Prog Acq Unit Cost	N/A	0.04	N/A	0.04

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MLRS Upgrade Program, December 31, 1998

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

a. RDT&E --
 (U) GMLRS EMD:
 LOCKHEED MARTIN VOUGHT SY, GRAND PRAIRIE TX
 DAAH01-98-C-0033, CPAF
 Award: November 4, 1998
 Definitized: November 4, 1998

			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	\$121.1	N/A	0		

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$121.1	N/A	0	\$	\$

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$	\$
Cumulative Variances To Date	\$	\$
Net Change	\$	\$

Explanation of Change:

(U) The GMLRS contract was awarded 4 Nov 1998. The contract effort is in the process of being baselined for Earned Value Management System (EVMS) measurement. EVMS data will begin reporting when the baselining is complete.

The GMLRS's total contract value of \$121.1M is comprised of \$104.6M estimated costs, \$3.9M Base Fee and \$12.6M maximum award fee. These costs are shared 50/50 between the U.S. and the European partners in accordance with the Memorandum of Agreement dated September 1998.

b. Procurement --
 (U) M270A1 Production:
 Lockheed Martin Vought Sy, Grand Prairie TX
 DAAH01-98-C-0138, FFP w/CPFF Clins
 Award: July 2, 1998
 Definitized: July 2, 1998

			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	\$63.0	N/A	21		

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$118.4	N/A	24	\$	\$

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$	\$
Cumulative Variances To Date	\$	\$
Net Change	\$	\$

Explanation of Change:

None.

(U) Contract Comments:

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MLRS Upgrade Program, December 31, 1998

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

The Launcher contract has a total estimated value of \$413.2M for up to 74 MLRS M270A1 launchers. The total amount includes yet to be awarded not-to-exceed amounts.

M270A1 LAUNCHER TOTAL VALUE BREAKOUT:

	<u>Launchers</u>	<u>\$M</u>
Basic Award	21	\$63.0
Remanufacture/Spares		
Option		12.9
FY99 Option	<u>24</u>	<u>42.5</u>
	45	\$118.4

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY96-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-14)</u>	<u>Total</u>
RDT&E	33.1	30.6	21.5	15.5	100.7
Procurement	360.1	156.2	242.0	4074.9	4833.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	393.2	186.8	263.5	4090.4	4933.9

Launcher

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

<u>Appropriation</u>	<u>Prior Years (FY98-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	2.5	2.2	-	-	4.7
Procurement	251.0	152.9	232.5	1601.3	2237.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	253.5	155.1	232.5	1601.3	2242.4

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MLRS Upgrade Program, December 31, 1998

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

Tactical Rocket

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

<u>Appropriation</u>	<u>Prior Years (FY96-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-14)</u>	<u>Total</u>
RDT&E	30.6	28.4	21.5	15.5	96.0
Procurement	109.1	3.3	9.5	2473.6	2595.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	139.7	31.7	31.0	2489.1	2691.5

b. Annual Summary -- Launcher

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY98 Dollars Nonrec</u>	<u>Flyaway FY98 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1998			0.1	0.1	0.1
1999			2.4	2.4	2.4
2000			2.1	2.1	2.2
2001					
2002					
2003					
Subtotal			4.6	4.6	4.7

Appropriation: 2032 - Missile Procurement, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY98 Dollars Nonrec</u>	<u>Flyaway FY98 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1998	21	7.9	86.8	121.7	124.0
1999	24		94.1	122.6	127.0
2000	47		131.5	145.3	152.9
2001	90		189.9	217.6	232.5
2002	90	3.2	167.4	189.4	206.1
2003	90	3.1	182.0	200.1	222.2
2004	96		137.9	162.9	184.7
2005	102		189.7	212.6	246.1
2006	110		181.3	202.9	239.9
2007	110		151.5	166.6	201.1
2008	77		144.6	158.4	195.2
2009			35.2	49.3	62.0
2010			34.3	34.3	44.0
2011					
2012					
2013					
Subtotal	857	14.2	1726.2	1983.9	2237.7

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MLRS Upgrade Program, December 31, 1998

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

Launcher

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	857	14.2	1730.8	1988.5	2242.4

b. Annual Summary -- Tactical Rocket

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY98 Dollars Nonrec	Flyaway FY98 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998			12.7	12.7	12.8
1999			17.4	17.4	17.8
2000			27.4	27.4	28.4
2001			20.4	20.4	21.5
2002			14.0	14.0	15.0
2003			0.5	0.5	0.5
Subtotal			92.4	92.4	96.0

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY98 Dollars Nonrec	Flyaway FY98 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996	1638	8.7	36.1	44.8	44.6
1997	1908		45.0	45.0	45.3
1998	624		18.8	18.8	19.2
1999					
2000			3.1	3.1	3.3
2001		5.0	3.9	8.9	9.5
2002	720	1.8	35.8	37.6	40.9
2003	1374		56.7	56.7	63.0
2004	1530		57.9	57.9	65.7
2005	2412		84.7	84.7	98.1
2006	3960		140.0	140.0	165.5
2007	6000		199.4	199.4	240.7
2008	6000		197.8	197.8	243.6
2009	6000		196.8	196.8	247.6
2010	6000		196.1	196.1	251.9
2011	6000		195.6	195.6	256.5
2012	6000		195.2	195.2	261.4
2013	6000		195.0	195.0	266.6
2014	6000		194.8	194.8	271.9
Subtotal	62166	15.5	2052.7	2068.2	2595.5

(U) True Baseyear dollars calculated without rounding are 2068.4 vice 2068.2

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MLRS Upgrade Program, December 31, 1998

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

Tactical Rocket

calculated here.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	62166	15.5	2145.1	2160.6	2691.5

17. (U) Delivery/Expenditure Information:

Launcher

a. (U) Deliveries To Date - None.

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 26.8

(U) Percent Total Program Expended: 1.2%

(U) The M270A1 Launcher LRIP Production Contract awarded to Lockheed Martin Vought System, 1701 West Marshall Drive, Grand Prairie, Texas 75051-0003. Deliveries include 21 launchers by December FY99, and 24 launchers FY00.

Tactical Rocket

a. (U) Deliveries To Date - None.

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 41.7

(U) Percent Total Program Expended: 1.5%

18. (U) Operating and Support Costs:

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MLRS Upgrade Program, December 31, 1998

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

Launcher

a. (U) Assumptions and Ground Rules --

The unit for tracking O&S costs is a firing battery of 9 launchers. The reflected O&S costs were estimated in the August 1997 excursion Program Office Estimate (POE). The POE includes operating tempo, reliability/maintainability, maintenance concept, manning and logistics policies. This POE information is integrated into the annual update of the MLRS O&S Cost Reduction Program and provides the methodology to portray the O&S costs per battery. A typical operating year is selected from the annual POE update and divided by the number of MLRS batteries deployed to give an O&S cost per battery. This typical operating year is a point in time after the completion of fielding when the operating and support costs are neither increasing nor decreasing in magnitude due to fielding changes. There is no antecedent program for MLRS.

b. (U) Costs -- (FY 98 Constant (Base-Year) Dollars in Millions)

Cost Element	MLRS Upgrade Avg Annual Cost Per Battery (FY98 O&M)	
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Military Personnel Direc	5.6	N/A
Replenishment Depot-Leve	0.1	N/A
POL	0.0	N/A
End Item Supply and Main	0.1	N/A
Transportation	0.0	N/A
Training	0.3	N/A
Other	0.0	N/A
Total	6.1	N/A

Tactical Rocket

a. (U) Assumptions and Ground Rules --

The unit for tracking O&S cost is the rocket pod. The estimated average annual unit cost per rocket pod is \$152.00. This estimate, taken from the August 1997, POE was based upon an annual cost of \$2.12M per year for Stockpile Reliability. The total number of rocket pods planned for production is 13,987.

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MLRS Upgrade Program, December 31, 1998

18b. (U) Operating and Support Costs (Cont'd):
Tactical Rocket

b. (U) Costs -- (FY 98 Constant (Base-Year) Dollars in Millions)

Cost Element	MLRS Upgrade Avg Annual Cost Per Rocket Pod	
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
GMLRS Stockpile Reliabil	N/A	N/A
Total	N/A	N/A

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AF-9 F-22

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: F-22

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): F-22

2. (U) DoD Component: USAF

3. (U) Responsible Office and Telephone Number:

F-22 SYSTEM PROGRAM OFFICE
AERONAUTICAL SYSTEMS CENTER
WRIGHT-PATTERSON AFB
DAYTON, OH 45433-7003

BGEN MICHAEL C. MUSHALA
Assigned: January 17, 1996
DSN 785-4167; COMM (937) 255-4167

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

RDT&E:

(U) PE 0207138F
(U) PE 0603109F (Shared)
(U) PE 0603230F
(U) PE 0604227F (Shared)
(U) PE 0604239F
(U) PE 0604250F (Shared) Project 643393, 643786

PROCUREMENT:

(U) APPN 3011 ICN 10F022 (Air Force)

MILCON:

(U) PE 0207219F
(U) PE 0604239F

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DEPARTMENT OF DEFENSE

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99-0270

CONGRESSIONAL

99-C-0635

~~Classified by: F-22 SCG, 10 May 96
Downgrade instruction:
Declassification: X3~~

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- 1 -

~~Review for Classification: F-22, 12 May 96, Section 1.5(u)~~

*** ~~SECRET~~ ***

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~~Reason for Classification: E.O. 12958, Section 1.5(a)~~
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F-22, December 31, 1998

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

(U) NOTE:

- 1) PE 0207219F is the procurement program element. The other PEs are shown for information as they are included in the total program funding.
- 2) PE 0207138F is the program element for F-22 Support. Included within this PE are funds for post EMD support.

5. (U) References:

SAR Baseline (Development Estimate):

(U) Defense Acquisition Executive (DAE) approved Acquisition Program Baseline (APB) dated February 3, 1992.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated October 5, 1998.

6. (U) Mission and Description:

(U) The F-22 program will develop the next-generation multi-mission air superiority fighter for introduction in the early 2000s to counter emerging proliferating world-wide threats. The F-22 is designed to penetrate enemy airspace and achieve a first-look, first-kill capability against multiple targets. F-22 Engineering and Manufacturing Development (EMD) is based on the Weapon System Specification formulated from data developed during the Demonstration/Validation (Dem/Val) phase. The EMD program consists of design, fabrication, and development testing of 9 EMD flight test vehicles; design, fabrication, development testing, and delivery of 26 EMD flight qualified engines; update of the Dem/Val Avionics Flying Laboratory into a Flying Test Bed for use in developing and integrating the EMD avionics suite; and design and development of F-22 support and training systems. The F-22 program from the outset has placed balanced emphasis on affordability, performance, survivability, and reliability/maintainability. The F-22 is characterized by a low observable highly maneuverable airframe, a new engine capable of supersonic cruise without using afterburner, and advanced integrated avionics.

7. (U) Executive Summary:

(U) The Advanced Tactical Fighter (ATF) Dem/Val phase involved two competing aircraft teams, led by Lockheed (with General Dynamics and Boeing as team members) and Northrop (teamed with McDonnell-Douglas), and two competing engine contractors, General Electric (GE) and Pratt & Whitney (P&W). Each aircraft team flew two prototype air vehicles--one with GE engines and the other with P&W engines. On 23 Apr 91, the Secretary of the Air Force announced the winners of the ATF EMD Source Selection: Lockheed Aeronautical Systems Company (LASC) for the air vehicle and overall weapon system integration and P&W for the engine. In conjunction with the selection, the ATF was redesignated the

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7. (U) Executive Summary (Cont'd):

F-22. Milestone II approval was confirmed by an Acquisition Decision Memorandum, dated 1 Aug 91, authorizing F-22 EMD and long lead procurement for four pre-production verification (PPV) air vehicles. EMD contracts were awarded to LASC and P&W on 2 Aug 91.

A series of funding restructures (FY93-FY96) led to three rephases of the F-22 Program. The rephases reduced the number of EMD aircraft from eleven to nine and the number of engines from 33 to 27. In addition, the EMD program schedule slipped 26 months and the production program slipped 32 months. The Air Vehicle Preliminary Design Review was completed on 30 Apr 93. Air Vehicle Critical Design Review was conducted on 20-24 Feb 95. In Jan 96, Lockheed Systems Company merged with Martin Marietta Corporation. As a result, LASC was renamed to Lockheed Martin Aeronautical Systems (LMAS).

In May 96, the FY98-03 Air Force Program Objective Memorandum deferred B-Model (two-seat aircraft) development converting the B-Models to single-seat aircraft (A-models) and deleting one PPV from the combined EMD/PPV program (12 vs 13 aircraft). Also in May 96, senior management established a Joint Estimate Team (JET) to provide a top-level review and analysis of the overall program most probable cost for the remainder of the EMD and production. The EMD and production program were restructured to reflect the findings of the JET. Specifically, the program deleted the remaining three PPVs (leaving 9 single-seat aircraft and 26 engines), adjusted Low Rate Initial Production (LRIP) Contract Award by 4 months, LRIP first delivery by 6 months, High Rate Production Contract Award by 9 months, adjusted several test milestone dates, and moved the Milestone III Decision 10 months. The net effect of these schedule changes was a 9-month extension to the EMD program. In addition, the RDT&E program cost increased to \$19,391.1M (BY90\$) or \$22,398.3M (TY\$). The JET identified the potential for the production program cost to increase to \$61.2B (TY\$). The revised production cost estimate incorporates a series of cost reduction initiatives to maintain the \$48.3B (TY\$) program cost.

On 19 May 97, SECDEF submitted the Quadrennial Defense Review (QDR) Report, in compliance with the National Defense Authorization Act of 1996, Public Law 104-201. The QDR recommended slowing ramp-up to full rate production by procuring 12 fewer F-22s during LRIP, limiting maximum production rate to 36 aircraft per year versus the planned rate of 48 per year, and reducing procurement quantity from 438 to 339 aircraft.

First flight of aircraft 4001 took place on 7 Sep 97. The mission was very successful with the aircraft performing as predicted. LMAS accomplished another flight on 14 Sep 97 to gain additional flight test data. After the initial two flights in Sep 97, aircraft 4001 began planned modifications required to expand the allowable flight test program flight envelope. The Strength Summary and Operating Restrictions modifications were completed as scheduled on 11 Nov 97. The aircraft was loaded in a test fixture and structural loads calibration was completed on 22 Dec 97. It was delivered to Edwards AFB on 5 Feb 98. First flight at Edwards occurred on 17 May 98. First

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7. (U) Executive Summary (Cont'd):

flight of aircraft 4002 occurred on 29 Jun 98 at LMAS with an extremely successful mission. The aircraft was ferried non-stop to Edwards AFB, CA on 26 Aug 98. The flight test criteria for PRTV full contract award were completed on 10 Oct 98, and 183 flight test hours for Lot 1 advanced buy contract were completed on 23 Nov 98. As of 31 Dec 98, aircraft 4001 and 4002 had accomplished 2001 flight test points, 94 flights, and 199.9 flight test hours.

The final 1997/98 Affordability Analysis program cost estimate integrates prime and supplier Production Cost Reduction Plan savings to achieve a \$43B affordability target for a 339 production aircraft buy. During Jan/Feb 98, a joint Government/prime contractor team continued updating their assessment of the supplier quotes for additional substantiation of the program cost estimate in support of the Air Force budget submission. The assessment was completed on 31 Mar 98.

The National Defense Authorization Act (NDAA) for FY98 capped the EMD program at \$18.688B and production at \$43.4B. SECAF advised the Congressional Defense Committees on 14 Jan 98 that the USAF was adjusting the EMD cap upward and the production cap downward by \$352.6M for Out-of-Production Parts (OPP) redesign efforts. The Authorization language provides for cap adjustment due to changes in inflation rate forecasts or changes in law. Negative adjustments of \$102.1M for EMD and \$2.1B for production were made in Jan 98. An additional negative adjustment of \$58.5M for EMD and \$1.1B for production resulted from the Jan 99 inflation rate forecast. Accounting for both OPP transfers and inflation, the adjusted cap for EMD is \$18.880B and \$39.759B for production. The NDAA also required the GAO to review the F-22 EMD program and submit to Congress, no later than 15 Mar of each year, a report on the results of the review.

In Mar 98, trends in cost and schedule variances on the Lockheed Martin EMD contract led to a review of EMD work to go. In the Oct 98 CPR, Lockheed declared a \$240M increase to the EAC. Sources for identified cost growth items and potential cost risks were identified from within current EMD assets.

PBD 604 inflation reductions have placed significant constraints on the program's ability to manage cost pressures within the congressionally-mandated funding caps. All efforts are being taken by the Air Force and contractor team to keep the costs within the reduced mandated caps. However, ongoing development and production contract negotiations may require program adjustments.

On 13 May 98, the Defense Acquisition Executive (DAE) determined the need to reduce risk and provide opportunity for demonstrating production readiness. This resulted in redesignating previous Lot 1 aircraft as Production Representative Test Vehicles (PRTVs) and renaming the previous Lot 2 buy as Lot 1 (6 aircraft and 12 engines).

In Dec 98, approval was given for full award of PRTVs (completion of the PRTV aircraft and engines), Program Support (includes essential sustaining labor,

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7. (U) Executive Summary (Cont'd):

i.e., business management, configuration management, security, etc, that cannot be tied directly to a particular aircraft or lot), and Advance Buy for Lot 1 Production. The procurements were successfully negotiated with Lockheed and Pratt & Whitney at or below the Air Force affordability objective. This is a significant first step toward meeting the F-22 production program affordability objective of 339 aircraft at a price at or below \$40.9B.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I (DSARC)	OCT 86	OCT 86	OCT 86
Dem/Val Contract Award (Airframe only)	OCT 86	OCT 86	OCT 86
Early Operational Assessment Start	OCT 86	OCT 86	OCT 86
Complete	MAR 91	MAR 91	MAR 91
System Requirements Review	MAY 87	MAY 87	MAY 87
System Design Review	NOV 89	NOV 89	NOV 89
Prototype First Flight	JUN 90	JUN 90	AUG 90
Milestone II (DAB)	JUN 91	JUN 91	JUN 91
EMD Contract Award	AUG 91	AUG 91	AUG 91
Preliminary Design Review Complete	OCT 92	APR 93	APR 93
Critical Design Review Complete	OCT 93	FEB 95	FEB 95
Engine Initial Flight Release	OCT 94	APR 97	MAY 97
PPV Long Lead	JAN 95	N/A	N/A

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

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
	SEP 95	MAY 97	SEP 97	
First Flight				
DT&E				
Start	SEP 95	MAY 97	SEP 97	
Complete	DEC 99	AUG 02	AUG 02	
PPV Contract Award	JAN 96	N/A	N/A	
Low Rate Initial Production (LRIP)	OCT 96	NOV 99	NOV 99	
Decision				
Low Rate Production Contract Award	JAN 97	DEC 99	DEC 99	
LRIP First Delivery	JAN 99	MAR 02	MAR 02	
Dedicated IOT&E				
Start	JUN 99	AUG 02	AUG 02	
Complete	SEP 99	FEB 03	FEB 03	
Milestone III	DEC 99	JUL 03	AUG 03	(Ch-1)
High Rate Production Contract Award	JAN 01	NOV 03	DEC 03	(Ch-1)
Initial Operational Capability	SEP 03	DEC 05	DEC 05	
Organic Organizational Maintenance	SEP 03	N/A	N/A	
Capability				
Required Assets Availability (RAA)	OCT 02	SEP 05	SEP 05	
Organic Depot Activation	SEP 03	N/A	N/A	

b. Current Change Explanations --

(U) (Ch-1) The current estimates for Milestone III and High Rate Production Contract Award were changed to reflect the current planned schedule, as updated in the Dec 98 DAES. This one month change is within the program thresholds.

Milestone III

From Jul 03 To Aug 03

High Rate Production Contract Award

From Nov 03 To Dec 03

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10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate	
Combat Radius (at optimum altitude)(nm)	(b)(1)	(b)(1)	(b)(1)	(b)(1)	(Ch-1)
Sub & Supersonic Subsonic Mission	8cc	8cc	/ 4 AIM- / 120 + 2 / AIM-9	6 AIM- 120C + 2 AIM-9#	
Missile Load			TBD		
Sortie Generation Rate (Wartime, per day)	(b)(1)		TBD	(b)(1)	(Ch-1)
Days 1 to 6	8	8	/ 8	7.7	(Ch-1)
C-141's for Deploy- ment (#a/c)					
Radar Cross Section (RCS)	*	*	/ *	***	
Maneuverability (max power sustained G) (30000 ft) (mach)	(b)(1)		TBD	(b)(1)	
@0.9 Mach			TBD		
Supercruise			TBD		
Vmax/Opt Alt/Mil			TBD		
Power (Mn)			TBD		
Acceleration/.8-1.5, 30K (sec)			TBD		
Radar Detection	*	*	/ *	***	
Range (RDR)					
Mean Time Between Maintenance (MTBM)	3.0	3.0	/ 3.0	3.1	
(hrs)					
USD(A) Risk					
Assessment Items:					
Mission Effective- ness (Compared to current operational F-15 at time of IOT&E)	2	2	/ 2	2***	
Direct on-and-off Maintenance	8.7	8.7	/ 8.7	7.25	(Ch-1)
Personnel (spaces per ac)	(b)(1)		TBD	(b)(1)	(Ch-1)
Weight Empty			TBD		(Ch-1)
Engine Thrust (.9 Mach @ 30K, Max)			TBD		(Ch-1)

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10a. (U) Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate	
(1.5 Mach @ 45K, Mil)	(b)(1)		TBD	(b)(1)	(Ch-1)
Fuel Consumption (specific fuel consumption)					
(.9 Mach @45K @2850 lbs thrust)			TBD		(Ch-1)
(1.5 Mach @45K @8390 lbs thrust)			TBD		(Ch-1)
Warning Time *	*	*	/ *	***	
Angle of Arrival (AOA) @ X Freq *	*	*	/ *	***	

(U) * Classification/control is beyond the level of this document.

(U) # Estimate reflects capability with a full primary mission load.

(U) ## Current Estimate is better than threshold.

(U) ### A mission scenario was assumed for estimating purposes. The current estimate will be updated when the scenario is refined.

b. Current Change Explanations --

(Ch-1) Fluctuations in the changed parameters from the last SAR resulted from completed tradeoff studies and incorporation of engineering changes.

Changes:

	FROM Jun 98	TO Dec 98
Combat Radius - sub & supersonic	(b)(1)	
Days 1 to 6		
C-141s for Deployment (#a/c)		
Direct on-and-off Maintenance Personnel		
A/C Weight - Empty		
Engine Thrust		
0.9 Mach @ 30K, Max		
1.5 Mach @ 45K, Max		

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10b. ~~(S)~~ Performance Characteristics (Cont'd):

Specific Fuel Consumption

~~(S)~~ 0.9 Mach @ 45K @ 2850 lbf thrust

(b)(1)

~~(S)~~ 1.5 Mach @ 45K @ 8390 lbf thrust

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	16560.0	19614.9	19907.6
Procurement	43510.0	28286.6	28344.4
Airframe	(21485.7)		(12810.8)
Engines	(5993.7)		(5724.6)
Avionics	(9250.6)		(3958.0)
BP 19			(177.3)
3011 Munitions			(63.4)
Total Nonrecurring			(1001.9)
Total Flyaway	(36730.0)		(23736.0)
Other Weapon Systems	(1032.1)		(582.5)
Peculiar Support	(1896.1)		(4005.3)
Initial Spares	(3851.8)		(20.6)
Construction (MILCON)	200.0	139.2	157.9
Acquisition O&M	0.0	0.0	0.0
Total FY 90 Base-Year \$	60270.0	48040.7	48409.9
Escalation	38839.0	17892.5	14330.2
Development (RDT&E)	(2969.0)	(3067.5)	(2887.0)
Procurement	(35762.0)	(14750.3)	(11377.1)
Construction (MILCON)	(108.0)	(74.7)	(66.1)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	99109.0	65933.2	62740.1
b. (U) Quantity --			
Development (RDT&E)	0	2	2
Procurement	648	339	339
Total	648	341	341

(U) Note: The current Low Rate Initial Production (LRIP) quantity is 56 aircraft. The previous development quantity was 9 articles all of which were non-fully configured units. The Defense Acquisition Board approved restructure reflects a current quantity of 9 EMD aircraft (2 of the 9 EMD aircraft are projected to be fully configured and used for IOT&E). The first 2 PRTV aircraft will also be used for IOT&E prior to fielding into Air Force inventory. The numbers above reflect the FY00 President's Budget position.

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11c. (U) Total Program Cost and Quantity (Cont'd):

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (FEB 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 90 BY\$)	48040.7	48409.9	
(2) Quantity	341	341	
(3) Unit Cost	140.882	141.965	+0.77
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 90 BY\$)	28286.6	28344.4	
(2) Quantity	339	339	
(3) Unit Cost	83.441	83.612	+0.20

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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	19529.0	79272.0	308.0	99109.0
Previous Changes:				
Economic	-687.0	-8759.9	-44.7	-9491.6
Quantity	-520.9	-32114.1	-	-32635.0
Schedule	+1870.2	+4343.6	-	+6213.8
Engineering	+99.8	-17.9	+5.0	+86.9
Estimating	+2370.6	+953.1	-65.8	+3257.9
Other	-	-	-	-
Support	+2.4	-2736.9	-	-2734.5
Subtotal	+3135.1	-38332.1	-105.5	-35302.5
Current Changes:				
Economic	-123.5	-838.2	-4.8	-966.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+166.1	-	-	+166.1
Estimating	+87.9	+1397.2	+26.3	+1511.4
Other	-	-	-	-
Support	-	-1777.4	-	-1777.4
Subtotal	+130.5	-1218.4	+21.5	-1066.4
Total Changes	+3265.6	-39550.5	-84.0	-36368.9
Current Estimate	22794.6	39721.5	224.0	62740.1

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

(U) Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	16560.0	43510.0	200.0	60270.0
Previous Changes:				
Quantity	-427.1	-15224.6	-	-15651.7
Schedule	+1415.9	+101.1	-	+1517.0
Engineering	+79.1	+52.9	+4.0	+136.0
Estimating	+2041.7	+1038.2	-66.2	+3013.7
Other	-	-	-	-
Support	+45.3	-1191.5	-	-1146.2
Subtotal	+3154.9	-15223.9	-62.2	-12131.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+123.6	-	-	+123.6
Estimating	+69.1	+1038.4	+20.1	+1127.6
Other	-	-	-	-
Support	-	-980.1	-	-980.1
Subtotal	+192.7	+58.3	+20.1	+271.1
Total Changes	+3347.6	-15165.6	-42.1	-11860.1
Current Estimate	19907.6	28344.4	157.9	48409.9

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-123.5
Added post EMD support in FY04 and FY05 (Engineering)	+123.6	+166.1
Adjustment for Current and Prior Inflation. (Estimating)	+51.5	+62.3
Out of Production Parts Reprogramming from FY97 to FY98 (Estimating)	-0.4	0.0
Revised estimate to realign with EMD funding cap. (Estimating)	+46.5	+60.0
Congressional general reductions and miscellaneous adjustments. (Estimating)	-28.5	-34.4
RDT&E Subtotal	+192.7	+130.5
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-1208.9
Economic adjustment for negative program change. (Economic)	N/A	+370.7
Adjustment for Current and Prior Inflation. (Estimating)	+13.6	+16.9

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

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Realign funding for various SAR/AQ initiatives (Estimating)	+68.7	+3.5
Congressional general reductions and miscellaneous adjustments (Estimating)	-24.0	-29.8
Refined program estimate resulting from an in-depth affordability analysis. (Estimating)	+980.1	+1406.6
Refined program estimate resulting from an in-depth affordability analysis. (Support)	-981.7	-1779.9
Adjustment for Current and Prior Inflation. (Support)	+1.6	+2.5

Procurement Subtotal	+58.3	-1218.4
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(3) MILCON

Revised escalation indices. (Economic)	N/A	-4.8
Adjustment for Current and Prior Inflation. (Estimating)	+0.2	+0.2
Authorization of additional bed-down projects. (Estimating)	+18.1	+23.2
Revised estimate based on updated results of operational site surveys (Estimating)	+1.8	+2.9

MILCON Subtotal	+20.1	+21.5
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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
152.95	-30.67	+41.99	+18.22	+0.74	+13.99	--	-13.23	+31.04	183.99

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14b. (U) Unit Cost and Other History (Cont'd):

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
122.33	-28.31	+16.78	+12.81	-0.05	+6.93	--	-13.32	-5.16	117.17

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	OCT 85	OCT 86	N/A	OCT 86
Milestone II	DEC 88	JUN 91	N/A	JUN 91
Milestone III	DEC 91	DEC 99	N/A	AUG 03
FUE/IOC	N/A	SEP 03	N/A	DEC 05
Total Cost	3282	99109	N/A	62740.1
Total Quantity	N/A	648	N/A	341
Prog Acq Unit Cost	N/A	152.95	N/A	183.99

(U) SAR Planning Estimate (PE) and Development Estimate (DE) reflect 18 Mar 96 Acquisition Program Baseline (APB) Then Year dollars. SAR PE represents Demonstration/Validation (DEMVAL) RDT&E funding only. SAR DE and Current Estimate reflect total RDT&E (3600), Production (3010), and MILCON (3300) funding. Quantity was not specified for SAR PE.

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

a. RDT&E --		Initial Contract Price		
(U) F-22 EMD (LMAS):		Target	Ceiling	Qty
LOCKHEED MARTIN CORP, Marietta, GA				
F33657-91-C-0006, CPAF		\$9550.1	N/A	11
Award: August 2, 1991				
Definitized: August 2, 1991				
Current Contract Price		Estimated Price At Completion		
Target	Ceiling	Qty	Contractor	Program Manager
\$13896.4	N/A	9	\$14191.8	\$14418.0

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-66.2	\$-101.5
Cumulative Variances To Date (12/31/98)	<u>\$-174.3</u>	<u>\$-53.6</u>
Net Change	\$-108.1	\$47.9

Explanation of Change:

(U) The -\$108.1M net change in the cost variance through Dec 98 represents negative change since the June 98 SAR. During this reporting period, costs increased due to backplane redesign and rework on the communication and navigation systems. Communication and navigation also experienced front end electronic software programming slips and mechanical design overruns. Manpower was added to meet the revised schedule for the aft fuselage and to eliminate inspection bottlenecks at the x-ray facility. The aft fuselage effort experienced problems with the electron beam welder; the associated workarounds at supplier, Aerojet, added to the cost growth on that effort. Unexpected manufacturing and engineering changes to the horizontal and vertical control assemblies in the empennage also occurred. Software producibility and late design release continue to impact the electronic warfare efforts. 1998 year end adjustments to contractor rates and overheads also contributed to the cost growth.

The cumulative cost variance of -\$174.3M is largely driven by the negative variance in Air Vehicle which has overruns in Airframe and Final Assembly as well as Avionics. The Airframe and Final Assembly variance is caused by raw material, outside production, non-recurring tooling changes, and labor costs needed to support design changes on the aft and forward fuselages. The wing was impacted by more machining work than expected, staff being added to support multiple shifts to meet delivery schedules and problems with side of body castings as well as flaws in the aileron strongback castings which required additional tooling. Avionics experienced front end electronics software slips and backplane redesign and rework in the communication and navigation systems which added to the variance. The electronic warfare efforts also had higher than expected software integration costs due to late engineering releases, supplier overruns, and lower than expected software productivity.

The +\$47.9M net change in the schedule variance through Dec 98 represents a positive change since the June 98 SAR. The primary driver for the positive schedule variance is the re-planning of effort to align the work packages with the SQ2250-4 Manufacturing and R-19 Avionics schedules. This single point adjustment to BCWS was reported in the Oct 98 CPR and was a result of the Cost Reduction Team analysis to implement more realistic measurement.

The cumulative schedule variance to date of -\$54.2M reflects late deliveries of side-of-body castings and flaws in the wing assemblies, parts shortages for the ailerons, flaperons, and vertical leading edges. Software slips and backplane redesign for the communications and navigation

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F-22, December 31, 1998

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

systems, as well as late engineering releases, design changes and testing rework in the electronic warfare systems add to the total schedule variance.

[The cumulative cost variance does not include an unfavorable cost variance of \$181.2M which existed prior to the Jun 95 cost growth baseline implementation and an unfavorable \$394.8M which existed prior to the Mar 97 cost growth baseline implementation.]

[The cumulative schedule variance does not include an unfavorable schedule variance of \$59.4M which existed prior to the Jun 95 cost growth baseline implementation and the unfavorable \$177.4M which existed prior to the Mar 97 cost growth baseline implementation.]

			Initial Contract Price	
	Target	Ceiling	Qty	
(U) <u>EMD ENGINE (P&W):</u>				
PRATT&WHITNEY - GOVT, WEST PALM BEACH FL				
F33657-91-C-0007, CPAF	\$1375.1	N/A	33	
Award: August 2, 1991				
Definitized: August 2, 1991				
			Estimated Price At Completion	
	Target	Ceiling	Qty	Contractor Program Manager
Current Contract Price	\$2375.0	N/A	26	\$2395.6 \$2395.6
			Cost Variance Schedule Variance	
Previous Cumulative Variances				\$-2.4 \$-19.5
Cumulative Variances To Date (12/31/98)				\$-16.1 \$-13.9
Net Change				\$-13.7 \$5.6

Explanation of Change:

(U) The Performance Measurement Baseline was updated to reflect the F119 EMD Restructure which was placed on contract on 25 Aug 97.

Through December 1998, the cumulative unfavorable cost variance was -\$16.1M (-0.7%). This is a decline of -\$13.7M from the June 1998 SAR. The cumulative variance drivers include the engine test, nozzle, compressor, controls and externals WBS elements.

Through December 1998, the cumulative unfavorable schedule variance was -\$13.9M (-0.8%). This variance is an improvement of \$5.6M from the June 1998 SAR. The cumulative variance drivers include engine test, nozzle, controls, test facilities and engine integration and assembly WBS elements.

[The cumulative cost variance does not include an unfavorable \$41.3M cost variance which existed prior to the August 1995 cost growth baseline

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

implementation or an unfavorable \$34.8M cost variance which existed prior to the FY97 program restructure.]

[The cumulative schedule variance does not include an unfavorable \$21.4M schedule variance which existed prior to the August 95 cost growth baseline implementation or an unfavorable \$11.2M schedule variance which existed prior to the FY97 program restructure.]

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

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

<u>Appropriation</u>	<u>Prior Years (FY83-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-15)</u>	<u>Total</u>
RDT&E	19398.8	1222.2	976.6	1197.0	22794.6
Procurement	878.7	1859.5	2554.1	34429.2	39721.5
MILCON	21.1	4.4	26.6	171.9	224.0
O&M	-	-	-	-	-
Total	20298.6	3086.1	3557.3	35798.1	62740.1

b. Annual Summary -- Advanced Tactical Fighter

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY90 Dollars Nonrec</u>	<u>Flyaway FY90 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1983				24.8	20.0
1984				40.7	34.1
1985				104.8	90.8
1986				171.5	152.1
1987				320.6	297.2
1988				529.8	504.4
1989				801.7	800.1
1990				1093.6	1124.2
1991				893.4	953.3
1992				1463.4	1606.8

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F-22, December 31, 1998

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				1717.4	1925.2
1994				1806.0	2058.8
1995				1962.7	2280.6
1996				1820.9	2154.1
1997				1514.1	1815.4
1998				1667.2	2010.7
1999				1287.7	1571.0
2000				986.4	1222.2
2001				775.7	976.6
2002				557.1	712.5
2003				244.5	318.4
2004				62.5	83.1
2005				61.1	83.0
Subtotal	2			19907.6	22794.6

(U) 1) The F-22 EMD program is currently Congressionally capped at \$18,688M. SECAF advised the Congressional Defense Committees on 14 Jan 1998 that the USAF was adjusting the cap upward by \$353M for OPP redesign efforts. An additional adjustment of \$160.6M for negative inflation adjusted the cap to \$18,880.0M.

2) PE 0207138F is a new program element for F-22 Support. Included within this PE are funds for post EMD support. FY04 and FY05 3600 funding is required Block 5 OPP upgrades. These funding increments are not considered part of the EMD Congressional funding cap.

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				6.2	7.5
1998				59.9	73.3
1999	2	48.4	465.0	642.1	797.5
2000	6	66.8	1172.0	1472.3	1858.1
2001	10	138.3	1532.2	1988.6	2551.4
2002	16	171.6	1844.0	2310.9	3020.4
2003	24	159.0	2185.6	3243.2	4326.4
2004	36	155.3	2333.9	2928.1	3988.1
2005	36	52.5	2076.5	2579.0	3584.8

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

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2006	36	31.8	2182.6	2527.6	3586.7
2007	36	40.1	2088.1	2403.2	3482.2
2008	36	35.7	1911.8	2484.3	3676.8
2009	36	34.0	1866.2	2184.6	3300.9
2010	36	33.6	1860.7	2121.3	3273.1
2011	29	34.8	1012.5	1190.1	1874.4
2012			58.1	58.1	93.4
2013			46.1	46.0	75.6
2014			25.4	25.6	42.9
2015			10.0	9.9	17.0
Subtotal	339	1001.9	22670.7	28281.0	39630.5

(U) 1.) Procurement funding requirements remain within the congressionally directed cap of \$43,400M. SECAF advised the Congressional Defense Committees on 14 Jan 1998 that the USAF was adjusting the cap downward by \$353M for OPP redesign efforts. An additional adjustment of \$3.288B for negative inflation adjustments adjusts the cap to \$39,759M.

Appropriation: 3011 - Procurement of Ammunition, Air Force

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999			0.3	0.3	0.4
2000			1.1	1.1	1.4
2001			2.1	2.1	2.7
2002			3.3	3.3	4.3
2003			4.9	4.9	6.5
2004			7.0	7.0	9.6
2005			6.9	6.9	9.6
2006			6.7	6.7	9.5
2007			6.6	6.6	9.6
2008			6.5	6.5	9.6
2009			6.5	6.5	9.8
2010			6.4	6.4	9.9
2011			5.1	5.1	8.1
Subtotal			63.4	63.4	91.0

(U) Per SAF/AQ guidance, funding for chaff and flares must be appropriation

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

3011. Funds were reprogrammed from 3010 BP19 to 3011 BP35 in Sep 98.

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				3.9	4.6
1996				10.1	12.1
1997				3.6	4.4
1998					
1999					
2000				3.5	4.4
2001				20.8	26.6
2002					
2003					
2004					
2005					
2006				31.5	44.5
2007				7.5	10.8
2008				25.4	37.5
2009				19.9	29.9
2010				15.8	24.3
2011				15.9	24.9
Subtotal				157.9	224.0

(U) 1) At the time of the 99 PB, only one project was included in the FY00 line. Since that time, several projects have been approved and funded for FY00 and FY01, totalling an additional \$23.1M.

2) The FY00 funding line was adjusted to an OSD levied incrementally funded program that shifted 75 percent of FY00 funding to FY01. This shift of funding was not F-22 unique, it was applied to MILCON projects DOD-wide.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	341	1001.9	22734.1	48409.9	62740.1

Reason for Classification: E.O. 12958, Section 1.4(a)
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17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	2	2
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.6%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 17268

(U) Percent Total Program Expended: 27.5%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
The Operating and Support (O&S) cost estimate has been updated to reflect current program restructure as of 31 December 1997.

For purposes of this cost comparison, the F-22 concept of operations is assumed to be a 24 aircraft fighter squadron with a utilization rate of 332 flight hours per aircraft per year. The wartime scenario was used to estimate the manpower. The peacetime utilization rate for the weapon system was used to estimate the O&S cost. Training and combat coded squadrons were addressed as operationally the same for this O&S estimate. Total aircraft buy for the F-22 is 339. Total aircraft included in the F-22 O&S estimate is 283, the number of Primary Aircraft Inventory (PAI) aircraft.

The F-15C is antecedent to the F-22; both are two engine air-to-air fighters with similar operational concepts. The F-15C estimate was updated based on the latest fleetwide data for FY96 from the Visibility and Management of Operating and Support Costs (VAMOSOC) database. For purposes of this cost comparison, the F-15C concept of operation is a 24 aircraft fighter squadron with 297 PAI and a fleetwide utilization rate of 100,664 flying hours.

The F-22 estimate was based on a combination of AFI 65-503 Cost and Planning Factors and information provided in the 1997/98 LMAS Affordability Analysis. Changes in the AFI 65-503 factors as well as refinements in the training and software estimates caused a slight decrease from the June 98 SAR.

Explanations for element increases/decreases:

Unit Mission Personnel - Inflation factor decreased.

Unit Level Consumption - Changes in AFI 65-503 and inflation factors.

Depot Maintenance - Changes in AFI 65-503 and inflation factors.

Contractor Support - Further refinement of the training estimate to include pilot training from FY2013-FY2032 and to exclude all maintenance training.

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

Sustaining Support - Changes in AFI 65-503, inflation, and unit flyway cost factors. Software maintenance estimate was further refined.

Indirect Support - Pilot training eliminated since it is covered under contractor support and included real property maintenance (RPM) personnel since new facilities will be required at operational bases.

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per F-22 Squadron	Avg Annual Cost Per F-15C Squadron
Mission Pay & Allowances	15.0	26.2
Unit Level Consumption	28.6	35.7
Intermediate Maintenance	0.0	0.0
Depot Maintenance	1.4	8.8
Contractor Support	2.5	4.2
Sustaining Support	9.7	5.8
Indirect Costs	5.7	25.3
acts	N/A	N/A
Total	62.9	106.0

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

PROGRAM: TITAN IV

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name):2. DoD Component: USAF3. Responsible Office and Telephone Number:

Space and Missile Systems Center/CL Col Jeffery J. Norton
 160 Skynet Street Assigned: January 27, 1997
 Suite 1215 DSN 833-3915; COMM (310)363-3915
 Los Angeles AFB, CA 90245-4659 michael.welborn@losangeles.af.mil

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0304111F (Shared) Project 299998, 346503, 6569AJ
 PE 0305119F (Shared) Project 66624A
 PE 0305144F
 PE 0305171F (Shared)

PROCUREMENT:

APPN 3080 ICN 834600 (Air Force)
 APPN 3020 ICN MSBSTR (Air Force) (Shared) Project 23BSTR
 APPN 3020 ICN MSO299 (Air Force)

MILCON:

PE 0305119F

SAF/PAS

99 - - 0274

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TITAN IV, December 31, 1998

5. References:

SAR Baseline (Development Estimate):
FY87 President's Budget, February 1986.

Approved Program:
DAE Approved Acquisition Program Baseline (APB) dated May 26, 1994.

6. Mission and Description:

The Titan IV is a heavy-lift rocket booster that assures continued access to space for the nation's highest priority space systems. The Titan IV does not replace any defense programs. The Titan IV system evolved from the basic family of Titan systems, namely the Titan II, Titan III and 34D, which have contributed to national space objectives for more than 25 years. The Titan IVA vehicle configuration consists of a two stage liquid propellant core with a pair of large, attached Solid Rocket Motors (SRMs) which provide the initial boost stage for liftoff. Beginning with the twenty-fourth vehicle in the program, a new block change Titan IVB incorporating advanced technology and improved processes will become operational. The Titan IVB did fly with Solid Rocket Motor Upgrades (SRMUs) and new avionics, both of which increase reliability, producibility, and performance for larger payload requirements. Two upper stage configurations are used on Titan IV, the Inertial Upper Stage (IUS) and the Titan/Centaur. When configured with the Centaur and SRMU, Titan IV is capable of placing an 13,350-pound payload into Geosynchronous Earth Orbit (GEO). When configured with No Upper Stage (NUS) and SRMU, Titan IVB can place a 40,000-pound payload into a 100-nmi circular, polar orbit.

7. Executive Summary:

The Titan IV was developed in direct response to a National Security Decision Directive. The initial contract for 10 Titan IV's with Centaur upper stages was awarded in February 1985. As a result of the January 1986 Space Shuttle accident, the Department of Defense (DoD) began a recovery plan which included the acquisition of 13 additional Titan IV's. The resulting 23-vehicle program was placed on contract in December 1987. The DoD later embarked on an increased capacity plan which included an additional launch pad at Cape Canaveral Air Station (CCAS), 18 additional Titan IV boosters, and associated facility enhancements. The 41-vehicle program was definitized in December 1989. The Titan IV was designated a Defense Acquisition Board program in July 1991. Between 1991 and 1994, two production slowdowns and a production bridge reduced production from 10 to 2 core vehicles per year to match the reduction in launch requirements. The Unified Payload Integration Contract was awarded in July 1992 to provide payload integration capability through FY97. The Titan Master Contract Plan, approved by the Acquisition Strategy Panel in March 1995, was developed in order to break out Titan contracts into four separate but interdependent contracts to better manage the program.

The first Titan IV was successfully launched in 1989 from CCAS. In April 1991, an explosion occurred during the static firing test of the first Solid Rocket Motor Upgrade (SRMU) Qualification motor. SRMU production began again in

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TITAN IV, December 31, 1998

7. Executive Summary (Cont'd):

November 1993. A Titan IVA launched from Vandenberg Air Force Base (VAFB) on August 2, 1993 experienced a catastrophic failure caused by a burn through on one of the SRM segments. The program successfully recovered with the first launch of a Titan IVA/Centaur carrying the Military Strategic and Tactical Relay (MILSTAR) satellite in February 1994, the first launch from Launch Complex 40 at CCAS. Three contracts in the Titan Contracts Master Plan were awarded in 1996 (-0001 Production, -0012 Launch Base Operations, and -0035 Research and Development). The second phase of the -0019 contract closeout was completed on December 23, 1996. On July 26, 1996, three Undefined Contract Actions (UCAs) were issued to implement the Air Force Acquisition Executive (AFAE) decision to buy out the Titan program at 41 vehicles, thereby accelerating the transfer of launches to the Evolved Expendable Launch Vehicle (EELV). In FY 97, Air Force Space Command conducted an operational effectiveness assessment which led to the deletion of the Centaur Processing Facility. United Technologies (Chemical Systems Division) completed production of the last SRM in September 1996 and Alliant Techsystems achieved Initial Launch Capability of the SRMU in July 1996. In December 1996 the Atlas launch operations were merged into the Titan launch operations -0012 contract to gain further program efficiencies.

This year the Titan IV program was marked by two major events. On August 12, 1998 Titan IV mission A-20, the last A model vehicle, experienced intermittent electrical shorting approximately 40 seconds into the planned flight. The shorting caused a guidance system reset, leading to a catastrophic mission failure. Post mission analysis identified the most probable cause of the failure to be defects in the vehicle's wiring harness. Programmatically, on August 31, 1998 the Program Office and Lockheed Martin awarded the \$1.3 billion "Titan Completion" modification. This modification included all actions necessary to fly-out the remainder of the currently authorized (39) mission Titan IV program and to terminate the government's involvement in the 40 year old Titan program. "Titan 39 Complete" represents a major milestone in this program culminating 18-months of difficult, yet effective negotiations. Changing requirements, re-direction, and detailed re-certification of pricing data drove this timeline.

In addition to these two events Titan IV B-25 was launched on May 8, 1998 with a NRO payload. No other Titan missions were launched after the A-20 mission failure pending the results of the failure investigation. No other major contractual events took place during this period.

As a result of the A-20 failure the program office is currently performing a program wide hardware and software process review. Early results have identified the need for a detailed review of the Lockheed Martin harness manufacturing and quality reporting system. These results have been included in the Program Office's Return To Flight (RTF) plan. The RTF plan was developed in accordance with AFSPC OI 12-120112, and was briefed to and approved by Secretary of the Air Force Acquisitions for Space, the Program Executive Officer for Space, Secretary of the Air Force Acquisitions, Spacecraft Program Directors, the 30th Space Wing Commander, and the 45th Space Wing Commander on January 28, 1999. The Air Force Space Command Commander and

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TITAN IV, December 31, 1998

7. Executive Summary (Cont'd):

the Director of the National Reconnaissance Office were briefed and also approved the RTF plan on January 29, 1999. This approval will lead to a projected Titan IV return to flight in April 1999.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	Yes
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

Schedule Breach: The Centaur Processing Facility project was on schedule for completion within the scheduled milestone time frame, but funds were removed by Secretary of the Air Force Acquisition preventing the completion of the facility and resulting in the schedule Breach of the Acquisition Program Baseline (APB). The next APB will delete this scheduled milestone.

Performance Breach: Titan IV had attained its threshold for performance following four successful launches in 1997, but performance fell to 92% following the failure of the Titan IVA-20 mission. The 92% Demonstrated performance rating is below the threshold of 96% as stated in the current baseline. A Program Deviation Report has been submitted, and a proposed APB is currently being developed.

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9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Initial Contract Award	FEB 85	FEB 85	FEB 85
Production Start	OCT 85	N/A	OCT 85
System Preliminary Design Review	APR 86	N/A	APR 86
Critical Design Review	NOV 86	NOV 86	OCT 86
Addition of 13 Vehicles	N/A	DEC 87	DEC 87
First Core Delivery to CCAFS	N/A	JAN 88	JAN 88
First Delivery to CCAFS	FEB 88	N/A	APR 88
Initial Launch Capability (ILC)			
Titan IV/IUS	OCT 88	FEB 89	FEB 89
Titan IV/NUS (WTR)	N/A	OCT 90	OCT 90
Titan IV/Centaur	N/A	MAY 93	SEP 93
SLC-40	N/A	SEP 92	FEB 93
Centaur Structural Test	N/A	JUL 89	APR 91
SRMU Static Firing (PQM-1)	N/A	JUN 92	JUN 92
SRMU ILC	N/A	JUL 96	JUL 96
Centaur Processing Facility IOC	N/A	JAN 97	N/A

Space Launch Complex - 40 (SLC-40) is referred to as Launch Complex - 40 (LC-40) throughout this document.

Due to programmatic changes, the Centaur Processing facility will not be completed.

b. Current Change Explanations --
None

10. Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate	
System Reliability (%)	98	98 / 96	92	95	(Ch-1)
Payload to Geosynchronous Orbit (k-lbs) (Titan IV/Centaur)					
SRM	10.0	10.0 / 10.0	10.35	10.35	
SRMU	N/A	11.5 / 11.5	13.25	13.25	
Payload to Transfer Orbit (k-lbs)					
SRM	N/A	38.8 / 38.8	39.7	39.7	
SRMU	N/A	47.0 / 47.0	49.1	49.1	
Payload to Low Earth Polar Orbit (k-lbs) (Titan IV/NUS)					
SRM	N/A	31.1 / 31.1	31.7	31.7	

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10a. Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
SRMU	N/A	38.8 / 38.8	40.0	40.0

b. Current Change Explanations --

(Ch-1) Due to one successful launch and one failure during the 1998 SAR reporting period, Titan IV demonstrated performance for system reliability has been decreased from 96% to 92% (23 of 25 launches have been successful). The current estimate has also been decreased to reflect the reality that Titan IV will only achieve 95% reliability when it launches out the remainder of the 39 vehicle program without failure (37 of 39 launches). A Program Deviation Report (PDR) has been submitted for the breach of the program threshold. A new acquisition program baseline is being developed.

11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	579.7	3194.0	3198.3
Procurement	1570.8	19868.4	10300.3
Flyaway	(1106.6)		(8767.1)
Other Wpn Sys	(464.2)		(1533.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	105.3	93.0
Acquisition O&M	0.0	0.0	0.0
Total FY 85 Base-Year \$	2150.5	23167.7	13591.6
Escalation	378.7	14545.4	3976.3
Development (RDT&E)	(61.4)	(1252.3)	(654.7)
Procurement	(317.3)	(13267.4)	(3293.5)
Construction (MILCON)	(0.0)	(25.7)	(28.1)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2529.2	37713.1	17567.9
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	10	65	39
Total	10	65	39

Note 1: On August 31, 1998, the Titan Completion contract negotiations were completed and the Titan IV program quantity was reduced from 40 to 39 vehicles.

Note 2: Vehicle Quantity History:

DEC 85 SAR	DEC 86 SAR	DEC 88 SAR	Aug 94 DAB	DEC 94 SAR	DEC 95 SAR
10	23	57	65	47	46
DEC 96 SAR	DEC 97 SAR	DEC 98 SAR			

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11b. Total Program Cost and Quantity (Cont'd):

41 40 39

c. Foreign Military Sales --
None.

d. Nuclear Costs --
None

12. Unit Cost Summary:

	UCR Baseline (MAY 94 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 85 BY\$)	23167.7	13591.6	
(2) Quantity	65	39	
(3) Unit Cost	356.426	348.503	-2.22
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 85 BY\$)	19868.4	10300.3	
(2) Quantity	65	39	
(3) Unit Cost	305.668	264.110	-13.60

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TITAN IV, December 31, 1998

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	641.1	1888.1	-	2529.2
Previous Changes:				
Economic	-80.6	-1205.1	+7.0	-1278.7
Quantity	-237.3	+1162.0	-	+924.7
Schedule	+795.1	+4478.5	+5.0	+5278.6
Engineering	+894.8	-3630.6	-	-2735.8
Estimating	+1430.1	+11779.0	+109.1	+13318.2
Other	-	-	-	-
Support	+45.6	+748.6	-	+794.2
Subtotal	+2847.7	+13332.4	+121.1	+16301.2
Current Changes:				
Economic	-5.6	-89.4	-	-95.0
Quantity	-	-214.6	-	-214.6
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+369.8	-1505.4	-	-1135.6
Other	-	-	-	-
Support	-	+182.7	-	+182.7
Subtotal	+364.2	-1626.7	-	-1262.5
Total Changes	+3211.9	+11705.7	+121.1	+15038.7
Current Estimate	3853.0	13593.8	121.1	17567.9

Summary (FY 1985 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	579.7	1570.8	-	2150.5
Previous Changes:				
Quantity	-138.8	+2278.6	-	+2139.8
Schedule	+377.7	+1553.1	-	+1930.8
Engineering	+651.4	-2288.6	-	-1637.2
Estimating	+1161.0	+7237.4	+93.0	+8491.4
Other	-	-	-	-
Support	+195.8	+946.5	-	+1142.3
Subtotal	+2247.1	+9727.0	+93.0	+12067.1
Current Changes:				
Quantity	-	-139.1	-	-139.1
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+371.5	-980.9	-	-609.4
Other	-	-	-	-
Support	-	+122.5	-	+122.5
Subtotal	+371.5	-997.5	-	-626.0
Total Changes	+2618.6	+8729.5	+93.0	+11441.1
Current Estimate	3198.3	10300.3	93.0	13591.6

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TITAN IV, December 31, 1998

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices (Economic)	N/A	-5.6
Revised completion estimate and projected contract underruns reduced launch vehicle development effort. (Estimating)	-27.0	-40.2
Revised estimate for contract and program completion requirements increased program management costs. (Estimating)	+3.6	+4.9
Program office estimate adjusted to include pending contractual requirements resulted in increased mission integration costs. (Estimating)	+4.5	+6.5
Adjustment for current and prior year escalation. (Estimating)	+0.1	+0.1
Revised estimate resulting from bottoms-up evaluation of total program funding from FY83 to FY98 funding. (Estimating)	+390.3	+398.5
RDT&E Subtotal	+371.5	+364.2
(2) <u>Procurement</u>		
Revised escalation indices (Economic)	N/A	-89.4
Reduction in operational missions from 40 to 39 reduces capability costs. (Quantity)	-139.1	-214.6
Program office estimate adjusted to include pending contractual requirements resulted in increased mission integration costs. (Estimating)	+2.1	+1.6
Revised estimate to account for SRMU reduction, Special Termination Contract Clause (STCC) and projected contract underrun reduced production costs. (Estimating)	-63.9	-95.4
Negotiated Completion Contract values and redistributed contract closeout costs reduced estimate for program completion. (Estimating)	-349.2	-537.9
Adjustment for current and prior year escalation. (Estimating)	+10.1	+14.3
Revised estimate resulting from bottoms-up evaluation of total program funding from FY83 to FY98. (Estimating)	-580.0	-888.0
Contract and program close-out costs increased program management support. (Support)	+122.5	+182.7
Procurement Subtotal	-997.5	-1626.7

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TITAN IV, December 31, 1998

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

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
252.92	-35.22	-169.86	+135.35	-70.15	+312.37	--	+25.05	+197.54	450.46

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
188.81	-33.19	-116.11	+114.83	-93.09	+263.43	--	+23.88	+159.75	348.56

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	N/A	N/A
Total Cost	N/A	2529.2	N/A	17567.9
Total Quantity	N/A	10	N/A	39
Prog Acq Unit Cost	N/A	252.92	N/A	450.46

Titan IV had no acquisition phase milestones.

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

a. RDT&E --			Initial Contract Price		
<u>Program R & D:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
LOCKHEED MARTIN, DENVER, CO					
F04701-96-C-0035, CPFF/AF			\$62.3	N/A	0
Award: July 1, 1996					
Definitized: July 1, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$265.3	N/A	0	\$246.0	\$246.0	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$5.2	\$-0.5	
Cumulative Variances To Date (12/31/98)			\$10.7	\$0.8	
Net Change			\$5.5	\$1.3	

Explanation of Change:

The current contract target price increased from the last SAR to \$265.3M. This increase was due to the definitization of several contract changes. During 1998 the following requirements were definitized: 1) Contract Value Funding Realignment, 2) Nozzle Recertification (KX0436), 3) Launch Operations Follow On Cleanup, 4) 39 Vehicle Completion, and 5) 1998 Earned Award Fee. This office has reviewed and evaluated the contractor's Price-At-Completion (PAC) of \$246M. The program manager accepts and recommends the contractor's PAC as the SPO's PAC. The net change of \$1.3M to the favorable cumulative cost variance is primarily due to Aerojet underrunning the Continuous Process Product Improvement (CPPI) Program by \$5.4M. The net change of \$1.3M to the favorable cumulative schedule variance is primarily a result of Aerojet completing the CPPI program ahead of schedule. An Integrated Baseline Review for the 39 Vehicle Completion effort is scheduled for May 99.

<u>Production:</u>			Initial Contract Price		
Lockheed Martin, Denver, CO			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F04701-96-C-0001, FPIF					
Award: April 1, 1996			\$568.9	\$589.6	0
Definitized: April 1, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$2791.8	\$3151.4	0	\$2640.2	\$2640.2	

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15. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$50.2	\$-4.9
Cumulative Variances To Date (12/31/98)	\$128.5	\$-18.4
Net Change	\$78.3	\$-13.5

Explanation of Change:

The current reported contract target price is \$2,791.8M. The net increase from the 1997 SAR is \$940.4M. The following authorized requirements were definitized during CY98 for the net change: 1) 1998 earned award fee, 2) 39 vehicle completion, 3) Lithium battery production and integration, and 4) several downward adjustments such as the Honeywell sub-contract downward adjustment for Centaur TC-20 Inertial Navigation Unit replacement, SRMU Long Term storage facilities, and Aerojet anomaly investigation. This office has reviewed and evaluated the contractor's Estimated Price-at-Completion (PAC) of \$2,640.2M. The program manager accepts and recommends the contractor's PAC as the SPO's PAC. The net change of \$78.3M to the favorable cumulative cost variance is due to favorable manpower performance that resulted from organizational synergies, favorable rate savings, and production and manufacturing efficiencies by sub-contractors. The net change of -\$13.5M to the unfavorable cumulative schedule variance is a result of inventory delays associated with core vehicle. An Integrated Baseline Review (IBR) for the 39 Completion effort is scheduled for May 99.

b. Procurement --
Launch Base Ops:
 LOCKHEED MARTIN, DENVER, CO
 FO4701-95-C-0012, CPAF/FF
 Award: April 1, 1996
 Definitized: April 1, 1996

			<u>Initial Contract Price</u>	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
	\$1538.0	N/A	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>
\$1833.8	N/A	0	\$1814.8	\$1814.8

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-1.5	\$-8.9
Cumulative Variances To Date (12/31/98)	\$14.6	\$-9.1
Net Change	\$16.1	\$-0.2

Explanation of Change:

The current contract target price is \$1,833.8M. The net increase from the 1997 SAR is \$179.6M. The following contractual requirements were definitized during CY98 for the net increase: (1) 39 Vehicle Completion, (2) FY98 Earned Award fee, (3) Launch Operations Follow On (LOFO) Cleanup, (4) Contract Line item Number (CLIN) Consolidation, (5) Space Launch System Contract Maintenance, and (6) Deletion of Core Automated Maintenance System (CAMS) and Standard Base Supply System (SBSS). This

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15. Contract Information (Cont'd):

office has evaluated and reviewed the LMA's Price At Completion (PAC) of \$1,814.8M. The Program Manager accepts and recommends the LMA's PAC as the SPO PAC. The net change of \$15.1M to the favorable cumulative cost variance is due to favorable 1997 rate savings, computer depreciation & maintenance; Alliant AP cost adjustment; and program synergy. The net change of \$-0.2M to the unfavorable cumulative schedule variance is due to delays in B-12, B-27, B-28, B-32 sequence debug/validation and delays in material delivery. An Integrated Baseline Review for 39 Vehicle Completion effort is scheduled for May 1999.

<u>Unified Payload Int(UPI):</u>			<u>Initial Contract Price</u>		
LOCKHEED MARTIN, DENVER, CO	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
F04701-98-C-0005, CPAF	\$283.4	N/A	0		
Award: October 1, 1997					
Definitized: October 1, 1997					

<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>
\$286.0	N/A	0	\$278.8	\$278.8

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.4	\$-0.7
Cumulative Variances To Date (12/31/98)	\$4.2	\$-2.4
Net Change	\$3.8	\$-1.7

Explanation of Change:

The current contract target price increased from the last SAR to \$286.0M. This increase was due to 1998 earned award fee. This office has reviewed and evaluated the contractor's Price-At-Completion (PAC) of \$278.8M. The program manager accepts and recommends the contractor's PAC as the SPO's PAC. The positive cumulative cost variance is due to favorable performance in Mission Management Level of Effort accounts, incorporation of new forward pricing rates, the use of experienced personnel, and less extensive engineering changes. The Negative cumulative schedule variance is due to launch slips, activities starting at a slower pace than planned, and the A-20 anomaly. An Integrated Baseline Review was conducted on this contract in June 98.

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TITAN IV, December 31, 1998

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

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

<u>Appropriation</u>	<u>Prior Years (FY83-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	3716.4	66.4	37.9	32.3	3853.0
Procurement	11656.8	643.4	622.6	671.0	13593.8
MILCON	121.1	-	-	-	121.1
O&M	-	-	-	-	-
Total	15494.3	709.8	660.5	703.3	17567.9

b. Annual Summary -- TITAN IV (ELV)

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1983				170.7	162.2
1984				13.4	13.2
1985				201.7	205.7
1986				200.8	209.8
1987				115.6	126.2
1988				481.4	539.6
1989				396.8	466.6
1990				363.7	440.8
1991				179.7	225.9
1992				233.2	301.7
1993				133.8	176.8
1994				224.8	302.1
1995				116.1	159.0
1996				115.9	161.5
1997				55.0	77.7
1998				46.7	66.4
1999				56.5	81.2
2000				45.5	66.4
2001				25.6	37.9
2002				21.4	32.3
Subtotal				3198.3	3853.0

A bottoms-up review continues to examine all authorized budget and user funding for the lifetime of the program. Changes in all fiscal years to the program funding summary since the last SAR reflect the correction of deficiencies found in prior calculations. This program budget review will continue through the closure of the -0019/-0028 contracts and may impact section 16 in subsequent SAR submittals.

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1983		111.0	117.0	274.7	269.8
1984		107.7	111.3	263.2	269.5
1985		74.7	66.3	165.7	174.6
1986		33.0	134.5	199.9	220.5
1987	2	87.2	255.6	405.9	466.8
1988	6	252.4	510.2	885.6	1055.6
1989	5	284.2	442.7	817.6	1017.9
1990	5	215.8	503.7	813.6	1031.6
1991	5	287.7	288.2	654.6	854.2
1992	6	243.7	378.1	678.7	896.6
1993	6	367.0	313.5	730.4	983.8
1994	4	239.3	485.1	770.5	1058.7
1995		199.8	253.0	496.8	689.1
1996		99.4	224.0	372.2	523.3
1997		111.3	194.2	347.7	495.8
1998		151.8	351.2	554.2	798.6
1999		52.7	297.7	526.5	769.2
2000		56.3	297.7	433.3	643.4
2001		54.8	260.1	412.3	622.6
2002		48.2	131.9	351.7	540.9
2003		7.7		40.9	64.1
2004		1.3		18.2	29.1
2005		0.6		22.6	36.9
Subtotal	39	3087.6	5616.0	10236.8	13512.6

In a continuing effort to baseline funding for Titan, Program Control continued its review of the -0019 contract as well as Titan IV Total Obligation Authority (TOA) history. Based on this continuing review, dollar values are changing. Funding for the Titan Program after the Shuttle disaster came from many different sources and the full import of this is being evaluated as part of the on-going -0019/-0028 contract closeout. After the contracts are closed, the full value of the Titan IV program during the period FY83 through FY95 will be known, as well as how the funding is aligned across all funding sources. Based on current guidance, only Air Force (Titan IV) and National Reconnaissance Office (NRO) funds are reflected in this SAR. This, however, does not reflect all funding that was used on the Titan IV program.

NRO funds approximately 50% of missile procurement funds in the Titan IV program. All NRO funded Titan IV vehicles, and all funding related to Air Force vehicles after December 1992, are incrementally funded. Therefore, recurring Flyaway dollars do not correspond logically to procurement quantities in FY83 through FY86, and FY96 through FY05. There are no production quantities associated with the Launch Base Operations (LBO)

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

contract (-0012). The LBO contract does however, procure a launch capability which includes recurring launch operation costs at both Eastern and Western Ranges which is not tied to any specific hardware unit.

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992		63.5		63.5	81.2
Subtotal		63.5		63.5	81.2

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990				44.1	55.8
1991				7.7	10.0
1992				16.0	21.2
1993				25.2	34.1
Subtotal				93.0	121.1

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	39	3151.1	5616.0	13591.6	17567.9

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	25	25

Percent Total Program Quantities Delivered: 64.1%

b. Total Expenditures To Date (In Millions of Dollars): \$ 13106.3

Percent Total Program Expended: 74.6%

The Deliveries to Date section of the SAR has now been amended. Previously the Titan IV program reported items as delivered when the core of a vehicle was completed. While this may have been deemed appropriate at the time,

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17. Delivery/Expenditure Information (Cont'd):

it no longer gives a clear picture as to the progress of the program. Deliveries will now be considered complete when vehicle ownership is transferred and the DD250 is signed. For Titan IV, the DD 250 is considered signed when the vehicle is 2 inches off the launch pad.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The costs for launch processing are based on actual contract values for the current Titan IV program and were transferred from operation and support costs to procurement costs in conjunction with the FY92/93 President's Budget. Thus, these costs are not included below. Range costs continue to be carried as operation and support costs. The FY 1998 Titan IV Program Office Estimate (POE) annual O&S costs were estimated to be \$66.6M in base year dollars. With a estimated rate of four launches per year the average annual cost per launch in base year dollars is \$16.6M.

b. Costs -- (FY 1985 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg annual cost per Titan IV Launch	Avg annual cost per Titan 34D Launch
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Range Support	16.6	7.5
Total	16.6	7.5

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AF-15 JSTARS

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)18231)
PROGRAM: Joint STARS

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Joint STARS

2. (U) DoD Component: USAF

Joint Participants:
US Army

3. (U) Responsible Office and Telephone Number:

Joint STARS Program Office	Col Robert H. Latiff
Electronic Systems Center	Assigned: December 6, 1996
75 Vandenberg Drive	DSN 478-5725; COMM (781) 377-5725
Hanscom AFB, MA 01731-2119	latiff@hanscom.af.mil

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

RDT&E:

(U)	PE 0207581F	
(U)	PE 0603770F	
(U)	PE 0604270F	Project 3894 (Shared)
(U)	PE 0604616F	
(U)	PE 0604770D	
(U)	PE 0604770F	

PROCUREMENT:

(U) APPN 3010 ICN 0207581F (Air Force)

MILCON:

(U) PE 0604770F

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AS AMENDED

FEB 25 1999 18

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

SAF/PAS

99--0158

CONGRESSIONAL

~~Classified by: Joint STARS Classification Guide dated 10 Jun 98~~
~~Downgrade instructions: Not subject to automatic Downgrade~~
~~Reclassification by: Originating Agency Determination Required (OAR)~~

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5. (U) References:

SAR Baseline (Production Estimate):

(U) AFAE Approved Acquisition Program Baseline (APB) dated October 24, 1996.

Approved Program:

(U) AFAE Approved Acquisition Program Baseline (APB) dated February 13, 1998.

6. (U) Mission and Description:

(U) The Joint Surveillance Target Attack Radar System (Joint STARS) is a Joint Army and Air Force Program, with the AF as the lead service. The Joint STARS system provides real-time wide-area surveillance of the battlefield and rear echelons. Joint STARS is unique because it detects and tracks enemy armor, vehicles, and troops over a wide-area in real-time using moving target indicator (MTI) and synthetic aperture radar (SAR) techniques. Joint STARS also plays a critical C2 battle management role providing precise real-time targeting information to direct attack aircraft, friendly artillery, and standoff missile batteries. Joint STARS unique capabilities can give the Joint Force Commander a near real-time look at enemy first and second echelon force buildups, force movements, and the enemy scheme-of-maneuver on the battlefield. This early information on the enemy battle plan will allow friendly forces to act 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. Joint STARS is also identified as one of the core assets that provides rapidly employable, information superiority. Joint STARS provides SAR/MTI coverage of ground activity, with target identification and intelligence support from RIVET JOINT and works in concert with AWACS to provide a collaborative situation awareness, battle management, and precision engagement capability for the Joint Force Commander. There is no antecedent system.

7. (U) Executive Summary:

(U) The Joint Program Office (JPO) delivered P-4 (the fourth low rate initial production E-8C aircraft) to the 93d Air Control Wing (ACW) on 18 Aug 98. Delivery of the fifth E-8C is scheduled for 31 Oct 99. Since the last SAR, additional funding has been added for a fourteenth production E-8C. In addition, the JPO awarded Lot VI (aircraft P-11) full production contract on 5 May 98.

In order to resolve production concerns as reported in the last SAR (Dec 97), the AF and Northrop Grumman revised the production Statement of Work for all Lots. Changing the production work-scope from aircraft remanufacture to refurbishment allows the contractor/government team better control of schedule and cost growth. Additionally, Northrop-Grumman out-sourced basic refurbishment of two Joint STARS aircraft to subcontractor Lockheed-Martin at Greenville, SC. Finally, a revised aircraft production delivery schedule was established on 11 Aug 98. While remaining cautiously optimistic, initial data indicates the contractor is maintaining and in some areas gaining schedule on

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7. (U) Executive Summary (Cont'd):

aircraft currently in production.

Development of TADIL-J Upgrade (TJU) software completed as scheduled on 30 Dec 98. TJU, merged with the first Annual Release (AR1) software upgrade, resolves a minimum of 67 high-priority system deficiencies and includes changes to bring the E-8C into Year 2000 (Y2K) compliance. Air Combat Command recommended the TJU/AR1 software program for AF Link 16 certification. The program will proceed to Joint Interoperability testing with the Army in Mar 99.

The Air Force Communications Agency certified Joint STARS Y2K compliant on 23 Nov 98 following review and approval of the JPO plan by the AF Program Executive Officer for Command and Control. All operational Joint STARS aircraft will receive Y2K changes with insertion of TJU and AR1 currently scheduled for completion no later than Jun 99.

The JPO is soliciting industry participation in exploring creative affordable ways to re-engine Joint STARS aircraft. These include options for leasing new and for re-use of existing AF engines. Partnering relationships between the government depot and engine manufacturer are being pursued.

The final Prime Mission Equipment Maintenance Training System was delivered to the 93d Air Control Wing on 18 Jun 98. This trainer provides operator workstations, computer and data racks and lower lobe equipment thus relieving operational aircraft from being used for prime mission equipment maintenance training.

In a related effort, the Air Force presented a NATO Alliance Ground Surveillance "fresh concept" option to the Apr 98 NATO Conference of National Armament Directors (CNAD). The Joint STARS JPO conducted the air segment portion of a CNAD approved twelve month Concept Definition Study with a focus on a system centered around a Radar Technology Insertion Program (RTIP) based sensor on either a business or mid-sized jet aircraft. The May 99 CNAD is expected to make final decision on the Alliance Ground Surveillance System NATO will pursue in the future.

While the RTIP is included in the Joint STARS Program Element and Research, Development, Test and Evaluation Descriptive Summary, funding for the effort is not included in this SAR. DoD designated the RTIP program an Acquisition Category 1D program on 7 Aug 98, with separate reporting requirements.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone IIA	SEP 85	SEP 85	SEP 85
FSD Contract Award	SEP 85	SEP 85	SEP 85
First Test Flight	APR 88	APR 88	APR 88
Milestone IIB	APR 88	APR 88	APR 88
System CDR	NOV 88	NOV 88	NOV 88
Contractor Flight Test Start	APR 89	APR 89	APR 89
Operational Field Demo I	JUL 90	JUL 90	SEP 90
System-level Perf. Verf.-start	SEP 91	SEP 91	OCT 91
DT&E Start	JUN 91	JUN 91	OCT 91
DAB Program Review, LRIP	MAR 93	MAR 93	MAY 93
Software Support Facility Delivery (MSSF Phase I)	MAY 96	MAY 96	AUG 96
DT&E Complete (FOFSD)	JUN 95	JUN 95	SEP 95
MOT&E			
Start	JUN 95	JUN 95	NOV 95
Complete	FEB 96	FEB 96	JUL 96
Milestone III	JUN 96	JUN 96	SEP 96
Full Rate Production Contract Award	JUN 97	JUN 97	JUN 97
First Aircraft Delivery to ACC	FEB 96	FEB 96	JUN 96
First Training Squad Ready for Trng	SEP 96	SEP 96	SEP 96
Depot Support Date	JAN 96	JAN 96	MAY 96
First SDS Installation (Group A)	FEB 96	FEB 96	FEB 96
Required Assets Availability (RAA)	SEP 96	SEP 96	FEB 97
Organic Support Capability	SEP 97	SEP 97	NOV 97
IOC	SEP 97	SEP 97	DEC 97

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<u>Production</u>	<u>Approved</u>	<u>Current</u>
<u>Estimate (SAR)</u>	<u>Program (APB)</u>	<u>Estimate</u>
SEP 98	MAR 02	MAR 02
FEB 98	FEB 98	AUG 97

10. (U) Performance Characteristics:

Production Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
------------------------------	--	---------------------------	---------------------

(b)(1)

Probability of
Detection (%)
(Clear)

Probability of
Detection (%)
(weather)

(c) MTI Position Accuracy,
CEP (m) @ Range (km)

(C) Radar Range from platform (km)
(D) SAR Resolution (m)

(SAR CEP (m))

Fix rate

Air (%) (min)

in 20

in 30

in 45

Ground (8) (hrs)

in 4

in 8

in 12

Ch-1)
Ch-1)
Ch-1)

(Ch-2)

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10a. (U) Performance Characteristics (Cont'd):

	Production <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>	
Mission Reliability Rate	.88	.88 / .78	72	78	(Ch-3)
(S) Sortie Wartime Generation Rate (D-1 to D+30)	(b)(1)				(Ch-4)
Effective time on station (ETOS%)					(Ch-5)

(b)(1)

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10a. ~~(a)~~ Performance Characteristics (Cont'd):

(b)(1)



b. Current Change Explanations --

(U) The Current Estimates for Air Fix Rate, 12-Hour Ground Fix Rate, Mission Reliability Rate, Sortie Generation Rate and Effective Time on Station have all been updated to reflect the latest demonstrated performance in the Air Force Operational Test and Evaluation Center (AFOTEC) Regression Test which took place from Apr 97-Apr 98.

Ch-1

The Demonstrated Performance and Current Estimate for Air Fix rates have changed to reflect the latest demonstrated performance in the Air Force Operational Test and Evaluation Center (AFOTEC) Regression Test (Apr 97-Apr 98). The Demonstrated Performance for Air Fix Rate changed from 96 to 94 in 20 minutes, from 98 to 96 in 30 minutes, and from 99 to 98 in 45 minutes. The Current Estimates for Air Fix Rate have improved from 60 to 94 in 20 minutes, from 73 to 96 in 30 minutes and from 76 to 98 in 45 minutes.

Ch-2

The Demonstrated Performance for 12-Hour Ground Fix Rate has changed from 76% in the last SAR to 36% reflecting the results of the AFOTEC regression test (Apr 97-Apr 98). The decrease is due to a reduction of contractor support and delays due to training and maintenance. The Current Estimate for 12-Hour Ground Fix Rate has been revised as well, changing from 100% to 65%. The Joint Reliability and Maintainability Evaluation Team (JRMET) is evaluating the regression test data and developing improvements and a roadmap toward reaching the objective, and are confident that the revised Current Estimate of 65% will be achieved.

Ch-3

The Demonstrated Performance for Mission Reliability Rate (MRR) increased from 65% to 72% to reflect the latest result from the AFOTEC Regression Testing (Apr 97-Apr 98). The Current Estimate for MRR changed from 81% to 78%, the threshold that must be achieved by the objective date of Mar 02. MRR is on track to meet the objective date.

Ch-4

The change in Demonstrated Performance (from 1.0 to .46) for Sortie Generation Rate (SGR) is based on models run by AFOTEC as part of the Regression Testing. The Current Estimate (change from 1.0 to .58) reflects the latest Program Manager's Estimate for this performance characteristic. Upon AFOTEC recommendation, the SGR requirement is being re-evaluated by Air Combat Command as it is not representative of the Joint STARS mission. The Director of Test and Evaluation supported this approach.

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10b. (U) Performance Characteristics (Cont'd):

Ch-5

The change in Demonstrated Performance for Effective Time on Station has increased from 78 in the last SAR to 83 to reflect the latest performance demonstrated in the AFOTEC Regrassion Testing (Apr 97 to Apr 98).

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	3820.4	4158.8	4005.2
Procurement	5982.4	4478.3	4636.8
Recurring	(4570.5)		(3286.4)
Non-Recurring	(196.5)		(119.5)
Total Flyaway	(4767.0)		(3405.9)
Other Wpn Sys	(585.6)		(726.4)
Peculiar Support	(58.8)		(54.0)
Initial Spares	(571.0)		(450.5)
Construction (MILCON)	129.5	125.8	117.8
Acquisition O&M	0.0	0.0	0.0
Total FY 98 Base-Year \$	9932.3	8762.9	8759.8
Escalation	-170.2	-425.9	-408.6
Development (RDT&E)	(-465.8)	(-454.0)	(-433.1)
Procurement	(296.5)	(30.6)	(27.1)
Construction (MILCON)	(-0.9)	(-2.5)	(-2.6)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	9762.1	8337.0	8351.2

(U) Total Program Cost and Quantity reflects the approved FY00 President's Budget.

While the Radar Technology Insertion Program is included in the Joint STARS Program Element and Research, Development, Test and Evaluation Descriptive Summary, funding for the effort is not included in this SAR. DoD designated the RTIP program an Acquisition Category 1D program on 7 Aug 98, with separate reporting requirements.

b. (U) Quantity --

Development (RDT&E)	1	1	1
Procurement	19	13	14
Total	20	14	15

(U) The Low Rate Initial Production (LRIP) quantity approved at the Joint STARS' Milestone III Decision was 19 aircraft. The Quadrennial Defense Review (QDR) recommendation to reduce the Joint STARS fleet from 19 to 13 took effect with the FY 99 President's Budget (PB) in Jan 98. Since then, funding for an additional aircraft was recieved with the FY00 PB, increasing the fleet size to 14 aircraft. A revised APB including the additional aircraft is in

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11b. (U) Total Program Cost and Quantity (Cont'd):

coordination within the Joint Program Office at this time.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (FEB 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 98 BY\$)	8762.9	8759.8	
(2) Quantity	14	15	
(3) Unit Cost	625.921	583.987	-6.70
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 98 BY\$)	4478.3	4636.8	
(2) Quantity	13	14	
(3) Unit Cost	344.485	331.200	-3.86

(U) The latest approved Acquisition Program Baseline (APB) (13 Feb 98) reflects 13 procurement aircraft. Funding for production aircraft P-14 was added to the Joint STARS program with the FY00 President's Budget. A revised APB including the additional aircraft is in coordination within the Joint Program Office at this time.

While the Radar Technology Insertion Program is included in the Joint STARS Program Element and Research, Development, Test and Evaluation Descriptive Summary, funding for the effort is not included in this SAR. DoD designated the RTIP program an Acquisition Category 1D program on 7 Aug 98, with separate reporting requirements.

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13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	3354.6	6278.9	128.6	9762.1
Previous Changes:				
Economic	-9.7	-6.4	-1.1	-17.2
Quantity	-	-1609.4	-	-1609.4
Schedule	-	-	-	-
Engineering	+295.8	+14.0	-	+309.8
Estimating	+214.0	-326.9	-4.2	-117.1
Other	-	-	-	-
Support	-	+9.0	-	+9.0
Subtotal	+500.1	-1919.7	-5.3	-1424.9
Current Changes:				
Economic	+8.2	-14.0	+0.4	-5.4
Quantity	-	+247.2	-	+247.2
Schedule	-	-	-	-
Engineering	+52.8	+91.8	-8.2	+136.4
Estimating	-343.1	+39.7	-0.3	-303.7
Other	-	-	-	-
Support	-0.5	-60.0	-	-60.5
Subtotal	-282.6	+304.7	-8.1	+14.0
Total Changes	+217.5	-1615.0	-13.4	-1410.9
Current Estimate	3572.1	4663.9	115.2	8351.2

(U) Summary (FY 1998 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	3820.4	5982.4	129.5	9932.3
Previous Changes:				
Quantity	-	-1399.6	-	-1399.6
Schedule	-	-	-	-
Engineering	+263.8	+12.3	-	+276.1
Estimating	+201.0	-281.0	-3.7	-83.7
Other	-	-	-	-
Support	-	+25.4	-	+25.4
Subtotal	+464.8	-1642.9	-3.7	-1181.8
Current Changes:				
Quantity	-	+235.2	-	+235.2
Schedule	-	-	-	-
Engineering	+45.2	+79.5	-7.7	+117.0
Estimating	-324.7	+48.9	-0.3	-276.1
Other	-	-	-	-
Support	-0.5	-66.3	-	-66.8
Subtotal	-280.0	+297.3	-8.0	+9.3
Total Changes	+184.8	-1345.6	-11.7	-1172.5
Current Estimate	4005.2	4636.8	117.8	8759.8

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	+8.3
Economic adjustment for negative program change. (Economic)	N/A	-0.1
Additional Requirement for Link 16 partially offset by requirement reductions in TADIL-J Upgrade (Engineering)	+20.5	+21.2
Additional Requirement for Global Air Traffic Management Effort (\$62.5M) offset by a reduction in Radar Technology Insertion Program (\$93.9M) as well as the addition of \$4.9M for advance studies (Engineering)	+24.7	+31.6
Adjustment for Current and Prior Inflation. (Estimating)	-20.7	-17.4
Refinement of Estimate for Computer Replacement Program (CRP) and Satellite Communications (Estimating)	-7.7	-7.7
Refinement of Estimate for Government Test-Addition of FY04 and FY05 (Estimating)	+56.5	+63.3
Refinement of Estimate-Radar Technology Insertion Program no longer reported. (Estimating)	-176.3	-196.5
Refinement of Estimate- Computer Replacement Program (\$85.7M), Last Lot Costs (\$80.0M) and Mature Reliability (\$9.0M) with the balance attributable to small miscellaneous support efforts. (Estimating)	-176.5	-184.8
Refinement of Estimate in Support Systems (Equipment) (Support)	-0.5	-0.5
RDT&E Subtotal	-280.0	-282.6
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-14.0
Total Quantity Variance associated with increase of 1 units.	+201.3	+211.6
Quantity increase of 1 units from 13 to 14 aircraft. (Quantity)	+235.2	+247.2
Allocation to Engineering variance resulting from Quantity Change. (Engineering)	+1.6	+1.6
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	-35.5	-37.2
Change in Modification Requirement (Engineering)	+77.9	+90.2
Adjustment for Current and Prior Inflation. (Estimating)	+2.9	+3.4

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Refinement of Estimate for Advanced Buy (Estimating)	-6.4	-6.9
Refinement of Estimate Other Costs (Estimating)	-39.1	-39.9
Refinement of Estimate in Fly Away Cost (Estimating)	+55.4	+55.0
Refinement of Estimate in Other Miscellaneous Categories (Estimating)	+71.6	+65.3
Refinement of Initial Spares Estimate (Support)	-56.4	-59.0
Adjustment for Current and Prior Inflation. (Support)	+2.8	+2.9
Change in Initial Spares. Reduction in budget associated with prior quantity decrease from 19 to 13 aircraft as reported in Dec 97 SAR. (Support)	-56.0	-59.1
Change in Peculiar Support. Mainly due to Test Program Sets, Automated Test Equipment and D Level Peculiar Support Equipment. (Support)	-6.5	-6.5
Change in Other Weapon Systems due in large part to the inclusion of the Global Air Traffic Management (GATM) modification estimate not previously reported. (Support)	+49.8	+61.7
Procurement Subtotal	+297.3	+304.7

(3) MILCON

Revised escalation indices. (Economic)	N/A	+0.3
Economic adjustment for negative program change. (Economic)	N/A	+0.1
Change in Facilities Requirements (Engineering)	-7.7	-8.2
Adjustment for Current and Prior Inflation. (Estimating)	-0.3	-0.3
MILCON Subtotal	-8.0	-8.1

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
488.11	-1.51	+71.88	--	+29.75	-28.05	--	-3.43	+68.64	556.75

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
330.47	-1.46	+20.72	--	+7.56	-20.51	--	-3.64	+2.67	333.14

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	APR 85	SEP 85	SEP 85	SEP 85
Milestone III	N/A	SEP 96	SEP 96	SEP 96
FUE/IOC	TBD	SEP 97	DEC 97	DEC 97
Total Cost	1388.2	6741.9	9762.1	8351.2
Total Quantity	0	21	20	15
Prog Acq Unit Cost	0	321.04	488.11	556.75

(U) NOTE: The SAR Planning Estimate (PE) Total Cost of 1388.2 was based on the RDT&E program only.

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

(U) Ground Support Systems, RDT&E contract F19628-93-C-0067 is over 90 percent complete, and is no longer being reported.

Low Rate Initial Production Lots I and II, Procurement contract F19628-92-C-0035 are over 90 percent complete, and are no longer being reported.

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

a. RDT&E --	Initial Contract Price			
(U) CRP:	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
Northrop Grumman Corp, Melbourne FL				
F19628-90-C-0197, CPFF	\$132.1	N/A	1	
Award: May 9, 1997				
Definitized: November 26, 1997				
Current Contract Price	Estimated Price At Completion			
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$136.1	N/A	1	\$136.1	\$136.1
	<u>Cost Variance</u>		<u>Schedule Variance</u>	
Previous Cumulative Variances	\$-0.2		\$-0.9	
Cumulative Variances To Date (12/25/98)	<u>\$7.2</u>		<u>\$-0.6</u>	
Net Change	\$7.4		\$0.3	

Explanation of Change:

(U) This reflects the Computer Replacement EMD Program (CRP) for the Joint STARS F19628-90-C-0197 contract. This effort is incorporated into the contract on two CLINs: CLIN 40 Central Computers (General Purpose Computer (GPC) and System Monitoring and Control Computers (SM&C)) and Operator Work Station Advanced Digital Display Processor (OWS ADDP) replacement effort; and CLIN 41 Programmable Signal Processor (PSP), Operator Work Station Local Area Network (OWS/LAN), and Signal Pre-Processor/Pulse Compression Unit (SPP/PCU) replacement effort.

CLIN 40 was awarded 9 May 97, with an effective date of 31 March 97. CLIN 41 was awarded as a UCA on 21 May 97, negotiations were completed 15 Oct 97 and definitization on 26 Nov 97. CLINs 40 and 41 were modified on 31 July 98 to accomplish Single Software Baseline effort.

The Initial Contract Price on CLIN 40 contract target price of \$74.0M and CLIN 41 NTE of \$58.1M (total \$132.1M). CLIN 41 was definitized 26 November 1997 and changed from \$58.1M to \$53.4M (total \$127.5M). The Contract Change Proposal (CCP) for Single Software Baseline effort adjusted CLINs 40 and 41 contract prices by \$7.9M and \$0.7M respectively (total contract adjustment \$8.6M). The Contractor's and Program Manager's Current Estimated Cost of Completion is the Current Contract Price of \$136.1M.

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

b. Procurement --
(U) LRIP Lot III:
Northrop Grumman Corp, Melbourne FL
F19628-92-C-0035, FFP OPTION
Award: May 10, 1994
Definitized: August 2, 1995

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$123.2	N/A	2

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$722.0	N/A	2	\$722.0	\$722.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-26.7	\$-19.6
Cumulative Variances To Date (11/20/98)	<u>\$4.5</u>	<u>\$6.6</u>
Net Change	\$31.2	\$26.2

Explanation of Change:

(U) The decrease in Current Contract Target Price and Estimated Price At Completion from \$751.8M to \$722.0M is due to a decrease in spares ordered.

The changes in cost and schedule variances are due to production program restructure. A revised aircraft delivery schedule was established and put on contract on 11 Aug 98.

(U) LRIP Lot IV:
Northrop Grumman Corp, Melbourne FL
F19628-95-C-0169, FFP
Award: July 21, 1995
Definitized: December 20, 1996

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$168.6	N/A	2

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$492.4	N/A	2	\$492.4	\$492.4

Explanation of Change:

(U) The increase in Current Contract Target Price and Estimated Price at Completion from \$489.4M to \$ 492.0M is due to additional Over and Aboves.

Cost and Schedule variance reporting is not required on this FFP contract.

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

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>LOT V:</u>					
Northrop Grumman Corp, Melbourne FL					
F19628-96-C-0021, FFP					
Award: June 19, 1996					
Definitized: June 30, 1997					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$409.0	N/A	2	\$409.0	\$409.0	

Explanation of Change:

(U) The decrease in Current Contract Target Price and Estimated Price At Completion from \$415.0M to \$409.0 is due to descoped statement of work transforming Over and Above work from remanufacture to refurbishment.

Cost and Schedule variance reporting is not required on this FFP contract.

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>Lot VI:</u>					
Northrop Grumman Corp, Melbourne FL					
F19628-97-C-0001, FPI					
Award: December 31, 1996					
Definitized: May 5, 1998					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$226.5	\$234.0	1	\$226.5	\$226.5	

Explanation of Change:

(U) Contract Type includes Fixed Price Incentive, Cost Plus Fixed Fee and Firm Fixed Price.

The increase in Current Contract Target Price and Estimated Price at Completion from \$211.0 to \$226.5M reflects definitization of this Firm Fixed Price Incentive (FPI) production contract.

Cost and Schedule variance reporting is not required on this FPI contract.

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

(U) <u>Lot VII:</u>	Initial Contract Price		
Northrop Grumman Corp, Melbourne FL	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F19628-98-C-0003, FPI	\$72.1	N/A	0
Award: October 31, 1997			
Definitized: N/A			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$81.5	N/A	0	N/A	N/A

Explanation of Change:

(U) Funding on this contract is long lead only.

Cost and Schedule variance reporting is not required on this FPI contract.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY82-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-05)	<u>Total</u>
RDT&E	3138.1	93.3	52.1	288.6	3572.1
Procurement	3963.6	382.5	145.0	172.8	4663.9
MILCON	115.2	-	-	-	115.2
O&M	-	-	-	-	-
Total	7216.9	475.8	197.1	461.4	8351.2

b. Annual Summary -- JSTARS

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY98 Dollars Nonrec</u>	<u>Flyaway FY98 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1982				50.6	32.5
1983				46.6	31.3
1984				58.7	41.0
1985				67.4	48.6
1986				211.2	156.1
1987				388.9	300.2
1988				417.0	330.7
1989				276.3	229.6

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Joint STARS, December 31, 1998

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY98 Dollars Nonrec	Flyaway FY98 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990				115.6	99.1
1991				261.6	232.6
1992				368.5	337.2
1993				335.5	313.4
1994				292.9	278.3
1995				161.7	156.5
1996				156.6	154.3
1997				205.8	205.6
1998				107.0	107.5
1999				82.3	83.6
2000				90.4	93.3
2001				49.7	52.1
2002				49.0	52.2
2003				32.4	35.2
2004				78.7	87.2
2005				100.8	114.0
Subtotal	1			4005.2	3572.1

(U) While the Radar Technology Insertion Program is included in the Joint STARS Program Element and Research, Development, Test and Evaluation Descriptive Summary, funding for the effort is not included in this SAR. DoD designated the RTIP program an Acquisition Category 1D program on 7 Aug 98, with separate reporting requirements.

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY98 Dollars Nonrec	Flyaway FY98 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992			77.2	145.1	137.3
1993	2	14.5	467.5	664.1	636.9
1994	2	6.0	584.5	551.5	537.7
1995	2	32.2	624.1	668.4	661.0
1996	2	15.2	342.9	494.2	495.2
1997	2	17.3	477.5	525.2	532.0
1998	1	15.7	183.6	348.9	355.9
1999	2	18.6	307.2	587.1	607.6
2000	1		221.7	363.9	382.5
2001				135.6	145.0
2002				31.3	34.1
2003				22.1	24.6

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Joint STARS, December 31, 1998

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

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY98 Dollars Nonrec	Flyaway FY98 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2004			0.1	42.9	48.7
2005			0.1	56.5	65.4
2006					
Subtotal	14	119.5	3286.4	4636.8	4663.9

(U) The latest approved Acquisition Program Baseline (APB) (13 Feb 98) reflects 13 procurement aircraft. Funding for production aircraft P-14 was added to the Joint STARS program with the FY00 President's Budget. A revised APB including the additional aircraft is in coordination within the Joint Program Office at this time.

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY98 Dollars Nonrec	Flyaway FY98 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				0.6	0.5
1990				0.4	0.4
1991				2.0	1.8
1992				20.1	18.8
1993				11.3	10.8
1994				25.1	24.4
1995				14.5	14.3
1996				6.9	6.9
1997				18.5	18.6
1998				18.4	18.7
1999					
2000					
2001					
Subtotal				117.8	115.2

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	15	119.5	3286.4	8759.8	8351.2

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Joint STARS, December 31, 1998

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	1	1
Procurement	4	4

(U) Percent Total Program Quantities Delivered: 33.3%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 5185.9

(U) Percent Total Program Expended: 62.1%

(U) Aircraft P1 was delivered on 4 Mar 96. P2 was delivered on 12 Dec 96. P3 was delivered on 25 Nov 97. P-4 was delivered on 18 Aug 98.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
O&S Costs were based on refurbished Boeing 707 aircraft operating hours at 63 hours per aircraft per month powered by the TF-33B engine. The support concept priced assumes two-level (organizational/depot) support of the Prime Mission Equipment (PME). The airframe support will be Government organizational level support, a mixture of Government and contractor support for organizational (off-equipment) maintenance, and contractor support for depot level requirements. The O&S costs of the PME and airframe were estimated individually and then added together to estimate the total system level O&S Costs. The PME costs were estimated using a Program Office developed Depot Level Repairables (DLR) cost estimating model which takes into account current Mean Time Between Failure (MTBF) projections for all components, latest acquisition price for each, and the current Repairable Support Division (RSD) surcharge expected to be levied against each depot return. The airframe costs were estimated using analogies to similar programs which use the exact same Planned Depot Maintenance (PDM) or a similar (Aircraft DLRs/Contractor Owned and Managed Base Supply) airframe. The cost data presented represents the first year of Steady State O&S costs (FY 04) which would occur in the same year that has all 11 Primary Aircraft Authorizations (PAA) available for a full year. The Operations and Support period for the current estimate has an eight year Ramp-Up (FY 96-04), eleven year Steady State (FY 04-15), and eight year Ramp-Down (FY 16-23). The Steady State costs presented below were extracted from the Service Cost Position, dated 22 Jul 96 updated for the thirteen aircraft profile, latest MSD surcharge and A/C actuals.

There is no antecedent system.

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Joint STARS, December 31, 1998

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

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element	Steady State (SS) Annual Costs - First Year SS FY04	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	53.3	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	7.6	N/A
Contractor Support	51.1	N/A
Sustaining Support	65.7	N/A
Indirect Costs	22.0	N/A
Mission Personnel	61.1	N/A
	N/A	N/A
Total	260.8	N/A

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AF-22 SFW

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: Sensor Fuzed Weapon

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Sensor Fuzed Weapon (SFW), CBU-97/B
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:
Air Armament Center (AAC)/YH COL WILLIAM M. WISE
102 W D Avenue, Suite 300 Assigned: June 28, 1996
EGLIN AFB, FL 32542-6807 DSN 872-5382; COMM (904) 882-5382
WISEW@EGLIN.AF.MIL
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0207320F Project 671016
(U) PE 0604602F (Shared) Project 643244
(U) PE 0604604F (Shared) Project 643086
(U) PE 0604607F Project 642961
PROCUREMENT:
(U) APPN 3011 ICN 273520 (Air Force)
(U) APPN 3011 ICN 353520 (Air Force)
(U) APPN 3080 ICN 813520 (Air Force)

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~~Classified by: [redacted] Security Classification Guide, 1 Jul 98
Downgrade instructions: [redacted] Agency Determination Required
Declassify on: Not Subject to Automatic Downgrade~~

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5. (U) References:

SAR Baseline (Production Estimate):

(U) OSD/CAIG Briefing, June 96. (Approved by OSD).

Approved Program:

(U) Approved Acquisition Program Baseline (APB) dated August 28, 1996.

6. (U) Mission and Description:

The objective of the Sensor Fuzed Weapon (SFW) program is to develop, produce and deploy a conventional munition capable of multiple kills per pass against operating armored vehicles and other support vehicles. The SFW system represents state-of-the-art technology that provides a multiple armored target kill capability.

Since this system is unlike "traditional" munitions, we do not have a historical data base to compare to SFW expected kill criteria. Consequently, we have relied on information provided by the Air Combat Command (ACC) Joint Studies Group and the Scientific Applications International Corporation (SAIC) model that quantifies expected mobility kills per pass. (b)(1)

(b)(1)

(b)(1) i.e., winter vs. desert environments, can affect system effectiveness. The Wind Corrected Munitions Dispenser (WCMD), a program currently in development, will provide a guidance kit for the CBU-97/B dispensers that provides inertial navigation to compensate for ballistic errors caused by wind when these munitions are released from medium to high altitudes.

The SFW does not replace any existing system but will enhance current capabilities. The requirement for SFW is the HQ ACC System Operational Requirements Document (SORD) (CAF 302-78-I/II/III-A (Revision 4), 5 Aug 96). The primary platform for SFW is the F-16. Additional platforms are compatible.

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7. (U) Executive Summary:

(U) The contractor started and completed deliveries for the entire Full Rate Production (FRP) 1 contract. Initially deliveries were slightly behind schedule due to some faulty, subcontracted machined metal clamping devices. However, the faulty parts were discovered and replaced and the contract finished deliveries without impact to the Government. The year closed with acceptance of the first deliveries of the FRP 2 contract hardware, on schedule.

The Program Office and ACC were successful in combining Lot Acceptance Testing (LAT) of production hardware with Follow-on Operational Test & Evaluation (FOT&E) requirements. The combined testing approach saved the Air Force about \$5M and 12 weapons. FOT&E was designed to verify performance of cost saving design changes. FOT&E results were outstanding. The original test plan required 16 SFWs to be dropped in four missions. Each mission employed two F-16s dropping two bombs each. The weapons achieved all test objectives and killed the planned target set in only three missions instead of the planned four. Air Force Operational Test and Evaluation Center, Air Combat Command, the Program Office and OSD agreed there was no need to conduct the last test and FOT&E was declared successful.

In March 1998, the PEO for Weapons held a meeting with the president of Textron to discuss the future of the PEP 2 program. The PEP 2 program was designed to make design changes to reduce manufacturing costs. As of March 1998, PEP 2 program overruns equaled expected cost savings. Given the difficulties faced by PEP 2, the PEO for Weapons would have terminated further PEP 2 work if the PEP 2 technology was not so important to P3I performance enhancements. The PEO directed PEP 2 be integrated into the P3I program to take advantage of synergistic effects of co-development.

In early calendar year 1998, the Air Force worked with Congress to add \$4M to the FY99 RDT&E funding line to cover an expected overrun on the P3I program. The overrun was due to technical difficulties the prime contractor was having in developing a miniature laser diode for the active sensor portion of P3I. By June 1998, the Program Office completed a cost and schedule review of P3I and identified other technical problem areas that increased the expected P3I overrun by an additional \$12M to a total of \$16M and a total schedule slip of 17 months. The Program Office found the contractor had: underestimated the original work required to fix the laser diode problem; encountered severe electronic noise problems with miniaturizing the warhead circuitry; and underestimated the software development effort. Due to the timing of the identified funding shortfall, there was no way to influence the FY99 budget. Knowing there was no additional RDT&E funds available in the FY00 budget, the Air Force supported a transfer of \$12M of procurement funds to the RDT&E funding line to cover the P3I overrun. In December 1998, the Program Office conducted an extensive P3I program review and ensured the additional resources applied to the P3I effort were sufficient to complete the restructured program. The restructured P3I program slipped the cut-in of P3I technology from the start of FY99 to the start of FY01. The Air Force plans to procure baseline SFWs at the minimum sustaining rate of 300 per year for FY99 and FY00. Prototype testing in October 1998 validated the warhead redesign and significantly reduced the risk for the remainder of the program. P3I projectile

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7. (U) Executive Summary (Cont'd):

testing and PEP 2 submunition testing, using production representative hardware began in February 1999. These upcoming tests will provide added confidence that the previous development difficulties are behind us and the programs are on track toward planned completion.

Previously, the Wind Corrected Munition Dispenser (WCMD) program conducted five Development Test and Evaluation (DT&E) bomber tests using the SFW. Two Tactical Munitions Dispensers (TMDs) dispensed prematurely, rendering the SFW submunitions ineffective. A tiger team was able to conclusively demonstrate susceptibility of the proximity sensor (FZU-39) to "false fires" in the WCMD environments. Tradeoffs of cost and reliability were presented to SAF/AQ on 15 October 1998 to fix the problem. The solution is two fold. The first part is to improve the manufacturing process for the FZU to improve false-fire resistance. This modification will be installed in new SFWs designated for WCMD, and inventory SFW/WCMD assets will be retrofitted. The second part of the fix includes using the WCMD tail kit to inhibit the FZU firing signal until the weapon is within its proper opening window. The Air Force has incorporated the first part of the fixes in the SFW production. The Air Force is seeking funds to implement the second part of the fix.

The baseline SFW weapon is exceeding user kill requirements by 70% and demonstrated reliability 12% above requirements. The weapon is operational worldwide. The difficulties with the P3I program have been corrected and testing to date shows the development effort is on track to completion and cut-in by FY01. Test data shows that P3I will increase weapon performance by 80% over what has been demonstrated to date and, due to aggressive design to cost requirements, P3I will not increase overall weapon procurement price.

This will be the final report submitted for SFW. The total estimated cost of the program is below the RDT&E and procurement dollar thresholds for a Major Defense Acquisition Program (MDAP). SFW has been redesignated an Acquisition Category (ACAT) II by the USD(A&T).

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone II (SAF/AL)	NOV 85	NOV 85	NOV 85
DT&E Start	DEC 88	DEC 88	DEC 88
Many-On-Many Test	JUL 89	JUL 89	JUL 89
Critical Design Review Complete	AUG 89	AUG 89	AUG 89
IOT&E Start	JUL 90	JUL 90	AUG 90
DAB Program Review	SEP 91	SEP 91	MAR 92
Production Contract Award	DEC 91	DEC 91	MAR 92
Complete DT&E/IOT&E	MAR 92	MAR 92	MAR 92
Lot 2 Contract Award	DEC 92	DEC 92	JAN 93
Lot 3 Contract Award	DEC 93	DEC 93	DEC 93
Milestone III	JUN 96	JUN 96	JUN 96
Lot 4 Contract Award	DEC 94	DEC 94	JAN 95
RAA	MAR 96	MAR 96	MAR 96
IOC	JAN 97	JAN 97	JAN 97
Lot 1 Initial Production First Delivery	JUN 94	JUN 94	JUN 94

(U) IOC - The SPO is responsible for making the weapon hardware, spares, training and logistics hardware, and materials available to the user. The availability of all necessary materials provided to the user is now called Required Assets Available (RAA). The user takes the RAA materials and implements them to achieve IOC.

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

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Shelf Life In Container (yr)	20	20 / 10	TBD	10
Aircraft Compatability	NATO (JAGUAR, TORNADO, ALPHA JET, HARRIER, MIRAGEV) USMC/USN	NATO / F-16, (JAGUAR/ F-15E, , / A-10, TORNADO/ B-1, , ALPHA / B-2, JET, / B-52 HARRIER/ , MIRAGE/ V) / USMC/US/ N /	F-16 A/B/C/D, F-15E, F-111 A/D/E/F/ G, F-4	1\ F-16 A/B/C/D, F-15E, A-10, USMC/USN A/C, NATO A/C B-52, B-1, B-2
Service Life Out of Container (yr)	1	1 / 1	3	1
Weight (lb Class Munition)	1000	1000 / 1000	925	1000
Delivery				2\ 200
Altitude FT AGL	200	200 / 200	228	200
Altitude FT MSL	40000	40000 / 20000	18700	20000
Attitude (degrees)	+45 to -45	+45 to / +45 to -45 / -45	+15 to -45	7\ +45 to -45 (Compat- ible w/ AC Env)
Airspeed (KCAS)	250 to 700	250 to / 250 to 700 / 650	250 to 648	200 to 650 (Up to Mach 1.4)
Acceleration (Gs)	+0.5 to +5	+0.5 to / +0.5 to +5 / +5	+5 to +4	+5 to +5
System Reliability	.89	.89 / .79	.83	.89 5\ 5\

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10a. (U) Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(1) Lethality - Kills per Pass (Counter- measured Environment)	(b)(1)			

(2) Lethality - Kills per
Pass (Uncounter-
measured Environ-
ment)

~~SECRET~~ ACRONYMS: AGL-Above Ground Level, KCAS-Knots Calibrated Air Speed, MSL-Mean Sea Level, TMD-Tactical Munitions Dispenser

1\Worldwide climatic conditions assumed for shelf and service life.
Service life is out-of-container time, including multiple aircraft flights.

2\The employment envelope has the following corners: 1) 600 Ft/250 KCAS, 2) 200 Ft/480 KCAS, 3) 200 Ft/650 KCAS, 4) 20,000 Ft/650 KCAS and 5) 20,000 Ft/250 KCAS. A-10 will drop SFW within the safe escape envelope.
Acceleration will be as imposed by aircraft/store/dispenser interface.

3\Primary: Main battle tanks, armored personnel carriers, and
armored artillery. Secondary: Trucks and other support vehicles.

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10a. ~~(S)~~ Performance Characteristics (Cont'd):

Mobility, firepower, and catastrophic (M, F, K) class kills are expected (firepower and catastrophic kills via secondary explosions). SFW will be used to impede the momentum of overwhelming enemy armored fighting vehicles blunting their attack and prevent their breakthrough of friendly forces' positions. Relevant task is to inflict mobility kills on battlefield maneuver units in order to delay the enemy's timetable for attack, thereby allowing time for friendly forces to destroy them permanently.

4\Average release of four weapons/pass versus Representative Armored Formation (RAF) target set. Includes mobility, firepower, or catastrophic kill categories. This number represents the average expected performance of all dive and level deliveries for a non-countermeasured environment. This average is based on the compilation of multiple delivery altitudes as specified in the 5 Aug 96, System Operational Requirements Document, Requirements Correlation Matrix, which recognizes inherent performance degradation at higher altitude. Multiple kills (mobility [required], firepower, or catastrophic [goal] kill) per pass against armored vehicles is the primary requirement for SFW.

5\The SFW has a 0.79 system hardware reliability (HR) requirement based on a conditional probability tree approach. HR will be defined in terms of expected number of projectiles functioning divided by the number of projectiles available to function. HR is a function of the reliability of the following systems which make up the SFW: SUU-66/B TMD, KMU-488/B, BLU-108/B submunition (10 each), and the projectile (40 each).

6\Average release of four weapons/pass versus RAF target set. Includes mobility, firepower, or catastrophic kill categories. This number represents the average expected performance of all dive and level deliveries for multiple countermeasures for a countermeasured environment as defined in the System Threat Assessment Report (STAR) dated 3 May 91.

7\Threshold release; 200 ft AGL-20,000 ft MSL; objective 40,000 ft.

(b)(1)



9\Performance characteristics are for deliveries below 3000 feet in multiple countermeasured environment ensuring multiple kills per pass per 4 SFW with baseline BLU-108.

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Sensor Fuzed Weapon, December 31, 1998

10b. ~~(S)~~ Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	158.3	158.3	165.3
Procurement	734.1	734.1	681.6
Recurring Flyaway	(694.0)		(607.7)
Nonrecurring Flyaway	(39.4)		(73.3)
Total Flyaway	(733.4)		(681.0)
Other Wpn Systems Costs	(0.7)		(0.6)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 79 Base-Year \$	892.4	892.4	846.9
Escalation	1195.5	1195.5	1074.0
Development (RDT&E)	(118.9)	(118.9)	(125.5)
Procurement	(1076.6)	(1076.6)	(948.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2087.9	2087.9	1920.9

(U) Procurement funding does not include SEEK EAGLE funding of \$10.8M.

b. (U) Quantity --

Development (RDT&E)	84	84	83
Procurement	5000	5000	4837
Total	5084	5084	4920

Note: Excludes 80 RDT&E prototypes from the SAR Baseline and 80 from the Current Estimate that are not considered fully configured.

(U) SFW was approved to enter LRIP in March 92 by the Office of the Secretary of Defense. LRIP quantities approved at Milestone II were 521 (LRIP 1 - 98 units, LRIP 2 - 23 units, LRIP 3 - 175 units, LRIP 4 - 225 units). LRIP quantities were increased during 1996 to 524 due to contract underrun (LRIP 1 - 98, LRIP 2 - 22, LRIP 3 - 131, LRIP 4 - 273). The LRIP quantity currently exceeds 10 percent of the total procurement buy primarily because of the FY94 reduction from 10,000 units to 5,000 units.

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11b. (U) Total Program Cost and Quantity (Cont'd):

Development (RDT&E) quantities for the current estimate changed from 84 to 83 to delete one unit that was erroneously counted. Procurement quantities for the current estimate changed from 5000 to 4837 due to budget realignment.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (AUG 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 79 BY\$)	892.4	846.9	
(2) Quantity	5084	4920	
(3) Unit Cost	0.176	0.172	-2.27
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 79 BY\$)	734.1	681.6	
(2) Quantity	5000	4837	
(3) Unit Cost	0.147	0.141	-4.08

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13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	277.2	1810.7	-	2087.9
Previous Changes:				
Economic	-0.6	-39.8	-	-40.4
Quantity	-	-	-	-
Schedule	-	+10.5	-	+10.5
Engineering	-	-	-	-
Estimating	-0.9	+9.5	-	+8.6
Other	-	-	-	-
Support	-	-0.2	-	-0.2
Subtotal	-1.5	-20.0	-	-21.5
Current Changes:				
Economic	-0.4	-18.0	-	-18.4
Quantity	-	-51.7	-	-51.7
Schedule	-	+15.4	-	+15.4
Engineering	-	-	-	-
Estimating	+15.5	-106.3	-	-90.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+15.1	-160.6	-	-145.5
Total Changes	+13.6	-180.6	-	-167.0
Current Estimate	290.8	1630.1	-	1920.9

(U) Summary (FY 1979 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	158.3	734.1	-	892.4
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	+4.0	-	+4.0
Engineering	-	-	-	-
Estimating	-0.1	+2.3	-	+2.2
Other	-	-	-	-
Support	-	-0.1	-	-0.1
Subtotal	-0.1	+6.2	-	+6.1
Current Changes:				
Quantity	-	-18.6	-	-18.6
Schedule	-	+0.8	-	+0.8
Engineering	-	-	-	-
Estimating	+7.1	-40.9	-	-33.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+7.1	-58.7	-	-51.6
Total Changes	+7.0	-52.5	-	-45.5
Current Estimate	165.3	681.6	-	846.9

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-0.4
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.4
Includes FY99 Congressional add (\$3.9M), FY00 Zero Based Transfer from production(\$11.8M) to complete P3I program and is offset by FY98 program reduction (\$0.6M). (Estimating)	+7.0	+15.1
RDT&E Subtotal	+7.1	+15.1
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-24.0
Economic adjustment for negative program change. (Economic)	N/A	+6.0
Quantity decrease of 163 units from 5000 to 4837. (Quantity)	-18.6	-51.7
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	+0.8	+1.7
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	+0.4	+1.5
Quantity related government furnished equipment cost decrease (Estimating)	-4.6	-12.0
Annual procurement buys adjusted due to budget changes and a two year stretch-out of the program. (Schedule)	0.0	+13.7
Adjustment for Current and Prior Inflation. (Estimating)	+2.6	+6.5
Adjustment for current and prior year actuals (Estimating)	+0.2	+0.4
Incorporate impact of production labor rate change on outyear costs (Estimating)	-18.4	-49.5
Savings due to concurrent JSOW quantities (Estimating)	-18.6	-49.0
P3I start date shift from FY99 to FY01 (Estimating)	-13.3	-33.0
Additional years support cost (Estimating)	+8.2	+23.4
Additional funds to complete PEP 2 program (Estimating)	+2.6	+5.4
Procurement Subtotal	-58.7	-160.6

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.41	-0.01	--	+0.01	--	-0.02	--	--	-0.02	0.39

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.36	-0.01	--	+0.01	--	-0.02	--	--	-0.02	0.34

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	NOV 85	NOV 85	NOV 85
Milestone III	N/A	N/A	JUN 96	JUN 96
FUE/IOC	N/A	N/A	TBD	JAN 97
Total Cost	N/A	2405.8	2087.9	1920.9
Total Quantity	N/A	14075	5084	4920
Prog Acq Unit Cost	N/A	0.17	0.41	0.39

(U) IOC - The SPO is responsible for making the weapon hardware, spares, training and logistics hardware, and materials available to the user. The availability of all necessary materials provided to the user is now called Required Assets Availability (RAA). The user takes the RAA materials and implements them to achieve IOC.

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

a. RDT&E --
(U) P31:
Textron Systems Corp., Wilmington MA
F08626-96-C-0162, CPAF
Award: April 26, 1996
Definitized: April 26, 1996

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$39.9	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$40.9	N/A		\$51.2	\$51.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-1.4	\$-1.8
Cumulative Variances To Date (08/30/98)	<u>\$0.0</u>	<u>\$0.0</u>
Net Change	\$1.4	\$1.8

Explanation of Change:

(U) The favorable change in cost and schedule variance is due to the contractor replanning the Performance Measurement Baseline which entailed setting Budgeted Cost of Work Scheduled (BCWS) and Budgeted Cost of Work Performed (BCWP) equal to Actual Cost of Work Performed (ACWP). This resulted in no cost and schedule variances. The contractor is in the process of restructuring the program.

The Estimated Price at Completion (Contractor) is based on an in-depth analysis by the contractor and increased due to the complexity of the Upper Housing and Transducer design efforts. The Estimated Price at Completion (Program Manager) is based on the cost and schedule performance indices to date.

b. Procurement --
(U) FRP 1:
Textron Systems Corp., Wilmington MA
F08626-96-C-0001, FPIF
Award: June 17, 1996
Definitized: June 17, 1996

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$157.1	\$172.5	500

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$159.7	\$175.2	521	\$154.7	\$154.7

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$1.2	\$-15.6
Cumulative Variances To Date (12/30/98)	<u>\$1.8</u>	<u>\$-0.1</u>
Net Change	\$0.6	\$15.5

Explanation of Change:

(U) This contract is 99 percent complete.

The change (increase) to current contract price is due to the addition of funds for the FZU-39 failure analysis.

The change (decrease) in estimated price at completion is due to the contract being 99 percent complete.

The favorable cost variance is due to an underrun in manufacturing management due primarily to lower labor costs.

The unfavorable cumulative schedule variance is due to the FZU-39 failure analysis task not yet completed.

(U) <u>FRP 2:</u> Textron Systems Corp., Wilmington MA F08626-97-C-0003, FPIF Award: February 18, 1997 Definitized: February 18, 1997	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$145.2	\$157.0	576

<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>
\$150.1	\$164.8	576	\$150.1	\$150.1

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.6	\$4.7
Cumulative Variances To Date (12/31/98)	<u>\$1.6</u>	<u>\$-7.6</u>
Net Change	\$1.0	\$-12.3

Explanation of Change:

(U) The increase to the current contract target price is due to the addition of funds for six JSOW BLU-108 submunitions.

The change in Estimated Price At Completion (increase) is due to addition of JSOW BLU-108 submunitions.

The favorable cost variance is due to underrunning manufacturing management due to delays in FRP1. This is considered only a temporary cost variance and will dissipate as deliveries are made.

The unfavorable schedule variance is due to a two-month delay in starting

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

FRP2 deliveries.

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

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

<u>Appropriation</u>	<u>Prior Years (FY83-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-07)</u>	<u>Total</u>
RDT&E	279.0	11.8	-	-	290.8
Procurement	919.6	61.3	101.5	547.7	1630.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1198.6	73.1	101.5	547.7	1920.9

b. Annual Summary -- SFW

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY79 Dollars Nonrec</u>	<u>Flyaway FY79 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1983				2.9	4.2
1984				11.2	16.7
1985				23.1	35.4
1986				15.6	24.6
1987				14.1	23.1
1988				17.0	28.7
1989				19.2	33.9
1990				14.9	27.1
1991				12.0	22.7
1992				5.0	9.7
1993					
1994					
1995				0.7	1.4
1996				4.5	9.5
1997				8.8	18.7
1998				7.4	15.8
1999				3.5	7.5
2000				5.4	11.8
2001					
2002					
Subtotal	83			165.3	290.8

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

Appropriation: 3011 - Procurement of Ammunition, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995	273	4.3	43.3	47.8	108.5
1996	521	4.8	65.1	69.9	160.8
1997	542	8.8	55.2	64.0	149.5
1998	550	5.9	57.0	63.0	148.6
1999	397	2.9	49.4	52.3	125.1
2000	203	2.3	22.8	25.2	61.3
2001	300	2.3	38.7	41.0	101.5
2002	300	2.3	32.4	34.7	87.5
2003	300	1.8	32.2	34.0	87.4
2004	300	1.8	31.2	33.0	86.4
2005	300	1.9	29.6	31.5	84.4
2006	300	1.9	34.1	36.0	98.3
2007	300	1.9	35.3	37.2	103.7
Subtotal	4586	42.9	526.3	569.6	1403.0

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992	98	15.6	40.8	56.6	112.9
1993	22	1.0	7.7	8.7	17.7
1994	131	13.8	32.9	46.7	96.5
Subtotal	251	30.4	81.4	112.0	227.1

(U) Procurement funding does not include SEEK EAGLE funding of \$10.8M. (\$2.0M - FY94, \$4.2M - FY95, \$4.6M - FY96)

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	4920	73.3	607.7	846.9	1920.9

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17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	83	75
Procurement	1154	1154

(U) Percent Total Program Quantities Delivered: 25.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 829.1

(U) Percent Total Program Expended: 43.2%

(U) The RDT&E quantities were adjusted to remove 80 RDT&E prototypes that were not fully configured.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The SFW is a no maintenance/wooden round weapon. As such, it will require: no scheduled maintenance; limited unscheduled repairs and stockpile sampling; no shop or operational checkout, testing or test equipment; preload checks and tasks limited to quick visual checks. Field level maintenance activities will be restricted to unscheduled, exterior, on-equipment activities - i.e., corrosion control, desiccant change in the storage container, and lug and lanyard replacement. No special training, support equipment, or personnel are required to maintain the SFW system. The SFW will be compatible with existing munitions handling/loading equipment. All support equipment needed to support the SFW is already in the inventory.

The elements that account for the Operating and Support (O&S) costs, per weapon per year, are warranty testing (\$100.36), disposal costs (\$10.17), manpower (\$6.22) and second destination transportation (\$2.29). Distributing those costs over five thousand weapons with a ten year shelf life yields a cost of approximately \$119.04 (BY79\$) per weapon per year. The latest cost estimate for the O&S costs is dated Dec 97.

b. (U) Costs -- (FY 1979 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per SFW	Avg Annual Cost Per NO ANTECEDENT
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
WARRANTY TESTING	0.1	0.0
Total	0.1	0.0

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N-9 E-2C REPRODUCTION

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

PROGRAM: E-2C AEW (HAWKEYE)

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): E-2C Hawkeye/Carrier Based Airborne Early Warning Command and Control System
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:
PEO(T) Aircraft Programs (PMA-231) Mr. Walter E. Bahr
Bldg #2272, Suite 455, NAVAIRSYSCOM Assigned: August 2, 1996
47123 Buse Road Unit IPT DSN 757-7361; COMM (301) 757-7361
Patuxent River, MD 20670-1547 BahrWE@navair.navy.mil
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0204152N Project E0463, E2321
PROCUREMENT:
(U) APPN 1506 ICN 0195 (Navy)
MILCON:
(U) PE 0204611N

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5. (U) References:

SAR Baseline (Production Estimate):

(U) The Acquisition Decision Memorandum for E-2C New Production Milestone III was approved 27 October 1994 by ASN RD&A. Approval was granted to begin E-2C Group II full rate production beginning with four aircraft in FY 95.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated April 24, 1997.

6. (U) Mission and Description:

(U) 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 and strike aircraft to the attack. Carrying a crew of five, the E-2C provides area surveillance, intercept, search and rescue, communication relay, and strike/air traffic control. Principal subsystems include APS-125/138/139/145 radar and ALR-73 Passive Detection Systems which allow the E-2C to detect emitters/targets well beyond radar range.

Plans and funding were established for the E-2C Mission Computer Upgrade (MCU) in order to: (1) take advantage of improved sensor and communication capabilities resulting from the Update Development Program (UDP II), (2) exploit emerging Commercial Off-The-Shelf Technologies (COTS), and (3) address supportability issues occurring with the current antiquated tactical computer (which predates the E-2C aircraft). The replacement computer's hardware and software will be integrated into the onboard subsystems encompassing complex sensor inputs and outputs.

7. (U) Executive Summary:

(U) Studies initiated in the late 1980's confirmed the need for an upgrade to the current E-2C computer and possible upgrade approaches. Funding was identified and a Mission Computer Upgrade (MCU) Milestone IV/II was approved by ASN(RDA) in September 1994. An Engineering and Manufacturing Development (E&MD) contract for MCU development and integration was signed with Grumman Aerospace Corporation in November 1994. Successful first flight of an MCU equipped developmental test aircraft took place January 24, 1997. Low Rate Initial Production (LRIP) approval was granted in August 1997. Final system testing and Initial Operational Capability (IOC) are planned for FY 2000.

MISSION COMPUTER UPGRADE (MCU):

As reported in the September 1998 SAR, the MCU OPEVAL completion and MS III decision were moved from November 1998 to May 2000. The contractor underestimated the complexity of integrating LINK functionality into the primary mission application software and caused this schedule change.

In response to Northrop-Grumman's request, the government authorized a revision of the MCU software schedule and a rebaseline of the related control accounts.

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E-2C AEW (HAWKEYE), December 31, 1998

7. (U) Executive Summary (Cont'd):

This rebaseline was completed November 1998 and resulted in a reduction in the schedule variance. This decrease is not attributed to any improvement in the contractor's schedule performance. However, the contractor did meet the November software release date and is on track to meet the March 1999 release as well.

E-2C PRODUCTION:

For FY99 through FY03, the Navy plans to purchase 21 E-2C airframes under a fully-funded, five year, firm-fixed-price multiyear procurement (MYP). The MYP buys out the remaining E-2C inventory requirement of 36 aircraft. In the fiscal year 1999 Defense Authorization and Appropriation Bills, Congress authorized the Secretary of the Navy to enter into a multiyear procurement contract for the E-2C aircraft. The multiyear Acquisition Strategy Report (ASR) was approved by the ASN(RDA) on 14 October 1998. The multiyear J&A was approved on 5 November 1998. PEO(T) forwarded MYP certification and notification letters to ASN(RDA) on 12 November 1998. Currently the Congressional notification and certification letters are at OSD(C) for concurrence and will be forwarded to Congress. The multiyear contract will be awarded 30 days after Congressional notification has been made.

Funding for support and production line shut down beyond 2003 was not included in the FY2000 President's budget. Though these costs are included in the E-2C APB, a decision has not been made as to what the follow-on AEW platform will be. Subsequent to the follow-on AEW platform decision, funding will or will not be required.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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9. (U) Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
IOC	APR 92	APR 92	APR 92
Milestone III	JUN 94	JUN 94	OCT 94
FRP Contract Award	JUN 94	JUN 94	DEC 94
FOC	OCT 94	OCT 94	OCT 94
FOT&E	JUN 97	JUN 97	JUN 97
Organic Support Capability Date	JUN 98	JUN 98	JUN 98
Service Depot Support Date	JUN 99	JUN 99	JUN 99
Mission Computer Upgrade (MCS)			
Milestone II	SEP 94	SEP 94	SEP 94
Navy Program Review	MAR 97	MAR 97	AUG 97
- LRIP I			
First Flight of Production Representative Aircraft	SEP 98	SEP 98	NOV 98
Initial Operational Capability (IOC)	JUN 99	JUN 99	OCT 99
Milestone III	NOV 99	NOV 99	MAY 00

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Take off weight	55000	55000 / 55000	55000	55000
Length	57'6"	57'6" / 57'6"	57'6"	57'6"
Span	80'7"	80'7" / 80'7"	80'7"	80'7"
Engine				
Number	2	2 / 2	2	2
Type	T56-A-427	T56-A- / T56-A-427	T56-A-427	T56-A-427
Crew	5	5 / 5	5	5
Speed (KIAS)				
Max Speed @13,500 ft (KIAS)	315	315 / 315	315	315
Cruise Speed @ 24,540 ft.	270	270 / 270	270	270
Time on Station @200 nm (hrs)	4.0	4.0 / 4.0	4.0	4.0
Service Ceiling (ft)	28100	28100 / 28100	28100	28100
Passive Detection System	(b)(1)			
Range (nm)				
Azimuth (deg)				
Radar Detection Range (AN/APS-145) (nm)				

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E-2C AFW (HAWKEYE), December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate	
(U) Overwater (C-141 target) (nm)	(b)(1)				
(U) Systems Accuracy (CEP to Target at 200 nm range) (nm)					
Mission Computer Upgrade (MCS)					
System Weight (lbs)	150	150 / 300	TBD	174	(Ch-1)
Load Time (sec)	45	45 / 270	TBD	243	
In-Flight Reload (sec)	20	20 / 144	TBD	20	
Operational Availability	0.97	0.97 / 0.93	TBD	.97	

b. Current Change Explanations --

(U) (Ch-1) System Weight: PM's Current Estimate has been changed from 150 pounds to 174 pounds to reflect the increase in weight of additional memory modules and 333MHz processor.

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E-2C AEW (HAWKEYE), December 31, 1998

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	205.7	379.7	331.8
Procurement	2122.7	2719.1	2515.6
Airframe & Changes	(1914.2)		(1882.0)
Nonrecurring			(28.3)
Total Flyaway	(1914.2)		(2273.1)
Other Weapons Sys Cost	(141.1)		(146.7)
Peculiar Support	(0.0)		(39.2)
Initial Spares	(67.4)		(56.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 94 Base-Year \$	2328.4	3098.8	2847.4
Escalation	859.5	488.8	282.8
Development (RDT&E)	(18.2)	(37.7)	(23.3)
Procurement	(841.3)	(451.1)	(259.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3187.9	3587.6	3130.2

(U) Dollars values (both then-year and base-year) in the SAR and APB baselines and current estimate represent the dollar values of both the E-2C aircraft and MCU end-items. These two end-items have been consolidated into the one end-item as of April 1997.

b. (U) Quantity --

Development (RDT&E)	N/A	N/A	0
Procurement	36	36	36
Total	36	36	36

(U) There are no Low Rate Initial Production (LRIP) quantities approved for the E-2C reprocurd aircraft.

c. (U) Foreign Military Sales --

Sales to date are 4 for Israel for a total of \$178.8M, 13 for Japan for a total of \$860.1M, 6 for Egypt for a total of \$734.1M, 4 for Singapore for a total of \$318.3M, and 2 for France for a total of \$529.8M. FMS sales to Taiwan total \$201.5M in support of 4 direct commercial sale (DCS) aircraft.

International Cooperative Program

	FY 92	FY 93	FY 94	Total
	(\$ millions)			
SD FYDP (Nunn)	0.225	0.350	0.800	1.375
PE 0603790D				

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11c. (U) Total Program Cost and Quantity (Cont'd):

EGYPT	2.880	2.880	0.000	5.760
Total	3.105	3.230	0.800	7.135

d. (U) Nuclear Costs --
None.

12. (U) Unit Cost Summary:

	UCR Baseline (APR 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 94 BY\$)	3098.8	2847.4	
(2) Quantity	36	36	
(3) Unit Cost	86.078	79.094	-8.11
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 94 BY\$)	2719.1	2515.6	
(2) Quantity	36	36	
(3) Unit Cost	75.531	69.878	-7.48

(U) The reduction in PAUC and APUC unit costs are primarily due to the following:
 (1) Savings associated with restructuring the APN-1 budget for multiyear procurement;
 (2) The removal of \$164.9M in shut-down cost and production support FY 2004 and 2005;
 (3) A reduction of \$66.9M in the Radar Modernization Program (RMP);
 (4) Significant changes in the escalation indices for RDT&E and Procurement.

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E-2C AEW (HAWKEYE), December 31, 1998

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	223.9	2964.0	-	3187.9
Previous Changes:				
Economic	-11.9	-213.6	-	-225.5
Quantity	-	-	-	-
Schedule	-	+19.3	-	+19.3
Engineering	+178.4	+110.4	-	+288.8
Estimating	+21.8	-36.9	-	-15.1
Other	-	-	-	-
Support	-1.0	+95.4	-	+94.4
Subtotal	+187.3	-25.4	-	+161.9
Current Changes:				
Economic	-1.2	-23.1	-	-24.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+18.8	-	+18.8
Estimating	-54.9	-80.8	-	-135.7
Other	-	-	-	-
Support	-	-78.4	-	-78.4
Subtotal	-56.1	-163.5	-	-219.6
Total Changes	+131.2	-188.9	-	-57.7
Current Estimate	355.1	2775.1	-	3130.2

(U) Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	205.7	2422.0	-	2627.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	+25.2	-	+25.2
Engineering	+154.7	+94.2	-	+248.9
Estimating	+18.9	-23.4	-	-4.5
Other	-	-	-	-
Support	-	+89.8	-	+89.8
Subtotal	+173.6	+185.8	-	+359.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+17.0	-	+17.0
Estimating	-47.5	-53.4	-	-100.9
Other	-	-	-	-
Support	-	-55.8	-	-55.8
Subtotal	-47.5	-92.2	-	-139.7
Total Changes	+126.1	+93.6	-	+219.7
Current Estimate	331.8	2515.6	-	2847.4

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E-2C AEW (HAWKEYE), December 31, 1998

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-3.9
Economic adjustment for negative program change. (Economic)	N/A	+2.7
Adjustment for Current and Prior Inflation. (Estimating)	+1.8	+2.0
Radar Modernization Program (RMP)	-56.7	-66.9
Restructuring. Reductions serve to streamline the RMP and deliver the minimum amount of data needed to validate the effectiveness of new antenna improvements (Estimating)		
Small Business Innovative Research (SBIR) and Minor Business Adjustments. (Estimating)	-2.4	-2.7
Below Threshold Reprpgramming (BTR) Updates as of June 1998. Transfers -\$2.2M to the SH-60 program for ALFS Radar development. Gains +\$0.5M from F-18 program. (Estimating)	-1.5	-1.7
OSD Program Budget Decisions (PBD) Adjustments. Includes several small adjustments for rate changes and balancing measures. (Estimating)	-0.1	0.0
N88 Programming. Adds funds for fiscal years 2004-2005 for ongoing development of future Airborne Early Warning (AEW) technology. (Estimating)	+11.9	+14.9
BTR 97-70 and ONR N0001498OB009-042 decreased funding within multiple projects and reprogrammed it to E2175 (Tactical Electronic Warfare). (Estimating)	-0.5	-0.5
RDT&E Subtotal	<u>-47.5</u>	<u>-56.1</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-47.1
Economic adjustment for negative program change. (Economic)	N/A	+24.0
New Propeller (NP2000). Reprogrammed from APN-5 into APN-1 per NAVAIR Comptroller. (Engineering)	+17.0	+18.8
Adjustment for Current and Prior Inflation. (Estimating)	+14.8	+19.2
Removal of Shut-down Costs. Costs are pending programming by N88. Requirement remains within the APB until a final decision on a follow-on AEW platform is made. (Estimating)	-81.8	-118.7

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E-2C AEW (HAWKEYE), December 31, 1998

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Advance Procurement Control Changes. Total represents the changes necessary to meet advance procurement budget controls established during periodic budget reviews. (Estimating)	-1.2	-1.8
Multiyear Shield. OSD added funds to offset inflation adjustments for the E-2C APN-1 account. This change was made with the intent of protecting the multiyear procurement. (Estimating)	+14.8	+20.5
Adjustment for Current and Prior Inflation. (Support)	+1.7	+2.0
Change in Initial Spares (Support)	-1.3	-2.1
Change in Peculiar Support (Support)	-10.0	-14.0
Change in Other Weapons Sys Cost. Reduction includes \$62.9M in support costs. Requirement remains within the APB until a final decision on a follow-on AEW platform is made. (Support)	-46.2	-64.3
Procurement Subtotal	-92.2	-163.5

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
88.55	-6.94	+0.01	+0.54	+8.54	-4.19	--	+0.44	-1.60	86.95

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
82.33	-6.57	--	+0.54	+3.59	-3.27	--	+0.47	-5.24	77.09

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E-2C AEW (HAWKEYE), December 31, 1998

14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History				
Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	SEP 94	SEP 94
Milestone III	N/A	N/A	NOV 99	MAY 00
FUE/IOC	N/A	N/A	JUN 99	OCT 99
Total Cost	0	N/A	3187.9	3130.2
Total Quantity	0	0	36	36
Prog Acq Unit Cost	0	N/A	88.55	86.95

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

a. RDT&E --		Initial Contract Price		
(U) <u>Mission Computer Upgrade:</u>		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Northrop-Grumman Corp, Bethpage NY				
N00019-93-C-0205, CPIAF		\$155.2	N/A	0
Award: November 30, 1994				
Definitized: November 30, 1994				
		Estimated Price At Completion		
Current Contract Price		<u>Contractor</u>	<u>Program Manager</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
\$155.2	N/A	0	\$140.0	\$140.0
		Cost Variance Schedule Variance		
Previous Cumulative Variances		\$-2.9	\$-5.3	
Cumulative Variances To Date (12/31/98)		\$-2.8	\$-0.7	
Net Change		\$0.1	\$4.6	

Explanation of Change:

(U) In response to the schedule change, the contractor requested and the Program Office authorized a revision to the software schedule and a rebaseline of software schedule and software-associated control accounts. The new earned value management baseline incorporates the new schedule, more accurately measures performance, and provides for improved management control. The cumulative Schedule Performance Index (SPI) for the MCU changed from 0.95 in October to 0.99 in November. This decrease in schedule variance was not attributed to any improvement in the contractor's schedule performance, but was a direct result of the contractor's rebaselining of the software schedule. The contractor met the first software release date of November and is on track to meet the next release date in March 1999.

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F-2C AEW (HAWKEYE), December 31, 1998

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

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>FY 98 Production A/C:</u>					
Northrop-Grumman Corp, Bethpage NY					
N00019-96-C-0195, FFP			\$186.6	N/A	3
Award: December 15, 1996					
Definitized: October 31, 1997					

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$186.6	N/A	3	\$186.6	\$186.6

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

The FY98 Congressional plus-up aircraft is not included on this contract. Contract award for the original three FY98 aircraft was in Dec 1996 and negotiated in conjunction with the FY97 aircraft buy as a second lot. Aircraft prices were finalized in August 1997 with funds obligated in October 1997. The plus-up aircraft funds were received in December 1997, which was too late to take advantage of a quantity buy of four aircraft. The plus-up aircraft was included on the FY98 for FY99 AAC contract as a not-to-exceed effort.

b. Procurement --

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>FY 95 Production A/C:</u>					
Northrop-Grumman Corp, Bethpage NY					
N00019-94-C-0020, FFP			\$231.2	N/A	4
Award: December 16, 1994					
Definitized: April 25, 1996					

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$230.3	N/A	4	\$230.3	\$230.3

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

This is the final reporting period for the FY95 Production Contract.

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E-2C AEW (HAWKEYE), December 31, 1998

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

Contract is more than 90% complete.

			Initial Contract Price	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
(U) <u>FY 96 Production A/C:</u>				
Northrop-Grumman Corp, Bethpage NY				
N00019-94-C-0020, FFP	\$168.5	N/A	3	
Award: December 16, 1994				
Definitized: April 25, 1996				

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$168.5	N/A	3	\$168.5	\$168.5

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

			Initial Contract Price	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
(U) <u>FY 97 Production A/C:</u>				
Northrop-Grumman Corp, Bethpage NY				
N00019-96-C-0049, FFP	\$241.5	N/A	4	
Award: April 4, 1996				
Definitized: August 6, 1997				

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$241.5	N/A	4	\$241.5	\$241.5

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

			Initial Contract Price	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
(U) <u>FY98 PLUS/FY99 Prod. A/C:</u>				
Northrop-Grumman Corp, Bethpage NY				
N00019-97-C-0147, AAC	\$	N/A		
Award: May 11, 1998				
Definitized: N/A				

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>

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F-2C AEW (HAWKEYE), December 31, 1998

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

\$ N/A \$ \$

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this AAC contract.

(U) Contract Comments:

Contract to be converted to a multiyear AAC contract for fiscal years 1999-2003 thirty days after Congressional notification.

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

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

<u>Appropriation</u>	<u>Prior Years (FY94-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	291.7	16.1	12.9	34.4	355.1
Procurement	1568.3	395.5	320.9	490.4	2775.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1860.0	411.6	333.8	524.8	3130.2

b. Annual Summary -- E-2C Aircraft

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY94 Dollars Nonrec</u>	<u>Flyaway FY94 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994				17.8	18.0
1995				48.1	49.7
1996				56.8	59.6
1997				56.0	59.5
1998				54.4	58.3
1999				43.0	46.6
2000				14.6	16.1
2001				11.5	12.9
2002				11.8	13.4
2003				5.9	6.8
2004				5.9	7.0
2005				6.0	7.2
Subtotal				331.8	355.1

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E-2C AEW (HAWKEYE), December 31, 1998

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994				36.6	37.8
1995	4		251.2	276.3	289.6
1996	3		180.0	199.1	211.6
1997	4	1.4	259.6	277.4	297.4
1998	4	11.0	261.3	293.0	317.6
1999	3	8.5	184.9	376.7	414.3
2000	3	6.2	196.7	353.9	395.5
2001	5	1.2	302.6	282.5	320.9
2002	5		304.3	232.2	268.6
2003	5		304.2	187.9	221.8
2004					
2005					
2006					
Subtotal	36	28.3	2244.8	2515.6	2775.1

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	36	28.3	2244.8	2847.4	3130.2

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	36	6

(U) Percent Total Program Quantities Delivered: 16.7%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1042.8

(U) Percent Total Program Expended: 33.3%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
ASSUMPTIONS ARE FOR FLEET SQUADRONS:

Flight Hours Per Aircraft Per Month	40.3
Number of Aircraft/Squadron	4.0
Consumption Rate, Gal/Hr	372.2

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E-2C AEW (HAWKEYE), December 31, 1998

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

POL Cost, JP-5, Per Barrel, FY 97 \$33.18
Date of estimate 9/98.

There is no antecedent program.

No current information is available at this time for the Mission Computer or Hawkeye 2000 contributions.

b. (U) Costs -- (FY 1994 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Squadron	Avg Annual Cost Per (Antecedent)
Mission Pay & Allowances	6.8	0.0
Unit Level Consumption	3.7	0.0
Intermediate Maintenance	1.9	0.0
Depot Maintenance	2.7	0.0
Contractor Support	0.0	0.0
Sustaining Support	1.2	0.0
Indirect Costs	5.7	0.0
Total	22.0	0.0

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A-15 ICH

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SELECTED ACQUISITION REPORT (RCS: DU-A&T(O&A)823)
PROGRAM: ICH (CH-47F)

AS OF DATE: December 31, 1998

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IMPROVED CARGO HELICOPTER



1. Designation and Nomenclature (Popular Name): Improved Cargo Helicopter (ICH)
(CH-47F)
2. DoD Component: Army
3. Responsible Office and Telephone Number:
Office of the Project Manager LTC William T. Crosby
Cargo Helicopters, ATTN: SFAE-AV-CH Assigned: July 1, 1998
Building 5681, Redstone Arsenal DSN 897-4607; COMM (256) 313-4607
Huntsville, AL 35898-5280 crosbyw@peoavn.redstone.army.mil
4. Program Elements/Procurement Line Items:
RDT&E:
PE 0203744A Project D430
PROCUREMENT:
APPN 2031 ICN AA0254 (Army)
5. References:

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline (APB) dated May 19, 1998.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated May 19, 1998.

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ICH (CH-47F), December 31, 1998

6. Mission and Description:

The Improved Cargo Helicopter (ICH) will be a modification to the current CH-47D helicopter to extend airframe service life, introduce an open electronic architecture that is compatible with the Army XXI digitized battlefield, and reduce Operating and Support (O&S) cost. This heavy lift helicopter program will be based on a remanufacture approach. The airframe will be rebuilt, mission capability improved, and vibrations reduced through airframe stiffening to provide for long term O&S cost reductions (See Section 18 O&S cost). Continued support, coverage, and sustainment of Maneuver, Fire Support, Air Defense, and Survivability mission areas will be provided by the ICH. Its mission is transportation of ground forces, class III/class V supplies, and battle critical cargo in support of all future contingencies.

A Service Life Extension Program, the ICH will sustain the aging CH-47D fleet and bridge the gap until the development of a follow-on aircraft. It will be fielded as a direct replacement for 300 of the CH-47D fleet.

The ICH program will retain most of the subsystems currently on the CH-47D, and repair them as required. The mission payload and range requirements will be met through installation of the T55-GA-714A engines on all CH-47D aircraft prior to induction into the ICH program.

7. Executive Summary:

The ICH program was the result of a U. S. Army study and analysis to complete definition of the operational requirement, and identification of low risk technical solutions to extend the service life of the CH-47D helicopter. Based on those results, the Army proceeded to structure a program based on low risk modifications and processes to meet this need. The airframe service life extension will be achieved through a second rebuild by the aircraft's original manufacturer. The Army XXI digital battlefield capability will be achieved through incorporation of existing avionics and electronic systems on a data bus which will provide a Joint Technical Architecture-Army compliant open system architecture for future growth.

The ICH provides the most cost effective solution to sustain the heavy lift capability. The program has the full support of the Department of the Army and many of the Commanders-in-Chief who depend on the CH-47D for support. Funding is available in the Fiscal Year 2000-2005 Program Objective Memorandum to complete development and begin the transition to production.

Army Systems Acquisition Review Council (ASARC) Milestone II approval was obtained on 18 December 1997. On 22 April 1998, the Overarching Integrated Product Team (OIPT) Chairman recommended the program for entry into Engineering and Manufacturing Development (EMD) with an Acquisition Category (ACAT) IC designation. On 6 May 1998, the Under Secretary of Defense (Acquisition and Technology) approved the program for entry into EMD with an ACAT IC designation. Milestone Decision Authority was delegated to the Army Acquisition Executive. The Acquisition Decision Memorandum was signed on 19 May 1998.

An EMD contract was awarded to Boeing Helicopters on 15 May 1998. Boeing has awarded a subcontract to Rockwell Collins for development of the avionics package. Engineering development activities are progressing with the aircraft and avionics Preliminary Design Reviews scheduled for February and March 1999 respectively. Two EMD aircraft were delivered to Boeing on schedule (5 Jan

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ICH (CH-47F), December 31, 1998

7. Executive Summary (Cont'd):

1999) and are currently in the process of inspection and tear down.

The PM has recently been notified of a \$4.769M decrement in FY99 RDT&E funding which will directly impact the FY99 incremental funding requirement for the EMD contract. An Unfinanced Requirement (UFR) has been submitted and will be resubmitted for the POM if required. In order to maintain the current baseline, funds must be restored in FY99 or early FY00. If funds are restored later than FY00 the program will require a payback of \$8 Million dollars (\$4.769M restored plus \$3.2 million additional funds) and still incur a ten month slip in the schedule. If funds are never restored, the EMD contractual effort will be forced to reduce scope which could affect the approved acquisition program baseline.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
ORD Approval	NOV 97	NOV 97	NOV 97
Milestone II ASARC	NOV 97	NOV 97	DEC 97
EMD Contract Award	MAR 98	MAR 98	MAY 98
Critical Design Review (CDR)	SEP 99	SEP 99	SEP 99
LRIP (#1) Contract Award	DEC 01	DEC 01	DEC 01
IOT&K			
Start	FEB 02	FEB 02	FEB 02
Finish	MAR 02	MAR 02	MAR 02
LRIP (#2) Contract Award	MAR 03	MAR 03	MAR 03

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ICH (CH-47F), December 31, 1998

9a. Schedule (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
LRIP (#1) First Delivery	MAY 03	MAY 03	MAY 03
Milestone III ASARC	JAN 04	JAN 04	JAN 04
Full Rate Production Contract Award	FEB 04	FEB 04	FEB 04
First Unit Equipped	SEP 04	SEP 04	SEP 04

First Unit Equipped will be a Heavy Lift Helicopter Company of 16 aircraft.

b. Current Change Explanations --
No changes to schedules.

10. Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Self-deploy w/30 min fuel reserve (nm)	1260	1260 / 1056	N/A	1260
Transport 16,000 lbs of internal/external cargo (nm)	100	100 / 50	N/A	100
Transport combat equipped troops:				
Number of Troops	44	44 / 31	N/A	44
Range (nm)	150	150 / 100	N/A	150
Reliability:				
Mean Time Between Essential Maintenance Actions (MTBEMA) (flt hrs)	3.5	3.5 / 3.3	N/A	3.5
Maintenance:				
Total Maintenance Ratio (mmh/flt hr)	9.2	9.2 / 9.8	N/A	9.2

(1) Performance requirements are to be achieved at 4000 ft above sea level and 95 degrees Fahrenheit.

(2) Confidence level at Milestone III, for Reliability, is 70 percent. Confidence level after 1000 flight hours by FUE unit is 90 percent.

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ICH (CH-47F), December 31, 1998

10b. Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	136.3	136.3	134.6
Procurement	2387.3	2387.3	2387.3
Flyaway	(2167.4)		(2167.4)
Total Other Wpn Sys			(0.0)
Peculiar Support	(172.0)		(172.0)
Initial Spares	(47.9)		(47.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 97 Base-Year \$	2523.6	2523.6	2521.9
Escalation	591.8	591.8	504.2
Development (RDT&E)	(6.5)	(6.5)	(4.8)
Procurement	(585.3)	(585.3)	(499.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3115.4	3115.4	3026.1
b. Quantity --			
Development (RDT&E)	2	2	2
Procurement	300	300	300
Total	302	302	302

Two years of Low Rate Initial Production (LRIP) for up to 30 aircraft was approved at Milestone 11. The FY00 President's Budget reflects revised quantities for the first two years with 11 in FY02 and 16 in FY03 for a total of 27 LRIP aircraft.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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ICH (CH-47F), December 31, 1998

12. Unit Cost Summary:

	UCR Baseline (May 98 APR)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 97 BY\$)	2523.6	2521.9	
(2) Quantity	302	302	
(3) Unit Cost	8.356	8.351	-0.06
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 97 BY\$)	2387.3	2387.3	
(2) Quantity	300	300	
(3) Unit Cost	7.958	7.958	0.00

13. Cost Variance Analysis:

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

	RD&E	PROC	MILCON	TOTAL
Development Estimate	142.8	2972.6	-	3115.4
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.0	-	-	-1.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1.0	-	-	-1.0
Current Changes:				
Economic	-1.9	-71.7	-	-73.6
Quantity	-	-	-	-
Schedule	-	-6.4	-	-6.4
Engineering	-	-	-	-
Estimating	-0.5	-7.8	-	-8.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-2.4	-85.9	-	-88.3
Total Changes	-3.4	-85.9	-	-89.3
Current Estimate	139.4	2886.7	-	3026.1

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ICH (CH-47F), December 31, 1998

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

Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	136.3	2387.3	-	2523.6
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.0	-	-	-1.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1.0	-	-	-1.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.7	-	-	-0.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.7	-	-	-0.7
Total Changes	-1.7	-	-	-1.7
Current Estimate	134.6	2387.3	-	2521.9

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RD&E</u>		
Revised escalation indices. (Economic)	N/A	-1.9
Adjustment for Current and Prior Inflation. (Estimating)	+0.8	+0.8
Incremental Contract Funding Alignment (Estimating)	-1.5	-1.3
RD&E Subtotal	-0.7	-2.4
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-12.5
Economic adjustment for negative program change. (Economic)	N/A	+0.8
Acceleration of annual procurement buy profile. Procurement of four aircraft shifted from final production year (FY14) to earlier timeframes FY04 and FY05. (Schedule)	0.0	-6.4
Long Lead Item Funding/Quantity Estimations (Estimating)	0.0	-7.8
Procurement Subtotal	0.0	-85.9

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ICH (CH-47F), December 31, 1998

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
10.32	-0.24	-0.01	-0.02	--	-0.03	--	--	-0.30	10.02

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
9.91	-0.24	--	-0.02	--	-0.03	--	--	-0.29	9.62

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	NOV 97	N/A	DEC 97
Milestone III	N/A	JAN 04	N/A	JAN 04
FUE/IOC	N/A	SEP 04	N/A	SEP 04
Total Cost	N/A	3415.4	N/A	3026.1
Total Quantity	0	302	0	302
Prog Acq Unit Cost	N/A	11.31	N/A	10.02

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

a. RDT&E --

ICH EMD:
Boeing Helicopters, Philadelphia PA
DAAH23-98-C-0069, CPTF
Award: May 15, 1998
Definitized: May 15, 1998

Initial Contract Price		
Target	Ceiling	Qty
\$76.1	N/A	2

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$76.1	N/A	2	\$76.1	\$76.1

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ICH (CH-47F), December 31, 1998

15a. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (12/31/98)	<u>\$-0.1</u>	<u>\$0.2</u>
Net Change	\$-0.1	\$0.2

Explanation of Change:

Current variances are the result of the start-up of the program and do not represent any significant schedule or cost issues. Contract is on target and within established baseline parameters.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY96-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-15)	<u>Total</u>
RDT&E	68.6	28.3	35.8	6.7	139.4
Procurement	-	-	82.9	2803.8	2886.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	68.6	28.3	118.7	2810.5	3026.1

b. Annual Summary -- ICH

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY97 Dollars Nonrec</u>	<u>Flyaway FY97 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				4.3	4.3
1997				16.8	16.9
1998				20.5	20.8
1999				25.9	26.6
2000				27.1	28.3
2001				33.8	35.8
2002				6.1	6.6
2003				0.1	0.1
Subtotal	2			134.6	139.4

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

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001		29.0		77.7	82.9
2002	11		129.2	146.0	159.4
2003	16		171.4	188.0	208.7
2004	29		222.2	269.4	304.4
2005	30		205.9	261.1	301.3
2006	26		186.1	191.3	225.4
2007	26		182.3	186.9	224.8
2008	26		179.3	183.7	225.6
2009	26		176.6	181.0	226.9
2010	26		174.3	179.3	228.3
2011	26		172.5	176.5	230.7
2012	26		170.8	174.4	232.7
2013	26		128.7	130.1	177.2
2014	6		39.1	34.4	47.9
2015				8.5	12.1
Subtotal	300	29.0	2138.4	2387.3	2886.7

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	302	29.0	2138.4	2521.9	3026.1

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RD&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 14.9

Percent Total Program Expended: 0.5%

The amount shown above for expenditures represent disbursements as of 31 Jan 1999. Obligations for the ICH program are \$43.379 million as of 31 Jan 1999.

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ICH (CH-47F), December 31, 1998

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

Costs are based on 300 ICH aircraft accumulating a total of 49,404 hours per year over 20 years of operation. Reliability/Maintainability will show a 25 percent improvement (25 percent less cost for Reliability/Maintainability driven O&S cost elements).

The CH-47D costs are also based on 300 aircraft accumulating a total of 49,404 hours per year over 20 years of operation.

This information based on the 30 March 1998 approved Army Cost Position.

b. Costs -- (FY 1997 Constant (Base-Year) Dollars in Thousands)

Cost Element	ICH	CH-47D
	Average Annual Per Aircraft	Average Annual Per Aircraft
Mission Pay & Allowances	426.4	426.4
Unit Level Consumption	101.2	118.5
Intermediate Maintenance	83.9	104.6
Depot Maintenance	180.6	683.3
Contractor Support	0.0	0.0
Sustaining Support	183.0	183.0
Indirect Costs	0.0	0.0
Total	975.1	1515.8

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A-16 JAVELIN

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: Javelin

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Javelin

2. (U) DoD Component: Army

Joint Participants:
USMC

3. (U) Responsible Office and Telephone Number:

Department of Army	COL William D. Knox
PEO - Tactical Missiles	Assigned: August 22, 1996
ATTN: SFAE-MSL-AM	DSN 746-4266; COMM (205) 876-4266
RSA, AL 35898-5720	william.knox@msl.redstone.army.mil

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

RDT&E:

(U) PE 64611

PROCUREMENT:

(U) APPN 2032 ICN CA0269 (Army)
(U) APPN 2032 ICN HO6102 (Army)
(U) APPN 2032 ICN HO6300 (Army)
(U) APPN 1109 ICN O38061 (Navy)

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FOR OPEN PUBLICATION

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3

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

~~Classified by: Javelin, SCG, PEO Tactical Missiles, dated 9 May 96~~
~~Downgrade instructions:~~
~~Declassify on: X3~~

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99-C0785

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5. (U) References:

SAR Baseline (Production Estimate):

(U) DAE Approved Acquisition Program Baseline dated June 15, 1989.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated September 18, 1997.

6. (U) Mission and Description:

(U) The Javelin system is a medium range, imaging infrared, fire-and-forget, manportable, antitank weapon system being developed for the U.S. Army and U.S. Marine Corps (USMC) to meet the Combat Developer's (CBTDEV's) requirements as specified in the Joint Service Operational Requirement (JSOR), dated 12 December 1988. Javelin will satisfy an operational requirement to provide increased reliability, survivability, higher hit/kill probability, and greater effective range against current and future armored threats. The JAVELIN tactical system is composed of two major items: a tactical round and a Command Launch Unit (CLU). Javelin training devices include the Missile Simulation Round (MSR), Basic Skills Trainer (BST), and the Field Tactical Trainer (FTT). The missile, sealed in a disposable launch tube assembly, is comprised of the seeker, guidance electronics, warhead and fuze, propulsion unit, and the control actuator system. The missile is classified as a "wooden round", i.e., having no field level repair and an expected minimum shelf life of ten years. The CLU consists of an integral visible day telescope and a long-wavelength infrared nightsight with wide and narrow fields of view. The CLU is used for battlefield surveillance, target acquisition, missile launch, and damage assessment. The Javelin may be used at the gunner's discretion in either top attack (the normal mode of operation) or direct mode (used for engaging targets under cover). The system is capable of defeating conventional and reactive armor in day/night engagements in excess of the design requirement of 2,000 meters. The Javelin soft launch capability enables firing from enclosures or covered fighting positions which reduce the gunner's vulnerability to counterfire. A secondary capability against helicopters and bunkers has been demonstrated but will not inhibit the primary mission of defeating armored targets. The Javelin will replace the Dragon.

7. (U) Executive Summary:

(U) This Selected Acquisition Report (SAR) is being submitted to document the significant accomplishments for the Javelin program during calendar year (CY) 1998. During this reporting period, the Javelin Project Office was responsible for managing the joint Army/Marine Corps Javelin Weapon System. This included continuing the production, fielding and deployment phases of the system.

Calendar year 1998 was a busy, successful, and challenging year for the Javelin program. Significant events included: (1) completion of fielding to the 82nd Airborne, (2) continued successful involvement in Foreign Military Sales (FMS), (3) extensive testing, (4) notification that the Javelin Project Manager (PM) was selected as PM of the year (for CY 1997), (5) notification by Raytheon of a decision to relocate Lewisville, TX production of the Command Launch Unit (CLU), guidance electronic unit (GEU), and JV Management and Engineering during 1999 to Tucson, Arizona, (6) reclama of a potential significant reduction of Army missile Multiyear II procurement quantities as a result of an OSD/OMB budget review

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7. (U) Executive Summary (Cont'd):

pending the outcome of the OSD CBMR study, (7) continued successful development of Javelin Lethality Improvement Tracker Enhancement (LITE) software (which significantly improves Javelin lethality), (8) award of the third year (FY99) of the Multiyear I contract, and (9) issuance of the second Multiyear contract request for proposal.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	Yes

c. (U) Explanation of Breach:

There are schedule, cost, and unit cost breaches to the approved APB dated Sept 18, 1997. The threefold cause of the unit cost breaches involves: a reduction in procurement quantity, a programmatic stretch in schedule, and increased fielding requirements of Command Launch Units (CLUs) and associated Training Devices.

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Joint Service Op Requirement Approved	APR 86	APR 86	APR 86
Milestone I (DSARC)	MAY 86	MAY 86	MAY 86
Proof of Principle Contract Award	AUG 86	AUG 86	AUG 86
Proof of Principle Complete	DEC 88	DEC 88	DEC 88
Milestone II (DAB)	JUN 89	JUN 89	JUN 89
FSD Contract Award	JUN 89	JUN 89	JUN 89
Pre-Prod Qual Test			
Start	JUN 90	JUN 90	JUN 90
Complete	DEC 93	DEC 93	DEC 93
Training Force Dev Test and Experimentation (FDT&E)			
Start	FEB 93	FEB 93	FEB 93
Complete	APR 93	APR 93	APR 93

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

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
	NOV 92	NOV 92	NOV 92
Prototype Delivery			
IOT&E			
Start	SEP 93	SEP 93	SEP 93
Complete	DEC 93	DEC 93	DEC 93
LRIP Decision (DAB)	JUN 94	JUN 94	JUN 94
LRIP I Contract Award	JUN 94	JUN 94	JUN 94
LRIP II Contract Award	MAR 95	MAR 95	MAR 95
First LRIP Delivery	OCT 95	OCT 95	OCT 95
Prod Verification Test			
Start	NOV 95	NOV 95	NOV 95
Complete	APR 96	APR 96	APR 96
LRIP III Contract Award	FEB 96	FEB 96	FEB 96
LRIP II Delivery	OCT 96	OCT 96	OCT 96
Limited User Test			
Start	APR 96	APR 96	APR 96
Complete	JUN 96	JUN 96	JUN 96
Live Fire Test			
Start	JUN 96	JUN 96	JUN 96
Complete	DEC 96	DEC 96	DEC 96
First Unit Equipped	JUN 96	JUN 96	JUN 96
IOC	OCT 96	OCT 96	OCT 96
Full Rate Production (ASARC)	MAY 97	MAY 97	MAY 97
Full Rate Production Contract Award	MAY 97	MAY 97	MAY 97
LRIP III Delivery	OCT 97	OCT 97	OCT 97
First Full Rate Production Delivery	OCT 98	OCT 98	OCT 98
Follow-on Operational Test and Evaluation			
Start	JAN 99	JAN 99	N/A
Complete	APR 99	APR 99	N/A
Organic Field Level Support Capability	JAN 99	JAN 99	APR 99 (Ch-1)
Organic Depot Level Support Capability	JUL 01	JUL 01	JUL 01

b. Current Change Explanations --

(U) The Organic Field Level Support Capability has changed from January 99 to April 99 due to a change in priorities in the fielding schedule.

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10. (U) Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate	
Min range (m)	(b)(1)				
Degraded					
Full					
Max range (m)					
Hit probability					
(Ph/reliable rnd)					
Kill probability					
Given a reliable					
shot (Pk/s)					
Given engagement					
opportunity					
(Pk/e)					
System weight (lbs)	35	35	/ 49.5	48.3	48.5 (Ch-1)
Missile operational	.92	.92	/ .92	.84	.92
reliability					
Cmd Launch Unit	129	129	/ 129	188	204
MTBOMF (hrs)					
Cmd Launch Unit MTTR	<1.5	<1.5	/ 1.5	.77	.77
(hrs)					

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(U) ACRONYMS:

MTBOMF - Mean Time Between Operational Mission Failures.
MTTR - Mean Time To Repair.

Objectives/thresholds/current estimates are at MS III except P(k/e) and Missile operational reliability. Values shown are objectives representing desired performance and minimum acceptable thresholds.

1. (U) Minimum range (Full) and maximum range. Full lethality must be met at this range.

2. (U) Probability of hit given a reliable round P(h/reliable round). Hit probabilities are specified for 7 km visibility (day/night) in benign environments. Must hit a fully exposed standard NATO target (2.3m H x 2.3m W x 4.6m L) stationary or moving (crossing velocity up to 20 km/hr) at all ranges (min to max). The hit probability must be attained given any attack azimuth or elevation angle (relative to target) given a shot with a reliable system.

(b)(1)

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5. (U) Missile Operational Reliability is established at system maturity

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10a. (U) Performance Characteristics (Cont'd):

which is three years after MSIII (May 00).

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b. Current Change Explanations --

(b)(1)

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	877.0	877.0	877.7
Procurement	2914.1	2914.1	3182.5
Round Flyaway	(2018.1)		(2127.6)
CLU Flyaway	(516.8)		(602.0)
Total Flyaway	(2534.9)		(2729.6)
Other Wpn System Costs	(51.1)		(58.1)
Training Devices	(245.5)		(271.6)
Plant Closure	(16.6)		(17.6)
Total Other Wpn Sys	(313.2)		(347.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(66.0)		(105.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 97 Base-Year \$	3791.1	3791.1	4060.2
Escalation	134.9	134.9	70.3
Development (RDT&E)	(-109.7)	(-109.7)	(-107.5)
Procurement	(244.6)	(244.6)	(177.8)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3926.0	3926.0	4130.5

(U) Values shown include USMC program.

b. (U) Quantity --

Development (RDT&E)	48	48	48
Procurement	28453	28453	26956
Total	28501	28501	27004

Note: Excludes 165 RDT&E prototypes from the SAR Baseline and 154 from the Current Estimate that are not considered fully configured.

(U) A system is comprised of a round, a Command Launch Unit (CLU), four Training Devices and initial spares. The round is the designated unit of measure. Of the total procurement quantity shown above, 2585 rounds (FY94-703, FY95-872, and FY96-1010 or 9.1% of total) were produced during low rate initial production (LRIP).

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11c. (U) Total Program Cost and Quantity (Cont'd):

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
None.

12. (U) Unit Cost Summary:

	UCR Baseline (DEC 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 97 BY\$)	3791.1	4060.2	
(2) Quantity	28501	27004	
(3) Unit Cost	0.133	0.150	+12.78
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 97 BY\$)	2914.1	3182.5	
(2) Quantity	28453	26956	
(3) Unit Cost	0.102	0.118	+15.69
	UCR Baseline (DEC 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
c. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (TY\$)	3926.0	4130.5	
(2) Unit Cost	0.138	0.153	+10.87
d. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (TY\$)	3158.7	3360.3	
(2) Unit Cost	0.111	0.125	+12.61
e. (U) Changes from Previous SAR (DEC 97)	Dollars/Qty	Percent	
(1) PAUC (BY\$)	0.017	+12.75	
(2) APUC (BY\$)	0.016	+15.68	
(3) PAUC Quantity	1497	+5.87	
(4) PAUC (TY\$)	0.015	+10.87	
(5) APUC (TY\$)	0.014	+12.65	
f. (U) Initial SAR Information			
Initial SAR Date (DEC 97):			
(1) Program Acquisition Cost (BY\$)	3775.1		
(2) Program Acquisition Cost (TYS)	3851.9		

g. Unit Cost PAUC Changes -- None.

(U) Unit Cost APUC Changes --

The threefold cause of the unit cost breach involves: a reduction in procurement quantity, a programmatic stretch in schedule, and increased fielding requirements of Command Launch Units (CLUs) and associated Training Devices. First, the total Army and USMC reportable end item quantities (rounds) have been reduced. The total Army & USMC round procurement quantities have

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Javelin, December 31, 1998

12. (U) Unit Cost Summary (Cont'd):

decreased by 1497 rounds from 28,453 to 26,956 rounds (5.5% decrease). Second, the procurement program has been stretched from 14 to 15 years. Third, the Department of the Army has resourced an extra 201 CLUs and associated Training Devices to complete fielding to the National Guard units. The total supporting Command Launch Units (CLUs) has increased from 4,348 to 4,549 (4.6% increase). Similarly, the four associated Training Device quantities have increased.

h. (U) Impact of Perf or Sched Changes --

The threefold cause of the unit cost breach involves: a reduction in procurement quantity, a programmatic stretch in schedule, and increased fielding requirements of Command Launch Units (CLUs) and associated Training Devices.

i. (U) Program Management & Control --

Military: John W Holly, Col (P), AR, Program Executive Officer, Tactical Missiles.

Military: William D. Knox, Col, AD, Program Manager, Javelin, Project Office.

The threefold cause of the unit cost breach involves: a reduction in procurement quantity, a programmatic stretch in schedule, and increased fielding requirements of Command Launch Units (CLUs) and associated Training Devices.

j. Cost Control Actions -- None.

k. (U) Contract Information (In Millions of Then-Year Dollars) -- None.

l. (U) Contracts exceeding Contract Cost Baseline Thresholds -- None.

m. General Comments -- None.

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13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	767.3	3158.7	-	3926.0
Previous Changes:				
Economic	+1.9	-58.9	-	-57.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-7.2	-0.4	-	-7.6
Other	-	-	-	-
Support	-	-9.5	-	-9.5
Subtotal	-5.3	-68.8	-	-74.1
Current Changes:				
Economic	-0.4	-38.5	-	-38.9
Quantity	-	+187.7	-	+187.7
Schedule	-	+16.9	-	+16.9
Engineering	+8.2	-	-	+8.2
Estimating	+0.4	+10.8	-	+11.2
Other	-	-	-	-
Support	-	+93.5	-	+93.5
Subtotal	+8.2	+270.4	-	+278.6
Total Changes	+2.9	+201.6	-	+204.5
Current Estimate	770.2	3360.3	-	4130.5

(U) Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	877.0	2914.1	-	3791.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-8.2	-0.3	-	-8.5
Other	-	-	-	-
Support	-	-7.5	-	-7.5
Subtotal	-8.2	-7.8	-	-16.0
Current Changes:				
Quantity	-	+184.4	-	+184.4
Schedule	-	-	-	-
Engineering	+8.5	-	-	+8.5
Estimating	+0.4	+10.6	-	+11.0
Other	-	-	-	-
Support	-	+81.2	-	+81.2
Subtotal	+8.9	+276.2	-	+285.1
Total Changes	+0.7	+268.4	-	+269.1
Current Estimate	877.7	3182.5	-	4060.2

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Javelin, December 31, 1998

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

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-0.4
Adjustment for Current and Prior Inflation. (Estimating)	+0.4	+0.4
Revised Estimate for system changes (Engineering)	+8.5	+8.2
RDT&E Subtotal	+8.9	+8.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-44.6
Economic adjustment for negative program change. (Economic)	N/A	+6.1
Quantity Variance associated with a decrease of 1497 Rounds from 28453 to 26956. (Quantity)	-86.3	-100.7
Adjustment for Current and Prior Inflation. (Estimating)	+10.6	+10.8
Quantity variance associated with an increase of 201 CLUs from 4348 to 4549. (Quantity)	+270.7	+288.4
Adjustment for Current and Prior Inflation. (Support)	+1.8	+1.8
Change in Initial Spares (Support)	+45.9	+54.0
Change in Other Wpn System Costs (Support)	+8.3	+10.1
Change in Training Devices (Support)	+25.1	+27.1
Change in Plant Closure (Support)	+0.1	+0.5
Stretchout of one year in the annual procurement buy from 14 years to 15 years. (Schedule)	0.0	+16.9
Procurement Subtotal	+276.2	+270.4

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.06	-0.01	+0.03	+0.03	--	+0.02	--	+0.01	+0.08	0.14

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14a. (U) Unit Cost and Other History (Cont'd):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.14	--	+0.01	--	--	--	--	--	+0.01	0.15

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.05	-0.01	+0.02	+0.03	--	+0.02	--	+0.01	+0.06	0.11

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.11	--	+0.01	--	--	--	--	--	+0.01	0.12

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	MAY 86	MAY 96	MAY 86
Milestone II	N/A	MAY 89	JUN 89	JUN 89
Milestone III	N/A	JUN 94	MAY 97	MAY 97
FUF/IOC	N/A	DEC 95	OCT 96	OCT 96
Total Cost	N/A	3936.5	3926	4130.5
Total Quantity	N/A	70631	28501	27004
Prog Acq Unit Cost	N/A	0.06	0.14	0.15

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

a. Procurement --
 (U) Multiyear I:
 TI/Martin Joint Venture, Lewisville TX
 DAAH01-97-C-0209, FFP
 Award: May 31, 1997
 Definitized: N/A

		Initial Contract Price		
		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
		\$745.0	\$745.0	6492

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$746.0	\$746.0	6492	\$746.0	\$746.0

Explanation of Change:

(U) This is a three year firm-fixed-price multi-service multi-year contract. Pricing data shown is for all three years of this contract. The annual Target (equals Ceiling) in millions and quantities are as follows: Program Year 1) \$192.4 & 1161 Rounds; Program Year 2) \$177.0 & 1274 Rounds; Program Year 3) \$376.6 & 4057 Rounds. Program Years 1, 2, & 3 are funded and awarded. The \$1.0 increase was the result of contractor itemization of initial spares for the revised CLU configuration.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY86-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	766.2	0.5	0.5	3.0	770.2
Procurement	1494.3	504.5	411.1	950.4	3360.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	2260.5	505.0	411.6	953.4	4130.5

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

b. Annual Summary -- Javelin

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986				73.7	55.1
1987				54.4	42.0
1988				36.8	29.5
1989				118.5	98.9
1990				161.0	139.5
1991				90.4	81.3
1992				132.9	122.3
1993				105.8	99.7
1994				49.2	47.2
1995				30.6	29.9
1996				2.2	2.2
1997				5.9	5.9
1998				7.4	7.5
1999				5.1	5.2
2000				0.5	0.5
2001				0.5	0.5
2002				0.5	0.5
2003				0.5	0.5
2004				0.9	1.0
2005				0.9	1.0
Subtotal	48			877.7	770.2

Appropriation: 1109 - Procurement, Marine Corps

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997	141	0.7	28.6	37.7	38.2
1998	380	1.8	45.5	56.8	58.3
1999	741	5.2	65.7	80.1	83.5
2000	954	1.7	79.2	88.8	93.9
2001	337		25.6	29.9	32.2
2002				1.0	1.1
2003				0.9	1.0
2004				0.1	0.1
2005				0.1	0.1
Subtotal	2553	9.4	244.6	295.4	308.4

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

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				19.1	18.3
1994	703	49.6	175.3	210.9	206.1
1995	872	9.9	176.6	211.1	210.0
1996	1010	1.7	175.9	200.2	200.8
1997	1020	3.4	164.3	194.9	197.5
1998	894	3.9	115.3	134.7	138.2
1999	3569	21.1	279.8	329.3	343.4
2000	2682	8.6	316.3	388.1	410.6
2001	3973	4.3	300.2	352.2	378.9
2002	4310		307.6	353.8	387.7
2003	5370	9.5	352.3	339.4	379.6
2004				42.0	48.0
2005				44.4	51.8
2006				42.0	50.0
2007				7.4	9.0
2008				9.7	12.0
2009				7.9	10.0
Subtotal	24403	112.0	2363.6	2887.1	3051.9

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Army	24451	112.0	2363.6	3764.8	3822.1
Navy	2553	9.4	244.6	295.4	308.4
Grand Total	27004	121.4	2608.2	4060.2	4130.5

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	48	48
Procurement	2591	2591

(U) Percent Total Program Quantities Delivered: 9.8%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1562.7

(U) Percent Total Program Expended: 37.8%

(U) This includes the delivery of all LRIP 1,2,& 3 and 6 Multiyear I Program Year I rounds.

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Javelin, December 31, 1998

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The Javelin system support concept is consistent with existing Army policy as follows:

(1) Command Launch Unit (CLU) is a 3 level organic support concept. Unit level is responsible for visual inspection, exterior cleaning, battery replacement and troubleshooting thru the Built In Test (BIT) capability. Removal/replacement of components will be accomplished at the Direct Support (DS) level. Depot level capability will exist for complete overhaul/repair of the unit.

(2) Maintenance of the round is a "wooden round" concept.

(3) Contractor Logistics Support (CLS) of training devices will be used for the life of the system.

Interim Contractor Support (ICS) for supply support and maintenance above unit level will be utilized for the first 60 months. CLU repair will consist of complete repair of the CLU's economically repairable circuit cards, assemblies, and components. Missile repair (resulting from surveillance checks) will be performed by the system's prime contractor.

Fielding began in June 1996. The CLU sustainment period covers 20 years of operation, maintenance, and modification. Military pay and allowances represent over 63% of the sustainment program costs not including contractor support costs. Sustainment for the antecedent system, DRAGON, also covers 20 years of operation, maintenance, and modification.

Mission Pay and Allowance includes crew pay and allowance, maintenance pay and allowance, and system project management. Unit Level Consumption consists of replenishment reparable, replenishment consumables, transportation, petroleum, oil, and lubricants plus ammunition/missiles. Intermediate Maintenance is field maintenance civilian labor. Depot Maintenance includes publications, civilian labor and material. Interim contractor support for the system and contractor logistics support for training devices make up the Contractor Support costs. Sustaining Support consists of system software maintenance, training device software maintenance, modifications/kits, system test and evaluation and demilitarization. Indirect Support includes system specific replacement training, costs associated with permanent change of station, and base operations.

Data source: Javelin - Project Office Estimate, updated December 1998, certified by MICOM Cost Analysis, average over 12 years fully fielded (i.e. no ramp up or down) (sustainment years (FY 04 through FY 15)), Army only; Antecedent - DRAGON II Life Cycle Cost Estimate, dated August 1984, 20 years sustainment, Army only.

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

b. (U) Costs -- (FY 1997 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Year JAVELIN	Avg Annual Cost Per Year DRAGONII (ANTECEDENT)
Mission Pay & Allowances	76.7	103.8
Unit Level Consumption	17.8	26.0
Intermediate Maintenance	0.0	0.4
Depot Maintenance	0.6	24.2
Contractor Support	8.5	0.0
Sustaining Support	3.8	5.4
Indirect Costs	25.0	40.1
Total	132.4	199.9

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N-5 CH-60S

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

PROGRAM: CH-60S

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): CH-60 VERTICAL REPLENISHMENT HELLO

2. DoD Component: Navy

3. Responsible Office and Telephone Number:

Commander, Naval Air Systems Command CAPT Larrie Cable
47123 Buse Road, Unit #IPT, Ste 156 Assigned: May 25, 1995
PMA-299 DSN 757-5409; COMM 301-757-5409
Patuxent River, MD 20670-1547 cablelg@navair.navy.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0604212N (Shared) Project H1709, H2415

PROCUREMENT:

APPN 1506 ICN 024000 (Navy)

5. References:

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline (APB) dated July 8, 1998.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated July 8, 1998.

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

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99-C-0129

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CH-60S, December 31, 1998

6. Mission and Description:

The Helicopter Combat Support (HC) mission is to maintain forward deployed fleet sustainability through rapid airborne delivery of materials and personnel and to support amphibious operations through search and rescue coverage. The primary roles of the aircraft are to conduct vertical replenishment (VERTREP), day/night ship-to-ship, ship-to-shore, and shore-to-ship external transfer of cargo; internal transport of passengers, mail and cargo, vertical onboard delivery (VOD); airhead operations, and day/night search and rescue (SAR). The aircraft secondary roles include torpedo and drone recovery, noncombatant evacuation operations (NEO), SEAL and UDT support.

7. Executive Summary:

The Mission Need Statement (MNS) for a Fleet Combat Support (HC) Helicopter, serial number M059-88-94, was approved and validated in November 1994. An Analysis of Alternatives, the HC Cost and Operational Effectiveness Analysis (COEA), was approved by CNO and ASN(RDA) on 10 May 1996. An updated threat assessment has also been completed. Details can be found in the V-22 Osprey/CH-60 Seahawk/H-1 Upgrades Joint Systems Threat Assessment (JSTAR) (U) ONI-TA-024-98, January 1998.

Defense Acquisition Board approved Engineering Manufacturing Development (MSII) on July 8, 1998.

Successfully completed the CH-60S Critical Design Review in December 1998.

The Non-Recurring Development contracts are planned to be definitized in April 1999.

On June 30, 1998 an 845 Other Transaction Authority was provided to Lockheed Martin for RDT&E funds (\$61.8M) for the development of a Common Cockpit. This effort will develop a cockpit that will be common to the SH-60 and the CH-60 platforms. Therefore, both programs are funding this effort.

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8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
MS-II/LRIP	APR 98	APR 98	JUL 98
Common Cockpit Critical Design Review	JUN 98	JUN 98	JUL 98
LRIP First Flight	JUL 99	JUL 99	DEC 99
Technical Evaluation Complete	MAR 00	MAR 00	AUG 00 (Ch-1)
Operational Evaluation Complete	JUL 00	JUL 00	JAN 01 (Ch-1)
MS-III (NAV SAE FRP)	SEP 00	SEP 00	MAR 01 (Ch-1)
IOC	DEC 01	DEC 01	DEC 01

b. Current Change Explanations --

(Ch-1) As a result of first flight slip, subsequent analysis revealed the following schedule changes: Technical Evaluation changed from March 00 to August 00, Operational Evaluation changed from September 00 to January 01, and MS-III changed from January 01 to March 01.

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10. Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
*Airspeed-Vmax (KIAS)	175	175 / 150	TBD	175
*Amphibious SAR Mission Radius (nm)	150	150 / 50	TBD	150
*VERTREP Endurance (hrs)	3	3 / 2	TBD	3
*VERTREP, External (lbs)	5,500	5,500 / 5,500	TBD	5,500
*VOD (lbs)	5,500	5,500 / 5,500	TBD	5,500
MTBF (hrs)	20.3	20.3 / 20.3	TBD	20.3
MTTR (hrs)	3.6	3.6 / 3.6	TBD	3.6
*CSAR Mission Radius (nm)	300	300 / 200	TBD	300
*SWS Mission Radius (nm)	300	300 / 200	TBD	300
*CV Plane Guard/SAR Mission Radius (nm)	200	200 / 100	TBD	200

b. Current Change Explanations -- None

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11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	71.0	71.0	69.4
Procurement	2698.0	2698.0	2775.4
Flyaway	(2188.7)		(2265.8)
Non-Recurring Flyaway	(28.6)		(31.8)
Total Flyaway	(2217.3)		(2297.6)
Other Wpn System Costs	(7.2)		(8.3)
Other Support	(241.9)		(272.4)
Total Other Wpn Sys	(249.1)		(280.7)
Peculiar Support	(97.4)		(106.7)
Initial Spares	(134.2)		(90.4)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 98 Base-Year \$	2769.0	2769.0	2844.8
Escalation	385.0	385.0	341.0
Development (RDT&E)	(1.0)	(1.0)	(0.8)
Procurement	(384.0)	(384.0)	(340.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3154.0	3154.0	3185.8

Two LRIP Lots are planned (Lot I of 5 aircraft, Lot II of 20 aircraft) which exceeds 10% of the total buy of 165 aircraft. Testing to support MS III will not be complete in time to meet multiyear contractual requirements. LRIP quantities were approved by the DAB on July 8, 1998.

b. Quantity --

Development (RDT&E)	1	1	1
Procurement	<u>165</u>	<u>165</u>	<u>165</u>
Total	166	166	166

Footnote: The RDT&E aircraft represents a Sikorsky built CH-60S prototype as a proof-of-concept vehicle. This aircraft has been used to conduct a flight demonstration, Integrated Test, and Operational Assessment, including sea trials.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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CH-60S, December 31, 1998

12. Unit Cost Summary:

	UCR Baseline (Jul 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 98 BY\$)	2769.0	2844.8	
(2) Quantity	166	166	
(3) Unit Cost	16.681	17.137	+2.73
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 98 BY\$)	2698.0	2775.4	
(2) Quantity	165	165	
(3) Unit Cost	16.352	16.821	+2.87

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	72.0	3082.0	-	3154.0
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-0.2	-54.6	-	-54.8
Quantity	-	-	-	-
Schedule	-	-8.2	-	-8.2
Engineering	-	-	-	-
Estimating	-1.6	+92.9	-	+91.3
Other	-	-	-	-
Support	-	+3.5	-	+3.5
Subtotal	-1.8	+33.6	-	+31.8
Total Changes	-1.8	+33.6	-	+31.8
Current Estimate	70.2	3115.6	-	3185.8

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

Summary (FY 1998 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	71.0	2698.0	-	2769.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.6	+80.3	-	+78.7
Other	-	-	-	-
Support	-	-2.9	-	-2.9
Subtotal	-1.6	+77.4	-	+75.8
Total Changes	-1.6	+77.4	-	+75.8
Current Estimate	69.4	2775.4	-	2844.8

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-0.2
Adjustment for Current and Prior Inflation. (Estimating)	+0.2	+0.2
Budget Reductions for Small Business Innovation Research, Federally Funded Research Development Centers, and Advisory and Assistance Services. (Estimating)	-1.8	-1.8
RDT&E Subtotal	-1.6	-1.8
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-55.8
Economic adjustment for negative program change. (Economic)	N/A	+1.2
Revised schedule to reflect realignment of FY98 through FY08 procurement buys. (Schedule)	0.0	-8.2
Adjustment for Current and Prior Inflation. (Estimating)	+1.3	+1.3
Correction of previous estimate for flyaway cost between FY98 and FY99. (Estimating)	+5.3	+5.7

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CH-60S, December 31, 1998

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

b. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Refinement of estimate associated with Non Recurring Combat Search and Rescue Development and Ancillary Equipment due to rephasing. (Estimating)	-27.7	-21.3
Refinement of estimate for the multiyear procurement. (Estimating)	+42.4	+41.2
Increase due to refinement of Common Cockpit estimates. (Estimating)	+59.0	+66.0
Adjustment for Current and Prior Inflation. (Support)	+0.4	+0.4
Revised estimate for Initial Spares to reflect budget reductions. (Support)	-43.9	-48.6
Revised estimate for Other Weapon System Costs to reflect updated post production estimate. (Support)	+1.1	+1.4
Revised estimate for Other Peculiar, Integrated Logistics, Logistics Support Analysis, field activities, and Maintenance Engineering Support to rephase and update post production cost. (Support)	+39.5	+50.3
Procurement Subtotal	+77.4	+33.6

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
19.00	-0.33	--	-0.05	--	+0.55	--	+0.02	+0.19	19.19

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
18.68	-0.33	--	-0.05	--	+0.56	--	+0.02	+0.20	18.88

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14c. Unit Cost and Other History (Cont'd):

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	APR 98	N/A	JUL 98
Milestone III	N/A	SEP 00	N/A	MAR 01
FUE/IOC	N/A	DEC 01	N/A	DEC 01
Total Cost	N/A	3154	N/A	3185.8
Total Quantity	0	166	0	166
Prog Acq Unit Cost	N/A	19	N/A	19.19

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

Anticipate award of Non-Recurring Development contract in March 1999.

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

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

<u>Appropriation</u>	<u>Prior Years (FY97-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-11)</u>	<u>Total</u>
RDT&E	62.5	7.7	-	-	70.2
Procurement	171.9	290.7	298.4	2354.6	3115.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	234.4	298.4	298.4	2354.6	3185.8

b. Annual Summary -- CH-60S

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY98 Dollars Nonrec</u>	<u>Flyaway FY98 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1997				6.9	6.9
1998				29.5	29.7
1999				25.5	25.9
2000				7.5	7.7
Subtotal	1			69.4	70.2

Note: The CH-60S RDT&E funding does not reflect Airborne Mine Counter Measure (AMCM) funding because the AMCM is a separate program from the CH-60S Program. The Tow Demo is a proof of concept demonstration intended

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

to validate the ability to tow AMCM sensors from H-60 helicopters. The prototype CH-60 will be used for this demonstration effort. AMCM development and production is an independent program covering sensor development and aircraft modification and integration.

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY98 Dollars Nonrec	Flyaway FY98 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	1	10.2	15.8	29.2	29.7
1999	5		78.5	137.8	142.2
2000	13		183.8	277.2	290.7
2001	18		225.5	279.8	298.4
2002	24	3.3	302.2	378.6	411.0
2003	20	18.3	254.4	321.6	356.2
2004	20		264.1	303.9	343.7
2005	20		266.8	302.1	348.8
2006	20		293.9	335.2	395.2
2007	20		290.8	266.6	320.9
2008	4		90.0	90.2	110.8
2009				18.6	23.3
2010				17.5	22.4
2011				17.1	22.3
Subtotal	165	31.8	2265.8	2775.4	3115.6

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	166	31.8	2265.8	2844.8	3185.8

17. Delivery/Expenditure Information:

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	1	1
Procurement	0	0

Percent Total Program Quantities Delivered: 0.6%

b. Total Expenditures To Date (In Millions of Dollars): \$ 26.5

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17b. Delivery/Expenditure Information (Cont'd):

Percent Total Program Expended: 0.8%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

A life cycle cost estimate for the CH-60S program was required to provide information for the Milestone II/III acquisition decision to pursue full rate production. The report provides the Operating and Support portion of the life cycle cost estimate. Based on the Cost Analysis Requirements Document, this estimate represents the anticipated cost to support one hundred sixty-five CH-60 aircraft, with each aircraft operating twenty years. The estimate does not include Operating and Support cost for any pipeline or attrition aircraft. The estimate utilizes the Office of the Secretary of Defense Cost Analysis Improvement Group (OSD CAIG) Work Breakdown Structure for Operating and Support of Aircraft Systems. Personnel costs were estimated from the H-60 Program Office (PMA-299) Manpower Estimate Report of January 1998. Other estimating relationships were established from analogy to operating H-60 aircraft in the U.S. Navy inventory (HH-60H, SH-60B, SH-60F). This is based on average annual cost per squadron. This estimate was prepared during the CAIG Review in February 1998.

b. Costs -- (FY 98 Constant (Base-Year) Dollars in Millions)

Cost Element	CH-60S VERTREP	HH-60H
Mission Pay & Allowances	5.3	4.9
Unit Level Consumption	3.1	2.6
Intermediate Maintenance	0.7	0.4
Depot Maintenance	0.9	1.9
Contractor Support	0.0	0.0
Sustaining Support	1.0	0.9
Indirect Costs	0.6	0.2
	N/A	N/A
Total	11.6	10.9

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A-9 CHEM DEMIL

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: Chem Demil

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Chemical Demilitarization Program
2. DoD Component: Army
3. Responsible Office and Telephone Number:
SFAE-CD-Z Mr. James Bacon
APG, MD 21010-4005 Assigned: July 1, 1997
DSN 584-3447; COMM 410-436-3447
4. Program Elements/Procurement Line Items:
RDT&E:
PE 0708007D
PROCUREMENT:
APPN 0390 ICN N/A (DCA/DNA)
MILCON:
PE 0708007A
PE 0708007D
O&M:
PE 0708007D

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AND SECURITY REVIEW
DEPARTMENT OF DEFENSE**

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5. References:

CSD

SAR Baseline (Production Estimate):

FY96 President's Budget dated February 6, 1995.

Approved Program:

DAF Approved Acquisition Program Baseline (APB) dated March 31, 1998.

NSCMD

SAR Baseline (Production Estimate):

FY96 President's Budget dated February 6, 1995.

Approved Program:

DAF Approved Acquisition Program Baseline (APB) dated March 31, 1998.

6. Mission and Description:

CHEMICAL DEMILITARIZATION PROGRAM (CDP)

The Chemical Demilitarization Program (CDP) consists of the Chemical Stockpile Disposal Project (CSDP), the Alternative Technologies and Approaches Product (ATAP), and the Non-Stockpile Chemical Materiel Project (NSCMP). The CDP also provides funding for the Chemical Stockpile Emergency Preparedness Project (CSEPP). The Program structure reflected in its current Acquisition Program Baseline dated March 31, 1998 contains two end items that reflect two major mission areas: Chemical Stockpile Disposal (CSD) and Non-Stockpile Chemical Materiel Disposal (NSCMD). Under this structure, the CSDP, the ATAP, and the CSEPP funding are reported as elements of the program's CSD end item, and the NSCMP is reported as the NSCMD end item.

CHEMICAL STOCKPILE DISPOSAL (CSD)

Chemical Stockpile Disposal Project (CSDP)

The CSDP mission is to demilitarize the United States (U.S.) unitary stockpile of lethal chemical agents and munitions stored at locations in the continental U.S. and at Johnston Atoll in the Pacific. The CSDP uses a reverse assembly process to separate the components of the chemical munitions and storage containers, followed by the incineration of each component.

Alternative Technologies and Approaches Product (ATAP)

The Product Manager for Alternative Technologies and Approaches was established in 1994 with responsibility for identifying alternative technology requirements and approaches, planning for the implementation of the requirements, and managing the activities of the various organizations involved. The Defense Acquisition Executive authorized the Army on January 17, 1997 to prepare an environmental impacts analysis (National Environmental Policy Act documentation) of the proposal to construct pilot plants

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6. Mission and Description (Cont'd):

to demonstrate the neutralization (hydrolysis) process for alternative technologies followed by either on-site or off-site post-treatment for nerve agent at Newport Chemical Depot, Indiana, and for mustard agent at Aberdeen Proving Ground (APG), Maryland.

Chemical Stockpile Emergency Preparedness Project (CSEPP)

The CSEPP is an effort complementary to the CSDP to enhance protection of the civilian population, the workers involved in the destruction effort, and the environment during storage activities and destruction of the U.S. chemical weapons stockpile. The CSEPP provides emergency response/preparedness to the eight CONUS chemical stockpile storage locations and the communities in ten states surrounding them. Federal Emergency Management Agency (FEMA) participates in this project by providing technical emergency preparedness assistance, as well as a financial structure for transferring funds to the states and counties.

Responsibility for the CSEPP function within the Army now resides with the Assistant Secretary of the Army (Installations, Logistics, and Environment), and the Commander of the Soldier and Biological Chemical Command (SBCCOM) has programmatic authority. The CDP provides the funding for the CSEPP as part of the Chemical Agent and Munitions Disposal, Army appropriation and will continue to coordinate and work together with FEMA and SBCCOM and employ a collaborative approach to decision-making and problem-solving by supporting existing Integrated Product and Process Teams.

NON-STOCKPILE CHEMICAL MATERIEL DISPOSAL (NSCMD)

Non-Stockpile Chemical Materiel Project (NSCMP)

Efforts accomplished under the NSCMP are: the location and identification of types and quantities of non-stockpile chemical materiel (NSCM); research development, test and evaluation (RDT&E) of transportation and destruction equipment systems; planning and execution of transportation and destruction operations; and the preparation of overarching project plans, schedules, and cost estimates. NSCM includes recovered chemical warfare materiel, former chemical weapons production facilities, binary chemical weapons, and three categories of miscellaneous materiel.

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Chem Demil, December 31, 1998

7. Executive Summary:

This Selected Acquisition Report (SAR) details impacts to cost and schedule since last reported (December 1997 SAR). This report, together with the Annual Status Report on the Disposal of Chemical Weapons and Materiel for Fiscal Year 1998, provides a complete status of the program as of the submission of the Fiscal Year 2000/2001 President's Budget dated February 1, 1999. Where possible, significant events that have occurred since that date are included in order to provide the most current and timely information available.

The CDP is continuing to make progress towards the elimination of U.S. chemical weapons and materiel and to comply with Chemical Weapons Convention (CWC) requirements. A number of significant milestones were accomplished this past year in the nation's demilitarization effort.

The Program Manager for Chemical Demilitarization (PMCD) has implemented actions necessary to ensure facilities that are in operation can safely sustain operations after the turn of the century. The program has implemented several options to accelerate the achievement of Year 2000 compliance milestones to ensure adequate verification prior to August 31, 1999. Additional options are still being explored to determine if further acceleration is achievable.

Chemical Stockpile Disposal Project (CSDP):

The CSDP is continuing to destroy the U.S. chemical stockpile of unitary chemical agents and munitions, while ensuring maximum protection to the communities surrounding the disposal facilities, the workers involved in the destruction effort, and the environment. As of February 28, 1999, the prototype facility, the Johnston Atoll Chemical Agent Disposal System (JACADS), and the first-generation facility, the Tooele Chemical Agent Disposal Facility (TOCDF) have destroyed 4,233 tons of chemical agent and 433,874 munitions, which altogether represent 13.4 percent of the original national chemical stockpile measured in tons of chemical agent.

JACADS

JACADS is scheduled to complete operations and begin the closure phase in the 4Q FY 00. The focus of JACADS planning is transitioning from disposal operations to disposal operations and closure planning for the facility. The completion of JACADS disposal operations will represent the complete disposal of more than 6 percent (measured in tons of chemical agent) of the original U.S. chemical stockpile. In total, as of February 28, 1999, 1,631 tons of agent have been successfully destroyed at JACADS representing 80.3 percent of the JACADS stockpile and 5.1 percent of the total U.S. stockpile of chemical weapons.

The major accomplishment at JACADS this year was the completion of the nerve agent GB campaign. Despite anticipated challenges with reject projectile processing, the GB campaign was successfully completed in June 1998. Following a period of reconfiguration of JACADS plant equipment to facilitate mustard agent processing, JACADS began processing 4.2-inch mortar rounds in October 1998. As of February 28, 1999, HD (mustard) agent contained in 38,759 mortar rounds has been processed.

The Environmental Protection Agency (EPA), Region IX, has completed the activities

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Chem Demil, December 31, 1998

7. Executive Summary (Cont'd):

necessary to support issuance of the JACADS Resource Conservation and Recovery Act (RCRA) permit renewal. The EPA initiated a public comment period in January 1999 to address the resolution of four operating permit conditions appealed by the Army in July 1998. Final resolution of the permit appeal is anticipated 2Q FY 99 (Jan-Mar).

TOCDF

On August 22, 1998, TOCDF marked the completion of 2 years of safe operations. The facility has surpassed the 15 percent complete milestone (measured in tons of chemical agent) for disposal of the Deseret Chemical Depot, Utah, stockpile. Disposal of 102,437 munitions and storage containers and 2,602 tons of nerve agent GB was completed as of February 28, 1999. TOCDF began processing nerve agent GB MC-1 (750-pound) bombs on January 1, 1998 and completed this campaign on July 26, 1998, destroying 4,463 bombs (the entire TOCDF nerve agent GB MC-1 bomb inventory). Operations at TOCDF are scheduled for completion by the 4Q FY 03 (Jul-Sep). Throughout 1998, TOCDF has been processing GB-filled ton containers and projectiles.

Processing of nerve agent GB M55 rockets at TOCDF was suspended from March 1997 to Sep 98, pending final approval of the Deactivation Furnace System (DFS) trial burn report by the Utah Department of Environmental Quality and issuance of a Toxic Substances Control Act (TSCA) operating permit by the EPA. In September 1998, the EPA issued approval to resume M55 rocket shakedown leading up to a re-evaluation of the DFS trial burn. Rocket processing started in October 1998 and the TOCDF successfully completed the repeat of the DFS trial burn on November 21, 1998 demonstrating better than 99.9999% Destruction Removal Efficiency. The results of the trial burn are to serve as the basis for the EPA-Toxic Substances Control Act (TSCA) to issue a national permit for the disposal of the rocket shipping and firing tubes. These tubes contain a material, polychlorinated biphenyl, regulated by TSCA.

Legal challenges to the sustained operation of the TOCDF continue. Decisions affirming the operations have been issued by Federal Court, State Court, and the Utah Solid and Hazardous Waste Control Board.

ANCDF

The Anniston Chemical Agent Disposal Facility (ANCDF) continues to move forward with construction, toward systemization and operations.

As of February 28, 1999, construction of ANCDF was approximately 36 percent complete. The facility is scheduled to begin chemical agent operations during 2Q FY 02 (Jan-Mar).

UMCDF

The Umatilla Chemical Agent Disposal Facility (UMCDF) continues to move forward with construction, toward systemization and operations.

As of February 28, 1999, construction of UMCDF was approximately 40 percent complete. The facility is scheduled to begin chemical agent disposal operations

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Chem Demil, December 31, 1998

7. Executive Summary (Cont'd):

during 2Q FY 02 (Jan-Mar).

PBCDF

The Arkansas Department of Pollution Control and Ecology and EPA, Region VI, issued the final Pine Bluff Chemical Agent Disposal Facility (PBCDF) environmental permits effective January 15, 1999. Raytheon Demilitarization Company was given full Notice to Proceed with construction activities that same day.

PUCDF/BGCDF

Activities remain on hold for Pueblo Chemical Agent Disposal Facility (PUCDF) and Blue Grass Chemical Agent Disposal Facility (BGCDF) as directed by Public Law 104-208 (FY 97 Defense Appropriation Act). This law established the Assembled Chemical Weapons Assessment (ACWA) program to identify and demonstrate not less than two alternatives to the baseline incineration process for destruction of assembled chemical weapons. The first and second annual status reports provided the status of the ACWA program's chemical munitions demilitarization technologies which were delivered to Congress in December 1997 and December 1998 respectively. A supplemental report containing the demonstration results will not be published until September 1999. Submission of the supplemental report has been delayed from April 1999 to September 1999 due to time required to seek additional program funds and resolution of a protest to the General Accounting Office.

In the event no viable alternative technology is identified, authority to proceed with the baseline technology in BGCDF and PUCDF is required by June 30, 1999, in order to meet the destruction schedule required by the CWC (April 2007). The U.S. Army is evaluating options associated with timelines to enable the U.S. Army to meet CWC destruction schedule milestones.

Alternative Technologies and Approaches Product (ATAP):

The Product Manager for Alternative Technologies and Approaches is proceeding with implementation of neutralization-based chemical demilitarization pilot facilities at the two bulk-only agent storage locations: Aberdeen Proving Ground (APG)-Edgewood Area, MD and Newport Chemical Depot, IN.

The Aberdeen Chemical Agent Disposal Facility (ABCDF) system contract was awarded to a team led by Bechtel National, Inc. on October 2, 1998. The ABCDF environmental permits were issued on February 22, 1999 and site preparation work is scheduled to begin 3Q FY 99 (Apr-Jun).

The Newport Chemical Agent Disposal Facility systems contract was awarded to Parsons Infrastructure & Technology Corporation on February 18, 1999. The RCRA/Clean Air Act permit applications were submitted for review in April 1998. The Clean Water Act permit application was submitted for review in May 1998. Permit approval is expected during 1Q FY 00 (Oct-Dec). The Environmental Impact Statement was submitted for DA approval on December 21, 1998. The Record of Decision (ROD) was signed by the Assistant Secretary of the Army (Installations and Environment) on February 3, 1999.

Non-Stockpile Chemical Materiel Project (NSCMP):

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7. Executive Summary (Cont'd):

The NSCMP continued to plan, prepare for, and execute, in compliance with the CWC, the disposal of U.S. chemical warfare materiel (CWM) not a part of the unitary chemical stockpile.

Preparation of the NSCMP Programmatic Environmental Impact Statement (PEIS) continued during 1998. The draft PEIS is scheduled to be released 3Q FY 99 (Apr-Jun). The PEIS and ROD are expected 3Q FY 00 (Apr-Jun).

The NSCMP met the project milestone "Begin Destruction, Initially Declared Category 3 Chemical Weapons" in November 1997, well ahead of the program baseline date of May 1998. Accomplishment of this project milestone also met the corresponding CWC requirement for start of destruction. The NSCMP has destroyed all Category 3 items for which the project is responsible. Note, however, that the CWC milestone for 100 percent destruction of all U.S. Category 3 materiel has not been met. CSDP retains a number of Category 3 items for use in the systemization of demilitarization facilities. CSDP has the responsibility for the destruction of the remaining CWC Category 3 materiel.

Binary munitions disposal operations at Hawthorne Army Ammunition Plant, which began in November 1997, continued through 1998. The program milestone "100% Destroyed, Excess Binary 'Other' or Non-key Chemical Destroyed" will be met well before the May 1999 program milestone date. Destruction of the critical components was achieved during the first week of January 1999, and destruction of all elements will be complete by March 1999.

The program milestone "Begin Destruction, Initially Declared Schedule 1 Production Facilities" was met with the start of destruction of the APG Pilot Plant, MD, support buildings in April 1998. Six of nine buildings at APG have been destroyed. This met the corresponding CWC milestone.

The date, May 1998, for the program milestone "Begin Destruction, Initially Declared Schedule 2 Production Facilities" was met with the start of destruction of the former BZ fill facility at Pine Bluff Arsenal (PBA), AR, in February 1998. This met the corresponding CWC milestone.

Over 1,600 empty ton containers at Aberdeen Proving Ground were inspected, cleaned and recycled for metal reuse. Preparation was made for future operations at PBA and Desert Chemical Depot (DCD).

Recovered CWM assessments were successfully conducted at Johnston Island using elements of the Mobile Munitions Assessment System (MMAS). An additional MMAS was prepared for testing that started in January 1999.

The RCRA final permit for agent testing of the Rapid Response System (RRS) at DCD was issued by the State of Utah on December 23, 1998. Agent testing is set to begin 2Q FY 99 (Jan-Mar). The RRS will be used for the disposal of Chemical Agent Identification Set components.

The RCRA draft permit for agent testing of the Munitions Management Device, Version One (MMD-1) at Dugway Proving Grounds (DPG) was released by the State of Utah for public comment December 15, 1998. Agent testing is expected to commence

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7. Executive Summary (Cont'd):

3Q FY 99 (Apr-Jun).

The Explosive Destruction System (EDS) was tested with over 30 explosive charges and, on August 22, 1998, a phosgene-loaded pressure bottle was burst and the contents neutralized. This was the first destruction of a simulated CWM item in an NSCMP system. The system will enter an accelerated test program on WWI and WWII recovered munitions in 3Q FY 99 (Apr-Jun), followed by further testing at APG.

Other Programmatic Areas:

The PMCD Public Outreach and Information Office (POIO) continued developing plans and executing programs to promote public involvement. This included opening a new community outreach office in White Hall, AR, near PBA. This is the second community outreach office in the PBA community. The first office was established in the city of Pine Bluff. The POIO moved an outreach office from its on-post location at Newport Chemical Depot, Indiana, to an off-post location in the community to make it more accessible to the public. The POIO also is pursuing a series of initiatives designed to enhance public outreach and involvement in the ever-changing climate of the CDP.

The PMCD, the Department of the Army, and the Office of the Secretary of Defense conducted the fifth and sixth Environmental Forums on the U.S. Chemical Weapons Destruction Program and an Environmental Mini-Forum on Communications. All forums are open to the public. Planning for a seventh forum is ongoing [tentatively scheduled to be held in the 3Q FY 99 (Apr-Jun)].

8. Threshold Breaches:

CSD

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

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8. Threshold Breaches (Cont'd):

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

NSCMD

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MII.CON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

CSD

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
CHEMICAL STOCKPILE DISPOSAL PROJECT (CSDP)			
Chemical Weapons Convention Compliance CWC (Entry into Force is 04/29/97) /2			
1% U.S. Category 1 Chemical Weapons Destroyed	JAN 94	JAN 94	JAN 94
20% U.S. Category 1 Chemical Weapons Destroyed	MAY 02	MAY 02	MAY 02
45% U.S. Category 1 Chemical Weapons Destroyed	MAY 04	MAY 04	MAY 04
100% U.S. Category 1 Chemical Weapons Destroyed	MAY 07	MAY 07	MAY 07
CAMDS Testing	SEP 79	SEP 79	SEP 79
DAB Program Review	MAR 95	MAR 95	MAR 95

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9a. Schedule (Cont'd):

CSD

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
JOHNSTON ATOLL (JACADS)			
JACADS Construction	SEP 85	SEP 85	SEP 85
Begin Operations	JUL 90	JUL 90	JUL 90
Begin Closure	SEP 00	SEP 00	SEP 00
TOOELE (TOCDF)			
Submit RCRA/CAA Permit Applications	OCT 88	OCT 88	OCT 88
Systems Contract Award/Start Const.	OCT 89	OCT 89	OCT 89
Begin Systemization	SEP 93	SEP 93	SEP 93
Begin Operations	AUG 96	AUG 96	AUG 96
Begin Closure	OCT 03	OCT 03	OCT 03
ANNISTON (ANCDF)			
Submit Updated RCRA/CAA Permit Applications	FEB 95	FEB 95	FEB 95
Systems Contract Award/Start Const.	FEB 96	FEB 96	FEB 96
Begin Operations	JAN 02	JAN 02	JAN 02
Begin Closure	NOV 05	NOV 05	NOV 05
UMATILLA (UMCDF)			
Submit Updated RCRA/CAA Permit Applications	SEP 95	SEP 95	SEP 95
Systems Contract Award/Start Const.	FEB 97	FEB 97	FEB 97
Begin Operations	FEB 02	FEB 02	FEB 02
Begin Closure	JUN 05	JUN 05	JUN 05
PINE BLUFF (PBCDF)			
Submit RCRA/CAA Permit Applications	JUL 95	JUL 95	JUN 95
Begin Construction M+1	TBD	TBD	FEB 99 (Ch-1)
Begin Operations M+54	TBD	TBD	AUG 03 (Ch-1)
Begin Closure M+94	TBD	TBD	DEC 06 (Ch-1)
PUEBLO (PUCDF)			
Submit Updated RCRA/CAA Permit Applications	OCT 95	OCT 95	OCT 95
Begin Construction M+1	TBD	TBD	TBD
Begin Operations M+55	TBD	TBD	TBD
Begin Closure M+84	TBD	TBD	TBD
BLUE GRASS (BGCDF)			
Submit RCRA/CAA Permit Applications	DEC 95	DEC 95	DEC 95
Begin Construction M+1	TBD	TBD	TBD
Begin Operations M+55	TBD	TBD	TBD
Begin Closure M+77	TBD	TBD	TBD
ALTERNATIVE TECHNOLOGIES AND APPROACHES			
PRODUCT			
ABERDEEN (ABCDF)			
Milestone 0	AUG 94	AUG 94	AUG 94
Milestone I/II (Pilot Scale)	DEC 96	DEC 96	DEC 96
Milestone III (Operations)	JAN 04	JAN 04	JAN 04
NEWPORT (NECDF)			
Milestone 0	AUG 94	AUG 94	AUG 94
Milestone I/II (Pilot Scale)	DEC 96	DEC 96	DEC 96
Milestone III (Operations)	MAY 04	MAY 04	MAY 04

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9a. Schedule (Cont'd):
CSD

ACRONYMS:

DAB - Defense Acquisition Board
CWC - Chemical Weapons Convention
EIF - Entry Into Force
RCRA - Resource Conservation and Recovery Act
CAA - Clean Air Act
CAMDS - Chemical Agent Munitions Disposal System
JACADS - Johnston Atoll Chemical Agent Disposal System
TOCDF - Tooele Chemical Agent Disposal Facility
ANCDF - Anniston Chemical Agent Disposal Facility
UMCDF - Umatilla Chemical Agent Disposal Facility
PBCDF - Pine Bluff Chemical Agent Disposal Facility
PUCDF - Pueblo Chemical Agent Disposal Facility
BGCDF - Blue Grass Chemical Agent Disposal Facility
ABCDF - Aberdeen Chemical Agent Disposal Facility
NECDF - Newport Chemical Agent Disposal Facility

1. Schedule parameters for the Chemical Stockpile Disposal Project (CSDP) and the Alternative Technologies and Approaches Product (ATAP) have been included under the Chemical Stockpile Disposal (CSD) end item.
2. CWC Milestone Information
 - a. The CWC entered into force on April 29, 1997 for the nations that ratified the CWC prior to this date. The United States Congress ratified the CWC five days earlier, on April 24, 1997. While the start date for the CWC purposes is April 1997, the United States has met some CWC requirements earlier than April 1997.
 - b. The CWC groups chemicals by toxicity and commercial utility by segregation into separate schedules (Annex on Chemicals, Part B, Schedule of Chemicals). Part A of the Schedules lists toxic chemicals and Part B lists Precursors.
 - c. The CWC divides chemical weapons into three categories based on the schedule of chemicals described above:
 - Category 1 - Chemical weapons on the basis of Schedule 1 chemicals and their parts and components.
 - Category 2 - Chemical weapons on the basis of all other chemicals and their parts and components.
 - Category 3 - Unfilled munitions and devices, and equipment specifically designed for use directly in

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9a. Schedule (Cont'd):

CSD

conjunction with employment.

While the majority of the Category 1 Chemical Weapons are contained in the Chemical Stockpile Disposal Project, the Non-Stockpile Chemical Materiel Project has declared Category 1 Chemical Weapons also. The United States currently has no declared Category 2 Chemical Weapons.

3. "M" equals the date (month) that the environmental permit applications are approved by the state. "M+" is that date plus the cumulative number of months by phase (i.e., construction, operations, closure) after issuance of the environmental permits by the state.
4. The FY97 Defense Appropriations Act, signed into law on September 30, 1996, required that no funds for construction of a baseline incineration facility at Pueblo Chemical Depot and Blue Grass Army Depot be obligated until 180 days after the Secretary of Defense report on the effectiveness of at least two alternative technologies for assembled munitions identified and demonstrated under a pilot program and meeting applicable safety and environmental requirements. Once this is accomplished, objective and threshold dates for these facilities will be established. "M" dates shown for PUCDF and BGCDF assume incineration based disposal process at these sites should Congress direct using incineration as the technology of choice.

b. Current Change Explanations --

(Ch-1) PBCDF - The System Contractor, Raytheon Demilitarization Company, was provided a Full Notice to Proceed for construction, equipment installation, systemization, operations and closure of the PBCDF facility on January 15, 1999. The current estimate for the following milestones have changed from TBD to the milestone dates listed below because the Resource Conservation and Recovery Act permit for the PBCDF was issued.

MILESTONES	FROM	TO
Begin Construction M+1	TBD	Feb 99
Begin Operations M+54	TBD	Aug 03
Begin Closure M+94	TBD	Dec 06

NSCMD

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9a. Schedule (Cont'd):

NSCMD

a. Milestones --

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
NON-STOCKPILE CHEMICAL MATERIEL			
DISPOSAL PROJECT (NSCMD)			
Chemical Weapons Convention			
Compliance (Entry Into			
Force is 29 April 97)			
Initially Declared Category 1			
Chemical Weapons (Other than Binary)			
100% Destroyed (EIF + 10 yrs)	MAY 07	MAY 07	MAY 07
Initially Declared Category 3			
Chemical Weapons			
Begin Destruction (EIF + 1 yr)	MAY 98	MAY 98	NOV 97 (Ch-1)
100% Destroyed (EIF + 5 yrs)	MAY 02	MAY 02	MAY 02
Initially Declared Category 1			
Chemical Weapons (Binary)			
Excess Binary "Other" or Non-key	MAY 99	MAY 99	JAN 99 (Ch-2)
Chemical destroyed (EIF + 2 yrs)			
100% Destroyed (EIF + 10 yrs)	MAY 07	MAY 07	MAY 07
Initially Declared Schedule 1			
Production Facilities			
Begin Destruction (EIF + 1 yr)	MAY 98	MAY 98	APR 98 (Ch-3)
100% Destroyed Period 3 (EIF +	MAY 07	MAY 07	MAY 07
10 yrs)			
Initially Declared Schedule 2			
Production Facilities			
Begin Destruction (EIF + 1 yr)	MAY 98	MAY 98	FEB 98 (Ch-4)
100% Destroyed (EIF + 5 yrs)	MAY 02	MAY 02	MAY 02
Disposal of CWM (non CWC)	MAY 07	MAY 07	MAY 07
Storage, Transportation, Disposal of	MAY 07	MAY 07	MAY 07
CWM in Support of Remediation/			
Emergency Operations			

ACRONYMS:

CWC - Chemical Weapons Convention
CWM - Chemical Warfare Materiel
EIF - Entry Into Force

1. While the majority of the Category 1 Chemical Weapons are contained in the Chemical Stockpile Disposal Project, the Non-Stockpile Chemical Materiel Project has declared Category 1 Chemical Weapons also. The United States currently has no declared Category 2 Chemical Weapons.
2. The date April 2007 reflects the proposed funding cut off of the chemical Agent and Munitions Disposal, Army (CAMD/A) funds for purposes of the APB.

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9b. Schedule (Cont'd):

NSCMD

b. Current Change Explanations --

(Ch-1) This milestone was achieved when destruction of M687 water-filled projectiles took place at Hawthorne Army Depot (HWAD) during November 1997.

<p> MILESTONES Initially Declared Category 3 Chemical Weapons Binary Destruction (EIF + 1 yr) </p>	<p> FROM MAY 98 </p>	<p> TO NOV 97 </p>
---	-------------------------------------	-----------------------------------

(Ch-2) This milestone was achieved when destruction of the Excess Binary "Other" or Non-key Chemical was completed in early Jan 99.

<p> MILESTONES Initially Declared Category 1 Chemical Weapons (Binary) Excess Binary "Other" or Non-key Chemical Destroyed (EIF + 2 yrs) </p>	<p> FROM MAY 99 </p>	<p> TO JAN 99 </p>
---	-------------------------------------	-----------------------------------

(Ch-3) This milestone was achieved when destruction of the Aberdeen Proving Ground Pilot Plant support buildings began 28 Apr 98.

<p> MILESTONES Initially Declared Schedule 1 Production Facilities Begin Destruction (EIF + 1 yr) </p>	<p> FROM MAY 98 </p>	<p> TO APR 98 </p>
---	-------------------------------------	-----------------------------------

(Ch-4) This milestone was achieved when destruction of the former BZ fill facility at Pine Bluff Arsenal, AR began in Feb 98.

<p> MILESTONES Initially Declared Schedule 2 Production Facilities Begin Destruction (EIF + 1 yr) </p>	<p> FROM MAY 98 </p>	<p> TO FEB 98 </p>
---	-------------------------------------	-----------------------------------

10. Performance Characteristics:

CSD

a. Performance --

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
CHEMICAL STOCKPILE DISPOSAL PROGRAM				
Environmental Laws & Regulations	Meets or Exceeds State and/or Federal Rqmts	Meets or / Meets or Exceeds / Exceeds State / State and/or / and/or Federal / Federal Rqmts / Rqmts	Meets or Exceeds TBD	Meets or Exceeds State and/or Federal Rqmts (Note 1)

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10a. Performance Characteristics (Cont'd):

CSD

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>			<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Safety and Occupational Laws and Regulations	Meets or Exceeds State and/or Federal Reqmts	Meets or/ Exceeds / State / and/or / Federal / Reqmts /	Meets or Exceeds State and/or Federal Reqmts	Meets or Exceeds State and/or Federal Reqmts	TBD	Meets or Exceeds State and/or Federal Reqmts (Note 2)
Chemical Agent Release	0	0	/ 0	/	TBD	0 (Notes 3&5)
Chemical Agent Exposure	0	0	/ 0	/	TBD	0 Notes (4&5)

ACRONYMS

GB - Nerve Chemical Agent
H/HD - Mustard Blister Chemical Agent
VX - Nerve Chemical Agent

1. "Meets environmental laws and regulations" means the facility is operating in compliance with all conditions specified in environmental permits and applicable laws and regulations. The threshold is breached if violation of law or regulation warrants a stop-work order issued by the state or the Environmental Protection Agency.

2. "Meets safety and occupational health laws and regulations" means the facility is operating in compliance with the conditions specified in safety and occupational health laws and regulations. The threshold is breached if a violation warrants a stop-work order issued by the state.

3. a. Chemical Stockpile Disposal: The term "Chemical Agent Release" is defined as an event involving:

1. Confirmed agent release above the 72-hour general population time weighted average (TWA) measure at a perimeter monitoring station with the disposal facility as the identified source. The 72-hour general population TWA values are:

GB - 0.000003 mg/m³
VX - 0.000003 mg/m³
H/HD/HT - 0.0001 mg/m³

2. Confirmed point source (stack) agent release above the allowable stack concentration (ASC). The ASC values are:

GB - 0.0003 mg/m³

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10a. Performance Characteristics (Cont'd):

CSD

VX - 0.0003 mg/m3
H/HO/HT - 0.03 mg/m3

3. Clinical symptoms of agent exposure to one or more individuals.

b. Non-Stockpile Chemical Materiel Disposal: A "Chemical Release" is defined as an event involving a chemical release above the applicable federal, state, or local restriction, with the processing system (i.e., RRS, MMD, etc.) as the confirmed source of the chemical release.

4. A "Chemical Agent Exposure", as defined by DA PAM 40-173 and DA PAM 40-8, refers to an individual who exhibits clinical signs or symptoms of being exposed to chemical agent.

5. Number of events

b. Current Change Explanations -- None

NSCMD

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
NON-STOCKPILE CHEMICAL MATERIEL DISPOSAL PROJECT				
Environmental Laws & Regulations	Meets or Exceeds State and/or Federal Rqmts	Meets or/ Exceeds / State / State and/or / and/or Federal / Federal Rqmts / Rqmts	TBD	Meets or Exceeds State and/or Federal Rqmts (Note 1)
Safety and Occupational Laws and Regulations	Meets or Exceeds State and/or Federal Rqmts	Meets or/ Exceeds / State / State and/or / and/or Federal / Federal Rqmts / Rqmts	TBD	Meets or Exceeds State and/or Federal Rqmts (Note 2)
Chemical Agent Release	0	0 / 0	TBD	0 (Notes 3&5)
Chemical Agent Exposure	0	0 / 0	TBD	0 (Notes 4&5)

Note: Approved Program Demonstrated Performance and Current Estimate parameters are explained in the notes accompanying the CSD portion of this

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10a. Performance Characteristics (Cont'd):

NSCMD

section. The performance parameters for the CSD and the NSCMD are identical.

b. Current Change Explanations -- None

11. Total Program Cost and Quantity (Dollars in Millions):

CSD

	Production <u>Estimate (SAR)</u>	Approved <u>Program (APR)</u>	Current <u>Estimate</u>
a. Cost --			
Development (RDT&E)	720.0	720.0	725.7
Procurement	2442.3	2442.3	2127.4
Flyaway	(2442.3)		(2127.4)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	1521.4	1521.4	1534.1
Acquisition O&M	<u>7583.1</u>	<u>7583.1</u>	<u>7529.7</u>
Total FY 94 Base-Year \$	12266.8	12266.8	11916.9
Escalation	1614.4	1614.4	1289.9
Development (RDT&E)	(99.4)	(99.4)	(79.9)
Procurement	(174.1)	(174.1)	(95.9)
Construction (MILCON)	(144.7)	(144.7)	(131.7)
Acquisition O&M	<u>(1196.2)</u>	<u>(1196.2)</u>	<u>(982.4)</u>
Total Then Year \$	13881.2	13881.2	13206.8

German retrograde and Johnston Atoll leave are included in O&M funding.

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>9</u>	<u>9</u>	<u>9</u>
Total	9	9	9

The PM's current estimate does not include \$374.5M in Chemical Agent Munition Destruction, Army (CAMD,A) RDT&E funding associated with the Assembled Chemical Weapon Assessment (ACWA) Program.

Public Law 104-208 (Section 8065) required the conduct of a pilot program to identify and demonstrate not less than two alternatives to the baseline incineration process for the demilitarization of assembled chemical munitions. The Assembled Chemical Weapon Assessment (ACWA) Program was created to carry out this mission. The Under Secretary of Defense for Acquisition and Technology designated a separate program manager for this program in Fiscal Year 1997. Because it is a separate Program Office, the ACWA portion of the CAMD,A appropriation is not reported as part of the PMCD current estimate.

Total quantity is defined as 9 (8 CONUS plants and Johnston Atoll).

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11c. Total Program Cost and Quantity (Cont'd):

CSD

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

NSCMD

a. Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	241.2	241.2	247.3
Procurement	70.2	70.2	71.8
Flyaway	(70.2)		(71.8)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	892.9	892.9	873.8
Total FY 94 Base-Year \$	1204.3	1204.3	1192.9
Escalation	224.8	224.8	187.2
Development (RDT&E)	(29.9)	(29.9)	(26.6)
Procurement	(12.4)	(12.4)	(10.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(182.5)	(182.5)	(150.0)
Total Then Year \$	1429.1	1429.1	1380.1
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	6	6	6
Total	6	6	6

The procurement quantity of six includes a non-homogeneous mix of two Rapid Response Systems (RRS) and four Munitions Management Devices (MMD) (with energetics), two original systems and two replacements. This is the number of units for the two systems to be fielded by the Non-Stockpile Chemical Materiel Project (NSCMP) as procurement items through Fiscal Year 2007 as defined in the June 1997 NSCMP Implementation Plan. The Implementation Plan was based upon the inventory of munitions to be processed and their location as it was known at the time the plan was generated and the designed processing rate of each of the systems. The total quantity of items in the inventory to be processed will continue to change. Processing requirements and methodologies will be better defined as the inventory is assessed. As a result, the types of systems, the number of each type of system, and the total number of systems to be fielded may change.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

CSD

	UCR Baseline (MAR 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 94 BY\$)	12266.8	11916.9	
(2) Quantity	9	9	
(3) Unit Cost	1362.978	1324.100	-2.85
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 94 BY\$)	2442.3	2127.4	
(2) Quantity	9	9	
(3) Unit Cost	271.367	236.378	-12.89

NSCMD

	UCR Baseline (MAR 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 94 BY\$)	1204.3	1192.9	
(2) Quantity	6	6	
(3) Unit Cost	200.717	198.817	-0.95
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 94 BY\$)	70.2	71.8	
(2) Quantity	6	6	
(3) Unit Cost	11.700	11.967	+2.28

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13. Cost Variance Analysis:

CSD

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	819.4	2616.4	1666.1	8779.3	13881.2
Previous Changes:					
Economic	-	-	-	-	-
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+11.0	-33.0	+0.6	-27.6	-49.0
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+11.0	-33.0	+0.6	-27.6	-49.0
Current Changes:					
Economic	-19.1	-26.1	-15.0	-205.4	-265.6
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-5.7	-334.0	+14.1	-34.2	-359.8
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	-24.8	-360.1	-0.9	-239.6	-625.4
Total Changes	-13.8	-393.1	-0.3	-267.2	-674.4
Current Estimate	805.6	2223.3	1665.8	8512.1	13206.8

Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	720.0	2442.3	1521.4	7583.1	12266.8
Previous Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+9.9	-29.4	-1.0	-26.2	-46.7
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+9.9	-29.4	-1.0	-26.2	-46.7
Current Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-4.2	-285.5	+13.7	-27.2	-303.2
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	-4.2	-285.5	+13.7	-27.2	-303.2
Total Changes	+5.7	-314.9	+12.7	-53.4	-349.9
Current Estimate	725.7	2127.4	1534.1	7529.7	11916.9

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Chem Demil, December 31, 1998

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

b. Current Change Explanations --		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>			
Revised escalation indices (Economic)	N/A	-19.5	
Economic adjustment for negative program change (Economic)	N/A	+0.4	
Adjustment for Current and Prior Inflation (Estimating)	+2.5	+2.9	
Decrease in the program estimate to reflect revised inflation assumptions (Estimating)	-6.7	-8.6	
RDT&E Subtotal	-4.2	-24.8	
(2) <u>Procurement</u>			
Revised escalation indices (Economic)	N/A	-36.4	
Economic adjustment for negative program change (Economic)	N/A	+10.3	
Adjustment for Current and Prior Inflation (Estimating)	+4.6	+5.2	
Adjustment to reflect prior year actuals (Estimating)	+3.1	+3.1	
Cost reductions implemented in the current year (Estimating)	-21.1	-24.2	
Reprogramming of Chemical Agent Munition Destruction, Army appropriations to fund Program Management for Assembled Chemical Weapons Assessment Program (Estimating)	-268.5	-312.7	
Decrease in the program estimate to reflect revised inflation assumptions (Estimating)	-3.6	-5.4	
Procurement Subtotal	-285.5	-360.1	
(3) <u>MILCON</u>			
Revised escalation indices (Economic)	N/A	-15.0	
Adjustment for Current and Prior Inflation (Estimating)	+4.5	+4.9	
Adjustment to reflect prior year actuals (Estimating)	+13.7	+12.5	
Revised requirements as submitted by the Corp of Engineers (Estimating)	-4.5	-3.3	
MILCON Subtotal	+13.7	-0.9	
(4) <u>O&M</u>			
Revised escalation indices (Economic)	N/A	-206.7	
Economic adjustment for negative program change (Economic)	N/A	+1.3	
Adjustment for Current and Prior Inflation (Estimating)	+15.4	+17.5	

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

CSD

b. Current Change Explanations --

(Dollars in Millions)

Decrease in the program estimate to reflect
revised inflation assumptions (Estimating)

Base-Year Then-Year
-42.6 -51.7

O&M Subtotal

-27.2 -239.6

NSCMD

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	271.1	82.6	-	1075.4	1429.1
Previous Changes:					
Economic	-	-	-	-	-
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-1.6	+2.2	-	-2.6	+1.2
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	-1.6	+2.2	-	-2.6	+1.2
Current Changes:					
Economic	-5.0	-1.9	-	-29.0	-35.9
Quantity	-	-	-	-	-
Schedule	-	-2.4	-	-	-2.4
Engineering	-	-	-	-	-
Estimating	+6.2	+1.9	-	-20.0	-11.9
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+1.2	-2.4	-	-49.0	-50.2
Total Changes	+2.8	-0.2	-	-51.6	-49.0
Current Estimate	273.9	82.4	-	1023.8	1380.1

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

NSCMD

Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	O&M	TOTAL
Production Estimate	241.2	70.2	-	892.9	1204.3
Previous Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+0.9	+1.9	-	-3.0	-0.2
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+0.9	+1.9	-	-3.0	-0.2
Current Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+5.2	-0.3	-	-16.1	-11.2
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+5.2	-0.3	-	-16.1	-11.2
Total Changes	+6.1	+1.6	-	-19.1	-11.4
Current Estimate	247.3	71.8	-	873.8	1192.9

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RD&E</u>		
Revised escalation indices (Economic)	N/A	-5.0
Adjustment for Current and Prior Inflation (Estimating)	+1.5	+1.7
Adjustments for prior years to reflect actual costs (Estimating)	+3.7	+4.5
RD&E Subtotal	+5.2	+1.2
(2) <u>Procurement</u>		
Revised escalation indices (Economic)	N/A	-2.3
Economic adjustment for negative program change (Economic)	N/A	+0.4
Acceleration of annual procurement buy profile (Schedule)	0.0	-2.4
Adjustment for Current and Prior Inflation (Estimating)	+0.1	+0.1
Adjustments for prior years to reflect actual costs (Estimating)	-0.4	+1.8
Procurement Subtotal	-0.3	-2.4
(3) <u>O&M</u>		
Revised escalation indices (Economic)	N/A	-29.6

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

NSCMD

b. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Economic adjustment for negative program change (Economic)	N/A	+0.6
Adjustment for Current and Prior Inflation (Estimating)	+2.1	+2.4
Adjustments for prior years to reflect actual costs (Estimating)	-18.2	-22.4
O&M Subtotal	-16.1	-49.0

14. Unit Cost and Other History (Then-Year Dollars in Millions):

CSD

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1542.36	-29.51	-0.01	--	--	-45.42	--	--	-74.94	1467.42

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
290.71	-2.90	--	--	--	-40.78	--	--	-43.68	247.03

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	SEP 95	MAR 98	DEC 98
Total Cost	N/A	11903	13881.2	13195.3
Total Quantity	N/A	9	9	9
Prog Acq Unit Cost	N/A	1322.56	1542.36	1466.14

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Chem Demil, December 31, 1998

14a. Unit Cost and Other History (Cont'd):

NSCMD

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
238.18	-5.98	--	-0.40	--	-1.78	--	--	-8.16	230.02

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
13.77	-0.32	--	-0.40	--	+0.68	--	--	-0.04	13.73

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
PUE/IOC	N/A	SEP 95	MAR 98	DEC 98
Total Cost	N/A	1207.6	1429.1	1380.1
Total Quantity	N/A	1	6	6
Prog Acq Unit Cost	N/A	1207.6	238.18	230.02

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

a. Procurement --

TOCDF Sys Contractor:
EG&G Defense Matl's, Tooele, UT
DACA87-89-C-0076, CPAF
Award: July 21, 1989
Definitized: July 21, 1989

Initial Contract Price		
Target	Ceiling	Qty
\$211.0	N/A	1

Current Contract Price

Target	Ceiling	Qty
\$901.3	N/A	1

Estimated Price At Completion

Contractor	Program Manager
\$1041.2	\$1099.8

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Chem Demil, December 31, 1998

15a. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-9.5	\$-3.6
Cumulative Variances To Date	<u>\$-7.4</u>	<u>\$-2.8</u>
Net Change	\$2.1	\$0.8

Explanation of Change:

The cost and schedule variances since the previous report are favorable and are not significant.

The target price is the current contract value through MOD P00176 including fee.

<u>ANCDF Systems Contract:</u>			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Westinghouse, Anniston, AL			\$575.8	N/A	1
DAA-09-96-C-0018, FFP/CPAF					
Award: February 29, 1996					
Definitized: February 29, 1996					
			Estimated Price At Completion		
			<u>Contractor</u>	<u>Program Manager</u>	
			\$579.8	\$615.7	

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.3	\$-0.6
Cumulative Variances To Date	<u>\$-0.2</u>	<u>\$-1.7</u>
Net Change	\$-0.5	\$-1.1

Explanation of Change:

The contract contains both fixed price (Construction) and cost plus elements (Systemization). Only the Cost Plus Award Fee (CPAF) portion is being reported in a Cost Performance Report (CPR). The contract is currently negotiated through Fiscal Year 1999.

The unfavorable cost and schedule variances since the previous report are not significant.

<u>UMCDF Systems Contract:</u>			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Raytheon Demil Company, Umatilla, OR			\$566.8	\$566.8	1
DAAA09-97-C-0025, FFP/CPAF					
Award: February 10, 1997					
Definitized: February 10, 1997					
			Estimated Price At Completion		
			<u>Contractor</u>	<u>Program Manager</u>	
			\$580.9	\$583.5	

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Chem Demil, December 31, 1998

15. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.7	\$-4.0
Cumulative Variances To Date	<u>\$2.5</u>	<u>\$-55.3</u>
Net Change	\$1.8	\$-51.3

Explanation of Change:

The contract contains both fixed price (Construction) and cost plus elements (Systemization). Both the Firm Fixed Price and CPAF portions are being reported in the CPR. The contract is currently negotiated through Fiscal Year 1999.

The contractor has reported a schedule variance which relates to the firm fixed price portion of the contract. It is based on approved progress payments accepted by the U.S. Army Corps of Engineers. It is used to track schedule progress and measure potential impacts on the cost-plus portion of the contract. A recovery plan was developed to bring construction back on schedule and was presented to PMCD Management in late January 1999. This plan, which contains several alternatives, is currently being evaluated.

<u>PBCDF Systems Contract:</u> Raytheon Demil Company, Philadelphia, PA DAAA09-97-C0098, FFP/CPAF Award: N/A Definitized: July 25, 1997	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$511.6	\$511.6	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>
\$511.6	\$511.6	1	\$	\$

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	<u>N/A</u>	<u>N/A</u>
Net Change	N/A	N/A

Explanation of Change:

None.

Contract Comments:

The limited notice to proceed for the Raytheon Demilitarization Company (RDC) contract was extended to accommodate the public comment period associated with issuance of the facility's RCRA/CAA permits. RDC was given Full Notice to Proceed on 15 Jan 99.

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Chem Demil, December 31, 1998

15. Contract Information (Cont'd):

<u>ABCDEF Systems Contract:</u>			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Bechtel National Inc., San Francisco, CA			\$305.6	\$305.6	1
DAAA09-98-C-0080, CPAF					
Award: October 2, 1998					
Definitized: N/A					

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$305.6	\$305.6	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

Explanation of Change:

None.

Contract Comments:

This contract was awarded on October 2, 1998 with initial, limited funding. Complete information is not currently available but will be provided in subsequent reports. The first Cost Performance Report will be submitted in April 1999.

b. O&M --

<u>JACADS Operator & Maint.:</u>			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Raytheon Eng. & Constr., Johnston Island			\$9.3	\$9.3	1
DAAA09-96-C-0081, CPAF					
Award: September 28, 1996					
Definitized: September 28, 1996					

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$408.5	\$408.5	1	\$441.4	\$424.2

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$2.1	\$-2.4
Cumulative Variances To Date	\$1.0	\$-3.2
Net Change	\$-1.1	\$-1.5

Explanation of Change:

The unfavorable cost and schedule variances since the previous report are not significant.

This contract is negotiated yearly with the contractor. It was initially funded (\$9.3M) to reflect efforts required only in Fiscal Year 1996. The previous report (December 31, 1997) reported a Current Contract Price target

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Chem Demil, December 31, 1998

15. Contract Information (Cont'd):

and ceiling price of \$206.4M reflecting the cumulative value of Fiscal Years 1996-1998. The increase in this report from \$206.4M in the target and ceiling price to \$408.5M reflects the cumulative value of Fiscal Years 1996-1998 plus the negotiation of the Fiscal Year 1999 budget and the estimated cost of authorized unpriced work for Fiscal Year 2000 and beyond.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY88-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	432.8	203.8	130.2	312.7	1079.5
Procurement	1566.2	241.5	51.2	446.8	2305.7
MILCON	787.5	267.1	290.0	321.2	1665.8
O&M	3383.2	593.5	622.1	4937.1	9535.9
Total	6169.7	1305.9	1093.5	6017.8	14586.9

CSD

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

<u>Appropriation</u>	<u>Prior Years (FY88-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	277.2	162.0	100.9	265.5	805.6
Procurement	1539.6	233.1	50.1	400.5	2223.3
MILCON	787.5	267.1	290.0	321.2	1665.8
O&M	3167.9	521.7	534.0	4288.5	8512.1
Total	5772.2	1183.9	975.0	5275.7	13206.8

NSCMD

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

<u>Appropriation</u>	<u>Prior Years (FY92-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-07)</u>	<u>Total</u>
RDT&E	155.6	41.8	29.3	47.2	273.9
Procurement	26.6	8.4	1.1	46.3	82.4
MILCON	-	-	-	-	-
O&M	215.3	71.8	88.1	648.6	1023.8
Total	397.5	122.0	118.5	742.1	1380.1

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Chem Demil, December 31, 1998

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

b. Annual Summary -- CSD

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				6.0	4.9
1989				20.0	17.8
1990				8.6	7.9
1991				5.6	5.3
1992				14.2	13.9
1993				6.5	6.5
1994				24.6	25.0
1995				9.1	9.4
1996				21.2	22.2
1997				21.9	23.5
1998				23.2	25.5
1999				103.8	115.3
2000				145.0	162.0
2001				88.8	100.9
2002				121.6	140.7
2003				97.5	115.0
2004				5.2	6.3
2005				0.7	0.8
2006				2.2	2.7
Subtotal				725.7	805.6

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988			117.3	117.3	96.4
1989			49.1	49.1	43.8
1990	1		78.4	78.4	72.2
1991			121.0	121.0	115.1
1992			155.2	155.2	151.8
1993			242.8	242.8	242.7
1994			47.8	47.8	48.7
1995			188.3	188.3	195.2
1996	1		215.0	215.0	225.6
1997			154.7	154.7	165.8
1998			65.5	65.5	72.0
1999			99.3	99.3	110.3
2000			208.7	208.7	233.7
2001	2		44.1	44.1	50.7
2002	1		205.5	205.5	237.7
2003	1		55.4	55.4	65.3
2004	3		36.0	36.0	43.3

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Chem Demil, December 31, 1998

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

CSD

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2005			22.7	22.7	27.9
2006			10.1	10.1	12.7
2007			6.2	6.2	7.9
2008			3.2	3.2	4.2
2009			1.1	1.1	1.5
Subtotal	9		2127.4	2127.4	2223.3

There are recurring flyaway dollars for years with no quantities due to the complexity of the program and the length of time it takes to procure a demilitarization facility.

Appropriation: 0500 - Military Construction, Defense Agencies

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				31.2	32.9
1996				12.2	13.0
1997				112.4	121.0
1998				79.4	86.5
1999				67.8	74.8
2000				236.9	267.1
2001				252.8	290.0
2002				204.1	238.6
2003				54.1	64.6
2004				14.8	18.0
Subtotal				1065.7	1206.5

Appropriation: 2050 - Military Construction, Army

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				18.1	16.0
1989				76.7	69.6
1990				6.4	6.0
1991				93.1	90.5
1992				144.6	143.8
1993				9.9	10.0
1994				119.6	123.4
Subtotal				468.4	459.3

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Chem Demil, December 31, 1998

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

CSD

Appropriation: 0100 - Operation & Maintenance, Defense Agencies

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				118.1	97.0
1989				131.5	117.3
1990				189.1	174.1
1991				181.2	172.3
1992				211.1	206.5
1993				261.3	261.1
1994				265.1	270.0
1995				332.1	344.4
1996				310.8	326.2
1997				392.7	420.9
1998				330.2	363.1
1999				373.4	415.0
2000				467.0	521.7
2001				470.0	534.0
2002				518.9	600.2
2003				481.9	568.2
2004				637.5	767.6
2005				680.3	836.3
2006				428.2	537.4
2007				329.1	421.7
2008				179.1	234.3
2009				213.1	284.6
2010				28.0	38.2
Subtotal				7529.7	8512.1

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	9		2127.4	11448.5	12747.5
Army				468.4	459.3
Grand Total	9		2127.4	11916.9	13206.8

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Chem Demil, December 31, 1998

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

b. Annual Summary -- NSCMD

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994				5.6	5.7
1995				10.9	11.3
1996				29.4	30.8
1997				29.9	32.1
1998				33.5	36.8
1999				35.0	38.9
2000				37.4	41.8
2001				25.8	29.3
2002				15.5	17.9
2003				10.8	12.7
2004				6.4	7.7
2005				4.2	5.2
2006				2.9	3.7
Subtotal				247.3	273.9

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994			2.7	2.7	2.7
1995			3.2	3.2	3.3
1996	1		12.2	12.2	12.8
1997			2.5	2.5	2.7
1998			0.2	0.2	0.2
1999			4.4	4.4	4.9
2000	1		7.5	7.5	8.4
2001			1.0	1.0	1.1
2002	2		18.8	18.8	21.8
2003					
2004					
2005					
2006	1		9.5	9.5	11.9
2007	1		9.8	9.8	12.6
Subtotal	6		71.8	71.8	82.4

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Chem Demil, December 31, 1998

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

NSCMD

Appropriation: 0100 - Operation & Maintenance, Defense Agencies

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				4.3	4.2
1993				6.3	6.3
1994				20.8	21.2
1995				10.9	11.3
1996				17.0	17.8
1997				29.4	31.5
1998				43.8	48.2
1999				67.3	74.8
2000				64.3	71.8
2001				77.5	88.1
2002				81.0	93.7
2003				74.5	87.8
2004				109.7	132.1
2005				111.4	136.9
2006				102.5	128.6
2007				53.1	69.5
Subtotal				873.8	1023.8

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	6		71.8	1192.9	1380.1

17. Delivery/Expenditure Information:

CSD

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	2	2

Percent Total Program Quantities Delivered: 22.2%

b. Total Expenditures To Date (In Millions of Dollars): \$ 3833

Percent Total Program Expended: 29.0%

N/A

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Chem Demil, December 31, 1998

17. Delivery/Expenditure Information (Cont'd):

NSCMD

NSCMD

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 188

Percent Total Program Expended: 13.6%

N/A

18. Operating and Support Costs:

CSD

a. Assumptions and Ground Rules --

O & S costs are an integral part of the Chem Demil Program and as such are reported in sections 11, 12, 13, and 16 in this report.

b. Costs -- (FY 1994 Constant (Base-Year) Dollars in Millions)

Cost Element	Actual Annual Cost FY88-FY95	To Complete Program FY96-FY05
Mission Pay & Allowances	0.0	0.0
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	0.0	0.0

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Chem Demil, December 31, 1998

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

NSCMD

a. Assumptions and Ground Rules --

O & S costs are an integral part of the Chem Demil Program and as such are reported in sections 11, 12, 13, and 16 in this report.

b. Costs -- (FY Constant (Base-Year) Dollars in Thousands)

Cost Element		
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	N/A	N/A

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AF-4 B-1 CMUP

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: B-1B CMUP

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): B-1B Conventional Munitions Upgrade Program (JDAM/Computer Upgrade/DSUP)
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:
ASC/YD Col Ben F. McCarter
B-1 System Program Office Assigned: June 1, 1997
2690 Loop Road West, Bldg 556 DSN 986-9187; COMM (937) 656-9187
WPAFB, OH 45433-7148 Ben.McCarter@blb.wpafb.af.mil
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0604226F Project
PROCUREMENT:
(U) APPN 3010 ICN 0101126F (Air Force)
O&M:
(U) PE 0101226F

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DIRECTORATE FOR FREEDOM OF INFORMATION:
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

SAF/PAS

99-0268

CONGRESSIONAL

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B-1B CMUP, December 31, 1998

5. (U) References:

JDAM

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline dated January 25, 1995.

Approved Program / Production Estimate (PdE):

(U) SAE Approved Acquisition Program Baseline (APB) dated February 9, 1999.

Computer Upgrade

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline dated January 25, 1995.

Approved Program:

(U) SAE Approved Acquisition Program Baseline (APB) dated September 18, 1998.

DSUP

SAR Baseline (Development Estimate):

(U) DAE approved Acquisition Program Baseline (APB) dated April 14, 1997.

Approved Program:

(U) SAE Approved Acquisition Program Baseline (APB) dated September 18, 1998.

6. (U) Mission and Description:

(U) In the January 1992 publication of The Bomber Roadmap, the Secretary of the Air Force designated the B-1B as the backbone of the bomber force. In the August 1992 Mission Need Statement and the April 1993 Operational Requirements Document, HQ ACC specified the need for an improved conventional mission capability on the B-1B. This will primarily be accomplished via the Conventional Mission Upgrade Program (CMUP)-- three major upgrades to the aircraft.

The first upgrade will enhance the capability of the B-1B Lancer to perform near precision attacks against all but heavily defended targets deep in enemy airspace during conventional operations. The requirement is satisfied with a material solution to provide the B-1B with improved lethality through the integration of near precision conventional weapons such as the Joint Direct Attack Munition (JDAM). As part of the advanced munitions integration, implementation of MIL-STD-1760 electrical interconnect system, communication upgrades and the Global Positioning System (GPS) is included. The upgrade is a modification program integrating predominantly non-developmental items to enhance aircraft conventional mission capabilities.

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

The Computer Upgrade is the major element of the next step of the CMUP. This portion will upgrade B-1B offensive avionics hardware and software to provide improved conventional weapons carriage and employment capabilities. Six existing computers (Controls and Displays, Guidance and Navigation, Weapon Delivery, Critical Resources Function, and two Terrain Following) will be replaced with four new computers. The current Data Transfer System (DTS) will be replaced with a new DTS, and the avionics flight software will be converted/rehosted from JOVIAL to Ada. The objective is to increase memory capacity, throughput, input/output bandwidth, and growth potential; to improve reliability and maintainability; and to provide a weapons flexibility capability. Weapons flexibility will enable the B-1B to carry and deliver three different types of weapons (one type per weapons bay) on the same sortie employing a single software load. The B-1B Computer Upgrade is a modification program integrating predominantly non-developmental items to enhance aircraft conventional mission capabilities.

The existing ALQ-161 defensive system, designed and optimized for the strategic nuclear mission (i.e., low altitude penetration against specific air defense threats) has limited effectiveness in the B-1B's conventional mission. Therefore, the last phase of CMUP (Defensive System Upgrade Program (DSUP)) will remove most of the ALQ-161 system and replace it with an upgraded AN/ALR-56M radar warning receiver and the RF Countermeasures (RFCM) portion of the Navy's IDECM program, which includes a techniques generator and a fiber optic towed decoy. An NDI low band transmitter for on-board jamming will be installed to provide the requisite threat coverage. These new systems will significantly improve situational awareness and the survivability of the B-1B in the medium and high altitude regimes where most conventional missions will be conducted. These enhancements are required to maximize the effectiveness of the new weapons capability provided under CMUP. Additionally, these modifications will reduce annual O&S costs approximately \$50M per year.

The B-1 currently fulfills conventional roles. CMUP modifications will not degrade its capability to re-role back to a nuclear platform should the need arise.

For greater economy and efficiency, the B-1B program has chosen to pursue integrated "block" updates of software which combine development activities for capability upgrades and sustainment activities for deficiency corrections and increased reliability and maintainability. Once the content of a block is defined, it becomes an integrated effort, with activities dependent on each other. Therefore, the Acquisition O&M funds are included to capture the dependency of the development upgrades upon the sustainment activities.

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7. (U) Executive Summary:

This B-1 Conventional Mission Upgrade Program (CMUP) SAR includes Joint Direct Attack Munition (JDAM), Computer Upgrade and Defensive System Upgrade Program (DSUP). These individual portions of the B-1 CMUP program were previously reported separately. On September 18, 1998, all three programs were consolidated into one Acquisition Program Baseline (APB) and are now reported as separate enditems in this report.

JDAM/1760/GPS/Communications-Low Rate Initial Production (LRIP)2 contract award for JDAM/1760 slipped from July 1998 to October 1998 due to an Omnibus reprogramming cut in May 1998. In addition, GPS/Comm installation rates at depot also increased. Despite contractor proposal coming in under cost, these issues forced some quantity changes in JDAM/1760 kit buy profiles (reduced from 21 to 7) to offset cost of GPS/Comm installs.

Combined DT&E/IOT&E for JDAM/1760 completed July 1998 with all technical issues resolved or closure plans identified. Flight test was restructured to accommodate late deliveries of software and maintain flight test schedule to avoid impact to subsequent Computer Upgrade and DSUP flight test schedules. Dedicated IOT&E began August 1998 and completed September 1998. GPS/JDAM drops met all requirements. Difficulties with KY-100 were solved and qualification testing complete. Demand Assigned Multiple Access (DAMA) function of ARC-210 radio met certification but flight test determined it not operationally suitable for B-1. Fix is identified and should be incorporated by April 1999. Offensive Radar Software successfully completed flight test and was fielded in January 1999. Live Fire Test report was delivered to OSD in May 1998. Seven LRIP deliveries were made. Required Assets Available was declared on December 18, 1998. Full Rate Production contract was awarded on February 16, 1999.

Computer Upgrade-Executive Critical Design Review (CDR) was held June 1998 with overall system design approved for implementation.

Several minor design problems caused a slight delay in delivery of Data Transfer Devices (DTDs) to Boeing software labs. OSC Fairchild, contractor for DTDs, was able to work around these delays and avoid impacts to Avionics Flight Software (AFS) development. DTD software development completed qualification testing in November 1998. Additional temperature related hardware problems have delayed start of hardware qualification testing until early February 1999, with projected completion in April 1999. A regression software qualification test will be performed in April 1999 on final hardware configuration. Assembly of flight worthy units is underway so they will be available once hardware qualification is complete. This should not delay flight test due to late hardware availability.

Lockheed Martin Federal Systems began delivery of Engineering and Manufacturing Development (EMD) computers in April 1998, two months ahead of schedule and continued to deliver units throughout the year. The early delivery greatly benefited AFS development. Hardware qualification successfully completed in December 1998, with no problems found. Delivered computers are being cycled back to Lockheed Martin during January-April 1999 for retrofit to final flightworthy configuration.

A potential problem for the production phase of the Computer Upgrade program may result from a diminishing manufacturing sources (DMS) problem. Beginning in December 1998, two parts used in the Avionics Control Unit (ACU)

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7. ~~(S)~~ Executive Summary (Cont'd):

are no longer available. Lockheed Martin has sufficient quantities of parts to satisfy their contract requirements for EMD and kitproof units, but a very minor redesign of the CPU module in the ACU will be required prior to production. No impacts are projected to avionics software. SPO and Boeing North American are working to lay out a plan for addressing this redesign. **Defensive System Upgrade Program (DSUP)**- DSUP completed a very successful PDR in January 1998 followed by a successful CDR in September 1998. CDR was slipped from July to September to allow BNA to complete the redesign of the tail antenna module for the ALR-56M radar warning receiver. This two-month slip had no impact on the remaining program milestones.

The Navy Integrated Defensive Electronic Countermeasures (IDECM) Radio Frequency Countermeasures (RFCM) program experienced several major technical, cost, and schedule problems in 1998 and early 1999. The Navy rebaselined the IDECM RFCM program in June 1998. DSUP was able to accommodate the 5-month schedule slip by developing an incremental software delivery plan. This rebaseline also resulted in a significant production cost increase for the IDECM fiber optic towed decoy. In December 1998, the IDECM RFCM program identified additional schedule slips. Fully integrated and tested B-1 software would be 4 months later than the June rebaselined schedule. In February 1999, the Navy issued a temporary 90-day stop work order on the IDECM RFCM program to allow time to rebaseline the program for a second time.

In response to these changes in the IDECM RFCM program, the B-1 SPO initiated the following actions: In July 1998, DSUP put Boeing on contract to develop a preliminary architecture for an alternative IDECM RFCM solution that would minimize the impact to the existing Group A design. The results of the study were briefed to APPEO/FB, SAF/AQP, HQ ACC/DR, and OSD (S&ST-EW). The DSUP team is waiting for the results of the latest Navy IDECM RFCM rebaselining effort - started in February 1999, to assess the impacts to the DSUP program. We don't expect to have the final results until the June 1999 timeframe.

Due to loss of an aircraft this reporting period (February 1998) quantities now reflect 93 aircraft instead of 94.

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8. (U) Threshold Breaches:

JDAM

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

Computer Upgrade

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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8. (U) Threshold Breaches (Cont'd):

DSUP

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

SPO is investigating impacts of Navy IDECM stop work order on the DSUP program. Probable breach to DSUP cost and schedule.

9. (U) Schedule:

JDAM

a. Milestones --

	Development Estimate (SAR)	Approved Program: PdE	Current Estimate
Milestone I	APR 93	APR 93	APR 93
Milestone II	JAN 95	JAN 95	JAN 95
Development Contract Award			
JDAM/1760	MAR 95	FEB 95	MAR 95
GPS/Comm	MAR 95	FEB 95	MAR 95
Computer	JAN 96	N/A	
Critical Design Review			
JDAM/1760	APR 96	APR 96	MAY 96
GPS/Comm	APR 96	APR 96	MAY 96
Computer	JUN 98	N/A	
Service Final DT&E			
JDAM/1760			
Start	AUG 97	AUG 97	AUG 97
Complete	JUN 98	JUN 98	JUL 98 (Ch-1)

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

	Development Estimate (SAR)	Approved Program: PdE	Current Estimate
GPS/Comm			
Start	AUG 97	AUG 97	AUG 97
Complete	JUN 98	JUN 98	JUL 98 (Ch-1)
Computer			
Start	JAN 00	N/A	
Complete	SEP 00	N/A	
Low Rate Production Contract Award			
JDAM/1760	DEC 96	DEC 96	JUN 96
GPS/Comm	FEB 96	FEB 96	MAY 96
Computer	JAN 00	N/A	
Low Rate Initial Production First Delivery			
JDAM/1760	SEP 98	SEP 98	APR 98
GPS/Comm	NOV 97	NOV 97	NOV 97
Computer	JUL 01	N/A	
IOT&E			
JDAM/1760			
Start	AUG 97	AUG 97	AUG 97
Complete	JUN 98	JUN 98	SEP 98
GPS/Comm			
Start	AUG 97	AUG 97	AUG 97
Complete	JUN 98	JUN 98	SEP 98
Computer			
Start	SEP 00	N/A	
Complete	JAN 01	N/A	
Milestone III - JDAM/1760	JAN 99	DEC 98	FEB 99 (Ch-2)
Milestone III - GPS/Comm	JAN 97	JAN 97	JUL 97
Milestone III - Computer	JAN 01	N/A	
Full Rate Production Contract Award			
JDAM/1760	JAN 99	JAN 99	FEB 99 (Ch-2)
GPS/Comm	JAN 97	JAN 97	JUL 97
Computer	JAN 01	N/A	
Organic Support Capability Date			
JDAM/1760	JUL 01	N/A	
GPS/Comm	NOV 99	N/A	
Computer	DEC 02	N/A	
Service Depot Support Date			
JDAM/1760	JUL 01	N/A	
GPS/Comm	NOV 99	N/A	
Computer	SEP 03	N/A	
Initial Operational Capability			
JDAM/1760	JUL 01	DEC 98	DEC 98
GPS/Comm	NOV 99	DEC 98	DEC 98
Computer	JAN 03	N/A	

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

(U) Notes:

Full Rate Production Contract Award is defined as the production contract award for follow-on upgrade kits. Initial Operational Capability is agreed to by HQ ACC as the Required Assets Available (RAA) date. RAA for JDAM integration is defined as the date assets consisting of three modified aircraft, a total of three modified module/launchers, associated O-level support equipment, O-level spares, verified O-level maintenance and flight manuals, and source data to support training systems, programs and courses are delivered to the using command. RAA for GPS/Communications is defined as the date assets consisting of three modified aircraft, associated O-level support equipment, O-level spares, verified O-level maintenance and flight manuals, and source data to support training systems, programs and courses are delivered to the using command.

b. Current Change Explanations --

(U) (Ch 1) - Service Final Development Test & Evaluation complete date for JDAM 1760 and GPS Comm changed from July 1998 to June 1998 to reflect actual completion date.

(Ch 2) - MS III for JDAM/1760 changed from December 1998 to February 1999 and Full Rate Production Contract Award from December 1998 to February 1999 due to longer than expected proposal evaluation and increased time in gathering information for the program office estimate and service cost position.

Computer Upgrade

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I	APR 93	APR 93	APR 93
Milestone II	JAN 95	JAN 95	JAN 95
Development Contract Award	JAN 96	MAY 96	MAY 96
Critical Design Review	JUN 98	MAY 98	JUN 98 (Ch-1)
Service Final DT&E			
Start	JAN 00	OCT 99	OCT 99 (Ch-2)
Complete	SEP 00	OCT 00	OCT 00 (Ch-2)
Low Rate Production Contract Award	JAN 00	JUL 99	NOV 99 (Ch-3)
Low Rate Initial Production 1st Delivery	JUL 01	FEB 01	APR 01 (Ch-3)
IOT&E			
Start	SEP 00	OCT 99	NOV 99

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9a. (U) Schedule (Cont'd):
Computer Upgrade

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Complete	JAN 01	MAR 01	APR 01
Milestone III	JAN 01	APR 01	AUG 01
Full Rate Production Contract Award	JAN 01	APR 01	OCT 01 (Ch-4)
Initial Operational Capability (IOC)	JAN 03	N/A	N/A
Required Assets Available	N/A	DEC 01	DEC 01 (Ch-5)

(U) Notes:

Low Rate Production Contract award is defined as the contract award for the kitproof upgrade kit. Low Rate Initial Production First Delivery is defined as the delivery of the first kitproof upgrade kit. Full-rate production contract award is defined as the production contract award for follow-on upgrade kits. Required Assets Available (RAA) is defined as the date assets consisting of three modified aircraft, a total of three modified module/launchers, associated O-level support equipment, O-level spares, verified O-level maintenance and flight manuals, and source data to support training systems, programs and courses are delivered to the using command. IOC is agreed to by HQ ACC as the RAA date.

b. Current Change Explanations --

(U) (Chg 1) Critical Design Review changed from May 1998 to June 1998 to reflect actual date.

(Ch 2) Service Final Development Test & Evaluation Start changed from November 1999 to October 1999 and Complete changed from November 2000 to October 2000. Contractor performance during FY98 allowed us to mitigate the shortfall and schedule slip reported last year due to PBD 604.

(Chg 3) Low Rate Production Contract Award changed from December 1999 to November 1999 and Low Rate Initial Production First Delivery changed from May 2001 to April 2001 due to revised program manager's estimate.

(Chg 4) Full Rate Production Contract Award changed from April 2001 to October 2001 due to deletion of 3010 FY01 funds with scheduled payback in FY02.

(Chg 5) Required Assets Available (RAA) changed from January 2002 to December 2001 due to revised program manager's estimate.

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

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>	
Milestone I	APR 93	APR 93	APR 93	(Ch-1)
Milestone II	APR 97	APR 97	APR 97	
Development Contract Award	JUN 97	JUN 97	JUN 97	
Critical Design Review Complete	JUL 98	JUL 98	SEP 98	(Ch-2)
Development Flight Test				
Start	MAR 00	MAR 00	MAR 00	(Ch-3)
Complete	APR 01	APR 01	APR 01	(Ch-3)
IOT&E				
Start	JUN 01	JUN 01	MAR 00	(Ch-4)
Complete	DEC 01	DEC 01	DEC 01	(Ch-4)
Milestone III	MAR 02	MAR 02	APR 02	
Full Rate Production Contract Award	APR 02	APR 02	APR 02	
Required Assets Available	FEB 02	FEB 02	FEB 02	(Ch-3)

(U) Notes:

Required Assets Available (RAA) is substituted for Initial Operational Capability in the schedule. HQ ACC has agreed that RAA is defined as the date assets consisting of three modified aircraft, associated O-level support equipment, O-level spares, verified O-level maintenance and flight manuals and source data to support training is available (does not include training system devices).

b. Current Change Explanations --

(U) (CHG 1) Milestone I date added for information.

(CHG 2) Critical Design Review changed from July 1998 to September 1998 due to a decision to allow a problem with the ALR-56M antenna assembly to be resolved.

(CHG 3) Development Test and Evaluation (DT&E) Start from April 2000 to March 2000, DT&E Complete from May 2001 to April 2001 and Required Assets Available from March 2002 to February 2002 revised to reflect Program Manager's current estimate. Navy rebaseline of IDECM RFCM in June 1998 forced detailed review of DSUP schedule to understand impacts of new IDECM schedule. In revising DSUP schedule to account for new IDECM RFCM schedule, efficient replanning allowed us to move start/complete of flight test and RAA back to their original dates.

(CHG 4) Initial Operational Test and Evaluation Start from July 2001 to March 2000 and Complete from January 2002 to December 2001 to reflect the start of Combined Development Test/Operational Test. Both the Computer upgrade and DSUP programs are conducting combined DT/OT. By reporting DSUP

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

IOT&E Start as the data combined DT/OT begins makes it consistent with the way the SPO reports combined DT/OT for the Computer upgrade. Previous submittals have reflected the start date for dedicated Operational Test & Evaluation, July 2001. That date is still current.

10. (U) Performance Characteristics:

JDAM

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program; PdE <u>Obj/Threshold</u>	Demon- strated Perf	Current <u>Estimate</u>	
Accurate GPS-Aided Munition	Capabil- ity to airborne retarget GPS- aided munition (intent JDAM)	Capabili/ ty to / ty to airborne/ employ 8 retarget/ JDAMs 8 JDAMs / per per / launcher launcher/	Capabil- ity to airborne retarget JDAM.	Capabil- ity to airborne retarget JDAM.	(Ch-1)
Mission Capable (MC) Rate (%)	75	75 / 65	TBD	67	(Ch-2)
Supportability CWIU MTBF (Hrs)	1000	3000 / 1000	TBD	2262	

(U) Note (For information only): Basic performance factors for the B-1B (speed, weight, range, terrain following/avoidance performance) will not be significantly affected by the CMUP-JDAM integration effort.

1. Mission Capable (MC) Rate as expressed applies to the overall fleet aircraft wartime mission capable rate. The integration of the weapons upgrade modifications will not cause the fleet MC rate to degrade below the threshold value. For information only - the following reliability and maintainability parameters are specified in the weapons upgrade contract specifications: mean time between critical failure, mean time between unscheduled maintenance, maintenance manhours per flight hour, and max/mean repair time on equipment. These parameters will be used to support MC rate calculations.

2. OSD/WSIG requested the addition of a supportability parameter that measures and tracks the weapon system upgrade reliability. The agreed to

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10a. (U) Performance Characteristics (Cont'd):
JDAM

parameter is the mean time between failure (MTBF) of the Conventional Weapons Interface Unit (CWIU). This parameter was selected because this line replacable unit (LRU) is the only conventional system carriage modification item that requires development. The specified values for the threshold and objectives are for system maturity. System maturity for the CMUP weapons upgrade occurs at IOC plus 15,000 operating flight hours.

b. Current Change Explanations --

(U) (Ch-1) Capability to airborne retarget JDAM was demonstrated in flight test.

(Ch-2) Mission Capable Rate changed from 65% to 67% based on recent modeling data.

Computer Upgrade

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Weapons Flexibility	N/A	Capabil- / Capabil- ity to / ity to safely / safely monitor, / monitor, ferry, / ferry, carry, / carry, arm, / arm, release / release and / and jettison / jettison up to 3 / up to 3 differ- / differ- ent / ent conven- / conven- tional / tional weapon / weapon types (1 / types (1 type per / type per bay) / bay) with a / with a single / single software / software load. / load.	TBD	Capabil- ity to safely monitor, ferry, carry, arm, release and jettison up to 3 differ- ent conven- tional weapon types (1 type per bay) with a single software load.
Mission Capable (MC) Rate (%)	75	75 / 65	TBD	67% (Ch-1)

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10a. (U) Performance Characteristics (Cont'd):
Computer Upgrade

(U) Mission Capable Rate as expressed applies to the overall fleet aircraft wartime mission capable rate. The integration of the weapons upgrade modification will not cause the fleet MC rate to degrade below the threshold value. For information only - the following reliability and maintainability parameters are specified in the weapons upgrade contract specifications: mean time between critical failure, mean time between unscheduled maintenance, maintenance manhours per flight hours, and max/mean repair time on equipment. These parameters will be used to support MC rate calculations

b. Current Change Explanations --

(U) (Chg 1) Mission Capable (MC) Rate changed from 65% to 67% based on recent modeling data.

DSUP

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(b)(1)				

(U) (U) KPPs - Key Performance Parameters as stated in the Operational Requirements Document.

(U) The specified values for the threshold and objectives are for system maturity. System maturity for the DSUP occurs after accumulation of 16,520 flight hours.

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10b. (U) Performance Characteristics (Cont'd):
DSUP

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):
JDAM

a. (U) Cost --	Development Estimate (SAR)	Approved Program PdE	Current Estimate
Development (RDT&E)	428.2	332.6	328.2
Procurement	210.3	228.0	220.5
Recurring Flyaway	(188.6)		(208.2)
Nonrecurring Flyaway	(4.3)		(0.0)
Total Flyaway	(192.9)		(208.2)
Total Other Wpn Sys			(0.0)
Peculiar Support	(3.2)		(5.7)
Initial Spares	(14.2)		(6.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	241.5	238.7
Total FY 99 Base-Year \$	638.5	802.1	787.4
Escalation	34.4	-9.9	-6.7
Development (RDT&E)	(7.5)	(-9.3)	(-6.2)
Procurement	(26.9)	(7.5)	(4.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(-8.1)	(-5.4)
Total Then Year \$	672.9	792.2	780.7

(U) The SAR Development Estimate was converted BY95 to BY99 dollars using an inflation factor of 1.057.

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	95	93	93
Total	95	93	93

(U) The procurement quantity of 95 in 11b. represents the number of operational aircraft being modified under the B-1 CMUP-JDAM program; however, as this is a modification program, the quantities specified in section 16b. represent procured modification kit quantities. Also, due to a loss of one aircraft in February 1998 the number of operational aircraft being modified under the B-1 CMUP-JDAM program is now 93.

In the APB, Low Rate Production Contract Award is defined as the contract award for the kit proof upgrade kit. The Low Rate Initial Production First Delivery is defined in the APB as delivery of the first kit proof upgrade kit. The kit proof upgrade kit quantities are 2 for GPS and 6 for JDAM.

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11b. (U) Total Program Cost and Quantity (Cont'd):
JDAM

c. (U) Foreign Military Sales --
None

d. (U) Nuclear Costs --
None

Computer Upgrade

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	159.9	232.7	217.5
Procurement	174.5	153.7	150.7
Recurring	(152.4)		(144.4)
Nonrecurring	(14.8)		(2.5)
Total Flyaway	(167.2)		(146.9)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.8)		(0.6)
Initial Spares	(6.5)		(3.2)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>211.8</u>	<u>220.7</u>
Total FY 95 Base-Year \$	334.4	598.2	588.9
Escalation	80.5	79.1	53.2
Development (RDT&E)	(23.2)	(22.7)	(14.5)
Procurement	(57.3)	(35.5)	(24.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(20.9)</u>	<u>(14.7)</u>
Total Then Year \$	414.9	677.3	642.1
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>103</u>	<u>103</u>	<u>101</u>
Total	103	103	101

(U) The procurement quantity of 101 in 11b. represents 93 operational aircraft that are being modified under the B-1 Computer Upgrade program and 8 kits that are being produced for labs and trainers.

c. Foreign Military Sales -- None.

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11d. (U) Total Program Cost and Quantity (Cont'd):
Computer Upgrade

d. Nuclear Costs -- None.

DSUP

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	303.0	303.0	306.4
Procurement	290.7	291.4	313.5
Recurring Flyaway	(262.8)		(282.4)
Total Other Wpn Sys			(0.0)
Peculiar Support	(6.3)		(6.0)
Initial Spares	(21.6)		(24.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	593.7	594.4	619.9
Escalation	106.6	105.9	74.3
Development (RDT&E)	(30.0)	(30.0)	(16.6)
Procurement	(76.6)	(75.9)	(57.7)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	700.3	700.3	694.2

(U) (U) RDT&E dollars do not include funds for Trainers, Air Force Mission Support Systems (AFMSS), AFOTEC, Group B (Techniques Generators and Fiber Optic Towed Decoy (FOTD) subsystem) and decoys. Trainers and AFMSS are separately managed ACAT III programs. Group B funds provided by Electronic Warfare Program element. AFOTEC costs funded under AFOTEC PE. Procurement costs do not include Fiber Optic Towed Decoy subsystem and decoys. Funding is provided by Electronic Warfare PE.

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	95	95	93
Total	95	95	93

(U) Current Estimate reflects loss of one aircraft this reporting period.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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B-1B CMUP, December 31, 1998

12. (U) Unit Cost Summary:

JDAM

	UCR Baseline (SEP 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 99 BY\$)	802.1	787.4	
(2) Quantity	93	93	
(3) Unit Cost	8.625	8.467	-1.83
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 99 BY\$)	228.0	220.5	
(2) Quantity	93	93	
(3) Unit Cost	2.452	2.371	-3.30

(U) The current estimate data elements entered in section 12a-b. represents the number of operational aircraft being modified under the B-1 CMUP-JDAM program; however, as this is a modification program, the quantities specified in section 16b. represent procured modification kit quantities. Also, due to a loss of one aircraft in February 1998 the number of operational aircraft being modified under the B-1 CMUP-JDAM program is now 93.

Computer Upgrade

	UCR Baseline (SEP 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	598.2	588.9	
(2) Quantity	103	101	
(3) Unit Cost	5.808	5.831	+0.40
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	153.7	150.7	
(2) Quantity	103	101	
(3) Unit Cost	1.492	1.492	0.00

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B-1B CMUP, December 31, 1998

12a. (U) Unit Cost Summary (Cont'd):

DSUP

	UCR Baseline (SEP 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	594.4	619.9	
(2) Quantity	95	93	
(3) Unit Cost	6.257	6.666	+6.54
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	291.4	313.5	
(2) Quantity	95	93	
(3) Unit Cost	3.067	3.371	+9.91

13. (U) Cost Variance Analysis:

JDAM

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	435.7	237.2	-	-	672.9
Previous Changes:					
Economic	-10.6	-17.6	-	-1.0	-29.2
Quantity	-	-1.3	-	-	-1.3
Schedule	-	+1.1	-	-	+1.1
Engineering	+3.6	-	-	-	+3.6
Estimating	-92.7	+15.0	-	+237.9	+160.2
Other	-	-	-	-	-
Support	-	+4.4	-	-	+4.4
Subtotal	-99.7	+1.6	-	+236.9	+138.8
Current Changes:					
Economic	-0.7	-3.4	-	-0.7	-4.8
Quantity	-	-	-	-	-
Schedule	-	+0.5	-	-	+0.5
Engineering	-	-	-	-	-
Estimating	-13.3	-0.3	-	-2.9	-16.5
Other	-	-	-	-	-
Support	-	-10.2	-	-	-10.2
Subtotal	-14.0	-13.4	-	-3.6	-31.0
Total Changes	-113.7	-11.8	-	+233.3	+107.8
Current Estimate	322.0	225.4	-	233.3	780.7

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B-1B CMUP, December 31, 1998

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

(U) Summary (FY 1999 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	428.2	210.3	-	-	638.5
Previous Changes:					
Quantity	-	-1.1	-	-	-1.1
Schedule	-	-	-	-	-
Engineering	+3.7	-	-	-	+3.7
Estimating	-91.4	+16.2	-	+241.5	+166.3
Other	-	-	-	-	-
Support	-	+3.4	-	-	+3.4
Subtotal	-87.7	+18.5	-	+241.5	+172.3
Current Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-12.3	-0.4	-	-2.8	-15.5
Other	-	-	-	-	-
Support	-	-7.9	-	-	-7.9
Subtotal	-12.3	-8.3	-	-2.8	-23.4
Total Changes	-100.0	+10.2	-	+238.7	+148.9
Current Estimate	328.2	220.5	-	238.7	787.4

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-1.5
Economic adjustment for negative program change. (Economic)	N/A	+0.8
Adjustment for Current and Prior Inflation. (Estimating)	+1.5	+1.6
Revised estimate to account for contract underrun and revised test requirement (Estimating)	-13.8	-14.9
RDT&E Subtotal	-12.3	-14.0
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-4.7
Economic adjustment for negative program change. (Economic)	N/A	+1.3
Stretchout of annual procurement buy profile. (Schedule)	0.0	+0.5
Adjustment for Current and Prior Inflation. (Estimating)	+2.6	+2.8

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B-1B CMUP, December 31, 1998

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised estimate to account for updated JDAM	-3.0	-3.1
Service Cost Position (Estimating)		
Change in Initial Spares (Support)	-8.0	-10.3
Change in Peculiar Support (Support)	+0.1	+0.1
Procurement Subtotal	-8.3	-13.4
(3) <u>Q&M</u>		
Revised escalation indices. (Economic)	N/A	-0.7
Adjustment for Current and Prior Inflation.	+0.7	+0.7
(Estimating)		
Revised estimate to account for reduced	-3.5	-3.6
government test requirements. (Estimating)		
O&M Subtotal	-2.8	-3.6

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B-1B CMUP, December 31, 1998

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

Computer Upgrade

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	183.1	231.8	-	-	414.9
Previous Changes:					
Economic	-10.5	-24.1	-	-3.9	-38.5
Quantity	-	-1.4	-	-	-1.4
Schedule	-	+0.5	-	-	+0.5
Engineering	+24.7	-30.0	-	-	-5.3
Estimating	+32.2	+0.8	-	+247.2	+280.2
Other	-	-	-	-	-
Support	-	+2.3	-	-	+2.3
Subtotal	+46.4	-51.9	-	+243.3	+237.8
Current Changes:					
Economic	-2.9	-3.7	-	-3.2	-9.8
Quantity	-	-1.7	-	-	-1.7
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+5.4	+6.2	-	-4.7	+6.9
Other	-	-	-	-	-
Support	-	-6.0	-	-	-6.0
Subtotal	+2.5	-5.2	-	-7.9	-10.6
Total Changes	+48.9	-57.1	-	+235.4	+227.2
Current Estimate	232.0	174.7	-	235.4	642.1

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B-1B CMUP, December 31, 1998

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

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	159.9	174.5	-	-	334.4
Previous Changes:					
Quantity	-	-1.3	-	-	-1.3
Schedule	-	-	-	-	-
Engineering	+21.7	-27.6	-	-	-5.9
Estimating	+31.2	+4.3	-	+225.0	+260.5
Other	-	-	-	-	-
Support	-	+1.4	-	-	+1.4
Subtotal	+52.9	-23.2	-	+225.0	+254.7
Current Changes:					
Quantity	-	-1.3	-	-	-1.3
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+4.7	+5.6	-	-4.3	+6.0
Other	-	-	-	-	-
Support	-	-4.9	-	-	-4.9
Subtotal	+4.7	-0.6	-	-4.3	-0.2
Total Changes	+57.6	-23.8	-	+220.7	+254.5
Current Estimate	217.5	150.7	-	220.7	588.9

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-2.9
Adjustment for Current and Prior Inflation. (Estimating)	+1.6	+1.7
Reallocation of program funds (Estimating)	+3.1	+3.7
RDT&E Subtotal	+4.7	+2.5
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-4.8
Economic adjustment for negative program change. (Economic)	N/A	+1.1
Quantity decrease of 1 unit. (Quantity)	-1.3	-1.7
Estimating change resulting from revised inflation assumption (Estimating)	+5.6	+6.2
Revised Initial Spares Estimate (Support)	-4.9	-6.0
Procurement Subtotal	-0.6	-5.2
(3) <u>O&M</u>		

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B-1B CMUP; December 31, 1998

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	Base-Year	Then-Year
Revised escalation indices. (Economic)	N/A	-3.3
Economic adjustment for negative program change. (Economic)	N/A	+0.1
Adjustment for Current and Prior Inflation. (Estimating)	+1.8	+1.9
Revised estimates from Combined Test Force (CTF)-decreased flight test cost (Estimating)	-6.1	-6.6
O&M Subtotal	-4.3	-7.9

DSUP

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	333.0	367.3	-	700.3
Previous Changes:				
Economic	-7.3	-13.8	-	-21.1
Quantity	-	-1.9	-	-1.9
Schedule	-	+0.9	-	+0.9
Engineering	-	-	-	-
Estimating	-13.4	+23.9	-	+10.5
Other	-	-	-	-
Support	-	+2.1	-	+2.1
Subtotal	-20.7	+11.2	-	-9.5
Current Changes:				
Economic	-5.1	-10.5	-	-15.6
Quantity	-	-4.6	-	-4.6
Schedule	-	+0.3	-	+0.3
Engineering	-	-	-	-
Estimating	+15.8	+6.9	-	+22.7
Other	-	-	-	-
Support	-	+0.6	-	+0.6
Subtotal	+10.7	-7.3	-	+3.4
Total Changes	-10.0	+3.9	-	-6.1
Current Estimate	323.0	371.2	-	694.2

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B-1B CMUP, December 31, 1998

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

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	303.0	291.4	-	594.4
Previous Changes:				
Quantity	-	-1.5	-	-1.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-11.5	+18.5	-	+7.0
Other	-	-	-	-
Support	-	+2.2	-	+2.2
Subtotal	-11.5	+19.2	-	+7.7
Current Changes:				
Quantity	-	-3.4	-	-3.4
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+14.9	+5.8	-	+20.7
Other	-	-	-	-
Support	-	+0.5	-	+0.5
Subtotal	+14.9	+2.9	-	+17.8
Total Changes	+3.4	+22.1	-	+25.5
Current Estimate	306.4	313.5	-	619.9

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-5.1
Adjustment for Current and Prior Inflation. (Estimating)	+2.0	+2.1
Reflects revised contract funding requirements and anticipated GFE impacts. (Estimating)	+12.9	+13.7
RDT&E Subtotal	+14.9	+10.7
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-10.9
Economic adjustment for negative program change. (Economic)	N/A	+0.4
Quantity decrease of 1 unit. (Quantity)	-3.4	-4.6
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	0.0	-0.0
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	-0.7	-0.9

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	Base-Year	Then-Year
Stretchout of annual procurement buy profile. (Schedule)	0.0	+0.3
Revised estimate and buy profile to account for non-pay purchase inflation and revised inflation assumptions. (Estimating)	+6.5	+7.8
Change in Initial Spares (Support)	+0.4	+0.5
Change in Peculiar Support (Support)	+0.1	+0.1
Procurement Subtotal	+2.9	-7.3

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):
JDAM

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
7.08	-0.37	+0.13	+0.02	+0.04	+1.55	--	-0.06	+1.31	8.39

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.50	-0.23	+0.03	+0.02	--	+0.16	--	-0.06	-0.08	2.42

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14c. (U) Unit Cost and Other History (Cont'd):
JDAM

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	APR 93	APR 93	APR 93
Milestone II	N/A	JAN 95	JAN 95	JAN 95
Milestone III	N/A	JAN 99	JAN 99	FEB 99
FUE/IOC	N/A	JUL 01	DEC 98	DEC 98
Total Cost	N/A	672.9	792.2	780.7
Total Quantity	N/A	95	93	93
Prog Acq Unit Cost	N/A	7.08	8.52	8.39

(U) In the APB, HQ ACC agreed that IOC would be RAA. RAA was declared December 18, 1998.

Computer Upgrade

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.03	-0.48	+0.06	--	-0.05	+2.84	--	-0.04	+2.33	6.36

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.25	-0.28	+0.03	--	-0.30	+0.07	--	-0.04	-0.52	1.73

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B-1B CMUP, December 31, 1998

14c. (U) Unit Cost and Other History (Cont'd):
Computer Upgrade

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	APR 93	N/A	APR 93
Milestone II	N/A	JAN 95	N/A	JAN 95
Milestone III	N/A	JAN 01	N/A	AUG 01
FUE/IOC	N/A	JAN 03	N/A	DEC 01
Total Cost	N/A	414.9	N/A	642.1
Total Quantity	N/A	103	N/A	101
Prog Acq Unit Cost	N/A	4.03	N/A	6.36

(U) Date shown as IOC is the RAA date. HQ ACC has agreed to use the RAA date as IOC.

DSUP

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
7.37	-0.39	+0.08	+0.01	--	+0.36	--	+0.03	+0.09	7.46

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
3.87	-0.26	+0.01	+0.01	--	+0.33	--	+0.03	+0.12	3.99

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14c. (U) Unit Cost and Other History (Cont'd):
DSUP

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	APR 93
Milestone II	N/A	APR 97	N/A	APR 97
Milestone III	N/A	MAR 02	N/A	APR 02
FUE/IOC	N/A	FEB 02	N/A	FEB 02
Total Cost	N/A	700.3	N/A	690.8
Total Quantity	N/A	95	N/A	93
Prog Acq Unit Cost	N/A	7.37	N/A	7.43

(U) The IOC date shown is the RAA date. HQ ACC has agreed to use the RAA date as IOC.

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

(U) Section b., Procurement, shows two parts of contract 2004 contained in JDAM enditem; JDAM launcher kits and GPS/Communications kits. These contracts are Firm Fixed Price and Fixed Price Incentive, respectively. The contracts contain different quantities. Cost and Schedule variance reporting in Section b. is not required on either FFP or FFI contract.

a. RDT&E --		Initial Contract Price		
(U) <u>JDAM EMD:</u>		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Boeing North American, Long Beach CA		\$250.2	N/A	0
F33657-94-C-0001, CPAF				
Award: March 16, 1995				
Definitized: March 16, 1995				
		Estimated Price At Completion		
Current Contract Price		<u>Contractor</u>	<u>Program Manager</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
\$307.9	N/A	0	\$302.9	\$300.3
		<u>Cost Variance Schedule Variance</u>		
Previous Cumulative Variances		\$0.6	\$-1.3	
Cumulative Variances To Date (12/30/98)		\$-0.1	\$-0.3	
Net Change		\$-0.7	\$1.0	

Explanation of Change:

(U) The cost and schedule variances are based on data from the program's Cost Performance Report (CPR) of December 31, 1998.

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B-1B CMUP, December 31, 1998

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

(U) Computer/WCMD:
Boeing North American, Long Beach CA
F33657-96-C-2075, CPAF
Award: January 30, 1997
Definitized: January 30, 1997

Initial Contract Price		
Target	Ceiling	Qty
\$202.2	N/A	0

Current Contract Price		
Target	Ceiling	Qty ✓
\$254.3	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$254.3	\$254.3

Previous Cumulative Variances
Cumulative Variances To Date (11/27/98)
Net Change

Cost Variance	Schedule Variance
\$4.1	\$-1.6
<u>\$1.1</u>	<u>\$-3.0</u>
\$-3.0	\$-1.4

Explanation of Change:

(U) The primary cause for the cost and schedule variance is staffing delays. Personnel have not transitioned from the CMUP-JDAM contract to the Computer Upgrade contract as planned. The variances have not adversely effected the contract.

(U) DSUP:
Boeing North American, Long Beach CA
F33657-97-C-0002, CPAF
Award: June 20, 1997
Definitized: June 20, 1997

Initial Contract Price		
Target	Ceiling	Qty
\$216.5	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$216.3	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$216.3	\$216.3

Previous Cumulative Variances
Cumulative Variances To Date (11/27/98)
Net Change

Cost Variance	Schedule Variance
\$0.4	\$-0.2
<u>\$1.0</u>	<u>\$-0.8</u>
\$0.6	\$-0.6

Explanation of Change:

(U) Net changes are not significant in relation to current contract target price.

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B-1B CMUP, December 31, 1998

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

b. Procurement --
(U) JDAM Production (FFP):
Boeing North American, Long Beach CA
F33657-97-C-2004
Award: February 16, 1999
Definitized: February 16, 1999

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$25.1	N/A	129

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$25.7	N/A	129

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$25.7	\$25.7

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this contract.

(U) JDAM Prod (GPS/Comm):
Boeing North American, Long Beach CA
F33657-97-C-2004, FPI
Award: February 16, 1999
Definitized: February 16, 1999

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$60.1	\$66.6	91

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$60.1	\$66.6	91

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$60.1	\$60.1

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FPI contract.

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B-1B CMUP, December 31, 1998

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY94-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-09)</u>	<u>Total</u>
RDT&E	629.3	137.6	92.1	18.0	877.0
Procurement	154.9	69.1	11.8	535.5	771.3
MILCON	-	-	-	-	-
O&M	390.6	58.5	19.6	-	468.7
Total	1174.8	265.2	123.5	553.5	2117.0

JDAM

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

<u>Appropriation</u>	<u>Prior Years (FY94-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-03)</u>	<u>Total</u>
RDT&E	322.0	-	-	-	322.0
Procurement	154.9	60.6	8.7	1.2	225.4
MILCON	-	-	-	-	-
O&M	233.3	-	-	-	233.3
Total	710.2	60.6	8.7	1.2	780.7

Computer Upgrade

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	147.0	54.0	31.0	-	232.0
Procurement	-	8.5	1.1	165.1	174.7
MILCON	-	-	-	-	-
O&M	157.3	58.5	19.6	-	235.4
Total	304.3	121.0	51.7	165.1	642.1

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B-1B CMUP, December 31, 1998

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

DSUP

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

<u>Appropriation</u>	<u>Prior Years (FY97-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-09)</u>	<u>Total</u>
RDT&E	160.3	83.6	61.1	18.0	323.0
Procurement	-	-	2.0	369.2	371.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	160.3	83.6	63.1	387.2	694.2

b. Annual Summary -- JDAM

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY99 Dollars Nonrec</u>	<u>Flyaway FY99 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994			1.1	0.9	0.8
1995			54.8	58.0	55.7
1996			113.9	120.5	117.9
1997			90.5	95.4	94.4
1998			54.9	51.9	51.7
1999			6.9	1.5	1.5
Subtotal			322.1	328.2	322.0

Appropriation: 3010 - Aircraft Procurement, Air Force

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY99 Dollars Nonrec</u>	<u>Flyaway FY99 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994					
1995					
1996	8		8.5	10.8	10.7
1997	46		43.3	43.9	44.1
1998	83		56.0	56.9	57.5
1999	47		36.6	41.5	42.6
2000	27		56.3	58.1	60.6
2001	9		7.5	8.2	8.7
2002				0.7	0.8
2003				0.4	0.4
2004					
Subtotal	220		208.2	220.5	225.4

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B-1B CMUP, December 31, 1998

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

(U) The B-1 CMUP-JDAM program consists of a Global Positioning System (GPS) with a Communication upgrade (Comm) and a Mil-Std 1760 Weapon Interface Unit (1760) with rotary launcher modifications for JDAM carriage. The quantities in Sec 16b. table are the kit quantities (e.g. FY96 procures 6 JDAM/1760 launcher kits and 2 GPS/Comm kit). The GPS/Comm kit buy schedule (FY96-FY98) is 2,28,61 with installations (FY98-FY00) of 8,22,61 to comply with the original GPS 2000 mandate. Installation funding is provided in the year install occurs. The 1760/JDAM buy schedule (FY96-FY01) 6,18,7,50,34,14 procures 129 rotary launcher kits and is an organizational/intermediate level installation. In FY02-FY04 there are no quantity buys as funding is for support and spares only.

Appropriation: 3400 - Operation & Maintenance, Air Force

Fiscal Year	Qty	Flyaway FY99 Dollars Nonrec	Flyaway FY99 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				81.2	78.0
1996				75.0	73.4
1997				43.8	43.4
1998				37.3	37.1
1999				1.4	1.4
Subtotal				238.7	233.3

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	220		530.3	787.4	780.7

b. Annual Summary -- Computer Upgrade

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995			1.3	1.3	1.3
1996			14.3	14.3	14.8
1997			33.4	33.0	34.6
1998			44.8	43.9	46.3
1999			53.3	46.9	50.0
2000			47.2	49.9	54.0
2001			18.5	28.2	31.0
Subtotal			212.8	217.5	232.0

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B-1B CMUP, December 31, 1998

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

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999					
2000	3	2.5	5.7	7.7	8.5
2001				1.0	1.1
2002	45		60.7	58.1	66.3
2003	29		42.1	43.4	50.6
2004	24		35.9	37.9	45.1
2005				2.6	3.1
2006					
2007					
2008					
Subtotal	101	2.5	144.4	150.7	174.7

Appropriation: 3400 - Operation & Maintenance, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				6.4	6.6
1997				25.0	26.2
1998				58.5	61.7
1999				58.9	62.8
2000				54.1	58.5
2001				17.8	19.6
Subtotal				220.7	235.4

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	101	2.5	357.2	588.9	642.1

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B-1B CMUP, December 31, 1998

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

b. Annual Summary -- DSUP

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				22.8	23.4
1998				61.7	63.7
1999				70.0	73.2
2000				78.8	83.6
2001				56.7	61.1
2002				16.4	18.0
Subtotal				306.4	323.0

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000					
2001	3	0.2	1.4	1.8	2.0
2002	12	0.3	37.8	32.5	36.4
2003	16		52.3	49.3	56.3
2004	18		56.5	59.9	69.9
2005	19		58.3	66.3	79.0
2006	18		53.0	61.9	75.3
2007	7		23.1	29.4	36.5
2008				9.1	11.5
2009				3.3	4.3
Subtotal	93	0.5	282.4	313.5	371.2

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	93	0.5	282.4	619.9	694.2

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B-1B CMUP, December 31, 1998

17. (U) Delivery/Expenditure Information:

JDAM

- a. (U) Deliveries To Date - None.
 - (U) Percent Total Program Quantities Delivered: N/A
- b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 0.0
 - (U) Percent Total Program Expended: 0.0%

Computer Upgrade

- a. (U) Deliveries To Date

	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	101	0
- (U) Percent Total Program Quantities Delivered: 0.0%
- b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 137.4
 - (U) Percent Total Program Expended: 21.4%

DSUP

- a. (U) Deliveries To Date

	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	93	0
- (U) Percent Total Program Quantities Delivered: 0.0%
- b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 79.7
 - (U) Percent Total Program Expended: 11.5%

18. (U) Operating and Support Costs:

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B-1B CMUP, December 31, 1998

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

JDAM

a. (U) Assumptions and Ground Rules --

This estimate was prepared by ASC/YDF as part of the Current Estimate.

The B-1 CMUP-JDAM/GPS/Comm Cost Analysis Requirements Description and Service Cost Position estimate were used as the basis for this estimate. The HQ ACC/XPM Manpower Estimate Report was used with a "beddown" O&S Phase In of FY98-FY01 and Steady State FY02-FY26. A 1.48 Utilization Factor (Equip Op Hrs per Flying Hour) was used for 94 aircraft at 374/FH/Acft/Yr.

Per CAIG direction, O&S costs do not include software maintenance.

There is no antecedent system.

b. (U) Costs -- (FY 1997 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per 94 B-1 Aircraft CMUP Modifications	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	52.1	0.0
Unit Level Consumption	31.8	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.0	0.0
Contractor Support	0.0	0.0
Sustaining Support	32.7	0.0
Indirect Costs	5.9	0.0
Total	122.5	0.0

Computer Upgrade

a. (U) Assumptions and Ground Rules --

This estimate was prepared by the B-1B Program Office as part of the updated Service Cost Position for the approved Acquisition Program Baseline.

The B-1 CMUP-Computer Upgrade Cost Analysis Requirements Description and Service Cost Position estimate, which reflects a revised system architecture, were used as the basis for this estimate. The HQ ACC/XPM Manpower Estimate Report was reviewed and found to have no manpower adjustments for the Computer Upgrade. The Operation and Support has a Phase In of FY02-FY07 and Steady State FY08-FY26. A 1.48 Utilization Factor (Equipment Operation Hours per Flying Hour) was used for 95 aircraft at 374/Flying Hour (FH)/Acft/Yr.

Changes to the Computer Upgrade program now include conversion to Ada software. It is estimated the Ada software environment will significantly reduce maintenance costs in future years, after completion of the computer upgrade.

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- B-1B CMUP, December 31, 1998

18a. (U) Operating and Support Costs (Cont'd):
Computer Upgrade

The antecedent system is the B-1 Avionics Control Unit Complex consisting of the AP-101F Computers with Jovial J3B2 software.

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per 95 B-1 Acft and 8 Trainer CMUP Mods	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	5.0	5.8
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	30.3	70.3
Indirect Costs	N/A	N/A
Total	35.3	76.1

DSUP

a. (U) Assumptions and Ground Rules --
This estimate was prepared by the B-1B Program Office as part of the updated Service Cost Position, dated 20 Dec 96, for the approved Acquisition Program Baseline.

The B-1B CMUP - Defensive System Upgrade Cost Analysis Requirements Description and Service Cost Position estimate, which reflects a revised system architecture, were used as the basis for this estimate. The HQ ACC/XPM Manpower Estimate Report was reviewed and found to have a 33 manpower reduction for the Defensive System Upgrade. The Operation and Support has a phase in of FY04-FY09 and steady state FY10-FY26. A 1.48 utilization factor (Equipment Operation Hours per Flying Hour) was used for 95 aircraft at 508/Flying Hour/Aircraft/Year.

Changes with the Defensive System Upgrade include replacing 118 ALQ-161 boxes with 35 ALR-56M and IDECM boxes; a 4000 pound B-1B aircraft weight reduction; elimination of over 41,000 Technical Order pages; and in Support Equipment, the elimination of one Test Station Type, 31 Line Replaceable Unit Test Program Sets and 66 Shop Replaceable Unit Test Program Sets. It is estimated the Defensive System Upgrade will significantly reduce the B-1B Operating and Support costs.

The antecedent system is the B-1B ALQ-161 Defensive System.

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B-1B CMUP, December 31, 1998

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

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element	B-1B CMUP-DSUP 95 B-1B Aircraft	Antecedent B-1B ALQ-161 Avg Annual Cost
Mission Pay & Allowances	36.2	58.8
Unit Level Consumption	42.0	1279.7
Intermediate Maintenance	0.0	N/A
Depot Maintenance	0.0	N/A
Contractor Support	0.0	N/A
Sustaining Support	109.9	546.8
Indirect Costs	3.0	3.9
	N/A	N/A
Total	191.1	1889.2

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N-23 TACTICAL TOMAHAWK

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

PROGRAM: TACTICAL TOMAHAWK

AS OF DATE: December 31, 1998

INDEX

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1. (U) Designation and Nomenclature (Popular Name): RGM109E/UGM-109E (TACTICAL TOMAHAWK)
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:
PEO Cruise Missiles and Joint RADM J. V. Chenevey
Unmanned Aerial Vehicles Assigned: January 14, 1999
Patuxent River, MD 20670-1547 DSN 757-6332; COMM 301-757-6332
 cheneveyjv@navair.navy.mil
4. (U) Program Elements/Procurement Line Items:
RDT&E:
 (U) PE 0204229N Project A0545, A2658, A2659
PROCUREMENT:
 (U) APPN 1507 ICN 30210100 (Navy)

~~Derived from: unavinst S5513.2B~~
~~Downgrade instructions: OPNAVINST S5513.2B~~
~~Declassify on: X3~~

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TACTICAL TOMAHAWK, December 31, 1998

5. (U) References:

SAR Baseline (Development Estimate):

(U) Draft Acquisition Program Baseline dated January 18, 1999.

Approved Program:

(U) None.

6. (U) Mission and Description:

(U) The Tomahawk Land Attack Missile counters threats against U.S. Forces by destroying targets ashore including command, control, logistic systems; industrial and other high value targets. Tactical Tomahawk provides major modernization to the existing Tomahawk technology, increased responsiveness and flexibility at a more affordable production unit cost. On December 18, 1997, ASN(RD&A) approved the termination of the Tomahawk Baseline Improvement Program (TBIP) pending a congressional reprogramming action and the initiation of the Tactical Tomahawk program. Tactical Tomahawk utilizes the legacy from both Tomahawk and the TBIP program to provide a more affordable missile with modernized avionics and increased capability. Key elements of the Tactical Tomahawk design are an improved navigation and guidance computer; improved anti-jam GPS capability; improved responsiveness and flexibility through two-way satellite communications for in-flight retargeting; a loiter capability; and the ability to send a single-frame, battle-damage-indication video of the target area prior to impact. Modern manufacturing techniques and hardware will provide this improved capability at an affordable production cost and allow lower O&S costs by extending the recertification interval from six years for Block III to 15 years for Tactical Tomahawk. Tactical Tomahawk will maximize use of the existing Tomahawk Weapon System program and logistic support. There will be no changes to the system's overall support concept.

7. (U) Executive Summary:

(U) Development of the Tomahawk generation of U. S. cruise missiles began in 1972. Since then, the sea-launched, land-attack conventional variants have completed full scale engineering and development and OPEVAL, entered full rate production, and have been deployed: approximately 3,500 missiles have been delivered to the Navy. Sea-launched cruise missiles have been deployed in more than 150 surface ships and submarines.

Tomahawk missiles have played a key role in Operations Desert Storm, Bushwacker, Southern Watch, Deliberate Force, Desert Strike and Desert Fox. The success of Tomahawk in destroying high priority targets significantly reduced the risk to manned aircraft in the critical early stages of these operations.

As a result of lessons learned from recent conflicts, the CINCs have requested

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TACTICAL TOMAHAWK, December 31, 1998

7. (U) Executive Summary (Cont'd):

a more flexible, more responsive missile that has all the capabilities of the current Tomahawk but with the ability to respond in a more tactical-mission role. At about the same time, Raytheon, who was under contract for the Tomahawk Baseline Improvement Program, submitted an unsolicited proposal to the Navy that met the requirements requested by the CINCs at more affordable unit production and lower total ownership costs. At present, Raytheon is in Engineering Manufacturing Development (EMD) phase of the Tactical Tomahawk Missile program. Initial Operational Capability (IOC) for Tactical Tomahawk is planned for April 2003.

This is the initial SAR submission for the Tactical Tomahawk program.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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TACTICAL TOMAHAWK, December 31, 1998

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone II Development Contract Award	JUN 98	N/A	JUN 98
Operational Assessment	OCT 01	N/A	OCT 01
TECHEVAL			
Start	JAN 02	N/A	JAN 02
Complete	SEP 02	N/A	SEP 02
OPEVAL			
Start	OCT 02	N/A	OCT 02
Complete	MAR 03	N/A	MAR 03
LRIP Authorization	DEC 01	N/A	DEC 01
Milestone III	JUN 03	N/A	JUN 03
FRP Contract Award	JUL 03	N/A	JUL 03
Initial Operational Capability	APR 03	N/A	APR 03

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Accuracy Land Attack CEP (ft.)	(b)(1)			
ECCM Jam Resistance				
GPS/Navigation (dBW)				
Mission Reliability (%)				
Cruise Reliability (%)				
Range Operational (km)				

b. Current Change Explanations -- None

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TACTICAL TOMAHAWK, December 31, 1998

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	525.3		521.2
Procurement	1158.4		1155.5
	(860.0)		(862.0)
Other Weapon System Costs	(237.6)		(233.7)
Peculiar Support	(60.8)		(59.8)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0		0.0
Acquisition O&M	0.0		0.0
Total FY 99 Base-Year \$	1683.7		1676.7
Escalation	179.7		186.7
Development (RDT&E)	(6.3)		(10.4)
Procurement	(173.4)		(176.3)
Construction (MILCON)	(0.0)		(0.0)
Acquisition O&M	(0.0)		(0.0)
Total Then Year \$	1863.4		1863.4

(U) Note: The Acquisition Program Baseline Agreement (APBA) has been submitted to reflect only the Tomahawk AUR segment of the Tomahawk Weapons System. Therefore, these figures do not reflect the President's Budget.

b. (U) Quantity --

Development (RDT&E)	12	N/A	12
Procurement	1353	N/A	1353
Total	1365	N/A	1365

(U) The LRIP quantities are 70. This does not represent more than 10% of the planned program buy. Contract Award Decision is scheduled for December 2001.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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TACTICAL TOMAHAWK, December 31, 1998

12. (U) Unit Cost Summary:

	UCR Baseline (N/A)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 99 BY\$)	0.0	1677.4	
(2) Quantity	0	1365	
(3) Unit Cost	N/A	1.229	N/A
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 99 BY\$)	0.0	1155.5	
(2) Quantity	0	1353	
(3) Unit Cost	N/A	0.854	N/A

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	531.6	1331.8	-	1863.4
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	+4.2	+2.9	-	+7.1
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-4.2	-1.8	-	-6.0
Other	-	-	-	-
Support	-	-1.1	-	-1.1
Subtotal	-	+0.0	-	+0.0
Total Changes	-	+0.0	-	+0.0
Current Estimate	531.6	1331.8	-	1863.4

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TACTICAL TOMAHAWK, December 31, 1998

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

(U) Summary (FY 1999 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	525.3	1158.4	-	1683.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-4.1	-1.8	-	-5.9
Other	-	-	-	-
Support	-	-1.1	-	-1.1
Subtotal	-4.1	-2.9	-	-7.0
Total Changes	-4.1	-2.9	-	-7.0
Current Estimate	521.2	1155.5	-	1676.7

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RD&E</u>		
Revised escalation indices. (Economic)	N/A	+4.2
Decrease in program estimate to reflect revised inflation assumptions. (Estimating)	-4.1	-4.2
RD&E Subtotal	-4.1	0.0
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	+2.9
Decrease in program estimate to reflect revised inflation assumptions. (Estimating)	-1.8	-1.8
Decrease in support estimate to reflect change in inflation assumptions. (Support)	-1.1	-1.1
Procurement Subtotal	-2.9	0.0

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TACTICAL TOMAHAWK, December 31, 1998

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.37	+0.01	-0.01	--	--	--	--	--	--	1.37

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.98	--	--	--	--	--	--	--	--	0.98

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	JUN 98	N/A	JUN 98
Milestone III	N/A	JUN 03	N/A	JUN 03
FUE/IOC	N/A	APR 03	N/A	APR 03
Total Cost	N/A	1863.4	N/A	1863.4
Total Quantity	N/A	1365	1353	1365
Prog Acq Unit Cost	N/A	1.37	N/A	1.37

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

a. RDT&E --

(U) New Contract:

RAYTHEON MISSILE SYSTEMS, TUCSON AZ

N00019-98-C-0177, CPFF

Award: June 3, 1998

Definitized: June 3, 1998

Initial Contract Price
Target Ceiling Qty

\$247.6 N/A 0

Current Contract Price
Target Ceiling Qty
\$247.6 N/A 0

Estimated Price At Completion
Contractor Program Manager
\$247.6 \$327.6

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TACTICAL TOMAHAWK, December 31, 1998

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

	<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

Explanation of Change:

None.

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

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

<u>Appropriation</u>	<u>Prior Years (FY98-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-07)</u>	<u>Total</u>
RDT&E	226.4	216.1	58.3	30.8	531.6
Procurement	-	-	-	1331.8	1331.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	226.4	216.1	58.3	1362.6	1863.4

b. Annual Summary -- TACTICAL TOMAHAWK

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY99 Dollars Nonrec	Flyaway FY99 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				70.8	70.7
1999				154.4	155.7
2000				211.0	216.1
2001				56.0	58.3
2002				21.2	22.4
2003				7.8	8.4
Subtotal	12			521.2	531.6

(U) Note: The Acquisition Program Baseline Agreement (APBA) has been submitted to reflect only the Tomahawk AUR segment of the Tomahawk Weapons System. Therefore, these figures do not reflect the President's Budget.

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TACTICAL TOMAHAWK, December 31, 1998

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

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY99 Dollars Nonrec	Flyaway FY99 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002	70		54.4	79.5	85.8
2003	149		83.3	115.7	127.4
2004	200		111.5	157.2	176.8
2005	342		190.9	239.4	274.9
2006	342		245.9	317.5	372.2
2007	250		176.0	246.2	294.7
Subtotal	1353		862.0	1155.5	1331.8

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1365		862.0	1676.7	1863.4

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 35.8

(U) Percent Total Program Expended: 1.9%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
Assumptions and Ground Rules have not been established. They will be provided in the next SAR.

b. (U) Costs -- (FY Constant (Base-Year) Dollars in Thousands)

Cost Element		
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A

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TACTICAL TOMAHAWK, December 31, 1998

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

b. (U) Costs -- (FY Constant (Base-Year) Dollars in Thousands)

Cost Element		
Depot Maintenance	122.1	120.9
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Tech/Operational Spt	188.6	186.7
OTL	159.4	157.8
Software Support	63.3	62.6
Platform Maintenance	0.0	0.0
Theater Mission Planning	0.0	0.0
Mission Personnel	121.0	119.8
Demilitarization	21.0	20.8
Total	675.4	668.6

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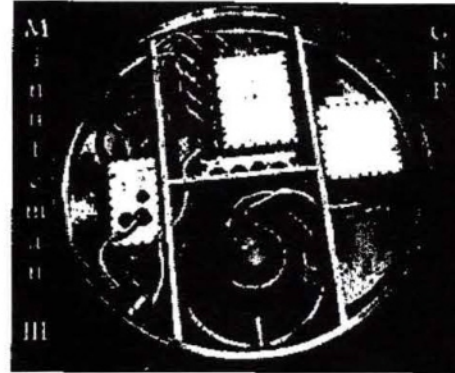
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
 PROGRAM: MMIII GRP

AS OF DATE: December 31, 1998

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- (U) Designation and Nomenclature (Popular Name): Minuteman III Guidance Replacement Program
- (U) DoD Component: USAF
- (U) Responsible Office and Telephone Number:
 OO-ALC/LMG
 6031 GUM LANE
 HILL AFB, UT 84056-5826
 MAJ (SA) MICHAEL A. MILLER
 Assigned: August 4, 1996
 DSN 775-2179; COMM (801) 775-2179
 millerma@hillwpos.hill.af.mil
- (U) Program Elements/Procurement Line Items:
 RDT&E:
 (U) PE 0101213F (Shared)
 (U) PE 0604312F
 (U) PE 0604851F
 PROCUREMENT:
 (U) APPN 3020 ICN LGM30G (Air Force)

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5. (U) References:

SAR Baseline (Development Estimate):

(U) Acquisition Decision Memorandum dated August 31, 1993.

Approved Program:

(U) AFAE Approved Acquisition Program Baseline (APB) dated February 24, 1999.

6. (U) Mission and Description:

(U) The Guidance Replacement Program (GRP) upgrades and extends the life of the Minuteman III guidance system through the year 2020. As a result of various arms control initiatives, the Minuteman III is projected to become the only land-based ICBM in the Triad when Peacekeeper is retired. The guidance electronics will be replaced since current electronic components continue to degrade and are projected to become unreliable and unsupportable as early as 2001. GRP replaces 1960's guidance system electronics and protects the option for future implementation of the Mark 21 RV/W87 warhead and an advanced inertial measurement unit (IMU), if required.

7. (U) Executive Summary:

(U) An Acquisition Strategy Panel (ASP) Roundtable was held in May 98 to discuss the Full Rate Production (FRP) strategy and impacts of the Dec 97 funding reduction. Approval was received from SAF/AQ to add the planned FY99 buy of 23 units to Low Rate Initial Production (LRIP). As a result of that decision, the FY00 buy will be the first buy for the FRP phase of the program and the planned FRP award date has moved to Nov 99. Approval was granted to revise the Acquisition Program Baseline (APB) to change the Milestone III objective and threshold dates from Nov and Dec 98 to Jun and Nov 99 respectively. This APB change was approved in Aug 98. Approval was also granted for the recommended contractor strategy for FRP.

During congressional FY99 budget deliberations, \$30M was added to the procurement funding for FY99. This enabled the program office to add 20 additional units in the FY99 LRIP buy for a total of 43.

In Dec 98, a further reduction in procurement funding across the FYDP was directed to support other Air Force priorities. This reduction capped GRP production at 60 units per year. This fact of life change forces a program restructure that stretches the program out four additional years. The program office has developed a new cost estimate for the restructured program and the APB has been revised to reflect the new estimate. This SAR is based on the revised APB.

The final Production readiness review for the program was held in Jan 98 and it was determined that the program was ready to proceed with production. Final negotiations for the LRIP contract were subsequently concluded and the LRIP contract awarded on 31 Mar 98, in accordance with the APB milestone. The hardware build began immediately after contract award and continues on schedule to meet the First Article Delivery (FAD) date of May 99 in accordance with the

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7. (U) Executive Summary (Cont'd):

APB milestone. The FY99 LRIP buy was negotiated and awarded in Jan 99.

The Air Force Operational Test and Evaluation Center (AFOTEC) test briefed their Operational Assessment to both AF/TE and DOT&E in Jan 99 and concluded that the program should proceed as planned into Initial Operational Test and Evaluation (IOT&E). On 24 Jun 98 the first of two GRP Integrated Demonstration Flights (IDFs) was successfully launched from Vandenberg AFB. The second IDF was successfully launched from Vandenberg AFB on 18 Sep 98. Both flights met all requirements and the Miss Other Than Reentry (MOTR) analysis for both verifies that GRP accuracy is within the Minuteman family.

Weapon System testing, Missile Guidance Set (MGS) Flight Proof testing, and Aerospace Vehicle Equipment (AVE) Box Qualification testing, each a technical criteria for entry into the LRIP phase of the program, were successfully completed in Mar 98. Final MGS Qualification was completed in early Jan 99, and the program is on track to complete the Engineering and Manufacturing Development phase of the program in May 99. Planning is underway for the Milestone III review scheduled in Jun 99.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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9. (U) Schedule:

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>	
Milestone I/II AFSARC	AUG 93	AUG 93	AUG 93	
Engineering and Manufacturing	AUG 93	AUG 93	AUG 93	
Development Contract Award				
Preliminary Design Review (PDR)	SEP 94	FEB 96	FEB 96	
Complete				
Critical Design Review (CDR) Complete	SEP 95	JUN 97	JUL 97	
AF QT&E				
Start	MAY 95	MAY 96	JUN 96	
Complete	MAY 97	JAN 98	APR 98	
Low Rate Initial Production (LRIP)	JUL 96	JAN 98	MAR 98	
Contract Award				
AF QOT&E Integration Demonstration	NOV 96	JUL 98	OCT 98	
Flight (IDF)				
Milestone III AFSARC	MAY 97	JUN 99	JUN 99	(Ch-1)
First Asset Delivery (FAD) to User	SEP 97	JAN 99	MAY 99	
Organic Support Capability	SEP 97	N/A	N/A	
Service Depot Support Date	SEP 98	N/A	N/A	
Initial Operational Capability (IOC)	MAR 98	NOV 99	JAN 00	

b. Current Change Explanations --

(U) (Ch-1) Milestone III From "Dec 98" to "Jun 99" due to change in Acquisition Strategy which added a second year to Low Rate Initial Production (LRIP).

10. (U) Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Demon- <u>strated</u>	Current <u>Estimate</u>
(S) Accuracy (G&C)	497	497 / 497	TBD	497
(Miss other than reentry - MOTR) (ft)				
(S) Weapon System	0.96	0.96 / 0.96	TBD	0.96
Reliability (G&C)				
(S) Weapon System	0.99	0.99 / 0.99	TBD	0.99
Availability (G&C)				
(S) Reaction Time (sec)	<= 30	<= 30 / <= 60	TBD	<= 30

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10b. (U) Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	423.3	496.0	517.0
Procurement	1040.3	1516.5	1515.3
Recurring Flyaway	(950.9)		(997.0)
Noncurring Flyaway	(0.0)		(393.3)
Total Flyaway	(950.9)		(1390.3)
Total Weapon Other System	(6.8)		(10.9)
Peculiar Support	(47.9)		(64.6)
Initial Spares	(34.7)		(49.5)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 93 Base-Year \$	1463.6	2012.5	2032.3
Escalation	172.6	387.6	371.3
Development (RDT&E)	(29.0)	(35.9)	(34.0)
Procurement	(143.6)	(351.7)	(337.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	1636.2	2400.1	2403.6
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	652	652	652
Total	652	652	652

Note: Excludes 11 RDT&E prototypes from the SAR Baseline and 10 from the Current Estimate that are not considered fully configured.

(U) The initial planned LRIP quantities were 46, the current planned LRIP quantities are 83.

This represents more than 10% of the total planned buy as approved by the Component Acquisition Executive per the Acquisition Strategy Panel.

The unit of measure for this program is the Missile Guidance Set for the Minuteman III missile.

c. (U) Foreign Military Sales --
None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

	UCR Baseline (FEB99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 93 BY\$)	2012.5	2032.3	
(2) Quantity	652	652	
(3) Unit Cost	3.087	3.117	+0.97
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 93 BY\$)	1516.5	1515.3	
(2) Quantity	652	652	
(3) Unit Cost	2.326	2.324	-0.09

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	452.3	1183.9	-	1636.2
Previous Changes:				
Economic	-8.1	-43.4	-	-51.5
Quantity	-	-	-	-
Schedule	+63.7	+110.4	-	+174.1
Engineering	-26.0	+18.9	-	-7.1
Estimating	+79.3	+245.7	-	+325.0
Other	-	-	-	-
Support	-	+38.2	-	+38.2
Subtotal	+108.9	+369.8	-	+478.7
Current Changes:				
Economic	-1.8	-29.1	-	-30.9
Quantity	-	-	-	-
Schedule	-	+46.5	-	+46.5
Engineering	-	-	-	-
Estimating	-8.4	+265.7	-	+257.3
Other	-	-	-	-
Support	-	+15.8	-	+15.8
Subtotal	-10.2	+298.9	-	+288.7
Total Changes	+98.7	+668.7	-	+767.4
Current Estimate	551.0	1852.6	-	2403.6

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

(U) Summary (FY 1993 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	423.3	1040.3	-	1463.6
Previous Changes:				
Quantity	-	-	-	-
Schedule	+56.0	+26.0	-	+82.0
Engineering	-24.4	+15.4	-	-9.0
Estimating	+69.3	+188.8	-	+258.1
Other	-	-	-	-
Support	-	+26.7	-	+26.7
Subtotal	+100.9	+256.9	-	+357.8
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-7.2	+209.2	-	+202.0
Other	-	-	-	-
Support	-	+8.9	-	+8.9
Subtotal	-7.2	+218.1	-	+210.9
Total Changes	+93.7	+475.0	-	+568.7
Current Estimate	517.0	1515.3	-	2032.3

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-2.1
Economic adjustment for negative program change. (Economic)	N/A	+0.3
Adjustment for Current and Prior Inflation. (Estimating)	+1.9	+2.1
USAF Transfer to 3020 (Estimating)	-6.8	-7.8
Higher level budget adjustment and general Headquarter reduction (Estimating)	-2.3	-2.7
RDT&E Subtotal	-7.2	-10.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-29.1
Four year stretchout of annual procurement buy profile from FY05 to FY09. (Schedule)	0.0	+46.5
Adjustment for Current and Prior Inflation. (Estimating)	+2.6	+2.8
Below program element level System Program Office reprogramming. (Estimating)	+1.0	+1.1
Parts Testing at White Sands (Estimating)	+0.2	+0.3
General Headquarters and across the board Congressional reductions. (Estimating)	-9.0	-10.7

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Increase Contractor Fee (Estimating)	+1.0	+1.1
Increase due to Lower Production Rate and added years. (Estimating)	+213.3	+270.4
Costs Deferred Due to Restructure (Estimating)	+1.5	+2.2
Program Cost Saving Initiatives (AR) (Estimating)	-6.7	-7.5
Adjustment for Current and Prior Inflation. (Support)	+0.7	+0.7
Change in Initial Spares (Support)	-0.8	+2.3
Revised estimate for Peculiar Support Equipment requirements. (Support)	+6.7	+9.7
Increase in data costs due to program stretchout. (Support)	+0.8	+1.3
USAF Transfer from 3600 (Estimating)	+6.8	+7.8
Correction to align fly away and support costs (Estimating)	0.0	0.0
(Support)	-1.5	-1.8
	+1.5	+1.8
Procurement Subtotal	<u>+218.1</u>	<u>+298.9</u>

AR = Acquisition Reform related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.51	-0.13	+0.01	+0.34	-0.01	+0.89	--	+0.08	+1.18	3.69

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.82	-0.11	--	+0.24	+0.03	+0.78	--	+0.08	+1.02	2.84

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14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	AUG 93	N/A	AUG 93
Milestone II	N/A	AUG 93	N/A	AUG 93
Milestone III	N/A	MAY 97	N/A	JUN 99
FUE/IOC	N/A	MAR 98	N/A	JAN 00
Total Cost	N/A	1636.2	N/A	2403.6
Total Quantity	N/A	652	N/A	652
Prog Acq Unit Cost	N/A	2.51	N/A	3.69

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

a. Procurement --

(U) MMIII GRP - Electronics:

Boeing North Ame. Intl, Anaheim CA
 F04704-93-C-0020, CPAF
 Award: April 7, 1997
 Definitized: April 7, 1997

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$160.8	N/A	40	\$160.8	\$160.8

Initial Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$38.0	N/A	40

Cost Variance Schedule Variance

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (12/31/98)	\$1.6	\$0.5
Net Change	\$1.6	\$0.5

Explanation of Change:

(U) This is the initial SAR requiring reporting for the GRP Production Contract.

(U) Contract Comments:

The RDT&E GRP Contract is over 90% complete and will no longer be reported.

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MMIII GRP, December 31, 1998

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

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

<u>Appropriation</u>	<u>Prior Years (FY93-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-11)</u>	<u>Total</u>
RDT&E	551.0	-	-	-	551.0
Procurement	289.6	149.1	157.8	1256.1	1852.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	840.6	149.1	157.8	1256.1	2403.6

b. Annual Summary -- MM III GRP

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY93 Dollars Nonrec</u>	<u>Flyaway FY93 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1993				52.8	53.7
1994				81.6	84.5
1995				88.2	93.0
1996				103.4	111.1
1997				103.7	112.9
1998				71.1	77.9
1999				16.2	17.9
Subtotal				517.0	551.0

Appropriation: 3020 - Missile Procurement, Air Force

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY93 Dollars Nonrec</u>	<u>Flyaway FY93 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996	4	1.3	7.9	9.2	10.0
1997	10	21.8	19.4	57.4	63.1
1998	30	26.0	51.0	94.0	104.3
1999	39	25.6	63.2	99.6	112.2
2000	60	32.9	91.4	130.3	149.1
2001	58	33.3	88.6	135.6	157.8
2002	58	32.6	88.9	129.9	153.9
2003	66	33.6	98.6	143.5	173.3
2004	60	32.4	89.3	129.0	159.2
2005	50	31.2	75.4	113.1	142.5
2006	60	32.5	89.2	128.8	165.6
2007	60	32.5	89.1	128.7	169.0
2008	60	32.5	89.0	128.6	172.5
2009	37	25.1	56.0	86.1	117.9

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY93 Dollars Nonrec	Flyaway FY93 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2010				0.9	1.3
2011				0.6	0.9
Subtotal	652	393.3	997.0	1515.3	1852.6

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	652	393.3	997.0	2032.3	2403.6

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 544.8

(U) Percent Total Program Expended: 22.7%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The concept of operations is based on 500 deployed guidance systems which operate continuously. This is only a modification to the current (antecedent) guidance system (NS-20), as such, Operating and Support (O&S) costs are not expected to change. Calculations are based on historical guidance repair data, which has varied little since Minuteman III was fielded in the early 1970s. Personnel costs are based on the current manning levels associated with guidance system repair. These levels will not change because maintenance personnel have multiple tasks and qualifications that drive overall manning requirements. Repair costs are calculated as the number of projected annual repairs, multiplied by the unit repair cost. Unit level consumption costs are based on costs associated with deployment of missile wing personnel to missile sites to remove and replace guidance systems, and the annual user costs associated with maintaining guidance related maintenance support equipment. Repair and unit level consumption costs will decrease as a result of this modification. The increase in reliability of the electronics will result in fewer guidance system repairs and fewer maintenance actions by field personnel. NOTE: The calculated costs to repair the guidance set compares

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

system level Missile Guidance System (MGS) repair. O&S data was extracted from the routine program office estimate dated Oct 96.

b. (U) Costs -- (FY 1993 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Year-NS-50 System	Avg Annual Cost Per Year-NS-20 Antecedent
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	3.5	3.5
Intermediate Maintenance	16.8	24.4
Depot Maintenance	4.1	4.5
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	24.4	32.4

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: JDAM

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Joint Direct Attack Munition (JDAM)

2. DoD Component: USAF

Joint Participants:
USAF, Navy

3. Responsible Office and Telephone Number:

AAC/YU, Bldg 11	GM-15 OSCAR L. SOLER
Joint Direct Attack Munition	Assigned: January 2, 1996
102 West D Ave Suite 300	DSN 872-3526; COMM 904-882-3526
Eglin AFB, FL 32542-6807	solero@eglin.af.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0604618F
PE 0604618N

PROCUREMENT:

APPN 1507 ICN 0550 (Navy)
APPN 3011 ICN 353620 (Air Force)

Air Force and Navy RDT&E funding includes the Product Improvement Program (PIP).

Air Force and Navy Procurement funding does not include PIP funding. Navy Procurement funding includes BLU-109 but not Joint Programmable Fuze.

SAF/PAS

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5. References:

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline (APB) dated September 20, 1995.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated February 22, 1999.

6. Mission and Description:

Operation DESERT STORM confirmed the need for a more accurate weapon delivery capability in adverse weather conditions from medium/high altitudes. Failure to satisfy this requirement will allow the enemy to continue to take advantage of the sanctuary of weather and/or prevent United States air power from prosecuting a conflict on its own terms. The JDAM is an Air Force and Navy munitions program to correct these shortfalls, with the Air Force as the Executive Service. JDAM will upgrade the existing general purpose bombs (MK-84, BLU-109, and MK-83/BLU-110) by integrating them with a tail guidance kit consisting of an Inertial Navigation System (INS) aided by a Global Positioning System (GPS). JDAM will provide an accurate (13 meters) adverse weather capability. The primary platforms for the JDAM development are the B-1B, B-2A, B-52H, FA-18C/D and the F-22A (for the MK-83/BLU-110 only). The services will certify other aircraft (e.g. F-16C/D, F-14D, F-15E, FA-18E/F, S-3, P-3, AV-8B, F-117) to deliver JDAM when funding becomes available. The JDAM Product Improvement Program (PIP) will investigate and develop improvement options for the JDAM system.

7. Executive Summary:

The minutes from the 12 December 1997 JDAM Overarching Integrated Product Team (OIPT) meeting were signed and provided to the program office on 15 January 1998. The OIPT approved changing the Lot 2 Full Rate Production to a Low Rate Initial Production (LRIP) 2 consisting of only MK-84 tail kits. They also decoupled the 1000 lb tailkit from the 2000 lb tailkit and established Milestone (MS) III dates of February 1999 as an objective and June 1999 as the threshold for the 2000 lb program.

The JDAM and its associated support equipment were Y2K certified on 7 May 1998.

The JDAM LRIP 2 contract was exercised on 22 June 1998.

We received the first MK-84 production unit at a formal "JDAM Rollout Ceremony" in St. Louis, MO on 24 June 1998.

We completed DT/OT on the B-1B in July 1998.

On 10 September 1998, Boeing conducted a Critical Design Review (CDR) on the new "Pin Fin Brake" which will extend the JDAM F/A-18 envelope into the low altitude/high speed area of extreme vibration.

We received a Letter of Request (LOR) on 23 November 1998 to provide Israel

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7. Executive Summary (Cont'd):

JDAM tailkits as Foreign Military Sales (FMS).

On 3 December 1998, we presented our approach to the JDAM OIPT for solving the F/A-18 flight restriction, restructuring the program to create a third LRIP lot of 2000 lb kits and moving the 2000 lb MS III threshold date. The OIPT agreed to these recommendations plus delegation of the Lot 3 LRIP decision to the Air Force SAE. The new MS III dates for the 2000 lb JDAM kits are November 1999 as an objective date and May 2000 as the threshold date.

The JDAM Product Improvement Program (PIP) contract was extended on 11 December 1998 to continue the evaluation of guidance technologies and aerodynamic, guidance and control trade studies.

Development program delays with the F-22 program delayed aircraft integration and flight test of the 1000 lb MK-83 variant. We are pursuing restructure options that include delaying the MK-83 operational test until the F-22 is available or accelerating another aircraft integration. Recommendations for USD (A&T) approval will be forwarded in April 1999.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

The RDT&E cost breach is due to the increase in Navy funding for the Product Improvement Program (PIP). The decision to fully fund the PIP program was made during the PB00 budget cycle.

The Milestone III decision for the 1000 lb (MK-83) tailkit on the F-22 was scheduled for September 2001. Test aircraft are unavailable to meet this schedule. A Program Deviation Report (PDR) has been submitted to USD (A&T)

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8c. Threshold Breaches (Cont'd):

reflecting current estimate dates of To Be Determined (TBD) until the availability of the F-22 is known. The following milestones changed:

OT&E/OPEVAL Complete (1000 lb Kit /F-22) changed from March 2003 to TBD.
Milestone III (1000 LB on F-22) changed from January 2005 to TBD.
LRIP (1000 lb) changed from April 1999 to TBD.

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
Milestone 0	JUN 92	JUN 92	JUN 92	
Milestone I	OCT 93	OCT 93	OCT 93	
Dem/Val Contract Award	APR 94	APR 94	APR 94	
Critical Design Review Complete	AUG 95	AUG 95	AUG 95	
Milestone II	SEP 95	SEP 95	SEP 95	
Exercise EMD Contract Option	OCT 95	OCT 95	OCT 95	
DT&E/TECHEVAL				
Start (Flight Tests)	OCT 95	OCT 95	DEC 95	
Complete (2000 lb Kit)	DEC 97	DEC 97	JUN 98	
Complete (1000 lb Kit) - Weapon Only	FEB 98	FEB 98	AUG 98	
Operational Assessment				
Start	OCT 95	OCT 95	OCT 95	
Complete	MAR 97	MAR 97	JAN 97	
OT&E/OPEVAL Complete (1000 lb Kit/F-22)	MAY 01	MAY 01	TBD	(Ch-1)
Exercise Lot 1 Option	APR 97	APR 97	APR 97	
Lot 1 Production First Delivery	APR 98	APR 98	MAY 98	
Required Assets Availability (AF)	MAR 99	MAR 99	MAR 99	
Initial Operational Capability (FA-18)	SEP 99	SEP 99	SEP 99	
Milestone III (1000 lb on F-22)	SEP 01	SEP 01	TBD	(Ch-1)
Milestone I JDAM PIP	SEP 99	SEP 02	SEP 02	
Milestone III (2000 lb)	APR 98	NOV 99	NOV 99	(Ch-2)
Exercise Lot 2 Option (LRIP)	APR 98	APR 98	JUN 98	(Ch-3)
IOT&E/OPEVAL (Dedicated 2000 lb Kit)	N/A	OCT 99	OCT 99	(Ch-2)
Complete				
LRIP (1000 lb)	DEC 97	APR 98	TBD	(Ch-1)
Award Lot 3 (LRIP)	N/A	JUN 99	JUN 99	
OT&E/OPEVAL Complete (1000 lb Kit)	N/A	N/A		
Milestone III (1000 lb)	N/A	N/A		
Milestone III (1000 lb)	N/A	N/A		

1/ The Required Assets Availability Milestone date will be provided once ACC identifies what is required for RAA.

NOTE: LRIP 1 Decision will be based on completion of Group 1 Threshold aircraft for DT&E/IOT&E.

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9a. Schedule (Cont'd):

Milestones and dates reflect the JDAM accelerated program.

Lot 1 Decision will be based on sufficient testing on B-52, F/A-18C/D, B-2, B-1, and F-16.

ACRONYMS: AUR - All Up Round

LRIP - Low Rate Initial Production

RAA - Required Assets Availability

b. Current Change Explanations --

Ch-1 The Milestone III decision for the 1000 lb (MK-83) on the F-22 was scheduled for September 2001. Test aircraft are unavailable to meet this schedule. A Program Deviation Report (PDR) has been submitted to USD (A&T) reflecting current estimate dates of To Be Determined (TBD) until the availability of the F-22 is known. The following milestones are changed:

OT&E/OPEVAL Complete (1000 lb Kit/F-22) changed from March 2003 to TBD.

Milestone III (1000 lb on F-22) changed from January 2005 to TBD.

LRIP (1000 lb) changed from April 1999 to TBD.

Ch-2 Delays incurred while rectifying quality problems with hardware delayed the start of operational test. This delay, coupled with the time previously scheduled for operational test on the B-52 and F/A-18, made it highly unlikely to complete IOT&E/OPEVAL and Milestone III prior to the Acquisition Program Baseline (APB) threshold dates. On 3 December 1998, the program office presented our approach to restructure the program. The OIPT agreed to create a third LRIP lot of 2000 lb JDAM kits and move the 2000 lb Milestone III threshold date. The following milestones changed:

Milestone III (2000 lb) changed from April 1999 to November 1999.

IOT&E/OPEVAL (Dedicated 2000 lb Kit) Complete changed from December 1998 to October 1999.

Ch-3 Since the previous SAR, Exercise Lot 2 Option (LRIP) changed to June 1998 from April 1998 due to GPS software problems.

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10. Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u> Adverse	Approved Program (APB) <u>Obj/Threshold</u> Adverse / Adverse	Demon- strated Perf Adverse	Current <u>Estimate</u> Adverse
Weather Capability Accuracy (CEP) (Meters)				
GPS Available,	13	13 / 13	9.7	13
Impact Angles > 60 Deg	Horizon- tal Targets	Horizon- tal / - tal Targets / Targets		Horizon - tal Targets
Inflight Re-targeting Capability (captive carry)	Yes	Yes / Yes	Yes	Yes
Carrier Operability	Yes	Yes / Yes	Yes	Yes
Warhead Compatibility	MK-82, MK-83	MK-82, / BLU-109, MK-83 / MK-84, / MK-83 / (F-22)	BLU-109, MK-84, MK-83 (F-22)	BLU-109, MK-84, MK-83 (F-22)
Aircraft Compatibility				
Bomber	B-1B, B-2	B-1B, / B-52H B-2 /	Yes	B-52H
Fighter Attack	FA-18 C/D (MK-83) , F-16 C/D, FA-18 E/F, F-117A, F-15E, P-3, S-3, F-14 A/B/D	FA-18 / FA-18C/ C/D / D, (MK-83)/ F-22A, , F-16 / AV-8B C/D, / FA-18 / E/F, / F-117A, / F-15E, / P-3, / S-3, / F-14 / A/B/D /	Yes	FA-18C/ D, F-22A, AV-8B
Mission Reliability	.90	.90 / .90	.96	.90
JDAM PIP Accuracy (CEP) (Meters)	3	3 / 3	TBD	3
JDAM PIP Weather Capability	Adverse	Adverse / Adverse	TBD	Adverse
JDAM PIP Warhead Compatibility	MK-82, MK-83	MK-82, / BLU-109, MK-83 / MK-84	TBD	BLU-109, MK-84

1/ Adverse weather is defined as natural/man-made conditions such as rain, haze, dust, smoke, fog, snow, ice, wind, and/or clouds that preclude the use of current inventory precision guided munitions.

2/ Assumes GPS quality hand-off from aircraft. In addition, the target location error (TLE) portion of the total system error is allocated to be

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10a. Performance Characteristics (Cont'd):

7.2 meters CEP. If TLE is larger than 7.2 meters CEP, the total system CEP will increase accordingly. For impact angles between 60 degrees and 35 degrees (with GPS available) accuracy degradation up to 19 meters CEP against horizontal targets is an objective.

3/ Inflight programming/targeting will be possible through MIL-STD-1553/1760 data bus interface to the weapon from existing aircraft stores management hardware and modified software.

4/ JDAM will be capable of operation on aircraft carriers to include withstanding 25 aircraft carrier catapult launches and arrested landings, and operating within the carriers' electromagnetic environments.

5/ Physical compatibility with the B-1B, B-2, FA-18C/D, AV-8B and B-52H were successfully demonstrated during actual fit test in EMD Phase 1. F-22A physical compatibility was also demonstrated using computerized physical fit analysis during this phase. Integration with the F-15E, F-16C/D, F-117, FA-18E/F, F-14D, S-3, and P-3 will be addressed as follow-on integration efforts. The A-6E aircraft was deleted by Chief of Naval Operations (CNO) Letter, Serial Number N880D5/4UG59112, dated 2 February 1994. The F-111F has been deleted (Reference AF/XOR Message 260111Z January 1994).

6/ F-22 compatibility will be limited to internal carriage of the MK-83/BLU-110 configuration. The AV-8B is a funded, non-key performance parameter, threshold aircraft.

7/ Mission reliability commences when the aircrew accepts the loaded aircraft and ends at weapon impact. Mission reliability for the guidance kits does not include reliability for the fuze. Mission reliability, a component of Guidance Kit system reliability, is used because the other component of system reliability (10 year storage reliability) cannot be demonstrated during development and operational testing.

ACRONYMS: CEP - Circular Error Probable
DEG - Degree
GPS - Global Positioning System
MSL - Mean Sea Level
PIP - Product Improvement Program
TBD - To Be Determined

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10b. Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	490.3	490.3	567.4
Procurement	2090.6	2090.6	1712.4
Hardware	(1638.9)		(1372.1)
Tooling & Test Equipmen	(7.9)		(0.7)
System Engineering & Pr	(40.5)		(10.8)
Containers	(39.9)		(29.6)
Warranty	(73.3)		(4.3)
Engineering Change Orde	(46.8)		(40.8)
Lot Acceptance Test	(15.8)		(0.0)
Nonrecurring Flyaway	(60.7)		(67.1)
Total Flyaway	(1923.8)		(1525.4)
Warhead	(65.4)		(46.2)
Product Support Cost	(79.8)		(121.6)
Total Other Wpn Sys	(145.2)		(167.8)
Peculiar Support	(21.6)		(19.2)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 95 Base-Year \$	2580.9	2580.9	2279.8
Escalation	811.4	811.4	311.1
Development (RDT&E)	(27.0)	(27.0)	(29.8)
Procurement	(784.4)	(784.4)	(281.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3392.3	3392.3	2590.9

NOTE: This baseline does not include Navy funding for the Joint Programmable Fuze (JPF) (\$6.5M TY\$ for RDT&E) (\$72.5M TY\$ for Procurement). Navy Procurement funding includes BLU-109 (2,848 units for \$52.5M TY\$).

Air Force and Navy RDT&E funding includes the Product Improvement Program (PIP). Air Force and Navy Procurement funding does not include PIP funding.

This Acquisition Program Baseline (APB) includes JDAM PEs 0604618F and 0604618N for Research, Development, Test and Evaluation (RDT&E), and 0207583F (3011) and Appropriation 1507N, ICN 0550, for Procurement.

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11b. Total Program Cost and Quantity (Cont'd):

b. Quantity --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	630	630	620
Procurement	87496	87496	87496
Total	88126	88126	88116

Note: Excludes 81 RDT&E prototypes from the SAR Baseline and 81 from the Current Estimate that are not considered fully configured.

NOTE: The Low Rate Initial Production (LRIP) quantities approved in the Acquisition Decision Memorandum (ADM) at Milestone II were 425 units for Lot 1. Subsequent FY97 budget cycle decisions approved a buy-to-budget approach for determining annual quantities. With the lower than expected unit costs, LRIP quantities were 937 for Lot 1. A second LRIP lot (Lot 2) was approved in December 1997. Lot 2 quantities were 2,202 tailkits. In December 1998, the OIPT approved a third LRIP lot (Lot 3). Planned Lot 3 quantities are 2,527 tailkits.

c. Foreign Military Sales --

The JDAM program office received a Letter of Request (LOR) on 23 November 1998 to provide Israel JDAM tailkits as Foreign Military Sales (FMS). The Israeli Air Force (IAF) issued the LOR for a quantity of 700 JDAM tailkits and would like to proceed in order to tie in with our Lot 3 award projected for June of this year. The JDAM Milestone II Acquisition Decision Memorandum (ADM) encourages early foreign sales. The JDAM FMS team has been working closely with SAF/IAM to get the Letter of Offer and Acceptance (LOA) to the IAF by 30 April 1999, subject to the approval of the OIPT leader.

d. Nuclear Costs --

None.

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12. Unit Cost Summary:

	UCR Baseline (SEP 95 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	2580.9	2279.8	
(2) Quantity	88126	88116	
(3) Unit Cost	0.029	0.026	-10.34
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	2090.6	1712.4	
(2) Quantity	87496	87496	
(3) Unit Cost	0.024	0.020	-16.67

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	517.3	2875.0	-	3392.3
Previous Changes:				
Economic	-8.7	-198.5	-	-207.2
Quantity	+16.8	-	-	+16.8
Schedule	-	+41.6	-	+41.6
Engineering	-19.0	-	-	-19.0
Estimating	-50.9	-717.2	-	-768.1
Other	-	-	-	-
Support	-	-0.7	-	-0.7
Subtotal	-61.8	-874.8	-	-936.6
Current Changes:				
Economic	-2.7	-39.4	-	-42.1
Quantity	-	-	-	-
Schedule	-	+25.3	-	+25.3
Engineering	-	-	-	-
Estimating	+144.4	-0.7	-	+143.7
Other	-	-	-	-
Support	-	+8.3	-	+8.3
Subtotal	+141.7	-6.5	-	+135.2
Total Changes	+79.9	-881.3	-	-801.4
Current Estimate	597.2	1993.7	-	2590.9

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

Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	490.3	2090.6	-	2580.9
Previous Changes:				
Quantity	+15.7	-	-	+15.7
Schedule	-	+25.8	-	+25.8
Engineering	-16.5	-	-	-16.5
Estimating	-48.7	-440.0	-	-488.7
Other	-	-	-	-
Support	-	+13.5	-	+13.5
Subtotal	-49.5	-400.7	-	-450.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+15.9	-	+15.9
Engineering	-	-	-	-
Estimating	+126.6	-0.1	-	+126.5
Other	-	-	-	-
Support	-	+6.7	-	+6.7
Subtotal	+126.6	+22.5	-	+149.1
Total Changes	+77.1	-378.2	-	-301.1
Current Estimate	567.4	1712.4	-	2279.8

NOTE: Difference between Planning Estimate (PE) and Development Estimate (DE) has been accounted for in previous estimating changes.

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-2.7
Adjustment for Current and Prior Inflation. (Estimating)	+2.0	+2.0
Revised Navy funds for various Department of the Navy balancing adjustments and inflation adjustments. (Estimating)	-0.9	-0.9
Navy funds increased for Product Improvement Program (PIP). (Estimating)	+119.8	+136.7
Navy funds increased for Tactical Air Mission Planning System (TAMPS). (Estimating)	+6.2	+7.2
Revised estimate due to changes in estimating methodology (Navy). (Estimating)	+0.7	+0.7
Congressional Reduction of funds (Air Force) (Estimating)	-1.1	-1.2
Reduction of funds due to Air Force Reprogramming. (Estimating)	-0.2	-0.2

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

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year
 Revised estimate due to changes in estimating methodology (Air Force). (Estimating) +0.1 +0.1

RDT&E Subtotal +126.6 +141.7

(2) Procurement

Revised escalation indices. (Economic) N/A -40.2
 Economic adjustment for negative program change. (Economic) N/A +0.8
 Revision of annual procurement buy profile for the Navy (Schedule) +9.5 +13.2
 Revision of annual procurement buy profile for the Air Force. (Schedule) +6.4 +12.1
 Adjustment for Current and Prior Inflation. (Estimating) +2.2 +2.4
 Revised estimate due to changes in estimating methodology (Navy). (Estimating) -0.6 -1.3
 Revised estimate due to changes in estimating methodology (Air Force). (Estimating) -1.7 -1.8
 Adjustment for Current and Prior Inflation. (Support) +0.4 +0.4
 Change in Peculiar Support (Support) -6.3 -6.8
 Adjustment for Current and Prior Inflation. (Support) +0.3 +0.3
 Change in Product Support Cost (Support) +14.6 +17.3
 Change in Warhead Cost for the Navy. (Support) -2.3 -2.9

Procurement Subtotal +22.5 -6.5

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.04	--	--	--	--	-0.01	--	--	-0.01	0.03

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14b. Unit Cost and Other History (Cont'd):

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.03	--	--	--	--	-0.01	--	--	-0.01	0.02

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	OCT 93	OCT 93	N/A	OCT 93
Milestone II	OCT 95	SEP 95	N/A	SEP 95
Milestone III	JUL 99	NOV 99	N/A	NOV 99
FUE/IOC	SEP 99	SEP 99	N/A	SEP 99
Total Cost	681.5	3392.3	N/A	2590.9
Total Quantity	378	88126	N/A	88116
Prog Acq Unit Cost	1.8	0.04	N/A	0.03

NOTE: SAR Planning Estimate (PE) total cost and total quantity only reflect RDT&E values.

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

a. RDT&E --

JDAM:
Boeing, St Charles, MO
F08626-94-C-0003, CPAF
Award: October 11, 1995
Definitized: October 11, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$70.5	\$0.0	630

Current Contract Price		
Target	Ceiling	Qty
\$104.6	\$0.0	620

Estimated Price At Completion	
Contractor	Program Manager
\$101.4	\$101.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (11/30/98)	\$0.4	\$-0.7
Net Change	\$0.4	\$-0.7

Explanation of Change:

The current contract price changed from \$95.2M to \$104.6M due to the following contract modifications: MK-83 Separation Test Vehicles (STV) for the AV-8B program, procurement of Environmental Measurement Vehicles for AV-8B program, support for B-1B test and integration, update to the JDAM

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15. Contract Information (Cont'd):

A/W/E for Version C2.1, Product Improvement Program (PIP), F-117 PIT (static ejection) test, Y2K version of A/W/E, update of A/W/E B-52 software, requirements definition for precision JDAM, separation wind tunnel test, revision A PC version 6DOF, LAR capability, removal of F/A-18 flight restriction, integration of A/W/E 1.5 release, conversion of 1000 lb telemetry kits to 2000 lb telemetry kits, integration of A/W/E 2.0 release, extension of B-1 support, JSF BLU-109 capability, F-117 wind tunnel testing, purchase of 2000 lb telemetry kits, deobligation of FY96 PIP, F-117 simulator support and MK-83 Pin Fin effort.

Favorable cost variance results from milestones being accomplished on or ahead of schedule with less staffing than originally planned.

Unfavorable schedule variance results from testing and procurement impacts occurring in the air vehicle configuration, airframe and Tail Actuator System (TAS) efforts. In addition, the schedule variance results from milestones not being reached from slipping flight test schedules occurring in the aircraft integration, flight test, and EGTV/EIMV development support areas.

The difference between the current contract price and the estimated price at completion is the deobligation of the Flight Termination System (FTS) effort. This effort should be complete February 1999.

Cost and Schedule Variances are based on Contract Performance Report (CPR) dated 30 November 1998.

b. Procurement --
JDAM:
Boeing, St Charles, MO
F08626-94-C-0003, FFP
Award: April 30, 1997
Definitized: April 30, 1997

Initial Contract Price		
Target	Ceiling	Qty
\$19.4	\$	937

Current Contract Price		
Target	Ceiling	Qty
\$61.6	N/A	3139

Estimated Price At Completion	
Contractor	Program Manager
\$61.6	\$61.6

Explanation of Change:

The change in target price from \$19.4M to \$61.6M is based on Lot 2 contract award for \$42.2M. Quantities increased from 937 to 3139 based on Lot 2 contract award for 2202 units. Lot 2 was awarded on 22 June 1998.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years (FY93-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-07)</u>	<u>Total</u>
RDT&E	417.4	13.1	27.6	139.1	597.2
Procurement	166.5	158.8	268.6	1399.8	1993.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	583.9	171.9	296.2	1538.9	2590.9

b. Annual Summary -- JDAM

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				23.8	23.2
1994				7.9	7.9
1995				22.8	23.1
1996				25.3	26.1
1997				21.9	22.8
1998				14.3	15.0
1999				10.3	11.0
2000				10.8	11.7
2001				24.1	26.4
2002				35.2	39.2
2003				30.4	34.5
2004				33.0	38.3
2005				21.5	25.5
Subtotal	114			281.3	304.7

The Joint Programmable Fuze (JPF) funding (\$6.5M TY\$) is not included in this Navy Funding Summary. JPF is not part of the JDAM program but is budgeted in the JDAM Navy RDT&E and Procurement PEs.

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				21.9	21.5
1994				62.1	61.9
1995				62.0	62.9

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				74.0	76.4
1997				31.2	32.7
1998				19.9	21.0
1999				11.2	11.9
2000				1.3	1.4
2001				1.1	1.2
2002				1.4	1.6
Subtotal	506			286.1	292.5

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	547	8.5	9.3	21.5	22.9
1999	745	6.3	13.6	32.7	35.4
2000	785	4.8	14.6	30.2	33.2
2001	641	4.5	12.2	24.9	27.8
2002	809	4.6	13.6	24.4	27.8
2003	2622	5.8	42.8	49.4	57.4
2004	2340	5.3	37.3	50.6	60.0
2005	2400	4.9	37.8	50.6	61.2
2006	8786	5.4	136.6	146.6	181.1
2007	5821	5.8	90.7	98.9	124.8
Subtotal	25496	55.9	408.5	529.8	631.6

The Joint Programmable Fuze (JPF) funding (\$72.5M TY\$) is not included in this Navy Funding Summary. JPF is not part of the JDAM program but is budgeted in the JDAM Navy RDT&E and Procurement PES. Navy Procurement funding includes BLU-109 (2,848 units for \$52.5M TY\$).

Appropriation: 3011 - Procurement of Ammunition, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997	937	0.8	15.7	21.8	23.0
1998	1655	0.8	28.9	36.7	39.2
1999	1782	0.3	32.4	42.5	46.0
2000	5410	1.0	100.7	114.1	125.6
2001	10404	1.9	197.2	215.0	240.8
2002	9908	1.6	166.4	185.6	211.6

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

Appropriation: 3011 - Procurement of Ammunition, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2003	9803	1.5	159.7	176.7	205.5
2004	10039	1.5	159.9	177.0	210.1
2005	7848	1.2	123.4	137.6	166.8
2006	4214	0.6	65.5	75.6	93.5
Subtotal	62000	11.2	1049.8	1182.6	1362.1

Note: FY98 procurement funding of \$39.2M includes \$0.3 SEEK EAGLE funds that are not included in the APB cost.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	25610	55.9	408.5	811.1	936.3
USAF	62506	11.2	1049.8	1468.7	1654.6
Grand Total	88116	67.1	1458.3	2279.8	2590.9

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	583	559
Procurement	296	442

Percent Total Program Quantities Delivered: 1.1%

b. Total Expenditures To Date (In Millions of Dollars): \$ 391.9

Percent Total Program Expended: 15.1%

Deliveries are as of 31 December 1998. Contractually, 583 RDT&E Guided Test Vehicles (GTVs) were planned to be delivered by 31 December 1998. Preparation of DT/OT assets took precedence. Missed deliveries did not affect flight test schedule.

Expenditures reflect program office records as of 31 December 1998.

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18. Operating and Support Costs:

a. Assumptions and Ground Rules --

Operating and Support (O&S) costs include both Air Force and Navy dollars.

O&S costs were updated in November 1995 from the Defense Acquisition Board (DAB) position to reflect the increase in Navy quantities from 12,000 to 25,496 units.

The Air Force JDAM O&S cost estimate is based on the use of an O&S cost model named the Financial O&S Estimate (FINOEST) developed by the Air Force Cost Center in Washington, D.C. The model was used for the Milestone (MS) I, MS II, and source selection deliberations to calculate the estimated O&S costs for the JDAM program. FINOEST calculates the O&S costs based on the association between known variables and the JDAM design (labor rates, failure rates, time to assemble, transportation costs, etc.).

The following are the assumptions that were used in forming the Air Force O&S cost estimate: Total Air Force JDAM inventory of 62,000 units. JDAM will have a 20 year extended repair warranty to cover all repairs. Air Force will have two levels of maintenance; Organizational and Depot Level. The JDAM kit has a 20 year operating life. Air Force will conduct 50 drops a year of JDAM kits. The 50 drops a year will require Telemetry (TM) and Flight Termination Systems (FTS). One half of a percent of the total JDAM failures will not be covered by the extended repair warranty. The extended repair warranty does not cover overseas transportation costs. Estimate does not take into account any Defense Business Operations Fund (DBOF) activities.

There is no antecedent system for the Air Force JDAM.

The cost drivers for the Air Force O&S cost estimate were Telemetry and Flight Termination Systems for the 50 yearly drops along with the Range Support costs for the drops.

The Navy O&S costs are based on the NAVAIR O&S cost model.

The following are the assumptions that were used in forming the Navy O&S cost estimate: Utilized Air-4.2.5 Air-Launched Missile Model. Twelve carriers deployed per year. Three hundred and fifty JDAMs per carrier. Fifty firings per year. Ten percent container failure rate per year. Contractual support identified for first two years of operations. Twenty year operating life.

The cost drivers for the Navy O&S cost estimate were Range Evaluation for practice bomb drops, Sustaining Engineering/Program Management, Transportation, and Organizational Maintenance Handling/Inspection.

There is no antecedent system for the Navy JDAM.

The Other category includes Integrated Logistics Support (ILS) functions such as quality surveillance and Naval Weapon Systems (NWS) handling/processing costs.

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

Contractor support costs for the Navy will begin in FY98 and continue for the first two years of operation. The Navy will use the contractor support as "tech rep" support for any Navy unique requirements at the Naval Weapon Stations and aboard the aircraft carriers.

Based on the 20 year extended repair warranty, the Air Force does not have a requirement for contractor support. The 20 year extended maintenance repair warranty begins with Lot 1 and will cover any repairs required.

b. Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Total Cost for 87,496 JDAM Units	N/A
Mission Pay & Allowances	0.0	N/A
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.0	0.0
Contractor Support	0.0	0.0
Sustaining Support	0.0	0.0
Indirect Costs	0.0	0.0
Mission Personnel	6.7	0.0
Sustaining Engineering	7.2	0.0
System & Inventory Manag	1.8	0.0
Contractor Support	0.6	0.0
AFMSS	14.4	0.0
Other	5.7	0.0
Support Costs	0.0	N/A
Consumable Material	2.7	N/A
TM/FTS	56.3	N/A
Range Support	45.3	N/A
Technical Data Managemen	0.2	N/A
Transportation	6.9	N/A
Non-Warranted Repair Cos	0.1	N/A
Total	147.9	0.0

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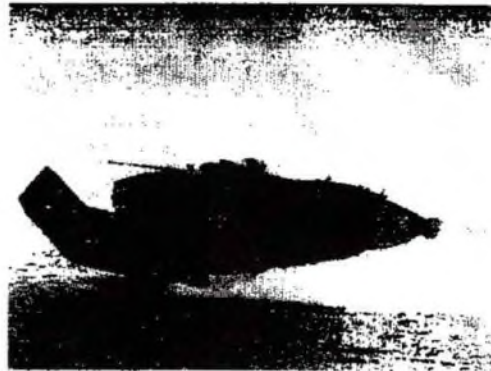
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: AAV

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Advanced Amphibious Assault Vehicle (AAAV)
2. DoD Component: USMC
3. Responsible Office and Telephone Number:
DRPM AAA COL BLAKE ROBERTSON
DEPT. OF THE NAVY U.S. MARINE CORPS Assigned: August 6, 1998
991 ANNAPOLIS WAY DSN ; COMM (703) 492-3300
WOODBIDGE, VA 22191-1215 bjr@aaav.usmc.mil
4. Program Elements/Procurement Line Items:
RDT&E:
PE 0603611M Project

5. References:

SAR Baseline (Planning Estimate):

Approved Acquisition Program Baseline dated March 17, 1995.

Approved Program:

Approved Acquisition Program Baseline (APB) dated March 17, 1995.

6. Mission and Description:

The Advanced Amphibious Assault Vehicle (AAAV) Program will field a successor to the Marine Corps' current amphibious vehicle, the Assault Amphibious Vehicle Model 7A1 (AAV7A1). The AAAV will provide the principal means of tactical surface mobility for the Marine Air Ground Task Force (MAGTF) during both ship-to-objective maneuver and subsequent combat operations ashore as part of

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DEPARTMENT OF DEFENSE

99-C-0795

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6. Mission and Description (Cont'd):

the Navy and Marine Corps Operational Maneuver from the Sea concept. The AAAV will provide the Marine Corps with the capability to execute the full spectrum of military missions from humanitarian operations to conventional combat operations. The AAAV replaces the AAV7A1 Vehicle.

The AAAV is a self-deploying, high water-speed, amphibious, armored, tracked vehicle capable of operating in all weather as well as Nuclear, Biological, and Chemical environments.

The Advanced Amphibious Assault Vehicle (AAAV) program is the only ACAT-ID program managed by the Marine Corps. The AAAV is the next generation of Marine Corps Assault Amphibious Vehicles being developed to satisfy the requirements of the 21st Century Marine Warfighters. Along with the Landing Craft Air Cushion (LCAC) and the MV-22 Osprey, the AAAV will provide the Marine Corps with the tactical mobility assets required to spearhead the Operational Maneuver From the Sea (OMFTS) concept. Acquisition of the AAAV is critical to the Marine Corps. The total AAAV requirement is for 1013 weapon systems. The AAAV program remains the Marine Corps number one priority ground system acquisition.

7. Executive Summary:

The Direct Reporting Program Manager, Advanced Amphibious Assault (DRPM AAA) is responsible for the development, production, and life cycle management of the AAAV.

The DRPM AAA was recognized by the Under Secretary of Defense (Acquisition and Technology) in May 1998 as the AAAV Program won, among other awards, the top two acquisition awards in the DoD. The David Packard Excellence in Acquisition Award and the Defense Superior Management Award.

The Office of the Inspector General, Department of Defense (DoD-IG) reviewed the DRPM AAA's records from June 1993 through October 1998 and submitted its final report on the AAAV Program on 15 December 1998. The DoD-IG report stated that "the AAAV Program Management Office was effectively managing the development of the AAAV." The report contains "no findings or recommendations."

The AAAV Program was approved by the Defense Acquisition Board (DAB) which conducted a Milestone I review in 1995 signifying the beginning of the Program Definition and Risk Reduction (PDRR) phase. In 1996, General Dynamics Land Systems was awarded the PDRR phase contract. Execution of the contract is at the AAAV Technology Center located in Woodbridge, VA. This facility houses the AAAV Program Office, General Dynamics and their subcontractors, and representatives from the Defense Contract Management Command. The PDRR prototypes successfully passed their Critical Design Review in July of 1998. Integration and Assembly of the first PDRR prototype began in Woodbridge on 14 December 1998, with the arrival of the hull and turret.

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7. Executive Summary (Cont'd):

The Program is currently ahead of the APB schedule and within budget. As of the end of the reporting period, the PDRR contract was 58.3% complete, the Schedule Performance Index was 96.7%, and the contract Cost Performance Index was 93.4% (Original Program Baseline).

PDRR prototype testing is scheduled to begin in the Fall of 1999. The program Milestone II DAB review is planned for January 2001. In 2001, the Engineering and Manufacturing Development (EMD) Phase starts, where 11 prototypes will be fabricated and tested in 2003 and 2004. Low Rate Initial Production (LRIP) of approximately 100 vehicles is planned for 2005 followed by a Full Rate Production and Deployment Phase spanning from 2006 to 2012. A total of 1,013 AAAVs will be produced with initial operational capability (IOC) scheduled for 2006. The AAAV is Pre-Milestone II (EMD), only the development costs (RDT&E) are reported in the Selected Acquisition Report (SAR) per, Section 2433, Title 10, USC.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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9. Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I DAB Review	MAR 95	MAR 95	MAR 95
Dem/Val Contract Award	FEB 96	FEB 96	JUN 96
AAAV(P) Prototype Delivery	OCT 00	OCT 00	JAN 00
Development Test (DT1)			
Start	OCT 00	OCT 00	JAN 00
Complete	JUN 01	JUN 01	JUL 00
Operational Test (OT1/EDA)			
Start	JUN 01	JUN 01	JUL 00
Complete	OCT 01	OCT 01	OCT 00
Milestone II DAB Review	JAN 02	JAN 02	JAN 01
Award of E&MD Contract	FEB 02	FEB 02	FEB 01
EMD Prototype Deliveries			
Start	OCT 04	OCT 04	OCT 02 (Ch-1)
Complete	MAR 05	MAR 05	JUN 03 (Ch-1)
Developmental Testing II			
Start	NOV 04	NOV 04	OCT 02 (Ch-1)
Complete	SEP 06	SEP 06	MAR 05
Award of LRIP	JUL 05	JUL 05	OCT 03
LRIP Vehicle #1 Delivery	JAN 07	JAN 07	APR 05
IOT&E			
Start	JAN 07	JAN 07	APR 05
Complete	JUL 07	JUL 07	SEP 05
Live Fire Testing (LFT&E)			
Start	JAN 06	JAN 06	MAY 04
Complete	JAN 07	JAN 07	MAY 05
Milestone III DAB Review	OCT 07	OCT 07	DEC 05
IOC	DEC 07	DEC 07	FEB 06
Full Rate Production Deliveries Start	JUL 09	JUL 09	SEP 07
Organic Support Capability	MAY 10	MAY 10	FEB 09
Service Depot Support	MAY 10	MAY 10	FEB 09
FOC	MAY 14	MAY 14	AUG 12

b. Current Change Explanations --

(Ch-1)The following schedule milestone dates were changed to reflect an acceleration of prototype fabrication and start of Developmental Testing and to also reflect an increased length of development testing.

	From	To
EMD Prototype Deliveries		
Start	MAR 03	OCT 02
Complete	JUL 03	JUN 03
Developmental Testing II		
Start	JUN 03	OCT 02

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10. Performance Characteristics:

a. Performance --

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
High Water Speed (kts) (SS-3, 36 in SWH)	25	25 / 20	TBD	22
Forward Speed on a Hard Surface Road (kph)	72	72 / 69	TBD	72
Armor Protection Against (mm/m)	30/1000	30/1000 / 14.5/300	TBD	14.5/300
Carry Capacity (Marines)	18	18 / 17	TBD	17
Firepower (M) (MER)	2000	2000 / 1500	TBD	2000
Reliability (hrs) MTBCMF	95	95 / 70	TBD	95

*Performance Characteristics reflect Joint Requirements Oversight Council (JROC) approved key performance parameters, dated 2/ February 1995.

b. Current Change Explanations -- None

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11. Total Program Cost and Quantity (Dollars in Millions):

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. Cost --			
Development (RDT&E)	725.0	725.0	823.5
Procurement	0.0	N/A	0.0
Total Sailaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 93 Base-Year \$	725.0	725.0	823.5
Escalation	209.1	209.1	110.6
Development (RDT&E)	(209.1)	(209.1)	(110.6)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	934.1	934.1	934.1
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	N/A	N/A	0
Total	N/A	0	0

Note: Excludes 13 RDT&E prototypes from the SAR Baseline and 12 from the Current Estimate that are not considered fully configured.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	934.1	-	-	934.1
Previous Changes:				
Economic	-25.9	-	-	-25.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+25.9	-	-	+25.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+0.0	-	-	+0.0
Current Changes:				
Economic	-23.9	-	-	-23.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+23.9	-	-	+23.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	+0.0	-	-	+0.0
Current Estimate	934.1	-	-	934.1

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

Summary (FY 1993 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	725.0	-	-	725.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+78.0	-	-	+78.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+78.0	-	-	+78.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+20.5	-	-	+20.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+20.5	-	-	+20.5
Total Changes	+98.5	-	-	+98.5
Current Estimate	823.5	-	-	823.5

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-23.9
Adjustment for Current and Prior Inflation. (Estimating)	+4.4	+4.7
Increased estimate to reflect revised inflation assumptions (Estimating)	+16.1	+19.2
RDT&E Subtotal	+20.5	0.0

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14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	MAR 95	N/A	N/A	MAR 95
Milestone II	JAN 02	N/A	N/A	JAN 01
Milestone III	OCT 07	N/A	N/A	DEC 05
FUE/IOC	DEC 07	N/A	N/A	FEB 06
Total Cost	934.1	N/A	N/A	934.1
Total Quantity	0	N/A	N/A	0
Prog Acq Unit Cost	0	N/A	N/A	0

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

a. RDT&E --

DEM/VAL:
GENERAL DYNAMICS, WOODBRIDGE, VA
M6785496-C-0038, CPAF
Award: June 13, 1996
Definitized: June 13, 1996

Initial Contract Price		
Target	Ceiling	Qty
\$217.0	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$259.5	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$254.5	\$258.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-3.2	\$-3.5
Cumulative Variances To Date (12/31/98)	\$-9.9	\$-4.8
Net Change	\$-6.7	\$-1.3

Explanation of Change:

Change in Current Contract Target Price: Corrected to reflect additional scope. The contract was modified to add a third prototype; to increase engine power by an additional 5%; to add improved hydrodynamic suspension units and to add an auxiliary power unit. The total value of the additional scope is \$24.8M.

Change in Cost Variance: Since last year's report, the two major reasons

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15. Contract Information (Cont'd):

for the increase in the cost variance were additional labor and material costs to manufacture the first two prototype hulls and increases in the Prime Contractor's General and Administrative (G&A) expenses due to a decrease in business base. The program is within budget.

Change in Schedule Variance: Since last year's report the dollar value of the schedule variance has increased from -\$3.5M to -\$4.8M. While the dollar magnitude has worsened the time equivalent has remained the same. This is mainly due to a programmatic decision to delay the start of the NATO verification tests on the engine. This delay will allow the incorporation of a superior fuel injection system and result in a more mature design that enables the delivery of a superior product. Engine delivery for the prototypes remains on schedule. The Program Schedule Performance Index (SPI) has improved by +1.5% from 95.5% to 97.0%. The engine subcontractor's SPI has remained at 96.0%, all year while his Cost Performance Index (CPI) has improved to 118.5%. Continued improvement for the program is expected.

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

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-06)</u>	<u>Total</u>
RDT&E	282.6	94.8	110.6	446.1	934.1
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	282.6	94.8	110.6	446.1	934.1

b. Annual Summary -- AAAV

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY93 Dollars Nonrec	Flyaway FY93 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				22.7	23.6
1996				30.3	32.1
1997				51.6	55.7
1998				61.8	67.2
1999				94.9	104.0
2000				85.3	94.8
2001				97.9	110.6
2002				112.3	128.9
2003				128.3	149.6

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY93 Dollars Nonrec	Flyaway FY93 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2004				58.6	69.8
2005				45.7	55.5
2006				34.1	42.3
Subtotal				823.5	934.1

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total				823.5	934.1

17. Delivery/Expenditure Information:

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 201

Percent Total Program Expended: 21.5%

18. Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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N-19 SSN 774

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: VIRGINIA CLASS SUB

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): VIRGINIA CLASS SUBMARINE (SSN 774)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:

VIRGINIA SUBMARINE PROGRAM OFFICE	CAPT PAUL SULLIVAN
PEO SUBMARINES	Assigned: September 11, 1998
2531 JEFFERSON DAVIS HIGHWAY	DSN 332-3700; COM (703) 602-3700
ARLINGTON, VA 22242-5168	SULLIVAN_PAUL_E_CAPT@hq.navsea.navy.mil

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

RDT&E:

(U) PE 0603561N
(U) PE 0603570N
(U) PE 0604558N

PROCUREMENT:

(U) APPN 1611 ICN 201300 (Navy)
(U) APPN 1611 ICN 201310 (Navy)
(U) APPN 1810 ICN 276200 (Navy) (Shared)
(U) APPN 1810 ICN 902099 (Navy)

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FOR OPEN PUBLICATION

AS AMENDED

AS AMENDED MAR 15 1999 9

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

99-C-0751
MAR 15 1999
Chief of the Chief of
Naval Operations
Dept. of the Navy

Derived from: OPNAVINST S5512-1-1 ENCL.90
Downgrade instructions:
Declassify on: X3

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5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline dated June 30, 1995.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated October 27, 1997.

6. (U) Mission and Description:

(U) The VIRGINIA Class (SSN 774) Submarine Program is bringing forward a critical national security asset designed to flexibly address the unique multi-mission requirements of the post-Cold War era. Capable of performing traditional submarine missions, dominating the littoral battle space and adapting to future requirements, the VIRGINIA Class Submarine will satisfy any assigned role well into the Twenty-First Century. Intended to replace the fleet of SSN 688 Class submarines ending service in large numbers early next century, the VIRGINIA Class Submarine is characterized by state-of-the-art stealth, enhanced features for special operations forces, and cost effective Command, Control, Communication and Intelligence capability. With an array of armament including the MK48 (ADCAP) torpedo and cruise missile vertical launch capability, the VIRGINIA Class Submarine maintains total undersea superiority at an affordable cost.

7. (U) Executive Summary:

~~U~~ As early as February 1991, a need for a new attack submarine class was identified to complement, yet be more affordable than SEAWOLF and to accommodate the impending end of service life of the SSN 688 class. Further impetus for the program was provided by nuclear submarine industrial base analyses. These studies concluded that the extensive design knowledge acquired through the SEAWOLF program needed to be captured and the nation's ability to build nuclear submarines needed to be preserved through low rate production of nuclear submarines if we were to sustain a credible submarine force in the future. In August 1992, the Under Secretary of Defense for Acquisition signed out the New Attack Submarine Acquisition Decision Memorandum approving Milestone 0. Following two years of extensive review of requirements and rigorous systems definition effort, the Defense Acquisition Board approved New Attack Submarine Milestone I with the signing of an Acquisition Decision Memorandum on August 18, 1994, initiating a program to develop and build a new attack submarine as a more cost effective follow-on to SEAWOLF with construction beginning at General Dynamics Electric Boat Division in FY98.

The VIRGINIA Class Submarine Program successfully passed Milestone II with the signing of an Acquisition Decision Memorandum (ADM) on June 30, 1995. A waiver from full-up, system-level live fire testing was approved jointly by USD (A&T) and DOT&E with notification letters sent to Congressional Defense Committees on June 29, 1995.

In the FY96 Authorization Act, Congress directed that a second nuclear

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7. ~~(U)~~ Executive Summary (Cont'd):

submarine builder would also be engaged in the VIRGINIA Class Submarine program and provisions for including Newport News Shipbuilding in the construction program were undertaken. The approach eventually determined to be most cost effective for including two constructors was a unique teamed construction plan under which each builder would fabricate selected modules for each ship and the two builders would alternate final assembly, integration, test, outfitting and delivery of completed submarines.

On May 9, 1996 the Integrated Process and Product Development 1996 Design/Build Contract with Electric Boat Corporation was definitized. Contract award for the NSSN Command, Control, Communications and Intelligence (C3I) System was executed April 24, 1996 to Lockheed Martin Federal Systems.

The program was reviewed for readiness to proceed with lead ship construction by an OIPT convened October 3, 1997. The ADM providing authorization to proceed was approved October 18, 1997. The acquisition program baseline (APB) was revised to reflect the co-construction teaming arrangement between Electric Boat (EB) and Newport News Shipbuilding (NNS) as approved in the FY98 Authorization and Appropriations Acts. The revised APB was approved on October 27, 1997.

During this period:

On September 30th 1998, the IPPD 96 Design Build contract with Electric Boat was modified to include construction of the first four VIRGINIA Class Submarines. Funding was placed on the contract for SSN (774). In December of 1998, funding was placed on the contract for construction of SSN (775).

In September 1998, SECNAV named the New Attack Submarine the VIRGINIA Class and assigned the first hull as (SSN 774). Later in the year, SECNAV named the second ship of the class the TEXAS (SSN 775).

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

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8. (U) Threshold Breaches (Cont'd):

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (\$AR)	Approved Program (APB)	Current Estimate	
Milestone 0	AUG 92	AUG 92	AUG 92	
Milestone I	AUG 94	AUG 94	AUG 94	
Milestone II	JUN 95	JUN 95	JUN 95	
New Attack Submarine Integrated Product and Process Development Contract Award	OCT 95	OCT 95	JAN 96	
Program Review (LRIP)	SEP 97	SEP 97	JAN 97	
Organizational Support (by Fast Cruise)	APR 04	APR 04	APR 04	
Lead Ship Delivery	JUN 04	JUN 04	JUN 04	
LFT&E Shock Tests	OCT 04	MAY 05	MAY 05	
Initial Operational Test & Evaluation Start	JUL 04	JUL 04	JUL 04	
Complete	OCT 04	JUN 07	JUN 07	
IOC (Lead Ship)	OCT 05	JAN 06	JUN 06	(Ch-1)
Intermediate Support (by IOC)	OCT 05	JAN 06	JAN 06	
Milestone III	OCT 07	OCT 07	OCT 07	
Depot Shipyard Support	AUG 15	AUG 15	AUG 15	
Related Programs				
NSSN COMMAND AND CONTROL SYSTEM				
FY95 Open Architecture Demo	OCT 95	OCT 95	SEP 95	
Complete				
C&CS Module Start Fabrication	JUN 99	JUN 99	JUN 99	
GFE C&CS Delivered to Shipyard	DEC 00	DEC 00	DEC 00	
LBTS Integration and Test Complete	APR 02	APR 02	APR 02	
C&CS Module delivered to ship	MAY 02	MAY 02	MAY 02	
NSSN Reactor Plant				
Reactor Vessel in Yard	(b)(1)			
Start Pre-fill Testing				
Power Unit Landed				
Start Alpha Trials				
MK-48 ADCAP Torpedo Modification Program				
LRIP				
MS III				
IOC Block IV				

(U) *The VIRGINIA Class Submarine Program is tracking and reports the six year earlier delivery of the MK-48 ADCAP weapon system, for associated weapons system coordination purposes only.

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

b. Current Change Explanations --

(U) CH-1. Current estimate for IOC (Lead Ship) changed from Jan 06 to Jun 06 to reflect an extension of Post Shakedown Availability from 6 to 12 months.

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Radiated Noise				
Broadband Noise				
5 and 10 knots (prior to installation of hull coating)	Figure A.1 (Except in Port and casualt y	Figure / Figure A.1 / A.1 (Except/ (Except in Port / in Port and / and casualt/ casualt y / y as / noted / below)	TBD	Figure A.1
Greater than or equal to 15 knots	Figure A.1 (All horizon - tal aspects	Figure / Figure A.1 (All/ A.1 horizon-/ (beam tal / aspect aspects)/ only). /	TBD	Figure A.1

~~(S)~~ Narrowband Noise



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10a. (U) Performance Characteristics (Cont'd):

	Development Estimate (CAP)	Approved Program (APB) Obj/Threshold	Demon- strated Rate	Current Estimate
(U) Transient Noise	(b)(1)			

(U) Exceptions:
Weapons Launch

Active Target
Strength (less than
or equal to)

(U) High Frequency
(15-30 kHz)
Stern Aspect (dB)

(U) Mid Frequency (2-15
kHz) Quarter
Aspect (dB)

(U) Low Frequency, Bow/
Stern (400Hz) (dB)

Electromagnetic
Quieting (less than
or equal to)

(U) DC Electric
(amp-meter)

(U) DC Magnetic
(gamma-ft³)
(million)

(U) AC Electric (amp-
meter)

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10a. (U) Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(C) Flank Speed (knots) (greater than or equal to)	(b)(1)			
(C) Torpedo Launch Rate Torpedoes in one minute				
(C) Payload (standard size weapons) (including weapons stored in torpedo tubes and vertical launch tubes)				
(C) Vertical Launch Missiles Cells				
(C) Test Depth (ft)				
(C) Endurance (days) (greater than or equal to)				
(C) Operational Availability (%)				
(C) Covert Strike Warfare (STW)				
(C) Covert Surveillance Intelligence Collection/Sur- veillance Covert Indication and Warning (ISW), and Electronic Warfare (EW)				
(C) Special Warfare (NSW)				
(C) Mine Warfare (MIW)				
(C) Anti-Submarine Warfare (ASW)				
(C) Anti-Surface Ship Warfare (ASUW)				
(C) Battle Group Support				

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10a. (U) Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj (Threshold)	Demon- strated Perf	Current Estimate
(U) 90-Day Basic Functions	(b)(1)			

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	3405.0	3408.1	3646.2
Procurement	42228.1	43932.0	47433.7
Flyaway	(42130.9)		(47199.8)
Other Wpn System Costs	(16.5)		(230.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(80.7)		(3.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 95 Base-Year \$	45633.1	47340.1	51079.9
Escalation	25447.7	18682.0	14073.0
Development (RDT&E)	(409.0)	(299.1)	(232.0)
Procurement	(25038.7)	(18382.9)	(13841.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	71080.8	66022.1	65152.9
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	30	30	30
Total	30	30	30

c. (U) Foreign Military Sales --
None

d. (U) Nuclear Costs --
\$11,905M (TY\$).

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12. (U) Unit Cost Summary:

	UCR Baseline (OCT 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	47340.1	51079.9	
(2) Quantity	30	30	
(3) Unit Cost	1578.003	1702.663	+7.90
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	43932.0	47433.7	
(2) Quantity	30	30	
(3) Unit Cost	1464.400	1581.123	+7.97

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	3814.0	67266.8	-	71080.8
Previous Changes:				
Economic	-186.4	-10420.9	-	-10607.3
Quantity	-	-	-	-
Schedule	-	+935.0	-	+935.0
Engineering	+65.1	+62.0	-	+127.1
Estimating	+54.7	+2142.0	-	+2196.7
Other	-	-	-	-
Support	-	-40.3	-	-40.3
Subtotal	-66.6	-7322.2	-	-7388.8
Current Changes:				
Economic	-36.6	-1322.6	-	-1359.2
Quantity	-	-	-	-
Schedule	-	-80.1	-	-80.1
Engineering	+39.0	+1028.8	-	+1067.8
Estimating	+128.4	+1545.7	-	+1674.1
Other	-	-	-	-
Support	-	+158.3	-	+158.3
Subtotal	+130.8	+1330.1	-	+1460.9
Total Changes	+64.2	-5992.1	-	-5927.9
Current Estimate	3878.2	61274.7	-	65152.9

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VIRGINIA CLASS SUB, December 31, 1998

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

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	3405.0	42228.1	-	45633.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	+88.6	-	+88.6
Engineering	+59.0	+53.1	-	+112.1
Estimating	+34.0	+3105.0	-	+3139.0
Other	-	-	-	-
Support	-	-36.0	-	-36.0
Subtotal	+93.0	+3210.7	-	+3303.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+36.0	+744.8	-	+780.8
Estimating	+112.2	+1109.5	-	+1221.7
Other	-	-	-	-
Support	-	+140.6	-	+140.6
Subtotal	+148.2	+1994.9	-	+2143.1
Total Changes	+241.2	+5205.6	-	+5446.8
Current Estimate	3646.2	47433.7	-	51079.9

(U) Increase in the engineering category in the procurement section for technology insertion reflects the estimate to maintain a modern fleet of VIRGINIA Class submarines and exploit technology opportunities, many of which will save future program dollars.

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-36.6
Technology Insertion reductions for the following: Sonar Dome, Advanced Submarine (ESM) combat systems development, C3I and advanced Sail Development. (Estimating)	-33.8	-39.0
Acquisition Stability Reserve Funding to support Ships Service Turbine Generator (SSTG) Advanced technology. (Engineering)	+36.0	+39.0
Adjustment for Current and Prior Inflation. (Estimating)	+11.6	+12.2
Adjustments for Small Business Innovative Research, various undistributed reductions. (Estimating)	+20.2	+22.3
Revised estimate for FY04 and 05. (Estimating)	+112.4	+130.8

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised estimate to reflect lower OSD indices. (Estimating)	+1.8	+2.1
RDT&E Subtotal	+148.2	+130.8
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-1325.8
Economic adjustment for negative program change. (Economic)	N/A	+3.2
Acceleration of build profile. (Schedule)	0.0	-80.1
Technology insertion for modernization to include (On-Hull Extremely Low Frequency Antenna, Tactical Tomahawk, Low Frequency Active Vulnerability Alertment, etc.) (Engineering)	+707.1	+984.1
Curriculum development for crew training. (Support)	+5.6	+6.3
Modernization/Technical upgrades (OPN). (Engineering)	+37.7	+44.7
Adjustment for Current and Prior Inflation. (Estimating)	+70.5	+76.0
Post Delivery and Outfitting cost adjustments. (Estimating)	-67.3	-77.5
FY 99 Appropriations Act reduction. (Estimating)	-6.9	-7.5
Revised estimate to reflect lower OSD approved indices. (Estimating)	+1091.7	+1524.8
Changes to Advance Procurement and Advance Construction to reflect an O3 ship. (Estimating)	+21.5	+29.9
Decrease in Support costs based on new estimate (OPN). (Support)	-3.8	-7.7
Change in Other Wpn System Costs for Major shore spares, Integrated Test and Maintenance systems, and Vertical Launch System peculiar support equipment (OPN). (Support)	+138.8	+159.7
Procurement Subtotal	+1994.9	+1330.1

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2369.36	-398.88	-0.01	+28.50	+39.83	+129.03	--	+3.93	-197.60	2171.76

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2242.23	-391.45	--	+28.50	+36.36	+122.92	--	+3.93	-199.74	2042.49

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	AUG 94	AUG 94	N/A	AUG 94
Milestone II	JUN 95	JUN 95	N/A	JUN 95
Milestone III	OCT 07	OCT 07	N/A	OCT 07
FUE/IOC	OCT 05	OCT 05	N/A	JUN 06
Total Cost	N/A	71080.8	N/A	65152.9
Total Quantity	N/A	30	N/A	30
Prog Acq Unit Cost	N/A	2369.36	N/A	2171.76

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

a. RDT&E --

(U) Design Studies IPPD:

Gen Dyn, EB Corp, Groton, CT
N00024-95-C-2103, CPFF
Award: February 21, 1995
Definitized: February 21, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$439.2	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$522.1	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$522.1	\$522.1

Explanation of Change:

(U) Increase in contract value from \$517.2M to \$522.1M is associated with the issuance of orders under the contract's Basic Ordering Agreements for material procurement.
This is a level of effort contract and does not invoke Earned Value

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VIRGINIA CLASS SUB, December 31, 1998

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

Measurement.

Cost and Schedule variance reporting is not required on this CPFF contract.

(U) Contract Comments:

This is a level of effort type contract with cost reporting at the task level.

			Initial Contract Price	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
(U) <u>NSSN/Sonar Combat Ctrl:</u>				
Lockheed Martin Fed Syst, Manassas VA				
N00024-96-C-6226, CPAF	\$99.6	N/A	1	
Award: April 24, 1996				
Definitized: April 24, 1996				
Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$171.7	N/A	1	\$182.8	\$188.1
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			\$-2.9	\$-2.5
Cumulative Variances To Date (12/23/98)			<u>\$-10.3</u>	<u>\$-1.8</u>
Net Change			\$-7.4	\$0.7

Explanation of Change:

(U) The increased unfavorable cost variance is attributed to increased design costs in Sonar and Combat Control subsystem hardware development. These costs were driven by design reuse assumptions not materializing causing complexity of non-propulsion electronics interface designs. Completion of Critical Design Review on these subsystems will stabilize design.

The improved favorable schedule variance has resulted from baseline changes required to incorporate the contract modification necessary to implement Non-Propulsion Electronics System (NPES) interfaces. Completion of a significant number of hardware design tasks also contributed to the favorable schedule variance. The Navy and Lockheed Martin continue to implement initiatives to mitigate cost and schedule impacts.

Current contract target price increased \$23.6M because of the NPES interface contract modification. The program manager's estimate at completion is \$16.4M higher than the target price due to technical risk, but is within approved funding.

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VIRGINIA CLASS SUB, December 31, 1998

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

(U) <u>Nuclear Components:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Westinghouse Electric Co., Monroeville PA N00024-96-C-4051, CPFF Award: December 15, 1995 Definitized: December 15, 1995	\$105.6	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$269.0	N/A	0	\$263.0	\$263.0

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this CPFF contract.

(U) <u>Nuclear Components:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Westinghouse Electric, Pittsburgh PA N00024-99-C-4006, CPFF Award: December 9, 1998 Definitized: December 9, 1998	\$118.3	\$	

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$118.3	\$		\$115.6	\$115.6

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this CPFF contract.

(U) Contract Comments:
This is a new contract since last year's SAR.

b. Procurement --

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VIRGINIA CLASS SUB, December 31, 1998

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

			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
(U) <u>IPPD96 Contract:</u>					
Gen Dyn, EB Corp, Groton, CT					
N00024-95-C-2100, CPFF	\$1437.7	N/A	0		
Award: January 29, 1996					
Definitized: May 9, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$1474.9	N/A	0	\$1265.2	\$1291.9	
			<u>Cost Variance Schedule Variance</u>		
Previous Cumulative Variances			\$-18.5 \$-8.7		
Cumulative Variances To Date (12/23/98)			\$-39.4 \$-14.5		
Net Change			\$-20.9 \$-5.8		

Explanation of Change:

(U) Cost and Schedule variance erosion resulted from higher than projected labor rates and the conscious sequencing of design efforts to mitigate the potential for future rework. This adjustment in design efforts produced a short term erosion in the cost and schedule variance to improve long term performance. Performance has begun to stabilize in the recent months.

The decrease in Program Manager Estimate at Completion (PMEAC) from \$1378.5M to \$1291.9M reflects the long lead time material transition to the construction contract.

			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
(U) <u>Nuclear Components:</u>					
Westinghouse Electric, Schenectady NY					
N00024-96-C-4053, CPFF	\$61.6	N/A	0		
Award: December 15, 1995					
Definitized: December 15, 1995					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$218.5	N/A	0	\$213.6	\$213.6	

Explanation of Change:

(U) Increase in target price from \$147.7 to \$218.5 reflects the modification of the contract for FY98 component buy.

Cost and Schedule variance reporting is not required on this CPFF contract.

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VIRGINIA CLASS SUB, December 31, 1998

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

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>SSN774:</u>					
Gen Dyn, EB Corp, Groton, CT					
N00024-95-C2100A, CPFF			\$1028.0	\$	1
Award: September 30, 1998					
Definitized: September 30, 1998					
			Estimated Price At Completion		
			<u>Contractor</u>	<u>Program Manager</u>	
Current Contract Price					
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>			
\$1028.0	N/A	1	\$1028.0	\$1028.0	
			<u>Cost Variance</u> <u>Schedule Variance</u>		
Previous Cumulative Variances			\$	\$	
Cumulative Variances To Date			\$	\$	
Net Change			\$	\$	

Explanation of Change:

None.

(U) Contract Comments:

The IPPD 96 Design contract was modified on 30 September 1998 for \$1,028.0M for construction of SSN 774. CPR data will be available in May 1999.

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>SSN 775:</u>					
Gen Dyn, EB Corp, Groton, CT					
N00024-95-C2100B, CPFF			\$1083.7	\$	1
Award: December 8, 1998					
Definitized: December 8, 1998					
			Estimated Price At Completion		
			<u>Contractor</u>	<u>Program Manager</u>	
Current Contract Price					
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>			
\$1083.7	N/A	1	\$1083.7	\$1083.7	
			<u>Cost Variance</u> <u>Schedule Variance</u>		
Previous Cumulative Variances			\$	\$	
Cumulative Variances To Date			\$	\$	
Net Change			\$	\$	

Explanation of Change:

None.

(U) Contract Comments:

The IPPD 96 Design Contract was modified on 08 December 1998 for \$1083.7M for construction of SSN 775. CPR data will be available in May 1999.

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VIRGINIA CLASS SUB, December 31, 1998

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

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

<u>Appropriation</u>	<u>Prior Years (FY92-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-20)</u>	<u>Total</u>
RDT&E	2486.6	280.5	234.2	876.9	3878.2
Procurement	6071.4	748.5	1659.4	52795.4	61274.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	8558.0	1029.0	1893.6	53672.3	65152.9

b. Annual Summary -- VIRGINIA CLASS SUBMARINE

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992					
Subtotal					

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				23.9	22.8
1993				68.0	66.3
1994				367.5	365.3
1995				449.8	455.7
1996				416.4	429.0
1997				435.5	454.2
1998				363.8	382.4
1999				292.4	310.9
2000				259.8	280.5
2001				213.5	234.2
2002				171.0	190.7
2003				156.6	177.8
2004				146.1	169.4
2005				133.5	158.0
2006				88.6	107.0
2007				52.7	65.0
2008				7.1	9.0
Subtotal				3646.2	3878.2

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VIRGINIA CLASS SUB, December 31, 1998

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

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996		152.9		755.8	790.3
1997		285.9		731.9	775.7
1998	1	827.2	1901.4	2334.2	2510.0
1999	1	50.6	1893.5	1825.5	1995.4
2000				672.7	748.5
2001	1		1782.8	1464.0	1659.4
2002	1		1873.5	1811.3	2093.7
2003	1		1615.4	1615.4	1905.9
2004	1		1603.0	1898.7	2287.0
2005	1		1418.1	2109.0	2593.6
2006	2		2989.3	3308.1	4154.0
2007	2		3040.3	3536.9	4534.3
2008	3		4430.0	4025.8	5269.8
2009	3		4364.6	4140.0	5532.7
2010	2		2932.9	3120.0	4257.2
2011	3		4312.7	4091.7	5700.5
2012	2		3001.1	3466.3	4930.5
2013	3		4401.0	3289.7	4777.6
2014	3		4323.6	2633.2	3904.5
2015				76.2	115.4
2016				86.7	134.0
2017				75.8	119.7
2018				62.4	100.5
2019				54.9	90.3
2020				13.6	22.8
Subtotal	30	1316.6	45883.2	47199.8	61003.3

(U) Note- Nonrecurring Flyaway consists of Detail Design and Design Transfer for FY 96-99

Schedule change revised build profile from 2 ships in 2005 to 1 ship in 2005 and from 0 ships in 2003 to 1 ship in 2003.

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002		67.7		67.7	76.3
2003		47.5		47.5	54.6
2004		63.2		63.2	74.1
2005		55.5		55.5	66.4
2006					
Subtotal		233.9		233.9	271.4

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VIRGINIA CLASS SUB, December 31, 1998

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

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD					
Navy	30	1550.5	45883.2	51079.9	65152.9
Grand Total	30	1550.5	45883.2	51079.9	65152.9

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 3170

(U) Percent Total Program Expended: 4.9%

(U) Total expenditures as of 10 Feb 98.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
Operations and Support (O&S) costs are developed at the ship level, on an annual cost per ship basis by cost category and appropriation, with total and annual average cost over the submarine's expected service life. Costs are estimated for all categories listed in the CAIG O&S Cost Estimating Guide using historical data from operating submarine classes. Maintenance and Personnel costs are the major contributors to the total O&S Program. The source of this cost estimate is the VIRGINIA Class Total Ownership Cost Baseline dated 31 Dec. 1998. Antecedent data is not available.

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Ship	
Mission Pay & Allowances	6.2	0.0
Unit Level Consumption	3.4	0.0
Intermediate Maintenance	2.1	0.0
Depot Maintenance	12.1	0.0
Contractor Support	0.4	0.0
Sustaining Support	5.3	0.0
Indirect Costs	0.0	0.0

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VIRGINIA CLASS SUB, December 31, 1998

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

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Ship	
Indirect Support	5.4	0.0
	0.0	0.0
	0.0	0.0
	N/A	N/A
Total	34.9	0.0

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AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): E-3 AWACS Radar System Improvement Program (RSIP)
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:
 ESC/AW COL GARY S. CONNOR
 3 EGLIN STREET Assigned: January 13, 1997
 HANSCOM AFB, MA 01731-2115 DSN 478-6899; COMM (781) 377-6899
4. (U) Program Elements/Procurement Line Items:
 RDT&E:
 (U) PE 0207417F (Shared) Project 67411L (Shared)
 PROCUREMENT:
 (U) APPN 3010 ICN 11411L (Air Force)

SAF/PAE

99--0266

CONGRESSIONAL

Classified by: E-3 SECURITY CLASSIFICATION GUIDE, 24 June 1993
 Downgrade instructions: Not Subject to Automatic Downgrade
 Declassify on: Originating Agency Determination Required (OADR)

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 AS AMENDED

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DIRECTORATE FOR FREEDOM OF INFORMATION
 AND SECURITY REVIEW
 DEPARTMENT OF DEFENSE

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5. (U) References:

SAR Baseline (Production Estimate):

(U) AFAE Approved Acquisition Program Baseline (APB) dated August 7, 1998.

Approved Program:

(U) AFSAE Approved Acquisition Program Baseline (APB) dated August 7, 1998.

6. (U) Mission and Description:

(U) The purpose of the RSIP modification is to provide Air Combat Command (ACC) with new and improved capabilities for the E-3 AWACS radar. The AWACS RSIP will provide improvements in radar sensitivity/electronic counter countermeasures (ECCM) performance, radar performance monitoring and control, and reliability/maintainability (R&M) to maintain system effectiveness against the projected operational environment of the 1990's and into the next century.

The RSIP program is made up of three phases: 1) System Definition/Risk Reduction (Pre-Engineering and Manufacturing Development), 2) Engineering and Manufacturing Development (EMD), and 3) Production Modification. This program will result in hardware and software changes to the AWACS.

The modifications are primarily to the AWACS Surveillance Radar Functional Group (SRFG) which:

- (1) Replaces the existing Radar Data Correlator (RDC) and Digital Doppler Processor (DDP) with the Surveillance Radar Computer (SRC).
- (2) Modifies the existing Radar Control Maintenance Panel (RCMP) with dual Cathode Ray Tube (CRT) displays and a new keyboard and cursor control.
- (3) Completes minor redesigns of the receiver, the Stable Local Oscillator (STALO), the Synchronizer, and the antenna phase control electronics, and replaces the analog to digital converter.
- (4) Replaces the existing Surveillance Radar Computer Program (SRCP) with a new SRCP.

7. (U) Executive Summary:

(U) The Milestone II approval to start EMD occurred in December 1988. EMD contracts were awarded in September 1989 to Northrop Grumman (formerly Westinghouse) for the radar upgrade, and to Boeing for system integration and testing. Test flights conducted in February-March 1990 successfully demonstrated the RSIP pulse compression waveform concept. Radar algorithm simulations in June 1990 confirmed the viability of the RSIP two-slant signal processing technique. The 8.6 dB lab radar demo was successfully completed in September 1992, and the government verified test results showing a 10.34 dB improvement in the laboratory environment. Also in 1992, NATO formally joined the program by way of a Cooperative International R&D Agreement.

In November 1993, Test System-3 (TS-3) Installation & Check Out (I&CO) was completed, and the first Development Test and Evaluation flight occurred. The qualification phase of the DT&E flight test program began in November 1994;

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E-3 AWACS RSIP, December 31, 1998

7. (U) Executive Summary (Cont'd):

Flight Qualification, Software Formal Qualification Testing (FQT) and In-Plant Formal Qualification were all completed with satisfactory radar detection performance. Concurrent U.S./NATO IOT&E testing began in October 1995. Other key events in 1995 were the signing of the RSIP Operational Requirements Document (ORD) and the U.S. Low Rate Initial Production (LRIP) approval. The initial IOT&E results unexpectedly indicated inconsistent radar tracking and poor long range fighter detection in the dense clutter environment of Europe. Consequently, IOT&E was extended in order to satisfactorily resolve these issues.

In February 1996, a production contract was awarded to Boeing for 13 U.S. kits (basic [2], plus 3 options [11]), 18 NATO kits and 8 UK kits; this included specific contract language to minimize expenditures pending the resolution of the open IOT&E issues. From January-July 1996, software updates were developed and tested, critical Deficiency Report (DR) fixes were implemented and training/tech order handbook deficiencies were resolved. In July 1996, a final IOT&E software version was released, following successful integration, regression and flight testing. U.S. and NATO operational flight tests in August-September 1996 confirmed the validity of the software fixes and provided the basis for NATO's full-rate production decision in November 1996. The award of U.S. production option #1 for 2 additional LRIP units and U.S. IOT&E completion both occurred in October 1996.

The Milestone III full rate production decision was made on September 11, 1997. Key events leading to the Milestone III and NATO retrofit readiness decisions in September 1997 included the development and implementation of new radar software versions to resolve remaining critical software deficiencies, the establishment and execution of a joint U.S./NATO EMD closeout plan and completion of development and test of the SRC R4400 processor to replace the Diminishing Manufacturing Sources R3000. The Option II award for 4 additional RSIP kits was awarded on October 31, 1997. In addition, the RSIP production and retrofit contract was modified to implement a process for mating software updates (managed by the software change working group (SCWG)) similar to the process that was successfully used as part of the IOT&E and post-IOT&E corrective action plans. The SCWG will manage the software updates to clean-up discrepancies remaining from EMD and new problems discovered during the U.S., NATO and UK retrofit programs.

The Option III award for 5 additional RSIP kits was awarded on October 8, 1998. This is the last option on the F19628-95-C-0041 contract. The Program Office is in the process of preparing the acquisition strategy and Request For Proposal (RFP) for the remaining 19 aircraft. This effort is expected to be awarded in October 1999. The Acquisition Baseline (APB) for RSIP was updated August 1998 to accommodate FY00 POM funding disconnects. The program restructuring will cause a delay in the completion of the RSIP production and installation program. The restructuring was not caused by any RSIP activities, but was caused by the overall weapon system funding constraints.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone II AFSARC	DEC 88	DEC 88	DEC 88
Brassboard Flight Tests	APR 91	APR 91	MAR 91
System Design Review	FEB 90	FEB 90	FEB 90
Critical Design Review	SEP 91	SEP 91	SEP 91
Test System-3 (TS-3) I&CO	NOV 93	NOV 93	NOV 93
Flight Test DT&E			
Start	JAN 94	JAN 94	NOV 93
Complete	JAN 95	JAN 95	MAR 95
IOT&E			
Start	AUG 95	AUG 95	AUG 95
Complete	NOV 96	NOV 96	OCT 96
Physical Configuration Audit	DEC 95	DEC 95	JUN 96
Low Rate Initial Production Decision	NOV 95	NOV 95	NOV 95
Trial Installation	MAR 98	MAR 98	SEP 98 (Ch-1)
Required Assets Available	JUN 00	JUN 00	JUN 00

b. Current Change Explanations --

(U) (Ch 1) The current estimate for the "Trial Installation" milestone was changed from Apr 98 to Sep 98 to reflect the actual completion date.

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E-3 AWACS RSIP, December 31, 1998

10. (U) Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Improve System	13.0	13.0 / 10.6	10.9 (1)	10.6
Sensitivity (dB)	(b)(1)			
Detection Range				
Towed-Sphere (.1M^2)				
Low Altitude (nm)				
High Altitude (nm)				
Overland Mission				
MTBCF (hrs)				
Detection Range (360 degrees)				
Fighter-size target				
Low Altitude (nm)				
High Altitude (nm)				
ECCM				
3 millirad strobe				
azimuth, accuracy				
strobe on mainbeam				
noise jammer at				
100 nm (dBW/MHz)				
Detect fighter-size				
target (.8m^2) (nm)				
(dBW/MHz)				
Detect 16 degrees				
off main beam				
jammer (nm)				
(dBW/MHz)				
Inband frequency				
change (msec)				
Maintainability				
(SRC/SRCMP)				
Mean Repair Time				
(hrs)				
Fraction of Failures				
detected (%)				
Reliability (Radar				
Set)				

(U) Acronyms:

(U) MTBCF - Mean Time Between Critical Failure
 (U) ECCM - Electronic Counter-counter Measures
 (U) SRC - Surveillance Radar Computer
 (U) SRCMP - Surveillance Radar Computer Maintenance Panel

Performance Characteristics, Reference Notes

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10a. ~~(U)~~ Performance Characteristics (Cont'd):

(b)(1)



Approved Program Threshold	Scaled Threshold	Demonstrated
-------------------------------	---------------------	--------------

(b)(1)



TARGET RCS
0.8m²

MODE
NEL/OFF

DETECTION PHASE
330nm ~~SECRET~~

(b)(1)



(U) 8. US IOT&E was completed in October 1996.

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10b. ~~(U)~~ Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	465.5	465.3	465.5
Procurement	424.6	454.3	459.4
Flyaway	(296.2)		(291.1)
Other Weapon Systems	(102.6)		(141.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(25.8)		(26.5)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 97 Base-Year \$	890.1	919.6	924.9
Escalation	1.2	-4.5	-14.4
Development (RDT&E)	(-41.1)	(-40.9)	(-41.1)
Procurement	(42.3)	(36.4)	(26.7)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	891.3	915.1	910.5

(U) Initial spares reflect Contract Authority (CA).

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	32	32	32
Total	32	32	32

(U) Development excludes 6 RDT&E units which are not fully configured end items. This number includes the Test System-3 (TS-3), Avionics Integration Lab (AIL), Reliability Verification Testing (RVT), Environmental Qualification (EQ), Performance Qualification Lab (PQL). The NATO kit was added in 1992 when RSIP became a joint cooperative program.

Production LRIP quantities are numbered at four; two in FY96 and two in FY97. This quantity of two per year was selected for economic reasons; the original buy of 34 production kits plus software maintenance facility, training, and partial spares kits was rounded to four kits.

c. (U) Foreign Military Sales --

NATO/UK: The RSIP Memorandum of Agreement (MOA) between the USAF and the NATO Airborne Early Warning and Control (AEW&C) Program Management Organization (NAPMO), signed on May 7, 1992, sets forth the terms for the RSIP Cooperative Development Program. Two U.S. RSIP EMD contracts were modified with Boeing and Northrop Grumman for the NATO RSIP Phase I effort. During Phase I Northrop Grumman is providing one more RSIP Group B radar set modification kit and

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11c. (U) Total Program Cost and Quantity (Cont'd):

instrumentation for the NATO E-3A aircraft. Boeing Phase I effort has provided one RSIP Group A Kit and the NATO Airborne Operational Computer Program (AOCP) software. In Phase II, added in January 1994, Northrop Grumman has developed the logistics support for the RSIP hardware and software components and supported Boeing during the test program; Boeing has installed and integrated the RSIP prototype Group A and B kits into the NATO E-3A test aircraft and conducted the test program. The AWACS SPO, working with NATO, developed a comprehensive strategy to implement a joint U.S. - NATO development test program for RSIP. Under the joint test concept, NATO participates in testing on the U.S. test aircraft and accomplishes the majority of NATO testing on the same aircraft. Joint test was implemented as part of the Phase II portion of the NATO RSIP effort. On March 31, 1993, the United Kingdom (UK) signed a \$5.6M Letter of Offer and Acceptance (LOA) to conduct a pre-production study for incorporating production U.S./NATO RSIP kits into the fleet of seven (7) UK E-3D AWACS aircraft. The study consisted of two parts: Phase IA provided technical information sufficient to identify differences in the UK configuration while Phase IB designed any adaptations necessary and prepared the production Request for Proposals (RFPs) and LOA. The Boeing Company was placed on contract (EST 93-UK-04A) July 13, 1993 with the Northrop Grumman Corporation placed on directed subcontract on September 1, 1993 to support Phase I. Including the \$5.8M Phase IB LOA option, the study lasted for approximately two years. UK requirements include acquisition of production kits for all 7 UK aircraft and 1 ground laboratory.

The U.S., NATO and UK joined together and awarded a contract on February 9, 1996 to purchase 28 aircraft worth of RSIP kits (2 U.S., 18 NATO, and 8 UK) under the production program. The U.S. has contracted for 11 more aircraft worth of kits in three follow-on options in FY97, FY98 and FY99. Option 1 to acquire two kits for the U.S. was awarded on October 31, 1996. Option 2 was awarded October 31, 1997 to acquire four kits. Option 3 was awarded in October 8, 1998 to acquire an additional 5 kits. The initial set of kits for NATO, N-2 and N-1, were delivered on September 30, 1997 and October 31, 1997, respectively and retrofit for N-2 began on December 8, 1997. As of December 31, 1998, NATO has four A/C operationally accepted. The U.S. completed the first RSIP install in September 1998. The next RSIP retrofit is scheduled to begin on March 1, 1999.

d. (U) Nuclear Costs --
None.

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12. (U) Unit Cost Summary:

	UCR Baseline (AUG 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 97 BY\$)	919.6	924.9	
(2) Quantity	32	32	
(3) Unit Cost	28.738	28.903	+0.57
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 97 BY\$)	454.3	459.4	
(2) Quantity	32	32	
(3) Unit Cost	14.197	14.356	+1.12

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	424.4	466.9	-	891.3
Previous Changes:				
Economic	-	-7.5	-	-7.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+11.1	-	+11.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+3.6	-	+3.6
Current Changes:				
Economic	-	-9.4	-	-9.4
Quantity	-	-	-	-
Schedule	-	+25.9	-	+25.9
Engineering	-	-	-	-
Estimating	-	-43.0	-	-43.0
Other	-	-	-	-
Support	-	+42.1	-	+42.1
Subtotal	-	+15.6	-	+15.6
Total Changes	-	+19.2	-	+19.2
Current Estimate	424.4	486.1	-	910.5

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E-3 AWACS RSIP, -December 31, 1998

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

(U) Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	465.5	424.6	-	890.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+13.3	-	+13.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+13.3	-	+13.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+22.2	-	+22.2
Engineering	-	-	-	-
Estimating	-	-40.6	-	-40.6
Other	-	-	-	-
Support	-	+39.9	-	+39.9
Subtotal	-	+21.5	-	+21.5
Total Changes	-	+34.8	-	+34.8
Current Estimate	465.5	459.4	-	924.9

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-9.5
Economic adjustment for negative program change. (Economic)	N/A	+0.1
Stretchout of annual procurement buy profile of 1 year. The APB was updated in August 1998 to reflect restructure. (Schedule)	+22.0	+25.6
Adjustment for Current and Prior Inflation. (Estimating)	+2.2	+2.3
Avionic Integrated Support Facility (AISF) GFE equipment not included in prior estimate. (Estimating)	+1.3	+1.5
Diminishing Manufacturing Sources (DMS) for life time buys and future buys. (Estimating)	+2.0	+2.1
The second AISF (APY-2) kit was deleted. (Estimating)	-7.1	-7.9
Install hourly rate change. (Estimating)	+0.3	+0.3
Installation stretchout. (Schedule)	+0.2	+0.3
Training cost actuals for Type 1 training and Surveillance Radar Training Set (SRTS) contract reduction. (Estimating)	-3.2	-3.3

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E-3 AWACS RSIP, December 31, 1998

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Cost actuals for support equipment, commodity mod kits, MILSTRIP, program office support and software development facility. (Support)	+3.2	+3.3
Adjustment for Current and Prior Inflation for initial spares actual costs. (Support)	+0.3	+0.3
Change in Initial Spares and additional spare requirements for the SRTS. (Support)	+0.3	+0.5
Correction to align flyaway and support cost. (Estimating)	-36.1	-38.0
Correction to align flyaway and support costs. (Support)	+36.1	+38.0
Procurement Subtotal	+21.5	+15.6

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
27.85	-0.53	--	+0.81	--	-1.00	--	+1.32	+0.60	28.45

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
14.59	-0.53	--	+0.81	--	-1.00	--	+1.32	+0.60	15.19

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14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	DEC 88	N/A	DEC 88
Milestone III	N/A	N/A	SEP 97	SEP 97
FUE/IOC	N/A	SEP 96	N/A	N/A
Total Cost	N/A	689.9	891.3	910.5
Total Quantity	N/A	34	32	32
Prog Acq Unit Cost	N/A	20.29	27.85	28.45

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

a. Procurement --
 (U) AWACS RSIP PRODUCTION:
 The Boeing Company, Seattle, WA
 F19628-95-C-0041, FFP
 Award: N/A
 Definitized: September 30, 1999

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$156.9	\$0.0	13

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$156.9	\$0.0	13	\$	\$

Explanation of Change:

(U) There is a yearly Contract Cost Data Report (CCDR) received for the production contract. Performance cost reporting for FFP contract is not required.

Cost and Schedule variance reporting is not required on this FFP contract.

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E-3 AWACS RSIP, December 31, 1998

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

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

<u>Appropriation</u>	<u>Prior Years (FY89-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	424.4	-	-	-	424.4
Procurement	227.9	70.0	61.2	127.0	486.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	652.3	70.0	61.2	127.0	910.5

(U) RSIP Development (RDT&E) is a cooperative program with NATO. The total \$424.2M (TY\$) is the U.S. share of the cooperative development program.

b. Annual Summary -- RSIP MOD

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY97 Dollars Nonrec</u>	<u>Flyaway FY97 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1989				52.8	44.2
1990				73.8	63.7
1991				80.2	71.8
1992				127.1	117.1
1993				16.4	15.4
1994				40.1	38.4
1995				43.8	42.7
1996				31.3	31.1
Subtotal				465.5	424.4

Appropriation: 3010 - Aircraft Procurement, Air Force

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY97 Dollars Nonrec</u>	<u>Flyaway FY97 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996	2	16.6	22.4	51.4	51.9
1997	2	1.6	15.3	45.2	46.1
1998	4		28.7	64.2	65.9
1999	5		41.3	61.4	64.0
2000	4		45.2	66.1	70.0
2001	5		41.4	56.8	61.2
2002	5		39.7	53.0	58.1
2003	5		38.9	52.4	58.6
2004				4.9	5.6
2005				4.0	4.7

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

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal	32	18.2	272.9	459.4	486.1

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	32	18.2	272.9	924.9	910.5

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	2	2

(U) Percent Total Program Quantities Delivered: 6.3%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 491

(U) Percent Total Program Expended: 53.9%

(U) Expenditures data are as of December 31, 1998, and reflect US funds only. The total program cost include initial spares, which reflect Contract Authority (CA).

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The operating and support cost estimate for AWACS RSIP was updated in August 1997. The concept of operation is for a fleet of 32 aircraft, which does not include the TS-3, flying 1000 hours per year each with two-level maintenance. In the updated O&S cost, a comparison was made between the Post-RSIP and the Pre-RSIP configurations. These two estimates were separately prepared to reflect the annual steady-state cost, the phase-out of the predecessor system AN/APY-1/2 radar and the phase-in to the steady-state of the Post-RSIP modification to the AN/APY-1/2 radar. The Pre-RSIP system estimated FY96 as the steady-state year with complete phase out by FY04. The O&S cost of the Pre and Post systems are used to compare the differences in support cost in the steady-state mode. The mission personnel element includes the cost of pay and allowances for officer, enlisted, and civilian personnel required to operate, maintain, and support a discrete electronic system. Unit level consumption includes consumables, condemnations, second destination transportation, and organizational level simulator maintenance. The depot

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

maintenance includes the cost of labor, material, and overhead incurred in performing major overhauls or maintenance on an electronic system, its components, and associated support equipment at centralized repair depots, contractor repair facilities, or on site by depot teams. The contractor support includes the cost of contractor labor, materials, and depreciable assets used in providing all or part of the logistics support to a weapon system, subsystem, or related support equipment. Sustaining support includes the cost of replacement support equipment, modification kits, sustaining engineering, software maintenance support and simulator operations. Indirect support includes the costs of personnel support for specialty training, permanent changes of station, and medical care. Indirect cost also includes the costs of relevant host installation services, such as base operating support and real property maintenance.

b. (U) Costs -- (FY 1997 Constant (Base-Year) Dollars in Millions)

Cost Element	Radar System, E-3 Annual Steady-State Radar with RSIP	Annual Steady-State Fleet Predecessor E3 Radar Pre-RSIP
Mission Pay & Allowances	9.9	9.9
Unit Level Consumption	2.2	4.1
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.2	0.0
Contractor Support	0.7	1.0
Sustaining Support	4.2	3.7
Indirect Costs	6.0	6.1
Total	23.2	24.8

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A-17 JSTARS CGS

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SELECTED ACQUISITION REPORT (RCS: DD-AWT(Q&A)823)
PROGRAM: Joint STARS CGS

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Joint STARS Common Ground Station (formerly Ground Station Module)

2. DoD Component: Army

3. Responsible Office and Telephone Number:

SFAE-IEW-JS

FT. Monmouth, NJ 07703-5304

COL. James E. Young

Assigned: August 23, 1996

DSN 987-5165; COMM 908-427-5165

4. Program Elements/Procurement Line Items:

RDT&E:

PE 64770A Project D202

PROCUREMENT:

APPN 2035 ICN BA1080 (Army)

APPN 2035 ICN BS9724 (Army)

5. References:

SAR Baseline (Development Estimate):

ADM dated 8 Mar 89, subject "Joint STARS Ground Station Module (GSM)

Acquisition Decision Memorandum".

Approved Program:

Approved Acquisition Program Baseline (APB) dated October 5, 1995.

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DIRECTORATE FOR FREEDOM OF INFORMATION
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DEPARTMENT OF DEFENSE

99-C-0771

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Joint STARS CGS, December 31, 1998

6. Mission and Description:

The Joint Surveillance Target Attack Radar System (Joint STARS) is a surveillance, battle management and targeting radar system. It is a Joint Army and Air Force Program with the Air Force as the executive service. The Joint STARS radar is an airborne multimode radar system, incorporating an electronically scanned antenna and combining both Moving Target Indicator (MTI), Fixed Target Indicator (FTI) and Synthetic Aperture Radar (SAR) functions. The radar is carried aboard a modified F-8 Aircraft and broadcasts processed radar data to the Army Common Ground Station (CGS) through an omnidirectional data link. CGSs also receive and process intelligence data from Unmanned Aerial Vehicles (UAV), Commander's Tactical Terminal (CTT) and Air Reconnaissance Low (ARL). Joint STARS fills a critical need for an effective capability to detect, delay, disrupt, and destroy first and second echelon mobile targets. Joint STARS is unique because it is a closed loop system for real-time detection, tracking, and attack information of enemy ground targets. The Army requires wide area surveillance to understand enemy force buildups and scheme-of-maneuver, in order to apply effective and timely maneuver of forces, battlefield management, and targeting of artillery, rockets and stand-off missiles. There is no other system planned to provide this data in real-time. Joint STARS provides commanders at tactical and operational echelons a near real-time, wide area surveillance system to monitor enemy force movements into and through the joint battle area. This allows air and ground commanders to take timely actions to shape the battle and decisively engage the enemy with fire and maneuver.

7. Executive Summary:

In May 82, an OSD/USDRE 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 the PAVE MOVER and SOTAS Program Offices. The Army Ground Station Module (GSM) Full Scale Engineering Development (FSED) contract was awarded to Motorola corporation in Aug 84. A Downsized Ground Station Module (DGSM) FSED was awarded Mar 86. In Sep 87, the Army directed the acquisition of nine Limited Procurement Urgent (LPU) Ground Station Modules (GSMs). In Dec 1988, the GSM program was restructured to capture all user requirements, synchronize GSM and aircraft fieldings, and to field GSMs in time to support other 'Deep Battle' programs. In order to achieve these objectives, the existing GSM was enhanced in a phased effort (IGSM, LPU, Block I, Block II). Block I improvements entailed downsizing the electronic suite, increasing operational capabilities, and enhancing modularity of LRUs (Line Replaceable Units) for standardization and subsequent export to other Intelligence and Electronic Warfare (IEW) systems. In Dec 89 an EMD contract was awarded to Motorola Corp. to develop the Block I Medium Ground Station Module (MGSM) to implement these OSD directed improvements. In Sep 90, Operational Field Demonstration (OFD-1) successfully demonstrated the JSTARS system (Aircraft/GSM) capabilities to NATO and US Forces in Europe. The JCS ordered the deployment of the Joint STARS system, aircraft and Ground Station Modules (GSMs) to Operation Desert Storm in December 90. The order came at the request of CINCCENT (Commander-in Chief Central Command). In March 91, HQDA approved a revised distribution plan which aligned GSM fieldings with

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Joint STARS CGS, December 31, 1998

7. Executive Summary (Cont'd):

documented operational requirements. Based on this new distribution, quantities increased from 90 to 125. During the FY92 Defense Appropriations review process, the CGS budget request was increased by the Congress in order to accelerate start-up of the Light GSM (LGSM) EMD effort. The LGSM mission equipment is housed in a Standard Integrated Command Post (SICP) type shelter and mounted on a HMMWV. The LGSM EMD program was completed in FY95. An LRIP contract was awarded to Motorola Corporation to produce 8 LGSMs, 12 MGSM LRIP models were also produced by Motorola in FY93-94.

A revised Acquisition Program Baseline (APB) was approved by the Under Secretary of Defense for Acquisition (USD(A)) on 11 August 93. In it the (USD(A)) approved the acceleration of the objective Joint STARS Ground Station, the Block II or Common Ground Station (CGS) based on the LGSM design. The CGS will integrate SIGINT and advanced imagery processing through a series of preplanned product improvement (P3I), which will result in an evolutionary program beginning in FY96. The approval of the Acquisition Decision Memorandum (ADM) accelerating the CGS was formally received on 6 November 93. A subsequent 5 Oct 95 ADM authorized the CGS LRIP contract. The CGS LRIP contract was awarded on 14 December 1995 via full and open competition to a team headed by Motorola Corp. This eight year competitive contract (basic year plus seven option year) provides for potential significant unit price reductions based on range quantity pricing. The first two years of the CGS contract were designated as LRIPs in order to allow the delivery and test of the performance based hardware prior to the Milestone III, now scheduled for June 1999. The first production configuration CGS successfully completed Acceptance Test Procedures in January 1997 and was formally accepted by the government.

Joint STARS participated in a NATO demonstration and experimentation program to evaluate alternative systems to provide airborne reconnaissance capability in support of NATO operations. In 1995, NATO created an Embryonic Project Office (EPO) to pursue additional cooperative efforts. The JSTARS Enhanced Ground Station Module (EGSM) was sent to the SHAPE Technical Center (STC) to be used as part of a US initiative to demonstrate and study interoperability of Joint STARS in the NATO command and control environment. On 2 December 95 the Chairman, Joint Chiefs of Staff (CJCS) tasked Joint STARS to support Operation JOINT ENDEAVOR. A total of twelve CGSMs and two aircraft were deployed. The PM staff participated in a series of briefings to NATO member nations throughout 1996, detailing the JSTARS capability. Cost data for the NATO request for information (RFI) was prepared and provided to the Air Force in May 1996. On March 25, 1997 the first CGS option was exercised for a total of 16 systems. The CGS successfully participated in Task Force XXI, Advanced Warfighting Exercise (AWE) at the National Training Center, Fort Irwin, California. The PM supported the Paris Air Show 14-22 June 1997 by providing and demonstrating stand-alone JSTARS workstations to numerous US and European dignitaries. The final MGSM was fielded in July 97 and the first CGS was fielded on 26 August 1997. TOT&E was changed to a mid-March commencement (vice November 97). A NATO Ground Station study plan was awarded to an international industry team headed by Motorola, Scottsdale, AZ, and concluded in October 1998. The NATO plan focused on: a NATO Ground Station Concept of Operations, architectural requirements and recommended design for the Ground Station.

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Joint STARS CGS, December 31, 1998

7. Executive Summary (Cont'd):

IOT&E commenced on 22 March 1998 at Ft. Huachuca, AZ and concluded on 13 April 1998. Due to testing concerns regarding the system availability and operator training the Milestone III DAB has been delayed until the 3RD QTR FY99. A reliability event will be conducted in February 1999 with the follow-on ASARC scheduled in April 1999 and the DAB June 1999. On December 11, 1998 the USDA&T approved the Army's request for 12 additional CGSs in LRIP. The contract award for the additional units was made in late December 1998. The Y2K renovations on the CGS are complete and were certified on 23 December 1998. During 1998 the CGS participated in the Winter Training Cycle, ACOM Exercise Purple Dragon and Ulchi Focus Lens 98.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

A schedule breach in the program occurred due to the need to conduct additional testing prior to the DAB. A program deviation report was submitted to notify Army and OSD leadership.

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Joint STARS CGS, December 31, 1998

9. Schedule:

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
INTERIM GSM			
FSD Award	AUG 84	AUG 84	AUG 84
CDR	FEB 85	FEB 85	FEB 85
Force DT&E	FEB 90	N/A	N/A
Joint SI/PA/CD/OA:			
Start	OCT 90	SEP 90	SEP 90
Complete	N/A	SEP 91	N/A
First Unit Equipped	OCT 93	OCT 93	OCT 93
LPU GSM			
Limited Prod Contract Award	SEP 87	SEP 87	SEP 87
ARDS Eval (UK)	N/A	NOV 88	NOV 88
FDT&E			
Start	JUN 89	AUG 89	N/A
First Delivery	N/A	JUL 89	JUL 89
ARDS Eval (France)	N/A	AUG 89	AUG 89
First US Unit Equipped	JUN 90	MAY 90	MAY 90
Type Classification (LPU)	N/A	JUL 92	JUL 92
Block I (Medium) GSM			
FSD Award	AUG 89	SEP 89	SEP 89
CDR	N/A	JUL 90	NOV 90
PDR	MAR 90	N/A	MAR 90
Development: Test			
Start	N/A	APR 92	APR 92
Complete	N/A	SEP 92	SEP 92
Milestone III	NOV 92	N/A	N/A
LRIP Decision	N/A	JUL 93	JUL 93
LRIP Contract Award	DEC 92	JUL 93	SEP 93
First Production Delivery	N/A	NOV 95	JUL 95
Production Qualification Test (PQT)			
Start	N/A	MAY 95	JUL 95
Complete	N/A	AUG 95	OCT 95
Organic Support Capability (MGSM)	N/A	FEB 96	DEC 95
First Unit Equipped	SEP 94	FEB 96	FEB 96
MOTE			
Start	N/A	JUN 95	NOV 95
Complete	N/A	FEB 96	FEB 96
Block I (Heavy) GSM			
Early Prototype Awd	N/A	JAN 92	JAN 92
Prototype Delivery	N/A	FEB 94	FEB 94
Operational Assessment	N/A	APR 94	APR 94
EMD Award	OCT 92	N/A	N/A
CDR	APR 93	N/A	N/A
FDT&E			
Start	JAN 94	N/A	N/A
Production Award	MAR 95	N/A	N/A
First Unit Equipped	MAR 97	N/A	N/A
Block I (Light) GSM (LGSM)			
EMD Award	N/A	MAY 92	MAY 92

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9a. Schedule (Cont'd):

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
FDT&E			
Start	N/A	AUG 94	SEP 94
Complete	N/A	OCT 94	OCT 94
LRIP Decision	N/A	MAR 95	MAR 95
MOTE			
Start	N/A	JUN 95	NOV 95
Complete	N/A	FEB 96	APR 96
First Low Rate Production Delivery	N/A	NOV 96	MAR 97
First Unit Equipped	N/A	JAN 97	MAY 97
Organic Support Capability (LGSM)	N/A	JAN 97	MAY 97
Block II Common Ground Station (CGS)			
LRIP Award	N/A	NOV 95	DEC 95
Milestone III/IV	N/A	MAY 98	JUN 99 (Ch-1)
Operational Test			
Start	N/A	NOV 97	MAR 98
Complete	N/A	DEC 97	APR 98
CDR	N/A	JUN 93	AUG 93
First Delivery	N/A	APR 97	APR 97
First Unit Equipped	N/A	SEP 97	SEP 97
Technical/Operational Assessment I	N/A	MAR 99	SEP 99
Organic Support Capability (CGS)	N/A	SEP 97	SEP 97

b. Current Change Explanations --

The following milestones have changed from the previous SAR:

(Ch-1) The CGS Milestone III/IV has been changed from Aug 98 to Jun 99 due to the need to conduct additional testing.

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10. Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>		<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
INTERIM GSM					
Time Compression/ Integration of Data Display (frames MTF data per second)	5	5	/ Level / suffic- / ient / to / demon- / strate / target / / movemen / t on / GSM / monitor	5	5
Target Auto Track/ Prediction (track on tgt file)	16	N/A	/ N/A	16	16
Software Assisted Target Tracking/ Prediction (# of target files traced)	N/A	16	/ 16	16	16
Interface JSTARS Radar & AN/UPD-7 Radar (bits per second) (k)	50	50	/ 50	50	50
Workstations	2	2	/ 2	2	2
Reliability					
Mean Time Between Failure (MTBF) (hrs)	150	150	/ 125	155	155
Mean Time Between Op Maint Failure (MTBOMF) (hrs)	71	70	/ 70	77	77
Maintenance					
Mean Time to Repair (MTTR) (min)	30	30	/ 30	13	13
Mean Time to Repair (MTTR) ODS/GS (min)	60	60	/ 60	60	60
Max Time to Repair Unit (min)	60	60	/ 60	30	30
Max Time to Repair (DS/GS (hrs)	3.5	3.5	/ 3.5	3.5	3.5

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10a. Performance Characteristics (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>		Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Interoperability	Rec & Trans to both TACFIRE (19) and ASAS (11)	Rec & Trans to TACFIRE/ (10) and ASAS (10)	/ Rec & / Trans / to / TACFIRE / (6) and / ASAS / (2) /	Rec & Trans to TACFIRE (19) and ASAS (2)	Rec & Trans to TACFIRE (7) and ASAS (2)
I.PU GSM					
Workstations	2	2	/ 2	2	2
Track Targets	Display time of detection heading, speed & location n	Display time of detection heading/ speed/ & location n	Display / target file descrip- tion - tion heading speed & location n	Display target file descrip- tion - tion heading speed & location n	Display target file descrip- tion - tion heading speed & location
Predict Target Locations	Time of arrival	Time of arrival	/ Time of arrival	Time of arrival	Time of Arrival
BLOCK I (MEDIUM) GSM					
Time Compression/ Integration of Data Display (frames MTI data per second)	N/A	5	/ Level / suffic- / ient to / demon- / strate / target / movemen / t on / GSM / monitor	5	5
Interface JSTARS Radar (bits per second) (k)	N/A	50	/ 50	50	50
Software Assisted Target Tracking Prediction (# of target files tracked)	N/A	16	/ 16	16	16
Operational Availability (HW&SW)	N/A	.80	/ .75	.86	.90
Workstations	N/A	2	/ 2	2	2

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10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Maintenance (HW&SW)				
Mean Time to Repair (MTTR)	N/A	60 / 180	60	60
DS/GS (min)				
Interoperability	N/A	Rec & / Rec & Trans / Trans to / to TACFIRE/ (10) / (6) and and / ASAS ASAS / (2) (10) /	Rec & Trans to TACFIRE (19) and ASAS (2)	Rec & Trans to TACFIRE (7) and ASAS (2)
Standard I&W Modules	Std HW & SF	Std HW & SW	Std HW & SW	Std HW & SW
Payload Weight (lbs)	9500	N/A / N/A	N/A	N/A
Imagery Storage (hrs on line per 2 hrs video)	8	N/A / N/A	N/A	N/A
Imagery Storage (hrs)				
Mean Time to Repair (MTTR)	N/A	30 / 60	30	30
(min)				
Video (analog)	N/A	2 / 2	2	2
Simultaneous Multisensor Operations	Data from 2 or more sensors	Data from 2 / or more/ sensors/ sensors/	Data from 2 sensors	Data from more than 2 sensors
Two Independent Workstations	Display MTI, FTI, and SAR data	Display / Display MTI, / MTI, FTI, / FTI, and / and SAR / SAR data / data	Display MTI, FTI & SAR data	Display MTI, FTI & SAR data
Remote Data Display	Data into existin g data process facility	Data / Data into / into existin/ existin g data / g data process/ process / process facilit/ facilit y / y	Data into existin g data process facility	Data into existin g data process facility
Nuclear Survivability	Hardened against EMP	Hardened/ against/ EMP	Hardened against EMP	Hardened against EMP

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10a. Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APH) <u>Obj/Threshold</u>		Demon- strated <u>Perf</u>	Current Estimate
		Color / Color printout/ printout t of / t of IMINT / IMINT graphic/ data s& text /		Color printout t of IMINT data	Color printout t of IMINT data
Hard copy data capability	N/A				
BLOCK I (HEAVY) GSM Nuclear Survivability	Hardened against EMP and TREE thermal radia- tion and blast	N/A	/ N/A	N/A	N/A
Digital Radar	N/A	8	/ 8	N/A	N/A
Commander's Tactical Terminal (CTT)	CTT data inter- face	N/A	/ N/A	N/A	N/A
BLOCK I (LIGHT) GSM Time Compression/ Integration of Data Display (frames MTI data per second)	N/A	5	/ Level / suffic- / ient to / demon- / strate / target / movemen / t on GSM / monitor	5	5
Software Assisted Target Tracking/ Prediction (# of target files tracked)	N/A	16	/ 16	16	16
Workstations	N/A	2	/ 2	2	2
Operational Availability (HW&SW)	N/A	.80	/ .75	.88	.90
Maintenance (HW&SW)					
Mean Time to Repair (MTTR) (min)	N/A	30	/ 60	19	30
Mean Time to Repair (MTTR) DS/GS (min)	N/A	60	/ 180	56	60

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10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Interoperability	N/A	Rec & / Rec & trans / trans to / to TACFIRE / TACFIRE (10) / (6) and and / ASAS ASAS / (2) (10) /	Rec & Trans to both TACFIRE (7) and ASAS (2)	Rec & Trans to both TACFIRE (7) and ASAS (2)
Standard IEW Modules	N/A	Std HW & / Std HW & SW / SW	Std HW & SW	Std HW & SW
Imagery Storage (hrs)				
Digital Radar	N/A	8 / 8	8	8
Video (analog)	N/A	2 / 2	2	2
Simultaneous Multisensor Operations	N/A	Data / Data from 2 / from 2 or more / or more / sensors sensors/	Data from 2 or more sensors	Data from 2 or more sensors
Two Independent Workstations	N/A	Display / Display MTI, / MTI, FTI, / FTI, and / and SAR / SAR data / data	Display MTI, FTI, and SAR data	Display MTI, FTI, and SAR data
Remote Data Display	N/A	Data / Data into / into existin/ existin g data / g data process/ process / facility facilit/ facilit y / y	Data into existin g data process facility	Data into existin g data process facility
Nuclear Survivability	N/A	Hardened/ Hardened against/ against EMP / EMP	Hardened against EMP	Hardened against EMP
Hard copy data capability	N/A	Color / Color printou/ printou t of / t of IMINT, / IMINT graghics/ data & text /	Color printou t of of IMINT data	Color printou t of IMINT data
Transportability	N/A	C-130 / C-130 drive / drive on, / on, drive / drive off / off	C-130 drive on, drive off	C-130 drive on, drive off

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10a. Performance Characteristics (Cont'd):

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Set up/Tear down (w/3 man crew) (min)	N/A	10 / 15	15	15
Commander's Tactical Terminal (CTT)	N/A	CTT data/ inter- / inter- face / face	CTT data inter- face	CTT data inter- face
Remote Data Display (m)	N/A	Up to / Up to 1000M / 100M into an/ into an existing/ existing data / data process/ process - ing / - ing fac- / facilit ility / y	Up to 300M into an existing data process facility	Up to 1000 into an existing data process - ing facilit y
Payload weight (each vehicle) (lbs)	N/A	4250 / 4400	4250	4250
Platforms	N/A	Develop / Develop and / and deploy / deploy in Lt, / in Lt Med, & / config Hvy / configs/	HMMWV mounted , light configu ration	Develop and deploy in Lt, config

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10a. Performance Characteristics (Cont'd):

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Secondary Data Dissemination	N/A	Provide / Provide second- / second- ary data/ ary data communi/ communi - / - ication/ ication via / via SATCOM / SATCOM or wide / or wide area / area Coms to/ Coms to distrib/ distrib - ute / - ute JSTARS / JSTARS and / data other / beyond correla/ line of - ted / sight IEW / capabil common / - ity data / beyond / line of / sight /	Provide second- ary data communi- cation via SATCOM or wide area Coms to distrib- ute JSTARS data beyond line of sight capabil- ity	Provide second- ary data commun- ication via SATCOM and wide area Coms (eg MSE) to distrib- ute JSTARS and other corre- lated IEW common data beyond line of sight
BLOCK II (CGS)				
Time Compression/ Integration of Data Display (frames MTI data per second)	N/A	5 / Level / suffic- / icent to / demon- / strate / target / movemen / t on GSM / monitor	5	5
Software Assisted Target Tracking/ Prediction (# of target files tracked)	N/A	16 / 16	16	16
Workstations	N/A	2 / 2	2	2
Operational Availability (HW&SW)	N/A	.80 / .75	TBD	.85

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10a. Performance Characteristics (Cont'd):

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>		<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
NBC Survivability	NBC pro- tected	N/A	/ N/A	N/A	N/A
Maintenance (HW&SW)					
Mean Time to Repair (MTTR) (min)	N/A	30	/ 60	30	30
Mean Time to Repair (MTTR) DS/GS (min)	N/A	60	/ 180	60	60
Interoperability	N/A	Rec & transmi t message/ s to TAC- FIRE/ AFATDS (to facili- tate target- ing) and/ ASAS (to/ facili- tate intelli- gence report- ing and battle- field mgmt)	/ Rec & transmi t message/ s to TAC- FIRE/ AFATDS (to facili- tate target- ing) and ASAS (to/ facili- tate intelli- gence report- ing and battle- field mgmt)	Rec & transmi t message/ s to TAC- FIRE/ AFATDS (to facilit targeti ng) and ASAS (to facilita te intelli gence reporti ng and battlefi eld mgmt)	Rec & transmi t messages to TAC- FIRE/ AFATDS (to facili- tate intelli- gence report- ing and battle- field mgmt)
Standard IEW Modules	N/A	Std HW & SW	/ Std HW & SW	Std HW & SW	Std HW & SW
Imagery Storage (hrs)					
Digital Radar	N/A	8	/ 8	8	8
Video (analog)	N/A	2	/ 2	2	2
Simultaneous Multi- sensor Operations	N/A	Data from 2 or more/ sensors	/ Data from 2 or more/ sensors	Data from 3 or more sensors	Data from 3 or more sensors

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10a. Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APH) Obj/Threshold	Demon- strated Perf	Current Estimate
Two Independent Workstations	N/A	Display / Display MTI, / MTI, FTI, / FTI, and SAR/ and SAR data / data	Display MTI, FTI and SAR data	Display MTI, FTI, and SAR data
Remote Data Display	N/A	Data / Data into / into existin/ existin g data / g data process/ process facility/ facility	Data into existin g data process facility	Data into existing data process facility or CGS provided remote terminal
Hard Copy Data Capability	N/A	Color / Color printou/ printou t of / t of IMINT, / IMINT graphics/ data & text /	Color printou t of IMINT data	Color printou t of IMINT, graphics & text
Nuclear Survivability	N/A	Hardened/ Hardened against/ against EMP / EMP	Hardened against EMP	Hardened against EMP
Commander's Tactical Terminal (CTT)	N/A	CTT data/ CTT data inter- / inter- face / face	CTT data intrfce	CTT data inter- face
Transportability (Light)	N/A	C-130 / C-130 drive / drive on, / on, drive / drive off / off	C-130 drive on, drive off	C-130 drive on, drive off
Set up/Tear down (w/3 man crew) (min) (Light)	N/A	10 / 15	10	10
Payload Weight (lbs)				
Light	N/A	4250 / 4400	4250	4250
Heavy	N/A	7100 / 8500	N/A	N/A

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10a. Performance Characteristics (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Data Dissemination	N/A	Maintain/ Maintain and / and automat/ automat - / - ically / ically dissem- / dissem- inate / inate current/ current enemy / enemy situa- / situa- tion / tion graphic/ graphic s / s	Maintain and automat- ically dissem- inate current enemy situa- tion graphics	Maintain and automat ically dissemi nate current enemy situati on graphic s
National Imagery Data	N/A	Provide / Provide imagery / imagery graphs &/ data text / through through / GSM comm GSM comm/ links links /	Provide imagery data through GSM comm links	Provide imagery graphs & text through GSM comm links

The bracketed numbers contained in the interoperability characteristic description for TACFIRE and ASAS refer to number of preformatted message sets that can be received.

b. Current Change Explanations -- None

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11. Total Program Cost and Quantity (Dollars in Millions):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	452.4	554.7	607.6
Procurement	680.6	651.9	626.0
Recurring Costs	(563.8)		(499.9)
Nonrecurring Costs	(55.6)		(16.5)
Total Flyaway	(619.4)		(516.4)
Other Weapon Systems	(16.2)		(78.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(45.0)		(31.5)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 89 Base-Year \$	1133.0	1206.6	1233.6
Escalation	158.6	271.0	200.1
Development (RDT&E)	(-4.0)	(27.7)	(40.0)
Procurement	(162.6)	(243.3)	(160.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	1291.6	1477.6	1433.7
b. Quantity --			
Development (RDT&E)	15	21	18
Procurement	97	104	121
Total	112	125	139

The procurement quantities noted above include a total of up to 72 LRIP CGSs. It should be noted that the LRIP quantity exceeds the statutory guideline of 10% for LRIP as a percentage of total production, however approval was granted based on the economic advantages and the documented low risk of the program.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

	UCR Baseline (OCT 95 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 89 BY\$)	1206.6	1233.6	
(2) Quantity	125	139	
(3) Unit Cost	9.653	8.875	-8.06
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 89 BY\$)	651.9	626.0	
(2) Quantity	104	121	
(3) Unit Cost	6.268	5.174	-17.45

13. Cost Variance Analysis:

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

	RD&E	PROC	MTLCON	TOTAL
Development Estimate	448.4	843.2	-	1291.6
Previous Changes:				
Economic	-0.6	+6.1	-	+5.5
Quantity	+15.1	+289.9	-	+305.0
Schedule	-	-15.2	-	-15.2
Engineering	+98.1	+72.5	-	+170.6
Estimating	+55.6	-449.6	-	-394.0
Other	-	-	-	-
Support	-	+93.9	-	+93.9
Subtotal	+168.2	-2.4	-	+165.8
Current Changes:				
Economic	-1.4	-9.3	-	-10.7
Quantity	-	-189.7	-	-189.7
Schedule	-	-1.9	-	-1.9
Engineering	+32.4	+122.4	-	+154.8
Estimating	-	+23.8	-	+23.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+31.0	-54.7	-	-23.7
Total Changes	+199.2	-57.1	-	+142.1
Current Estimate	647.6	786.1	-	1433.7

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

Summary (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	452.4	680.6	-	1133.0
Previous Changes:				
Quantity	+12.1	-224.1	-	+236.2
Schedule	-	+2.7	-	+2.7
Engineering	+76.5	+52.6	-	+129.1
Estimating	+42.2	-347.1	-	-304.9
Other	-	-	-	-
Support	-	+48.4	-	+48.4
Subtotal	+130.8	-19.3	-	+111.5
Current Changes:				
Quantity	-	-142.2	-	-142.2
Schedule	-	+4.7	-	+4.7
Engineering	+24.4	+92.3	-	+116.7
Estimating	-	+9.9	-	+9.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+24.4	-35.3	-	-10.9
Total Changes	+155.2	-54.6	-	+100.6
Current Estimate	607.6	626.0	-	1233.6

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Ther-Year

(1) <u>RDT&E</u>		
Revised escalation indices (Economic)	N/A	-1.4
To account for additional P3I enhancements (Engineering)	+24.4	+32.4
RDT&E Subtotal	+24.4	+31.0
(2) <u>Procurement</u>		
Revised escalation indices (Economic)	N/A	-9.9
Economic adjustment for negative program change (Economic)	N/A	+0.6
Adjustment to reflect higher headquarters direction to reduce the quantity 22 systems from 143 to 121 (Quantity)	-142.2	-189.7
Allocation to Schedule variance resulting from Quantity change (Schedule)	+4.7	-1.3
Allocation to Engineering variance resulting from Quantity change (Engineering)	+92.3	+122.4
Allocation to Estimating variance resulting from Quantity change (Estimating)	-35.3	-38.9
Acceleration of annual procurement buy profile (Schedule)	0.0	-0.6

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

b. Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year
Adjustment for Current and Prior Inflation (Estimating)	+2.9	+3.7
To account for increased P3I modifications not documented in previous SAR (Estimating)	+42.3	+59.0
Procurement Subtotal	-35.3	-54.7

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
11.53	-0.04	-1.42	-0.12	+2.34	-2.66	--	+0.68	-1.22	10.31

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.69	-0.03	-0.89	-0.14	+1.61	-3.52	--	+0.78	-2.19	6.50

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	DEC 88	N/A	DEC 88
Milestone III	N/A	N/A	N/A	JUN 99
EUE/IOC	N/A	JUN 90	N/A	JUN 90
Total Cost	N/A	1291.6	N/A	1433.7
Total Quantity	N/A	112	N/A	139
Prog Acq Unit Cost	N/A	11.53	N/A	10.31

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

a. Procurement --		Initial Contract Price		
<u>CGS LRIP:</u>		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Motorola, Scottsdale, AZ				
DAAB07-96-C-S204, FFP		\$70.6	N/A	18
Award: December 14, 1995				
Definitized: December 14, 1995				

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$352.2	N/A	72	\$352.2	\$352.2

Explanation of Change:

The adjusted target price includes additional end item units and current P3I efforts to upgrade the end item.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY82-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-05)	<u>Total</u>
ROD&E	556.8	11.5	26.9	52.4	647.6
Procurement	563.7	88.3	64.0	70.1	786.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1120.5	99.8	90.9	122.5	1433.7

b. Annual Summary -- COMMON GROUND STATION

Appropriation: 2040 - Research, Development, Test & Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY89 Dollars Nonrec</u>	<u>Flyaway FY89 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1982				5.1	4.1
1983				43.4	36.5
1984				75.0	65.3
1985				30.8	27.7
1986				43.9	40.6
1987				27.2	25.9
1988				18.9	18.7
1989				22.2	22.9

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Joint STARS CGS, December 31, 1998

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

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990				35.3	37.8
1991				38.8	43.1
1992				59.6	67.8
1993				53.7	62.5
1994				24.8	29.4
1995				31.3	37.8
1996				12.4	15.3
1997				7.6	9.4
1998				5.2	6.5
1999				4.3	5.5
2000				8.9	11.5
2001				20.5	26.9
2002				18.9	25.2
2003				8.0	10.8
2004				11.8	16.4
Subtotal	18			607.6	647.6

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987	3	2.1	9.8	14.9	14.7
1988	6		16.9	21.3	21.9
1989				2.2	2.4
1990					
1991					
1992					
1993	5	1.0	22.5	29.3	34.9
1994	7	0.2	33.8	53.1	64.0
1995	8	1.7	39.6	46.6	57.3
1996	16	5.3	52.2	67.8	84.1
1997	16	4.3	52.2	74.4	93.4
1998	26	1.9	71.2	75.2	95.4
1999	12		65.5	74.5	95.6
2000	12		55.2	67.9	88.3
2001	10		38.6	48.4	64.0
2002			12.5	15.2	20.4
2003			5.3	6.3	8.6
2004			8.4	10.1	14.2
2005			16.2	18.8	26.9
Subtotal	121	16.5	499.9	626.0	786.1

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Joint STARS CGS, December 31, 1998

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

Recurring flyaway in FY98/99 includes \$22.5M required to upgrade 16 MGSM units to the CGS configuration. Recurring costs in FY02, 03, 04 and 05 are P31 costs which will be required to upgrade the entire fleet to the final and standard CGS HW/SW configuration.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	139	16.5	499.9	1233.6	1433.7

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	18	18
Procurement	63	63

Percent Total Program Quantities Delivered: 58.3%

b. Total Expenditures To Date (In Millions of Dollars): \$ 913.9

Percent Total Program Expended: 63.7%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --
O&S costs were based on LPU & IGSM models being fielded for 5 years. All CGSs are presumed to have a 20 year life. Sustainment is based on cumulative quantity of fielded systems and appropriate personnel necessary to maintain the system. The source of the O&S data is the May 1998 Joint STARS (Army) Army Cost Position. There are no antecedent systems.

b. Costs -- (FY 1989 Constant (Base-Year) Dollars in Thousands)

Cost Element	JSTARS CGS Avg Annual Cost CGS	N/A
Mission Pay & Allowances	221.0	0.0
Unit Level Consumption	114.0	0.0
Intermediate Maintenance	11.0	0.0
Depot Maintenance	1.0	0.0
Contractor Support	14.0	0.0
Sustaining Support	33.0	0.0
Indirect Costs	0.0	0.0
Support Costs	6.0	0.0
Other	0.0	0.0
Total	400.0	0.0

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A-2 AFATOS

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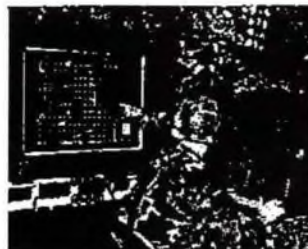
SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: AFATDS

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Advanced Field Artillery
Tactical Data System (AFATDS)

2. DoD Component: Army

3. Responsible Office and Telephone Number:

SFAE-C3S-FS

Ft Monmouth, NJ 07703-5404

COL David Meriwether

Assigned: January 13, 1999

DSN 987-3090; COMM 732-427-3090

DMeriwether@C3SMail.Monmouth.ARMY.M
IL

4. Program Elements/Procurement Line Items:

RDT&E:

PE 23726 Project D2ET, D322

PROCUREMENT:

APPN 2035 ICN B28600 (Army)

APPN 2035 ICN B78100 (Army)

APPN 2035 ICN B78400 (Army) (Shared) LFED Funding

APPN 2035 ICN BA9708 (Army)

APPN 2035 ICN BA9726 (Army) (Shared)

APPN 2035 ICN BS9708 (Army)

APPN 2035 ICN MA9708 (Army)

APPN 0350 ICN MIPR (NGRE)

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99-C-0818

AFATDS, December 31, 1998

5. References:

AFATDS

SAR Baseline (Production Estimate):

AAE Approved Acquisition Program Baseline dated Feb 5, 1996.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated March 15, 1999.

Block 2 Future Effort

SAR Baseline (Production Estimate):

AAE Approved Acquisition Program Baseline dated Feb 5, 1996.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated March 15, 1999.

6. Mission and Description:

The Advanced Field Artillery Tactical Data System (AFATDS) is a digital, integrated battlefield management and decision support system. It will function at Battery through Corps and Above as one of the five battlefield automation systems of the Army Battlefield Command System (ABCS) utilizing the Common Operating Environment (COE) architecture. AFATDS will also interoperate with the Air Force and Naval systems to provide a Joint Fire Control capability. AFATDS utilizes evolving commercial computer technology through procurement of the ABCS Common Hardware/Software (CHS).

Based on the organizational structure to be supported, AFATDS hardware items will include the following: Fire Support Control Terminals (FSCT), Compact Computer Units and Notebook Computer Units tailored to the Force Structure and available vehicles. This will all be ABCS Common Hardware.

AFATDS is designed to overcome the vulnerability, limited functionality, central processing and training limitations of present artillery battalion, brigade, division and corps fire direction systems. AFATDS will take advantage of advancing software technology, graphics, decision aids, and embedded training to expand the Fire Support functions. AFATDS is the Fire Support node of the ABCS providing advanced software automation assistance to the Fire Support elements and interfacing with all systems subordinate to AFATDS and other nodes of ABCS via the standard communications media available to the force. AFATDS will provide 27 Fire Support functions, grouped in five Fire Support operational needs (Fire Support Execution, Fire Support Planning, Movement Control, Field Artillery Mission Support and Field Artillery Fire Direction Operations).

Responsiveness, survivability, and continuity of Fire Support Operations will be enhanced via dispersed processing centers, intelligent remote (work

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6. Mission and Description (Cont'd):

stations) terminals, a distributed data base management system and distributed operations for Fire Support Officers at the Infantry and Armor battalion/brigade levels. AFATDS will interface/interoperate via standard communications media with all functional control elements of existing and future Army Fire Support Systems, other ABCS Battlefield Functional Area (BFA) Systems, other services employing Fire Support Joint Interoperability Tactical Command and Control Systems message standards and Allied Forces using NATO Fire Support Standards.

Fire Support Ada Conversion (FSAC) and Initial Fire Support Automated System (IFSAS) are associated programs that are included in the AFATDS Acquisition Program Baseline (APB). These programs, reflected in the AFATDS Sunk Cost, were originally intended to be a prepositioning of AFATDS hardware until AFATDS software became available. Under the current program strategy, this hardware will be replaced under AFATDS Block 2, Future Effort.

FSAC converted the existing Battery Computer System (BCS) technical fire control software to Ada and replaced the existing BCS hardware with the Lightweight Computer Unit (LCU). IFSAS replaced the Variable Format Message Entry Device (VFME) and Battalion TACFIRE and provided the National Guard with an initial automated capability. IFSAS replaced the TACFIRE equipment with the LCU hosting Lightweight TACFIRE (LTACFIRE) software.

7. Executive Summary:

FY98 was a productive and successful year for the AFATDS program.

The Acquisition Program Baseline was revised twice over the year. The first revision was signed by the Army Acquisition Executive (AAE) on 6 Mar 98, reflecting growth of the system to incorporate joint and enhanced Army digital capabilities. AFATDS now provides a seamless fire support capability, theater missile defense and joint force support planning and execution, utilizing Air Force and Naval assets as well as Army and Marine ground forces.

The second rebaselining occurred as a result of the SARDA initiative to integrate and simplify the ABCS programs to better reflect the First Digitized Division (FDD) efforts. The AFATDS program was split as of FY98, with all previous efforts (FY81-97) reflected as AFATDS Block 1, Sunk Efforts, and all remaining efforts identified as Block 2, Future Efforts. Block 2 further adds milestones reflecting the First Digitized Division and First Digitized Corps. This SAR reflects this "split" program. The quantities shown under Block 1 reflect the CHS1 procured early in AFATDS and Lightweight Computer Units procured under FSAC/IFSAS which are now being replaced. Block 2 reflects the CHS 2 hardware being fielded to the total Army which better represents the Army Acquisition Objective.

In the area of software development, efforts proceeded on AFATDS Releases '97, '98, and '99. The Material Release for AFATDS 97 was achieved in Jul 98 with initial fielding to the XVIII Corps ARTY and the 82nd ABN. AFATDS '98 underwent a Limited User Test and Evaluation (LUT&E). The test consisted of a

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7. Executive Summary (Cont'd):

USMC Marine Expeditionary Force slice utilizing AFATDS 98 hosted on Compact Computer Units and UltraSparc Computer Units. Preliminary results of the test indicated issues with fire planning and air mission processing. Fixes for a majority of software issues have been identified and forwarded to the contractor for resolution. The issues for the Fire Planning were addressed at a Fire Planning Conference held in Dec. 98. The stated objective of the conference was to review the current force planning functionality and determine if it meets the needs of the Army and Marine Corps. All attendees agreed that the Fire Planning function works technically, but requires more training. The conference identified that the scheduling of fires should be conducted at the sustained rate rather than the maximum rate of fire. This represents a change to the original TRADOC requirements that had mandated that the first minutes of the schedule use max rate and the rest to use sustained rate. In either case, this is already an operator selectable parameter in AFATDS 99.

AFATDS 99 was renegotiated to address functionality and schedule more directed to FDD. Preliminary system design continues while final negotiations are completed.

On the procurement side, AFATDS continues to field to the active force throughout the world. AFATDS was also fielded to the Battlefield Coordination Detachments (BCD) to support Army-Air Force interoperability.

The objective hardware architecture was updated with approval of the TRADOC System Manager. Originally, AFATDS was fielded on two platforms; the Ultrasparc Computer Unit (UCU) and Lightweight Computer Unit (LCU). With the growth in technology and computer processing power, AFATDS will now field a mix of the UCU, the Compact Computer Unit (CCU) (similar to the USMC fielding), and a Notebook Computer Unit (NCU). This will eliminate the LCU from AFATDS configuration. This replacement of old LCUs (already procured under Block 1) with CCUs and NCUs accounts for the increase in quantities identified in this document.

AFATDS was nominated as a pilot program for the Testing Program Manager Performance of Product Support Oversight Responsibilities for Life Cycle of Acquisition Programs Initiative (Section 816) by the Office of the Secretary of Defense (OSD). Under this initiative, AFATDS will assume control of the software maintenance for all fire control systems, including the previously transitioned FSAC and IFSAS. This will allow us to better streamline and coordinate software changes over the fire support arena to obtain better synergy at a cost savings.

AFATDS 97 has been certified as Y2K compliant. AFATDS 98 will be certified by May 15, 1999. Y2K Fire Support and Aviation Demonstrations at White Sands Missile Range, NM involved AFATDS receiving fire missions from Kiowa Warrior Longbow Apache and Apache A. All fire mission threads were executed successfully both before and after the midnight (Year 1999-2000) rollover.

AFATDS participated in a number of Army Warfighting Experiments over the year, including United Endeavor 98, Blue Flag and Prairie Warrior. In general,

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7. Executive Summary (Cont'd):

participation in these exercises benefits the program by confirming interoperability and operational suitability, while identifying future areas of improvement. In FY99, AFATDS will continue to participate in the Army digital and joint warfighting exercises.

AFATDS is working with the Security Assistance Management Directorate of the Communications-Electronics Command to support the sale of AFATDS to Kuwait. Other possible Foreign Military Sales under discussion include Saudi Arabia, Turkey and Norway.

This may be the final SAR for this program, since the AFATDS Block 1 is more than 90% complete, and the Block 2, Future Effort, is below major defense acquisition program thresholds.

8. Threshold Breaches:

AFATDS

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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AFATDS, December 31, 1998

8. Threshold Breaches (Cont'd):

Block 2 Future Effort

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

RDTE shown under Block 2 indicates a Breach status. The breach is due to the reduced cost threshold resulting from the Block 1 / 2 split. The breach is therefore considered to be administrative.

9. Schedule:

AFATDS

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate	
Concept Evaluation (CE) Contract Award	MAY 84	MAY 84	MAY 84	
Milestone II (ASARC)	JUL 89	JUL 89	JUL 89	
Milestone II (DAB)	SEP 89	SEP 89	SEP 89	
First Unit Equipped (FUE) V1	AUG 95	AUG 95	AUG 95	
IOTE:				
Begin	AUG 95	AUG 95	JUL 95	
Complete	SEP 95	SEP 95	SEP 95	
Milestone III (ASARC)	DEC 95	DEC 95	DEC 95	
Initial Operational Capability (V1)	JAN 97	JAN 97	JAN 97	
Fielding Total Force - Start (V1)	JAN 97	N/A	JAN 97	
Limited User Test	N/A	N/A	SEP 97	
Multi-Service OT	JAN 98	N/A	N/A	
Software Release AFATDS '97	AUG 97	JUL 98	JUL 98	(Ch-1)
Software Release AFATDS '98	AUG 98	N/A	N/A	(Ch-2)

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9a. Schedule (Cont'd):

AFATDS

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>	
Software Release AFATDS '99	AUG 99	N/A	N/A	(Ch-2)
Software Release AFATDS '00	SEP 00	N/A	N/A	
Complete Active Force	MAY 01	JUL 01	N/A	(Ch-2)

b. Current Change Explanations --

(CH-1) AFATDS 97 Materiel Release occurred in Jul 98 instead of the previously estimated Feb 98. Thus the milestone for AFATDS 97 Software Release was changed from Feb 98 to Jul 98.

(CH-2) AFATDS 98 and 99 Software Releases and the Fielding milestones have been realigned with the Block 2, Future Effort end item. Therefore, the milestones shown above for each of these efforts has been changed to Not Applicable.

Block 2 Future Effort

a. Milestones --

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
Begin Fielding Total Force (CHS 2)	N/A	MAR 98	MAR 98
Software Release AFATDS 98	AUG 98	JUL 99	JUL 99
First Digitized Division	N/A	SEP 00	SEP 00
Software Release AFATDS 99	N/A	SEP 00	SEP 00
Software Release AFATDS 02	N/A	JAN 02	JAN 02
Software Release AFATDS 03	N/A	APR 03	APR 03
First Digitized Corps	N/A	APR 04	APR 04
Software Release AFATDS 04	N/A	JUL 04	JUL 04
Complete Total Force	JAN 07	APR 07	APR 07

b. Current Change Explanations -- None

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10. Performance Characteristics:

AFATDS

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold		Demon- strated Perf	Current Estimate	
System Ao-(Wartime) (Operating 24 hrs/day for 108 hours)						
Version 1	0.90	0.90	/ 0.90	.95	.95	
Objective	0.90	N/A	/ N/A	N/A	N/A	(Ch-1)
Fire Mission Proces- sing Peak Load (Fire Missions/hr)						
Version 1	247	247	/ 247	338	338	
Objective	780	N/A	/ N/A	N/A	N/A	(Ch-1)
Sustainment of Oper- ation During Power Loss (min)	5	5	/ 5	10	10	
Set-up/Tear-down (min)	10	10	/ 10	10	10	
Operating Temperature (deg F)	0-120	0-120	/ 0-120	0-120	0-120	
Process Combat Information Message (per hour)						
Version 1	323	323	/ 157	226	226	
Objective	970	N/A	/ N/A	N/A	N/A	(Ch-1)
Develop Orders to Fire (per hour)						
Version 1	359	359	/ 168	386	386	
Objective	1078	N/A	/ N/A	N/A	N/A	(Ch-1)
Establish and Update Battlefield Geometry (min)						
Version 1	1	1	/ 2	1	1	
Objective	1	N/A	/ N/A	N/A	N/A	(Ch-1)
Change Attack Guidance (min)						
Version 1	2	2	/ 3	1	1	
Objective	2	N/A	/ N/A	N/A	N/A	(Ch-1)
Coordinate Movement Request with Maneuver (min)						
Version 1	4.6	4.6	/ 5	1	1	
Objective	3	N/A	/ N/A	N/A	N/A	(Ch-1)
Prepare Quick Fire Plan (min)						
Version 1	10	10	/ 15	5	5	
Objective	10	N/A	/ N/A	N/A	N/A	(Ch-1)

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10a. Performance Characteristics (Cont'd):

AFATDS

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>	
Process Field					
Artillery Sensor					
Tasking Order (min)					
Version 1	4	4 / 6	1	1	
Objective	1.3	N/A / N/A	N/A	N/A	(Ch-1)
Process Fire Support					
Coordination Measure					
(FSCM) (min)					
Version 1	2	2 / 3	1	1	
Objective	2	N/A / N/A	N/A	N/A	(Ch-1)

AFATDS Version 1, (AFATDS '96) has received Materiel Release and is being fielded with demonstrated performance parameters. Therefore, all Current Estimate for Version 1 have been changed to reflect the demonstrated value.

b. Current Change Explanations --

(CH-1) All Objective parameters for the performance characteristics have been identified as representing Block 2, Future Effort. Therefore, objective parameters for the characteristics: System Ao, Fire Mission Processing Peak Load, Process Combat Information Messages, Develop Order to Fire, Establish and Update Battlefield Geometry, Change Attack Guidance, Coordinate Movement Request with Maneuver, Prepare Quick Fire Plan, Process Field Artillery Sensor Tasking Order, and Process Fire Support Coordination Measure have all been changed to reflect a Not Applicable status under AFATDS, Block 1, and are now shown under Block 2, Future Effort.

Block 2 Future Effort

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Objective System				
Characteristics:				
System Ao	.90	.90 / .88	TBD	.90
Fire Mission	780	780 / 720	TBD	780
Processing Peak				
Load (Fire				
Missions/hr)				
Sustainment of	5	5 / 5	5	5
Operations During				
Power Loss (min)				

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10a. Performance Characteristics (Cont'd):

Block 2 Future Effort

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Set Up/Tear Down (min)	10	10 / 10	10	10
Operating Tempera- ture (Deg F)	0-120	0-120 / 0-120	0-120	0-120
Process Combat Infor- mation Message (per hour)	970	970 / 895	TBD	970
Develop Orders to Fire (per hour)	1078	1078 / 995	TBD	1078
Establish and Update Battlefield Geometry (min)	1	1 / 2	TBD	1
Change Attack Guidance (min)	2	2 / 3	TBD	2
Coordinate Movement Request with Maneuver (min)	3	3 / 4	TBD	3
Prepare Quick Fire Plan (min)	10	10 / 15	TBD	10
Process Field Artillery Sensor Tasking Order (min)	1.3	1.3 / 1.5	TBD	1.3
Process Fire Support Coordination Measure (FSCM) (min)	N/A	2 / 3	TBD	2

Objective parameters reflect the objective system to be fielded FY04. As such, demonstrated performance parameters are not yet available.

b. Current Change Explanations -- None

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11. Total Program Cost and Quantity (Dollars in Millions):

AFATDS

	Production <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. Cost --			
Development (RDT&E)	471.9	499.6	466.5
Procurement	220.6	221.4	223.1
Flyaway	(175.3)		(174.4)
Other Weapon System	(36.2)		(41.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(9.1)		(7.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 96 Base-Year \$	692.5	721.0	689.6
Escalation	-80.1	-36.7	-44.4
Development (RDT&E)	(-80.1)	(-36.5)	(-42.5)
Procurement	(0.0)	(-0.2)	(-1.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	612.4	684.3	645.2
b. Quantity --			
Development (RDT&E)	63	63	63
Procurement	<u>2742</u>	<u>2820</u>	<u>2820</u>
Total	2805	2883	2883

The AFATDS Unit of Measure is computer terminals, which includes both the Fire Support Control Terminals (FSCT) and Lightweight Computer Terminals (LCU). There are no LRIP quantities associated with this program.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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11a. Total Program Cost and Quantity (Cont'd):

Block 2 Future Effort

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	88.1	126.2	209.1
Procurement	315.3	414.5	428.5
Flyaway	(233.1)		(250.9)
Other Wpn System Cost	(64.0)		(155.7)
Peculiar Support	(0.0)		
Initial Spares	(18.2)		(21.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 96 Base-Year \$	403.4	540.7	637.6
Escalation	125.8	97.9	70.4
Development (RDT&E)	(46.3)	(16.2)	(16.4)
Procurement	(79.5)	(81.7)	(54.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	529.2	638.6	708.0
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>2449</u>	<u>2654</u>	<u>3571</u>
Total	2449	2654	3571

The Unit of Measure is computer terminals, which includes the Ultrasparc Computer Unit, Compact Computer Unit, and Notebook Computer Unit.

c. Foreign Military Sales --
AFATDS sales are under discussion with Thailand, Kuwait, Portugal, Turkey, Saudi Arabia and the United Arab Emirate.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

AFATDS

	UCR Baseline (JAN 99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	721.0	689.6	
(2) Quantity	2883	2883	
(3) Unit Cost	0.250	0.239	-4.40
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	221.4	223.1	
(2) Quantity	2820	2820	
(3) Unit Cost	0.079	0.079	0.00

Block 2 Future Effort

	UCR Baseline (JAN 99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	540.7	637.6	
(2) Quantity	2654	3571	
(3) Unit Cost	0.204	0.179	-12.25
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	414.5	428.5	
(2) Quantity	2654	3571	
(3) Unit Cost	0.156	0.120	-23.08

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AFATDS, December 31, 1998

13. Cost Variance Analysis:

AFATDS

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	391.8	220.6	-	612.4
Previous Changes:				
Economic	-	+1.9	-	+1.9
Quantity	-	-	-	-
Schedule	-	-0.3	-	-0.3
Engineering	+32.2	-	-	+32.2
Estimating	-	-1.5	-	-1.5
Other	-	-	-	-
Support	-	+0.1	-	+0.1
Subtotal	+32.2	+0.2	-	+32.4
Current Changes:				
Economic	-0.2	-0.5	-	-0.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.2	-2.5	-	-2.3
Other	-	-	-	-
Support	-	+3.4	-	+3.4
Subtotal	-	+0.4	-	+0.4
Total Changes	+32.2	+0.6	-	+32.8
Current Estimate	424.0	221.2	-	645.2

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	471.9	220.6	-	692.5
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-5.6	+1.6	-	-4.0
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-5.6	+1.6	-	-4.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.2	-2.5	-	-2.3
Other	-	-	-	-
Support	-	+3.4	-	+3.4
Subtotal	+0.2	+0.9	-	+1.1
Total Changes	-5.4	+2.5	-	-2.9
Current Estimate	466.5	223.1	-	689.6

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AFATDS, December 31, 1998

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-0.2
Adjustment for Current and Prior Inflation. (Estimating)	+0.2	+0.2
RDT&E Subtotal	+0.2	0.0
(2) <u>Procurement</u>		
Revised Escalation Indices (Economic)	N/A	-0.5
Adjustment for Current and Prior Inflations (Estimating)	+0.9	+0.9
Adjustment to reconcile flyaway and support (Estimating)	-3.4	-3.4
Adjustment to reconcile flyaway and support (Support)	+3.4	+3.4
Procurement Subtotal	+0.9	+0.4

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AFATDS, December 31, 1998

13. Cost Variance Analysis (Cont'd):

Block 2 Future Effort

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	134.4	394.8	-	529.2
Previous Changes:				
Economic	-3.3	-17.8	-	-21.1
Quantity	-	+15.6	-	+15.6
Schedule	+27.3	-5.7	-	+21.6
Engineering	+8.1	-	-	+8.1
Estimating	+15.0	-25.3	-	-10.3
Other	-	-	-	-
Support	-	+29.9	-	+29.9
Subtotal	+47.1	-3.3	-	+43.8
Current Changes:				
Economic	-3.0	-5.4	-	-8.4
Quantity	-	+54.2	-	+54.2
Schedule	-	-4.1	-	-4.1
Engineering	+47.0	-	-	+47.0
Estimating	-	-21.6	-	-21.6
Other	-	-	-	-
Support	-	+67.9	-	+67.9
Subtotal	+44.0	+91.0	-	+135.0
Total Changes	+91.1	+87.7	-	+178.8
Current Estimate	225.5	482.5	-	708.0

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AFATDS, December 31, 1998

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

Block 2 Future Effort

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	88.1	315.3	-	403.4
Previous Changes:				
Quantity	-	+13.2	-	+13.2
Schedule	+30.5	-	-	+30.5
Engineering	+40.5	-	-	+40.5
Estimating	+6.4	-23.2	-	-16.8
Other	-	-	-	-
Support	-	+37.6	-	+37.6
Subtotal	+77.4	+27.6	-	+105.0
Current Changes:				
Quantity	-	+45.7	-	+45.7
Schedule	-	-	-	-
Engineering	+43.6	-	-	+43.6
Estimating	-	-17.9	-	-17.9
Other	-	-	-	-
Support	-	+57.8	-	+57.8
Subtotal	+43.6	+85.6	-	+129.2
Total Changes	+121.0	+113.2	-	+234.2
Current Estimate	209.1	428.5	-	637.6

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) RDT&E

Revised Inflation Indices (Economic)	N/A	-3.0
Increased software functionality requirements. (Engineering)	+43.6	+47.0
	0.0	0.0
RDT&E Subtotal	+43.6	+44.0

(2) Procurement

Revised Escalation Indices (Economic)	N/A	-5.4
Increase of 127 UCU from 1242 to 1369 due to changes in employment concept (Quantity)	+9.6	+11.5
Increase of 790 CCU/NCU from 1412 to due to changes in employment concept (Quantity)	+36.1	+42.7
Allocation to Estimating variance resulting from quantity changes (Estimating)	+0.1	+0.1
Savings resulting from increase in annual buy profile. (Schedule)	0.0	-4.1
Adjustment to reconcile flyaway and support (Estimating)	+3.6	+3.6

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AFATDS, December 31, 1998

13b. Cost Variance Analysis (Cont'd):
Block 2 Future Effort

b. Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year
Changes in flyaway cost due to decrease in average unit cost of hardware, (Estimating)	-21.6	-25.3
Increase in Software Support Costs (Support)	+61.4	+71.5
Adjustment to reconcile flyaway and support (Support)	-3.6	-3.6
Procurement Subtotal	+85.6	+91.0

14. Unit Cost and Other History (Then-Year Dollars in Millions):
AFATDS

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.22	--	-0.01	--	+0.01	--	--	--	--	0.22

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.08	--	--	--	--	--	--	--	--	0.08

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	MAY 84	MAY 84	MAY 84
Milestone II	N/A	SEP 89	SEP 89	SEP 89
Milestone III	N/A	APR 94	DEC 95	DEC 95
PUE/IOC	N/A	SEP 93	AUG 95	AUG 95
Total Cost	N/A	1052.1	612.4	645.2
Total Quantity	N/A	3321	2805	2883
Prog Acq Unit Cost	N/A	0.32	0.22	0.22

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AFATDS, December 31, 1998

14a. Unit Cost and Other History (Cont'd):

Block 2 Future Effort

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.22	-0.01	-0.05	--	+0.02	-0.01	--	+0.03	-0.02	0.20

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.16	-0.01	-0.03	--	--	-0.01	--	+0.03	-0.02	0.14

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PDE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	N/A	N/A
Total Cost	N/A	N/A	529.2	708
Total Quantity	N/A	N/A	2449	3571
Prog Acq Unit Cost	N/A	N/A	0.22	0.2

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

a. RDT&E --

AFATDS V2:

Raytheon System Com., Ft Wayne, IN

DAAB07-90-C-E708, CPAF/FFP

Award: October 28, 1992

Definitized: N/A

Initial Contract Price
Target Ceiling Qty

\$47.4 \$0.0 1

Current Contract Price

Target Ceiling Qty
\$77.7 \$0.0 1

Estimated Price At Completion

Contractor Program Manager
\$93.7 \$93.7

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AFATDS, December 31, 1998

15a. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-2.4	\$-2.3
Cumulative Variances To Date (12/11/98)	<u>\$-6.9</u>	<u>\$-1.3</u>
Net Change	\$-4.5	\$1.0

Explanation of Change:

The AFATDS Version 2 contract consists of three products: Task Force XXI (TFXXI), AFATDS 97 and AFATDS 98. TFXXI and AFATDS 97 were completed in previous years. AFATDS 97 received Materiel Release in June 1998. Continuing efforts this year centered on completing AFATDS 98 which was expanded twice over the year with the addition of the AFATDS 98 Completion and AFATDS 98 Completion II contract modifications. The new work includes Korea specific functionality, porting to the Compact Computer Unit (CCU) and CCU AXI, expanded ATACMS BAT functionality and TBMCS (Theater Battlefield Management Core System interface). This new functionality and the associated management support cost is the cause of the increase in the Estimated Price at Completion shown above.

AFATDS 98 underwent a Limited User Test and Evaluation in Nov 98, and the remaining effort consists of the addition of "Completion I" and "II" functionality, test fixes and regression testing. This effort is more than 90% complete, therefore this is the last SAR in which it will be addressed.

<u>AFATDS '99:</u>			Initial Contract Price		
Raytheon System Com., Ft Wayne, IN			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
DAABO7-C-90-E708, CPAF			\$21.6	\$0.0	1
Award: April 11, 1997					
Definitized: N/A					

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$21.6	\$0.0	1	\$27.8	\$27.8

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (12/11/98)	<u>\$0.1</u>	<u>\$-0.7</u>
Net Change	\$0.1	\$-0.7

Explanation of Change:

The AFATDS 99 software development effort was placed on contract in April 97 with the exercise of the \$21.6M option to the basic AFATDS contract. This effort is reported under a separate Cost Performance Report from the AFATDS 97 and AFATDS 98 to facilitate tracking of the various efforts.

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AFATDS, December 31, 1998

15. Contract Information (Cont'd):

AFATDS 99 was redefined to reflect the First Digitized Division schedule, with software releases to support ABCS 5.0 and 6.0. The increase in the Estimated Price reflects this new contract baseline. AFATDS 99 efforts consisted of system level requirements definition, architecture and design. The effort is 17% complete, and essentially on schedule and within cost.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY81-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-07)</u>	<u>Total</u>
RDT&E	494.8	36.2	34.5	84.0	649.5
Procurement	297.3	46.0	51.4	309.0	703.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	792.1	82.2	85.9	393.0	1353.2

AFATDS

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

<u>Appropriation</u>	<u>Prior Years (FY81-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	424.0	-	-	-	424.0
Procurement	221.2	-	-	-	221.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	645.2	-	-	-	645.2

Block 2 Future Effort

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AFATDS, December 31, 1998

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

Block 2 Future Effort

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

Appropriation	Prior Years (FY98-99)	Budget Year (FY00)	Budget Year (FY01)	Balance To Complete (FY02-07)	Total
RDT&E	70.8	36.2	34.5	84.0	225.5
Procurement	76.1	46.0	51.4	309.0	482.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	146.9	82.2	85.9	393.0	708.0

b. Annual Summary -- AFATDS

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1981				2.2	1.4
1982				2.6	1.7
1983				4.8	3.3
1984				21.3	15.3
1985				31.9	23.6
1986				21.7	16.5
1987				9.2	7.2
1988				13.6	11.1
1989				20.1	17.1
1990				32.5	28.7
1991				43.8	40.1
1992				52.4	49.1
1993				42.0	40.3
1994				44.2	43.2
1995				51.2	51.0
1996				36.4	36.9
1997				36.6	37.5
Subtotal	63			466.5	424.0

Appropriation: 0350 - National Guard & Reserve Equipm, Defense

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992	498	3.6	14.9	21.5	20.6
1993	353	2.0	10.4	13.0	12.7
1994	.	1.5		5.0	5.0
Subtotal	851	7.1	25.3	39.5	38.3

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AFATDS, December 31, 1998

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

AFATDS

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988		10.4		10.4	8.8
1989					
1990					
1991					
1992	276	4.6	12.2	17.7	17.0
1993	131	3.0	6.9	12.5	12.2
1994	866	9.6	32.3	51.8	51.4
1995	179	2.3	16.2	22.1	22.4
1996	226		20.6	31.3	32.0
1997	291		23.9	37.8	39.1
Subtotal	1969	29.9	112.1	183.6	182.9

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Army	2032	29.9	112.1	650.1	606.9
OSD	851	7.1	25.3	39.5	38.3
Grand Total	2883	37.0	137.4	689.6	645.2

b. Annual Summary -- Block 2 Future Effort

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				35.0	36.2
1999				33.1	34.6
2000				34.1	36.2
2001				32.0	34.5
2002				28.4	31.2
2003				22.4	25.1
2004				13.0	14.8
2005				11.1	12.9
Subtotal				209.1	225.5

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AFATDS, December 31, 1998

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

Block 2 Future Effort

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	245		22.4	35.0	36.6
1999	260		23.2	37.4	39.5
2000	456	0.6	27.9	43.0	46.0
2001	468	0.5	31.0	47.2	51.4
2002	347	3.3	27.0	47.4	52.5
2003	447	3.3	28.6	46.2	52.2
2004	398	2.6	21.6	45.3	52.2
2005	437	2.5	24.4	46.2	54.4
2006	513	2.5	26.8	59.9	72.0
2007			2.7	20.9	25.7
Subtotal	3571	15.3	235.6	428.5	482.5

The current President's Budget identifies funding under PE78400 which is programmed to support BCS/IFSAS hardware procured under the AFATDS Block 1 effort. However, as this hardware is not part of the Block 2 objective system, the outyear funding is not considered to be applicable to the AFATDS program, and is not reflected in this SAR.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	3571	15.3	235.6	637.6	708.0

17. Delivery/Expenditure Information:

AFATDS

a. Deliveries To Date	Plan	Actual
RDT&E	63	63
Procurement	2821	2821

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 644.9

Percent Total Program Expended: 100.0%

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AFATDS, December 31, 1998

17b. Delivery/Expenditure Information (Cont'd):

Block 2 Future Effort

Block 2 Future Effort

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	245	245

Percent Total Program Quantities Delivered: 6.9%

b. Total Expenditures To Date (In Millions of Dollars): \$ 146.9

Percent Total Program Expended: 20.7%

18. Operating and Support Costs:

AFATDS

a. Assumptions and Ground Rules --

All of the AFATDS quantities previously procured are being replaced with Block 2 equipment. Therefore, O&S costs are not applicable to this hardware.

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per DIVISION	Avg Annual Cost Per TACFIRE SYSTEM
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	N/A	N/A

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AFATDS, December 31, 1998

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

Block 2 Future Effort

a. Assumptions and Ground Rules --

The O&S costs are to operate and maintain the Block 2 system, based on a peacetime operating tempo of 1800 hrs/yr. The costs are based on an operating life of 20 years, with a replacement of the CHS hardware after 10 years. The CHS will be contractor maintained above the unit level. Costs are from the AFATDS Program Office Estimate, Jan 98. Military personnel requirements are based on the AFATDS Manpower Estimate Report (MER), May 95. Costs are shown per division.

The AFATDS will replace the TACFIRE/LTACFIRE systems and associated Fire Support hardware. The costs shown were provided by the Field Artillery School (USAFAS), Ft Sill, and reflect TACFIRE support costs only.

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per DIVISION	Avg Annual Cost Per TACFIRE SYSTEM
Mission Pay & Allowances	18.1	18.2
Unit Level Consumption	4.5	17.8
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	22.6	36.0

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N-3 AV-8B REMANUFACTURE

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

PROGRAM: AV-8B Remanufacture

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): AV-8B/Attack, V/STOL, Close Air Support (Harrier II+ Remanufacture)
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:
PMA-257, AV-8B Joint Program Office COL Thomas White, III
IPT Building Assigned: January 15, 1999
47123 Buse Road DSN 757-5460; COMM (301) 757-5460
Patuxent River, MD 20670-1547 WHITETBIII@navair.navy.mil
4. (U) Program Elements/Procurement Line Items:
PROCUREMENT:
(U) APPN 1506 ICN 0124 (Navy)

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AV-8B Remanufacture, December 31, 1998

5. (U) References:

SAR Baseline (Production Estimate):

(U) NAE Approved Acquisition Program Baseline dated June 30, 1994.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated April 10, 1998.

6. (U) Mission and Description:

(U) The AV-8B (Harrier II) is a second generation, Vertical/Short Takeoff and Landing (V/STOL) light-attack jet aircraft 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 AV-8B Remanufacture program converts older AV-8B aircraft to the most recent production configuration. The process requires disassembly of the aircraft; modification of selected subsystems and components; and reassembly of selected original, modified, and new production subsystem and parts. Production processes and tooling are used to fabricate new subsystems, parts and components as well as to assemble the aircraft.

AV-8B Remanufacture is an Acquisition Category IC program managed by the A/V Weapon Systems Program Manager, PMA-257. Because the remanufactured aircraft reflect the present production aircraft configuration, they satisfy existing Operational Requirements (OR) 025-05-85 of September 19, 1984 (Night Attack) and OR 224-05-89 of August 8, 1988 (Radar). Remanufacture provides the Marine Corps with increased quantities of aircraft capable of effective night fighting operations at a reduced cost by reusing major components of the day attack fleet aircraft.

7. (U) Executive Summary:

(U) On January 23, 1998, McDonnell Douglas Aerospace (MDA), a subsidiary of The Boeing Corporation, was awarded a single year FY 1998 AV-8B aircraft contract for twelve (12) aircraft which was definitized for \$187.6M. This contract included a reopener clause for conversion to multiyear procurement starting in FY 1998. On July 13, 1998, a contract modification was signed with Boeing converting the FY 1998 single year contract to a FY 1998 through FY 2001 multiyear contract and provided \$8.7M in advance procurement dollars for the additional thirty two (32) aircraft. Multiyear contract definitization for forty-four (44) aircraft (FY98-FY01) is expected in March 1999.

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AV-8B Remanufacture, December 31, 1998

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone IV/III Review	JAN 94	JAN 94	MAR 94
Contract Award	FEB 94	FEB 94	MAY 94
First A/C delivery	FEB 96	FEB 96	FEB 96
DT-III			
Start	FEB 96	FEB 96	FEB 96
Complete	AUG 96	AUG 96	AUG 96
OT-IIIIB FOT&E			
Start	FEB 96	FEB 96	FEB 96
Complete	SEP 96	MAY 97	MAY 97
IOC (Completion of FOT&E Report)	DEC 96	AUG 97	SEP 97
FOC (Delivery of the 20th REMAN acft)	MAR 99	MAR 99	MAR 99 (Ch-1)
Material Support Date 1/	MAR 99	MAR 99	APR 95
Navy Support Date 2/	MAR 99	MAR 99	MAR 99

b. Current Change Explanations --

(U) (Ch-1) The FOC date was changed from January 99 to March 99 as a result of a contract modification that was executed to adjust the remanufacture aircraft delivery schedule.

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AV-8B Remanufacture, December 31, 1998

10. (U) Performance Characteristics:

a. Performance --

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Dimensions				
Length	47.97	47.97 / 47.97	47.97	47.97
Height	11.65	11.65 / 11.65	11.65	11.65
Span	30.33	30.33 / 30.33	30.33	30.33
Weight Empty (lbs)	14,700	14,700 / 14,730	14,730	14,730
Max VTOGW Wt (lbs)	19,200	19,200 / 19,200	19,200	19,200
(Vertical Take-off Gross Weight)				
Max STOGW Wt (lbs)	29,750	29,750 / 29,750	32,000	32,000
Speed Max. (Mach)	.83	.83 / .83	1.00	1.00
Mission Radius (nm)				
CAS	142	142 / 95	250	250
Interdiction	486	486 / 440	486	486
Reliability (hrs)				
MFHBMCF(HW) - Oper	12.6	12.6 / 12.6	32.6	32.6
Maintainability (hrs)				
MMH/FH(HW) Oper	3.2	3.2 / 3.2	2.7	2.7
MTTR (Critical)	6.7	6.7 / 6.7	4.4	4.4
Oper				
Gun Accuracy (mils)	(b)(1)			
Sea Surf Search (nm)				
Air-to-Air Det Range				
(5 sq.m. tgt) (nm)				
Nose, VS 1000 (ft)	8	8 / 8	36	36
Tail, RWS 2000 (ft)	80	12.9 / 12.9	12.9	12.9

b. Current Change Explanations -- None

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AV-8B Remanufacture, December 31, 1998

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	0.0	0.0	0.0
Procurement	1843.0	2044.3	1949.3
Airframe	(1163.2)		(1128.5)
Engine	(310.6)		(266.4)
Avionics	(37.2)		(41.6)
Other GFE	(1.1)		(43.3)
Total Flyaway	(1512.1)		(1479.8)
Other Wpn Sys Cost	(0.0)		(0.0)
Peculiar Support	(248.3)		(383.6)
Initial Spares	(82.6)		(85.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 94 Base-Year \$	1843.0	2044.3	1949.3
Escalation	315.4	277.7	168.1
Development (RDT&E)	(0.0)	(0.0)	(0.0)
Procurement	(315.4)	(277.7)	(168.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2158.4	2322.0	2117.4
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	73	73	72
Total	73	73	72
c. Foreign Military Sales --	None.		
d. Nuclear Costs --	None.		

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AV-8B Remanufacture, December 31, 1998

12. (U) Unit Cost Summary:

	UCR Baseline (Apr 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 94 BY\$)	2044.3	1949.3	
(2) Quantity	73	72	
(3) Unit Cost	28.004	27.074	-3.32
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 94 BY\$)	2044.3	1949.3	
(2) Quantity	73	72	
(3) Unit Cost	28.004	27.074	-3.32

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	2158.4	-	2158.4
Previous Changes:				
Economic	-	-140.0	-	-140.0
Quantity	-	-20.9	-	-20.9
Schedule	-	+38.8	-	+38.8
Engineering	-	+69.3	-	+69.3
Estimating	-	-169.3	-	-169.3
Other	-	-	-	-
Support	-	+140.6	-	+140.6
Subtotal	-	-81.5	-	-81.5
Current Changes:				
Economic	-	-27.7	-	-27.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+42.9	-	+42.9
Other	-	-	-	-
Support	-	+25.3	-	+25.3
Subtotal	-	+40.5	-	+40.5
Total Changes	-	-41.0	-	-41.0
Current Estimate	-	2117.4	-	2117.4

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AV-8B Remanufacture, December 31, 1998

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

(U) Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	1843.0	-	1843.0
Previous Changes:				
Quantity	-	-16.6	-	-16.6
Schedule	-	+23.0	-	+23.0
Engineering	-	+60.3	-	+60.3
Estimating	-	-137.5	-	-137.5
Other	-	-	-	-
Support	-	+116.2	-	+116.2
Subtotal	-	+45.4	-	+45.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+38.5	-	+38.5
Other	-	-	-	-
Support	-	+22.4	-	+22.4
Subtotal	-	+60.9	-	+60.9
Total Changes	-	+106.3	-	+106.3
Current Estimate	-	1949.3	-	1949.3

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) Procurement

Revised escalation indices. (Economic)	N/A	-27.7
Adjustment for Current and Prior Inflation. (Estimating)	+12.5	+13.5
Refinement of program estimate to reflect actual costs in prior years. (Estimating)	-6.0	-6.6
Refinement of airframe costs to account for shielding multiyear contract inflation beyond current projections. (Estimating)	+6.6	+7.0
Increase estimate for foreign currency exchange rate higher than previously planned. (Estimating)	+9.2	+10.5
Revised estimate for increased contractor overhead costs associated with business base changes. (Estimating)	+16.2	+18.5
Adjustment for Current and Prior Inflation. (Support)	+3.9	+4.2
Refinement of estimate for Initial Spares. (Support)	+2.8	+3.2

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AV-8B Remanufacture, December 31, 1998

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

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Refinement of estimate for Peculiar Support (Support)	+15.7	+17.9
Procurement Subtotal	+60.9	+40.5

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
29.57	-2.33	+0.13	+0.54	+0.96	-1.76	--	+2.30	-0.16	29.41

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
29.57	-2.33	+0.13	+0.54	+0.96	-1.76	--	+2.30	-0.16	29.41

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	JAN 94	MAR 94
FUE/IOC	N/A	N/A	DEC 96	SEP 97
Total Cost	N/A	N/A	2158.4	2117.4
Total Quantity	N/A	N/A	73	72
Prog Acq Unit Cost	N/A	N/A	29.57	29.41

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AV-8B Remanufacture, December 31, 1998

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

a. Procurement --

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>FY96 AIRFRAME:</u>					
McDonnell Douglas Corp., St. Louis MO					
N00019-95-C-0094, FFP					
Award: April 22, 1996					
Definitized: April 22, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$145.8	N/A	8	\$145.8	\$145.8	

Explanation of Change:

(U) Target price and estimated price at completion has increased from \$145.5M to \$145.8M as a result of additional engineering support.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

This is the last reporting for contract N00019-95-C-0094 which is over 90% complete.

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>FY97 AIRFRAME:</u>					
McDonnell Douglas Corp., St. Louis MO					
N00019-96-C-0025, FFP					
Award: September 30, 1996					
Definitized: September 30, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$210.4	N/A	12	\$210.4	\$210.4	

Explanation of Change:

(U) The target price and estimated price at completion has not increased.

Cost and Schedule variance reporting is not required on this FFP contract.

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

(U) FY 98 AIRFRAME:
MCDONNELL DOUGLAS CORP, ST. LOUIS MO
N00019-97-C-0046, FFP
Award: September 16, 1997
Definitized: January 23, 1998

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$10.5	N/A	

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$218.6	N/A	12	\$218.6	\$218.6

Explanation of Change:

(U) On July 13, 1998 this contract was converted into an advanced acquisition multiyear contract. Negotiations are currently ongoing to establish a definitive price. The Government has provided the Contractor with \$30.5M of advance funding for the FY99 through FY01 airframe requirements pending the completion of contract negotiations. \$.5M was added as a result of engineering support.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

On September 16, 1997, the FY 1998 AV-8B airframe production contract was awarded for advanced acquisition costs only. This is reflected in the initial contract price.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY94-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	-	-	-	-	-
Procurement	1570.6	307.7	239.1	-	2117.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1570.6	307.7	239.1	-	2117.4

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AV-8B Remanufacture, December 31, 1998

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

b. Annual Summary -- AV-8B Remanufacture

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994	4		121.4	141.0	145.4
1995	4	2.3	96.6	124.3	130.3
1996	8	13.1	169.7	239.2	254.2
1997	12	6.3	242.1	334.6	358.7
1998	12	6.0	230.5	298.8	323.9
1999	12		222.4	325.6	358.1
2000	12		220.0	275.3	307.7
2001	8	1.8	147.6	210.5	239.1
Subtotal	72	29.5	1450.3	1949.3	2117.4

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	72	29.5	1450.3	1949.3	2117.4

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	17	18

(U) Percent Total Program Quantities Delivered: 25.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 764.9

(U) Percent Total Program Expended: 36.1%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
There is no antecedent to the AV-8B.

Flight hours per aircraft per month	22.7
Number of aircraft/squadron	16
(10 aircraft per squadron with a six aircraft detachment)	
Consumption rate gal/hr	686.4
POL cost, JP-5, per barrel, FY 94	31.4

Date of estimate: 25 Aug 1998

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

Source: AIR-4.2 FY98 Operating and Support Cost Update Report

b. (U) Costs -- (FY 1994 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per squadron/year	Avg Annual Cost Per squadron/year
Mission Pay & Allowances	10.6	N/A
Unit Level Consumption	14.7	0.0
Intermediate Maintenance	3.9	0.0
Depot Maintenance	4.5	0.0
Contractor Support	0.0	0.0
Sustaining Support	2.1	0.0
Indirect Costs	11.5	N/A
Total	47.3	0.0

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

PROGRAM: NAS

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): National Airspace System (NAS)

2. DoD Component: USAF

Joint Participants:

Army, Navy

3. Responsible Office and Telephone Number:

ESC/GAA

75 Vandenberg Drive

Hanscom AFB

Bedford, MA 01731-2103

GM-15 Thomas Robillard

Assigned: June 22, 1997

DSN 478-4947; COMM (781) 377-4947

4. Program Elements/Procurement Line Items:

RD&E:

PE 0204696N

PE 0305137F

PE 0604633A

PROCUREMENT:

APPN 1810 ICN 24696N (Navy)

APPN 3080 ICN 35137F (Air Force)

APPN 2031 ICN 64633A (Army)

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5. References:

SAR Baseline (Development Estimate):

AFAE Approved Acquisition Decision Memorandum dated July 24, 1995.

Approved Program:

AFAE Approved Acquisition Program Baseline (APB) dated April 22, 1998.

6. Mission and Description:

The DoD National Airspace System (NAS) program will modernize the DoD radar approach control facilities in parallel with the Federal Aviation Administration (FAA). The DoD NAS program provides systems and facilities compatible/interoperable with the FAA modernization, prevents DoD flight delays and cancellations, continues DoD's access into Special Use Airspace, provides transparent services to military and civil aircraft, replaces aging DoD Air Traffic Control (ATC) systems, and increases flight safety. DoD will upgrade voice, data, and sensor systems as well as facility configurations and operations concepts to provide continued quantity and quality of ATC services to the aviation community. The NAS program also includes the Military Airspace Management System (MAMS) which will schedule and manage special use airspace. MAMS is an automated Special Use Airspace (SUA) scheduling and utilization reporting tool which will enable DoD to more efficiently manage SUA. DoD military ATC and fighting/flying readiness will be maintained.

7. Executive Summary:

DoD will acquire, to the maximum extent practical, systems on contract or systems to be on contract with the FAA to reduce development costs and prevent duplication. If the DoD does not modernize the DoD Air Traffic Control (ATC) system, the resulting reduced interoperability between current DoD and FAA facilities will negatively impact DoD flight operations.

1993 included the demonstration of the Military Airspace Management System (MAMS) prototype software at Edwards AFB, CA; the demonstration of a repackaged Federal Aviation Administration (FAA) Common Console into the DoD configuration; release of the MAMS Request for Proposal (RFP); and formal approval of executive interagency agreements for test, procurement and support of FAA Automation Systems.

1994 included Chief of Staff of the Air Force (CSAF) approval of updated National Airspace System (NAS) and MAMS Operational Requirements Documents (ORDs); DAC approval of MAMS Milestone II review; OSD approval of the NAS Test and Evaluation Master Plan (TEMP); and the FAA release of the Enhanced Terminal Voice Switch (ETVS) RFP. In August 1994, the DoD assumed from the FAA, the lead role for the Digital Airport Surveillance Radar (DASR) acquisition.

1995 included the NAS paper AFSARC Milestone II review; the Military Airspace Management System (MAMS) successful negotiations with SM-ALC to utilize their existing Advanced Technology Support Program (ATSP) contract for completion of the MAMS development effort; and the Federal Aviation Administration (FAA)

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7. Executive Summary (Cont'd):

Enhanced Terminal Voice Switch (ETVS) contract award to Denro, Inc.

1996 included the Federal Aviation Administration (FAA) contract award of the Standard Terminal Automation Replacement System (STARS) to Raytheon Corporation on September 16, 1996. The DASR contract was awarded to Raytheon Corporation on August 9, 1996.

Change 1 to the NAS APB received AFAE approval on February 27, 1997. This APB change was necessitated due to delays in the DASR contract award and delays in the acquisition of the FAA ETVS and STARS programs. SAF/AQ approved an amendment to the DoD National Airspace System (NAS) MS II Decision and Phase II Guidance on June 30, 1997. The new ADM authorized NAS a quantity increase from 53 to 65 operational sites.

Change 2 to the NAS APB received AFAE approval on April 22, 1998. This APB change was necessitated due to an anticipated schedule slip to the Voice Communication Switching System (VCSS) Program Review Milestone date of September 1998. Delays resulting from FAA operational testing impacted deliveries of functional voice switches to the DoD test sites at Dover AFB and Eglin AFB while corrective redesign was completed. Required DoD schedule changes impacted from the FAA delays were reflected in Change 2 to the APB.

The second half of 1998 included the successful completion of several key program events as well as the programmatic restructure of the Digital Airport Surveillance Radar (DASR) and DoD Advanced Automation System (DAAS) portions of NAS. Key highlights included the successful completion of the Military Airspace Management System (MAMS) Combined Test & Evaluation, favorable Milestone III Review, and multi-Service CONOPS approval. MAMS IOC was declared on January 21, 1999 by the Chairman of the Policy Board for Federal Aviation (PBFA). The Voice Communications Switching System (VCSS) portion of NAS experienced success with the completion of DT&E, the PEO approval of the OT&E certification briefing, and the continued steady march toward the June 1999 PEO Production Decision. During the Summer of 1998, Raytheon announced additional schedule slips to both the DASR and DAAS portions of NAS. As a result, the program office declared the FY99 LRIP unexecutable and undertook a risk analysis which supported an LRIP decision in 1st quarter FY00 and which effectively executes all of the FY00 DASR/DAAS funding early in the fiscal year. This restructured the DoD DASR/DAAS portions of the program within current APB parameters. Because there is still moderate risk associated with DASR/DAAS software deliveries, the operational community has asked the Joint Program Office (JPO) to evaluate an incremental test strategy as a means to protect the DASR schedule. These efforts along with the incremental software deliveries for STARS restructuring has proven effective in reducing overall schedule impact. The program office continues to work closely with the FAA and Raytheon to ensure DoD impact remains minimal. The current NAS APB schedule estimates have been adjusted and are reflected in Section 9 of this report. Additional schedule adjustments may be necessary but are pending further FAA/DoD assessments of the schedule risk. This report also includes the modernization of 10 additional sites into the DoD NAS program in accordance with SAF/AQ mandated Phase 2 Exit Criteria.

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7. Executive Summary (Cont'd):

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
DoD ATCALs in the NAS				
Milestone 0	NOV 90	NOV 90	NOV 90	
Milestone I	JUL 92	JUL 92	JUL 92	
Milestone II	JUL 95	JUL 95	JUL 95	
Milestone III	JUN 98	MAY 00	AUG 00	(Ch-1)
IOC (First DoD Site Activation)	APR 00	APR 00	APR 00	
RADAR (DASR)				
Contract Award	DEC 95	AUG 96	AUG 96	
DT&E				
Start	AUG 96	JUL 97	JUL 97	
Complete	JAN 98	JUN 99	JUN 99	
LRIP Contract	MAR 98	N/A	N/A	
LRIP First Delivery	JUN 99	N/A	N/A	
IOT&E				
Start	JUN 97	JUN 99	NOV 99	(Ch-1)
Complete	MAR 98	DEC 99	MAR 00	(Ch-1)
Full Rate Production Contract Award	MAR 99	JUN 00	AUG 00	(Ch-1)
AUTOMATION (DAAS)				
Production Award Exercise	JUL 98	JUN 00	AUG 00	(Ch-1)
VOICE (VCSS)				
Program Review	MAY 97	SEP 99	SEP 99	

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9a. Schedule (Cont'd):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
MAMS			
Development Contract	JUL 95	JUL 95	NOV 95
DT&E	N/A	N/A	N/A
Combined T&E			
Start	OCT 97	MAR 98	MAR 98
Complete	MAR 98	AUG 98	AUG 98
IOT&E	N/A	N/A	N/A
Start	MAY 98	N/A	N/A
Complete	AUG 98	N/A	N/A
Milestone III Review	NOV 98	NOV 98	DEC 98 (Ch-2)
Full Rate Production Contract Award	NOV 98	NOV 98	MAR 99 (Ch-2)
IOC (First Delivery)	AUG 98	AUG 98	JAN 99 (Ch-2)

ATCALs = Air Traffic Control and Landing Systems
DASR = Digital Airport Surveillance Radar
DAAS = DoD Advanced Automation System
VCSS = Voice Communications Switching System
MAMS = Military Airspace Management System

b. Current Change Explanations --

(Ch-1) The Federal Aviation Administration (FAA) Standard Terminal Automation Replacement System (STARS) program office announced a schedule slip due to software anomalies and requirements issues. The program office is working closely with the FAA and FAA STARS contractor to evaluate the schedule migration and minimize DoD impact. The following changes reflect the current DoD schedule adjustments. Additional schedule adjustments may be necessary but are pending further FAA/DoD assessments of the schedule risk.

Milestone Event	From	To
Milestone III	MAY 00	AUG 00
IOT&E Start	JUN 99	NOV 99
IOT&E Complete	DEC 99	MAR 00
Full Rate Production Contract Award	JUN 00	AUG 00
Automation Production Award Exercise	JUN 00	AUG 00

(Ch-2) The Military Airspace Management System (MAMS) conducted a successful Milestone III Review December 1, 1998 which is reflected below in our revised current estimate of this event. MAMS Full Rate Production Contract Award has been adjusted to reflect the impact of the delayed IOC declaration which was detained due to a longer than anticipated tri-Service CONOPS coordination. Subsequently, MAMS IOC was declared by the DoD Policy Board on Federal Aviation (PBFA) January 21, 1999. The following

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9b. Schedule (Cont'd):

adjustments reflect the required changes.

Milestone Event	From	To
MAMS Milestone III Review	NOV 98	DEC 98
MAMS Full Rate Production Contract Award	NOV 98	MAR 99
MAMS IOC (First Delivery)	AUG 98	JAN 99

10. Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
DOD ATCALs IN THE NAS				
Inter/Intrafacility Data Transfer				
Auto Transfer of Position Track Data	IAW ICD	IAW ICD / IAW ICD	TBD	IAW ICD
Electronic Inter- facility Transfer of Flight Plans	IAW ICD	IAW ICD / IAW ICD	TBD	IAW ICD
Aircraft Tracked Medium (LCF)	900	900 / 250	TBD	900
Radar Subclutter Visibility (dB)	55	55 / 42	TBD	43
Voice Compatibility/ Interoperability	Digital Voice Systems	Digital / Inter- Voice / face to Systems/ existing / FAA / Systems	TBD	Digital Voice Systems
MAMS				
Conflict Identification	100% of con- flicts identi- fied; 85% of con- flicts identi- fied <or= 10 (sec)	100% of / 98% of con- / con- flicts / flicts identi- / identi- fied; / fied; 85% of / 85% of con- / con- flicts / flicts identi- / identi- fied / fied <or= 10 / <or= 30 (sec) / (sec)	Met Thresh.	100% of con- flicts identi- fied; 85% of con- flicts identi- fied <or= 10 (sec)

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10a. Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Interface with FAA	Trans- mittal Time for 85% of message s between Schedul- er and FAA <or= 5 (min)	Trans- / Trans- mittal / mittal Time / Time for 85% / for 85% of / of message/ message s / s between/ between Schedul-/ Schedul- er and / er and FAA / FAA <or= 5 / <or= 10 (min) / (min)	Met Obj.	Trans- mittal Time for 85% of messages between schedul- er and FAA <or= 5 (min)
Reporting	Process- ing Time of Util- ization Data Request s <or= 1 (min); Total Manual and Automat- ic Report Genera- tion <or= 10 (min)	Process-/ Process- ing Time/ ing Time of Util-/ of Util- ization / ization Data / Data Request/ Request s <or= 1/ s <or= (min); / 10 Total / (min); Manual / Total and / Manual Automat/ and - ic / Automat Report / - ic Genera-/ Report tion / Genera- <or= 10/ tion (min) / <or= 30 / (min)	Met Obj.	Process- ing Time of Util- ization Data Requests <or= 1 (min); Total Manual and Automat- ic Report Genera- tion <or= 10 (min)

ICD - Interface Control Document

b. Current Change Explanations -- None

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11. Total Program Cost and Quantity (Dollars in Millions):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	96.6	105.4	101.9
Procurement	473.7	487.6	510.3
Flyaway	(302.8)		(341.3)
Other Wpn Systems Cost	(144.7)		(135.5)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(26.2)		(33.5)
Construction (MILCON)	3.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 90 Base-Year \$	573.3	593.0	612.2
Escalation	217.8	198.1	174.9
Development (RDT&E)	(16.4)	(21.8)	(14.5)
Procurement	(200.0)	(176.3)	(160.4)
Construction (MILCON)	(1.4)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	791.1	791.1	787.1
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	53	65	75
Total	53	65	75

The unit of measure of this program represents National Airspace System (NAS) operational sites.

The LRIP quantity approved at MS II was 8 Digital Airport Surveillance Radars (DASR) and 0 DoD Advanced Automation Systems (DAAS) for the radar and automation portions of NAS. However, the current approved LRIP quantities are 20 DASR and 20 DAAS. The LRIP quantity for both DASR and DAAS represents less than 10% of the total maximum contractual DoD/DoT buy.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

	UCR Baseline (APR 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 90 BY\$)	593.0	612.2	
(2) Quantity	65	75	
(3) Unit Cost	9.123	8.163	-10.52
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 90 BY\$)	487.6	510.3	
(2) Quantity	65	75	
(3) Unit Cost	7.502	6.804	-9.30

Please note that because of significant variations of the many complex and varied configurations at each NAS site, Program Acquisition Unit Cost (PAUC) and Average Unit Procurement Cost (AUPC) information does not provide a useful measure of unit cost. PAUC and AUPC provides only notional data.

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	113.0	673.7	4.4	791.1
Previous Changes:				
Economic	-5.8	-56.9	-	-62.7
Quantity	-	+95.9	-	+95.9
Schedule	-	+27.9	-	+27.9
Engineering	-	+4.7	-	+4.7
Estimating	+8.1	-103.7	-4.4	-100.0
Other	-	-	-	-
Support	-	+25.7	-	+25.7
Subtotal	+2.3	-6.4	-4.4	-8.5
Current Changes:				
Economic	-0.5	-1.1	-	-1.6
Quantity	-	+76.0	-	+76.0
Schedule	-	+34.2	-	+34.2
Engineering	-	+4.6	-	+4.6
Estimating	+1.6	-82.5	-	-80.9
Other	-	-	-	-
Support	-	-27.8	-	-27.8
Subtotal	+1.1	+3.4	-	+4.5
Total Changes	+3.4	-3.0	-4.4	-4.0
Current Estimate	116.4	670.7	-	787.1

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

Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	96.6	473.7	3.0	573.3
Previous Changes:				
Quantity	-	+67.4	-	+67.4
Schedule	-	+12.4	-	+12.4
Engineering	-	+2.9	-	+2.9
Estimating	+4.1	-70.4	-3.0	-69.3
Other	-	-	-	-
Support	-	+19.8	-	+19.8
Subtotal	+4.1	+32.1	-3.0	+33.2
Current Changes:				
Quantity	-	+56.3	-	+56.3
Schedule	-	+15.1	-	+15.1
Engineering	-	+3.5	-	+3.5
Estimating	+1.2	-48.7	-	-47.5
Other	-	-	-	-
Support	-	-21.7	-	-21.7
Subtotal	+1.2	+4.5	-	+5.7
Total Changes	+5.3	+36.6	-3.0	+38.9
Current Estimate	101.9	510.3	-	612.2

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-0.5
Adjustment for Current and Prior Inflation. (Estimating)	+0.4	+0.4
Refinement of estimate to reflect change in test assumptions. (Estimating)	+0.8	+1.2
RDT&E Subtotal	+1.2	+1.1
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-11.6
Economic adjustment for negative program change. (Economic)	N/A	+10.5
Quantity increase of 10 units from 65 to 75. (Quantity)	+56.3	+76.0
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	+15.1	+27.2
Allocation to Engineering variance resulting from Quantity Change. (Engineering)	+3.5	+4.6
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	-36.4	-56.7
Stretch out of annual procurement buy profile to FY05. (Schedule)	0.0	+7.0

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Adjustment for Current and Prior Inflation. (Estimating)	+0.6	+0.7
Refinement of estimate to reflect actual costs related to voice switch LRIP procurement. (Estimating)	-12.9	-26.5
Adjustment for Current and Prior Inflation. (Support)	+0.8	+0.8
Change in Initial Spares estimate based on increase in NAS quantities. (Support)	+6.0	+8.2
Refinement of DoD Other Weapon Systems Cost to reflect an integrated Engineering, Installation & Integration (EI&I) requirements strategy. (Support)	-28.5	-36.8
Procurement Subtotal	+4.5	+3.4

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
14.93	-0.86	-2.09	+0.83	+0.12	-2.41	--	-0.03	-4.44	10.49

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
12.71	-0.77	-1.44	+0.83	+0.12	-2.48	--	-0.03	-3.77	8.94

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14c. Unit Cost and Other History (Cont'd):

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	JUL 92	JUL 92	N/A	JUL 92
Milestone II	JAN 94	JUL 95	N/A	JUL 95
Milestone III	MAR 97	JUN 98	N/A	AUG 00
FUE/IOC	OCT 99	APR 00	N/A	APR 00
Total Cost	122.6	791.1	N/A	787.1
Total Quantity	N/A	53	N/A	75
Prog Acq Unit Cost	N/A	14.93	N/A	10.49

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

a. RDT&E --
DASR:
 Raytheon Company, Marlborough, MA
 F19628-96-D0038, FFP
 Award: August 9, 1996
 Definitized: August 9, 1996

Initial Contract Price
Target Ceiling Qty
 \$186.0 \$0.0 0

Current Contract Price
Target Ceiling Qty
 \$186.0 \$0.0 0

Estimated Price At Completion
Contractor Program Manager
 \$186.0 \$186.0

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years (FY90-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-06)</u>	<u>Total</u>
RDT&E	114.0	1.8	0.2	0.4	116.4
Procurement	42.9	106.6	113.8	407.4	670.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	156.9	108.4	114.0	407.8	787.1

b. Annual Summary -- NAS

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY90 Dollars Nonrec</u>	<u>Flyaway FY90 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				3.9	4.0
Subtotal				3.9	4.0

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY90 Dollars Nonrec</u>	<u>Flyaway FY90 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				2.9	3.0
Subtotal				2.9	3.0

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY90 Dollars Nonrec</u>	<u>Flyaway FY90 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				3.9	4.0
1991				9.3	9.9
1992				3.8	4.2
1993				6.0	6.7
1994				12.5	14.2
1995				25.4	29.5
1996				11.2	13.3
1997				9.8	11.8
1998				9.6	11.6
1999				1.5	1.8
2000				1.5	1.8

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001				0.2	0.2
2002				0.2	0.2
2003				0.2	0.2
Subtotal				95.1	109.4

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998			1.3	1.8	2.2
1999			5.4	5.4	6.7
2000	2		18.3	25.1	31.7
2001	7		18.8	26.1	33.6
2002	10		28.9	37.8	49.6
2003	5		17.9	25.2	33.7
2004	7		16.4	26.4	36.0
2005	6		9.5	14.2	19.8
Subtotal	37		116.5	162.0	213.3

Note: A NAS Quantity represents a site receiving a full complement of NAS equipment. Recurring Flyaway Dollars shown without any respective quantity represents locations that will receive less than a full complement of NAS equipment.

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				0.6	0.7
1998			0.1	0.4	0.5
1999			0.8	1.3	1.6
2000	1		2.9	12.4	15.7
2001			4.0	13.7	17.6
2002	1		5.7	16.8	22.0
2003	4		5.8	7.5	10.0
2004	2		0.4	1.0	1.4
2005	1		0.5	0.7	1.0
Subtotal	9		20.2	54.4	70.5

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

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998			7.5	12.9	15.8
1999			8.9	12.4	15.4
2000	1		30.6	46.8	59.2
2001	3		35.3	48.6	62.6
2002	7		37.5	51.2	67.2
2003	5		31.3	42.9	57.3
2004	8		26.9	37.2	50.8
2005	5		26.6	37.2	51.9
2006				4.7	6.7
Subtotal	29		204.6	293.9	386.9

Note: Appropriation 3080 Other Procurement, Air Force, includes spares funding.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	37		116.5	165.9	217.3
Army	9		20.2	57.3	73.5
USAF	29		204.6	389.0	496.3
Grand Total	75		341.3	612.2	787.1

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RD&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 110.3

Percent Total Program Expended: 14.0%

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18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The Operating and Support (O&S) cost estimate is based on analysis performed in preparation for the July 1995 MS II decision. The estimate assumes a 20 year life from year FY00 to FY19.

b. Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per NAS Site	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	1.4	0.0
Unit Level Consumption	0.6	0.0
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	0.3	0.0
Sustaining Support	0.1	0.0
Indirect Costs	0.4	0.0
Total	2.8	0.0

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A-19 LONGBOW HELLFIRE

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: LONGBOW HELLFIRE

AS OF DATE: December 31, 1998

SUBJECT	PAGE
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1. (U) Designation and Nomenclature (Popular Name): LONGBOW HELLFIRE - subsystem of the AH-64 APACHE Weapon System
2. (U) DoD Component: Army
3. (U) Responsible Office and Telephone Number:
PROJECT MANAGER COL RICHARD T. SAVAGE
AIR-TO-GROUND MISSILE SYSTEMS Assigned: July 3, 1996
ATTN: SFAE-MSL-HD DSN 746-8408; COMM (256) 876-8408
RSA, AL 35898-5610 SAVAGE-RT
4. (U) Program Elements/Procurement Line Items:
RDT&E: PE 23802 (Shared) Project D785
(U) PE 64816 (Shared) Project DC13
PROCUREMENT:
(U) APPN 2032 ICN C70300 (Army)

NO FURTHER

Classified by: ~~SECRET~~ from HELLFIRE Security Classification Guide
Downgrade instructions: ~~SECRET~~ Security Classification Guide, 10 Aug 98
Declassify on: ~~SECRET~~

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Longbow HELLFIRE, December 31, 1998

5. (U) References:

SAR Baseline (Production Estimate):

(U) DAE Approved Acquisition Program Baseline dated November 27, 1995.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated October 1, 1998.

6. (U) Mission and Description:

(U) HELLFIRE is an air-to-ground, point target, precision strike missile system designed to defeat individual hardpoint targets. The missile configuration has the capability for modular guidance section replacements. A version of the missile utilizing laser guidance, Laser HELLFIRE, is presently in production and is a separate program. Longbow HELLFIRE (a version utilizing a radio frequency guidance section) is in production. Longbow HELLFIRE and Laser HELLFIRE are complementary and neither missile replaces another missile system in the air-to-ground role.

Longbow HELLFIRE and Laser HELLFIRE will be employed on the AH-64D Longbow Apache helicopter. Longbow HELLFIRE will provide the capability to engage targets both day and night in adverse weather and with battlefield obscuration present. Longbow also offers a fire and forget capability against a given target set which complements the semi-active Laser HELLFIRE missile. The Longbow HELLFIRE Missile contains a radio frequency guidance section which will provide a lock-on before launch (LOBL) or lock-on after launch (LOAL) capability, depending on target range and movement parameters. Longbow will not change the AH-64 mission or role, but will provide for increased aircraft survivability. It is envisioned that Longbow HELLFIRE will also be used on the Comanche as a pre-planned product improvement item.

7. (U) Executive Summary:

(U) In 1981, the U.S. Army Aviation Applied Technology Directorate, Fort Eustis, Virginia, conducted competition and awarded parallel competitive technology demonstration contracts to Martin Marietta Corporation (MMC) and Westinghouse Electric Corporation (WEC) for a fire control radar to be integrated and tested on the AH-64 Apache. In late 1981, after a series of study efforts, a classified program was initiated for a millimeter wave radar seeker for the HELLFIRE Modular Missile System which, in conjunction with the fire control radar, yielded a total systems approach for Apache. In 1982, WEC and MMC were again awarded parallel competitive contracts for the Critical Technology Demonstration (CTD). During the three-plus years of the CTD program, both MMC and WEC demonstrated that the technology was in hand for further systems development. As a result of a Government In-Process Review in Aug 85, a contract was awarded in Nov 85 to MMC and WEC, as a joint venture (JV), for preliminary design of the tactical Longbow System. This was followed in Aug 86 by the award of a Proof of Principle demonstration contract to the JV. An Initial Design Phase contract was awarded to the JV in Sep 89. Proof of Principle of the Longbow missile was accomplished 11 Apr 90. The Defense Acquisition Board (DAB) granted approval for engineering and manufacturing

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Longbow HELLFIRE, December 31, 1998

7. (U) Executive Summary (Cont'd):

development (EMD) of the Longbow Missile 5 Dec 90, and a letter contract for EMD of the Longbow missile was awarded 26 Dec 90. The letter contract was definitized 7 May 91. A Special Program Review (SPR) to assess the Longbow HELLFIRE Program and define funding strategies to support Longbow Apache, fire control radar and missile programs was held in Aug 92. To better align the Longbow HELLFIRE program with the Longbow Apache program, initiation of production was delayed by one year and the procurement program was stretched. The Conventional Systems Committee review for Longbow long lead items and initial production facilitization was held 5 Oct 94. Approval to proceed with long lead of the HELLFIRE missile was withheld until cost reduction efforts were evaluated and approved. The Longbow HELLFIRE Cost Reduction Plan was briefed to the Defense Acquisition Executive on 1 Dec 94. The plan was approved and the contract for long lead procurement was awarded 23 Dec 94 by definitization of option one under the engineering and manufacturing development contract.

On 11 May 95, the final development flight test of the Longbow HELLFIRE Missile was conducted. This flight met a cost effective combination of system qualification and live fire test objectives and successfully concluded the development flight test program. Live fire tests were successfully completed 27 Jul 95.

On 13 Oct 95 the Defense Acquisition Executive granted approval for Longbow HELLFIRE to enter low-rate initial production (LRIP) and delegated authority to the Army to make the full-rate production (FRP) decision. The Longbow HELLFIRE LRIP I option was definitized with available Continuing Resolution Authority funding 14 Dec 95. The remaining portion of this option was exercised 31 Jan 96. The LRIP II contract was awarded to the Longbow Limited Liability Company 7 Feb 97. Savings from Cost Reduction Program hardware initiatives early cut-in for FY 97, were used to procure an additional 51 missiles in FY 97. The first Longbow HELLFIRE tactical missile was delivered 31 Jul 97. On 28 Oct 97 the Army Acquisition Executive granted approval for Longbow HELLFIRE to proceed into full rate production. The FY 98 full rate production contract option was exercised by letter contract 24 Nov 97 and definitized 1 Jul 98. The final milestone for the program, first unit equipped, was accomplished Jul 98. Congressional authorization for the FY 99 - FY 03 multiyear contract was received Oct 98. Negotiations for the multiyear contract are expected to be completed Mar 99 with contract award in Apr 99. On 29 Oct 98 successfully completed the missile firings associated with the Longbow Apache System first article tests. Currently the Army has 401 missiles in inventory.

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Longbow Hellfire, December 31, 1998

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I In-Process Review	AUG 85	AUG 85	AUG 85
Milestone IB ASARC	JUL 89	JUL 89	JUL 89
Milestone II DAB	DEC 90	DEC 90	DEC 90
FSD Contract Award	DEC 90	DEC 90	DEC 90
Component Qual Test			
Start	AUG 93	AUG 93	AUG 93
Complete	MAY 95	MAY 95	MAY 95
System Qual Test			
Start	JUL 94	JUL 94	JUL 94
Complete	MAY 95	MAY 95	MAY 95
Milestone III (LRIP - DAB)	OCT 95	OCT 95	OCT 95
Low-Rate Initial Production Contract Award	DEC 95	DEC 95	DEC 95
First Production Delivery	MAR 97	MAR 97	JUL 97
Milestone III (Full Rate - ASARC)	N/A	OCT 97	OCT 97
Full-Rate Production Contract Award	DEC 97	DEC 97	NOV 97
Authorization FY 99 Multiyear Contract	OCT 98	OCT 98	OCT 98 (Ch-1)
First Unit Equipped (FUE)	JUL 98	JUL 98	JUL 98

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Longbow Hellfire, December 31, 1998

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

b. Current Change Explanations --

(U) (Ch-1) Authorization FY 99 Multiyear Contract was changed from Jul 98 to Oct 98 to reflect actual date authorization was received.

10. (U) Performance Characteristics:

a. Performance --

Independent Function	Production Estimate (SAR) Yes	Approved Program (APB) Obj/Threshold Yes / Yes	Demon- strated Perf YES	Current Estimate YES
----------------------	-------------------------------------	---	----------------------------------	----------------------------

(b)(1)

(U) Demonstrated data source is the 42 missile inertially guided, radar aided development test firing program.

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	411.0	458.2	433.2
Procurement	1941.0	1934.2	1950.7
Flyaway	(1932.9)		(1935.7)
Other Wpn Sys Cost	(2.8)		(4.1)
Peculiar Support	(5.3)		(10.9)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	2352.0	2392.4	2383.9
Escalation	283.6	213.5	125.0
Development (RDT&E)	(-24.4)	(-9.6)	(-16.2)
Procurement	(308.0)	(223.1)	(141.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2635.6	2605.9	2508.9
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	13311	12905	12905
Total	13311	12905	12905

Note: Excludes 70 RDT&E prototypes from the SAR Baseline and 70 from the Current Estimate that are not considered fully configured.

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11b. (U) Total Program Cost and Quantity (Cont'd):

(U) (1) Unit of measure is one missile.

(2) LRIP quantities were established at the Milestone II DAB in Dec 90. In order to align the missile deliveries with the aircraft fielding schedule, during a Special Program Review held in Aug 92, the LRIP quantities were increased to 83 missiles over the 10% limit. From the Dec 93 SAR to the Dec 94 SAR the LRIP I quantity changed from 364 to 352 and the LRIP II quantity changed from 1050 to 1056. From the Dec 94 SAR the LRIP II quantity has changed from 1056 to 1005. From the Dec 95 SAR the LRIP II quantity was increased from 1005 to 1056.

c. (U) Foreign Military Sales --

A direct commercial sale (co-production) with the United Kingdom was implemented Apr 96 for a quantity of 987 missiles (Quantity is classified UK Restricted) and a cost of \$195M.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (Oct 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	2392.4	2383.9	
(2) Quantity	12905	12905	
(3) Unit Cost	0.185	0.185	0.00
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	1934.2	1950.7	
(2) Quantity	12905	12905	
(3) Unit Cost	0.150	0.151	+0.67

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LONGBOW HELLFIRE, December 31, 1998

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	386.6	2249.0	-	2635.6
Previous Changes:				
Economic	+3.7	-135.0	-	-131.3
Quantity	-	-54.7	-	-54.7
Schedule	+2.5	+4.7	-	+7.2
Engineering	+56.8	-8.6	-	+48.2
Estimating	-6.4	+44.9	-	+38.5
Other	-	-	-	-
Support	-	+18.5	-	+18.5
Subtotal	+56.6	-130.2	-	-73.6
Current Changes:				
Economic	-0.6	-31.9	-	-32.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-26.7	-	-	-26.7
Estimating	+1.1	+17.1	-	+18.2
Other	-	-	-	-
Support	-	-12.1	-	-12.1
Subtotal	-26.2	-26.9	-	-53.1
Total Changes	+30.4	-157.1	-	-126.7
Current Estimate	417.0	2091.9	-	2508.9

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	411.0	1941.0	-	2352.0
Previous Changes:				
Quantity	-	-41.8	-	-41.8
Schedule	-1.1	-	-	-1.1
Engineering	+51.1	-8.0	-	+43.1
Estimating	-5.7	+36.8	-	+31.1
Other	-	-	-	-
Support	-	+16.8	-	+16.8
Subtotal	+44.3	+3.8	-	+48.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-23.1	-	-	-23.1
Estimating	+1.0	+15.8	-	+16.8
Other	-	-	-	-
Support	-	-9.9	-	-9.9
Subtotal	-22.1	+5.9	-	-16.2
Total Changes	+22.2	+9.7	-	+31.9
Current Estimate	433.2	1950.7	-	2383.9

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Longbow Hellfire, December 31, 1998

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	Base-Year	Then-Year
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-1.1
Economic adjustment for negative program change. (Economic)	N/A	+0.5
Reduced the Counter Active Protection System (CAPS) capability from a broad range of systems to a select number of systems. (Engineering)	-23.1	-26.7
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
Revised estimate of test hardware cost. (Estimating)	+0.9	+1.0
RDT&E Subtotal	-22.1	-26.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-33.1
Economic adjustment for negative program change. (Economic)	N/A	+1.2
Adjustment for Current and Prior Inflation. (Estimating)	+11.1	+11.7
Revised estimate of in-house and contract production support costs. (Estimating)	+4.7	+5.4
Adjustment for Current and Prior Inflation. (Support)	+0.2	+0.2
Reduced the quantity of environmental covers from 12905 to 7305. A reduction of 5600 units. (Support)	-10.1	-12.3
Procurement Subtotal	+5.9	-26.9

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline									PAUC Prod Est
PAUC Init Est	Changes								
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.20	-0.01	--	-0.01	-0.01	+0.03	--	--	--	0.20

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Longbow Hellfire, December 31, 1998

14a. (U) Unit Cost and Other History (Cont'd):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.20	-0.01	--	--	--	--	--	--	-0.01	0.19

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.17	--	--	-0.01	-0.02	+0.03	--	--	--	0.17

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.17	-0.01	--	--	--	--	--	--	-0.01	0.16

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	AUG 85	AUG 85	AUG 85
Milestone II	N/A	DEC 90	DEC 90	DEC 90
Milestone III	N/A	OCT 95	OCT 95	OCT 95
FUE/IOC	N/A	APR 97	JUL 98	JUL 98
Total Cost	N/A	2190.3	2635.6	2508.9
Total Quantity	N/A	10896	13311	12905
Prog Acq Unit Cost	N/A	0.2	0.2	0.19

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Longbow Hellfire, December 31, 1998

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

a. Procurement --

(U) Longbow HF LRIP II/FRP:	Initial Contract Price		
Longbow LLC, Orlando, FL	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
DAAH01-97-C-0082, FFP	\$233.7	N/A	1056
Award: February 7, 1997			
Definitized: February 7, 1997			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$445.2	N/A	2156	\$445.2	\$445.2

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

The FY 98 options for 1100 missiles was exercised by Letter Contract 24 Nov 97 and definitized on 1 Jul 98.

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

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

<u>Appropriation</u>	<u>Prior Years (FY91-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	386.2	-	12.4	18.4	417.0
Procurement	1048.9	294.3	288.3	460.4	2091.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1435.1	294.3	300.7	478.8	2508.9

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Longbow Hellfire, December 31, 1998

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

b. Annual Summary -- Longbow Hellfire

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991			66.9	66.9	61.2
1992			107.6	107.6	100.8
1993			85.7	85.7	82.2
1994			108.7	108.7	106.2
1995			35.9	36.0	35.8
1996					
1997					
1998					
1999					
2000					
2001			10.6	11.5	12.4
2002			17.2	16.8	18.4
2003					
2004					
Subtotal			432.6	433.2	417.0

(U) The following costs for Modernized Hellfire are included in this program element but are not part of the Longbow Hellfire program and have been excluded (Then Year Dollars in Millions): FY 03 - \$16, FY 04 - \$54, and FY 05 - \$75.5.

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995		25.1		40.7	41.2
1996	352	27.4	165.4	178.4	182.1
1997	1056	19.7	220.7	241.6	249.3
1998	1100	7.3	210.6	221.3	231.2
1999	2000		321.3	325.0	345.1
2000	2200		271.8	273.3	294.3
2001	2200		261.8	263.3	288.3
2002	2200		200.6	202.0	225.4
2003	1797		204.0	163.4	186.1
2004				22.7	26.4
2005				19.0	22.5
Subtotal	12905	79.5	1856.2	1950.7	2091.9

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Longbow HELLFIRE, December 31, 1998

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	12905	79.5	2288.8	2383.9	2508.9

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	598	430

(U) Percent Total Program Quantities Delivered: 3.3%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 704.8

(U) Percent Total Program Expended: 28.1%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
Operating and support costs for Longbow HELLFIRE are costed under the philosophy of a "certified round" concept. The sustainment phase costs are for FY 97 through FY 25. The following efforts are considered applicable:

- o Replenishment spares for support equipment.
- o Annual overhaul of Longbow HELLFIRE equipment - ten percent of missiles in storage will be checked annually. Of the items checked, those that fail will be shipped to the depot for overhaul and return. Costs are based on predicted failure rate and average cost to repair.
- o Transportation costs associated with annual overhaul.
- o System Project Management
- o Surveillance Program.

There is no antecedent system.

Total operations and maintenance cost is \$78.5M from the approved Army Cost Position dated Oct 97.

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Longbow Hellfire, December 31, 1998

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

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per Missile	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	0.0
Intermediate Maintenance	N/A	0.0
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	0.1	N/A
Indirect Costs	N/A	N/A
Total	0.1	0.0

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N-13 LPD 17

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

PROGRAM: LPD 17 Class

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): LPD 17 Class Amphibious Transport Dock Ship
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:
LPD 17 AMPHIBIOUS TRANSPORT DOCK CAPT W.H. LUEBKE
SHIP PROGRAM OFFICE (PMS317) Assigned: August 29, 1997
NAVAL SEA SYSTEMS COMMAND DSN N/A; COMM (504) 437-3434
NEW ORLEANS, LA 70094-0000
4. (U) Program Elements/Procurement Line Items:
ROD&E:
(U) PE 0603564N (Shared) Project S0408 (Shared)
(U) PE 0604211N Project 22283, 22425, S2283
(U) PE 0604567N Project S1803 (Shared), S2198 (Shared)
PROCUREMENT:
(U) APPN 1611 ICN 303600 (Navy)

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5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline (APB) dated May 5, 1997

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated May 5, 1997.

6. (U) Mission and Description:

(U) The LPD 17 Class Amphibious Transport Dock Ship will be the functional replacement for the LPD 4, LSD 36, LKA 113, and LST 1179 Classes of Amphibious Ships in embarking, transporting and landing elements of a Marine landing force in an assault by helicopters, landing craft, amphibious vehicles, and by a combination of these methods to conduct the primary amphibious warfare mission. The LPD 17 Class is required to fill the projected lift shortfall created by the retirement of the above ships.

The current ship configuration including Rolling Airframe Missiles and NULKA decoys meet the Chief of Naval Operations capstone self defense anti-air warfare requirement. Evaluation of combat system alternatives and future threats continues. However, the Navy removed the Vertical Launch System (VLS) and Evolved Sea Sparrow missile from the LPD 17 defense suite subsequent to OSD Milestone II approval of the LPD 17 baseline. Until the Navy completes its comparative analysis of this decision, there is an open issue in the Department over whether the less robust baseline meets Congressional direction regarding ship capability for the LPD 17.

7. (U) Executive Summary:

(U) The Joint Requirements Oversight Council (JROC) validated the LPD 17 Class Mission Need Statement (MNS) on September 18, 1990. The Milestone 0 DAB was held on November 1, 1990 and feasibility studies initiated in February 1991. The Milestone I DAB was held on January 11, 1993 and on January 19, 1993, the Under Secretary of Defense for Acquisition, (USD(A)), signed the Acquisition Decision Memorandum (ADM) approving the Navy recommended ship alternative and authorizing the program to enter Phase I, Preliminary/Contract Design. The JROC validated the LPD 17 Key Performance Parameters in May 1995 and May 1996. The current ship configuration includes the cooperative engagement capability and a reduced own-ship self-defense capability against sea-skimming anti-ship cruise missiles addressed by the FY94 and FY95 DoD Appropriation Act reports.

The program received Milestone II approval by OSD(A&T) on June 17, 1996 to enter Phase II, Engineering and Manufacturing Development and to produce the first three ships. The lead ship contract (with options for up to two follow ships) for detail design, ship systems integration, construction, testing, logistics and life cycle support was awarded to a team led by Avondale Industries on December 17, 1996. A protest was filed by the losing team to GAO on December 26, 1996 resulting in a stop work order. The protest was resolved and performance under the contract resumed on April 1997. Detail Design is in progress.

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LPD 17 Class, December 31, 1998

7. (U) Executive Summary (Cont'd):

An option for Life Cycle Planning (CLIN 009) was awarded to Avondale Industries in October 1998. The LPD 18 option was awarded in December 1998. A three phase Executive Committee (EXCOMM) program review and outbrief to ASN (RD&A) was completed in December 1998. Production Readiness Review will begin in August 1999, with start of construction on the lead ship (LPD 17) scheduled in the Fall of 1999. A Congressionally mandated combat system analysis of alternatives is being conducted with a report due in March 1999.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I	JAN 93	JAN 93	JAN 93
DT&E (DT-I)			
Start	MAR 93	MAR 93	MAR 93
Complete	FEB 96	FEB 96	FEB 96
OT&E (OT-IA)			
Start	JAN 95	JAN 95	JAN 95
Complete	MAR 95	MAR 95	MAR 95
OT&E (OT-IB)			
Start	FEB 96	FEB 96	FEB 96
Complete	APR 96	APR 96	APR 96
Milestone II	JUN 96	JUN 96	JUN 96
Lead Ship Award	AUG 96	AUG 96	DEC 96
DT&E (DT-IIA)			
Start	SEP 96	SEP 96	JAN 97
Complete	AUG 98	AUG 98	DEC 98

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

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
DT&E (DT-IIB)				
Start	SEP 98	SEP 98	JAN 99	
Complete	JUN 02	JUN 02	SEP 02	
OT&E (OT-IC)				
Start	SEP 98	SEP 98	JAN 99	
Complete	MAR 99	MAR 99	JUL 99	
Lead Ship Delivery	JUN 02	JUN 02	NOV 02	(Ch-1)
DT&E (DT-IIC)				
Start	JUL 02	JUL 02	OCT 02	
Complete	JAN 04	JAN 04	MAR 04	
OT&E (IIA)				
Start	JUN 03	JUN 03	SEP 03	
Complete	SEP 03	SEP 03	DEC 03	
(C) LEAD SHIP IOC	(b)(1)			
OT&E (OT-IIIA)				
Milestone III	AUG 07	AUG 07	AUG 07	

b. Current Change Explanations --

(U) (Ch-1) Lead Ship Delivery changed from SEP 02 to NOV 02 due to the protest delay being adjudicated.

10. ~~(U)~~ Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Mobility	(b)(1)			
(S) Sustained Speed (Kts)				
(S) Endurance ((NM)(K) @ Kts)				
Amphibious Warfare Embarkation (NET)				
Troops	750	750 / 650	TBD	720
Vehicles (Sq Ft)(k)	25	25 / 22	TBD	25
Cargo (Cubic Feet)(k)	25	25 / 22	TBD	36
Bulk Fuel (Gals)(k)	325	325 / 250	TBD	325
LCAC	2	2 / 1(+1)	TBD	2
VTOL Land/Launch Spots (CH-46 or CH-53E or MV-22)	4/3/2	4/3/2 / 4/2/2	TBD	4/2/2
VTOL Maint/Storage (CH-46 or CH-53E or MV-22)	3/1/1	3/1/1 / 2/1/1	TBD	2/1/1
Ship To Shore Capability (LCAC)				

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10a. (U) Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Sustained Operations (reload 6 LCACs) (mins)	220	220 / 285	TBD	285
Operational Availability (Ao)	.90	.90 / .80	TRD	.80

b. Current Change Explanations --

~~U~~ NONE

11. ~~U~~ Total Program Cost and Quantity (Dollars in Millions):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E)	78.7	92.7	98.5
Procurement	8939.4	8925.9	8633.9
Sailaway	(8939.4)		(8633.9)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	9018.1	9018.6	8732.4
Escalation	1743.7	1745.2	1149.0
Development (RDT&E)	(-0.9)	(1.5)	(-0.1)
Procurement	(1744.6)	(1743.7)	(1149.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	10761.8	10763.8	9881.4
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	12	12	12
Total	12	12	12

(U) Milestone II approval was granted to produce the first three ships. An OIPT Program Review will be conducted prior to contract award of the FY 2000 contract.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

	UCR Baseline (MAY 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	9018.6	8732.4	
(2) Quantity	12	12	
(3) Unit Cost	751.550	727.700	-3.17
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	8925.9	8633.9	
(2) Quantity	12	12	
(3) Unit Cost	743.825	719.492	-3.27

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	77.8	10684.0	-	10761.8
Previous Changes:				
Economic	-0.5	-443.4	-	-443.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+23.5	-370.5	-	-347.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+23.0	-813.9	-	-790.9
Current Changes:				
Economic	-0.7	-80.3	-	-81.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.7	-6.8	-	-8.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-2.4	-87.1	-	-89.5
Total Changes	+20.6	-901.0	-	-880.4
Current Estimate	98.4	9783.0	-	9881.4

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

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	78.7	8939.4	-	9018.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+21.4	-289.6	-	-268.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+21.4	-289.6	-	-268.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.6	-15.9	-	-17.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1.6	-15.9	-	-17.5
Total Changes	+19.8	-305.5	-	-285.7
Current Estimate	98.5	8633.9	-	8732.4

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-0.7
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
Decrease in estimates to reflect revised inflation assumptions. (Estimating)	-1.9	-2.0
RDT&E Subtotal	-1.6	-2.4
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-80.3
Adjustment for Current and Prior Inflation. (Estimating)	+5.9	+6.3
Decrease in estimates to reflect revised inflation assumptions. (Estimating)	-21.8	-13.1
Procurement Subtotal	-15.9	-87.1

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14. ~~(S)~~ Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC	Changes								PAUC
Dev Est	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	Cur Est
896.82	-43.74	-0.01	--	--	-29.62	--	--	-73.37	823.45

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC	Changes								PUC
Dev Est	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	Cur Est
890.33	-43.64	--	--	--	-31.44	--	--	-75.08	815.25

c. ~~(U)~~ Schedule, Cost, and Quantity History

Item/Event	SAR	SAR	SAR	Current Estimate
	Planning Estimate (PE)	Development Estimate (DE)	Production Estimate (PdE)	
Milestone I	JAN 93	JAN 93	N/A	JAN 93
Milestone II	JUL 95	JUN 96	N/A	JUN 96
Milestone III	OCT 03	AUG 07	N/A	AUG 07
FUE/IOC	(b)(1)	(b)(1)	N/A	(b)(1)
Total Cost	59.1	10761.8	N/A	9881.4
Total Quantity	0	12	N/A	12
Prog Acq Unit Cost	0	896.82	N/A	823.45

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

a. Procurement --

(U) LPD 17:
 AVONDALE IND. INC., NEW ORLEANS LA
 N00024-97-C-2202, CPAF
 Award: December 17, 1996
 Definitized: December 17, 1996

Initial Contract Price		
Target	Ceiling	Qty
\$641.4	N/A	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$645.2	N/A	1	\$649.5	\$666.6

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-3.4	\$0.1
Cumulative Variances To Date (12/31/98)	<u>\$-31.7</u>	<u>\$-11.4</u>
Net Change	\$-28.3	\$-11.5

Explanation of Change:

(U) Cost and Schedule Variances

Although the program is only about fifteen percent into the first contract and production does not begin for almost a year, the continuing negative cost variance and the potential for rate increases above those proposed are areas that are being aggressively managed by the program manager and the full service contractor. The initial negative cost variance is well understood and is attributed to greater than estimated training and non recurring start up costs for integrated product and process teams, as well as earlier functionality of the integrated product data environment, that were necessary in implementing this highly innovative acquisition program. Control of production labor and engineering rates will be incentivized through the award fee structure of the contract.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY90-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-04)	<u>Total</u>
RDT&E	84.2	2.6	0.3	11.3	98.4
Procurement	1686.6	1520.5	1529.9	5046.0	9783.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1770.8	1523.1	1530.2	5057.3	9881.4

b. Annual Summary -- LPD 17 CLASS

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY96 Dollars Nonrec</u>	<u>Flyaway FY96 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990			0.6	0.6	0.5
1991			5.4	5.4	4.9
1992			1.3	1.3	1.2
1993			10.8	10.8	10.3
1994			28.7	28.7	28.0
1995			10.9	10.9	10.8

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996			9.1	9.1	9.2
1997			4.2	4.2	4.3
1998			13.3	13.3	13.7
1999			1.3	1.2	1.3
2000			2.5	2.5	2.6
2001			0.3	0.3	0.3
2002			0.9	0.9	1.0
2003			9.3	9.3	10.3
Subtotal			98.6	98.5	98.4

(U) Program funding shown in 16b does not include \$21.3 million of life of type non-acquisition development funds for in-service ship product improvements that is included in the LPD 17 program element budget.

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996	1		918.7	918.7	953.6
1997					
1998				90.0	96.1
1999	1		676.7	586.7	636.9
2000	2		1376.3	1376.3	1520.5
2001	2		1359.2	1359.2	1529.9
2002	2		1359.9	1359.9	1560.9
2003	2		1426.3	1426.3	1670.9
2004	2		1516.8	1516.8	1814.2
Subtotal	12		8633.9	8633.9	9783.0

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	12		8732.5	8732.4	9881.4

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17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 213.5

(U) Percent Total Program Expended: 2.2%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
The costs include all personnel, equipment, supplies, software and services including support associated with operating, modifying, maintaining, supplying, training and supporting the LPD 17 Program. The primary source of data was the Visibility and Management of Operating and Support Costs (VAMOSC) data base. LSD 41 VAMOSC data was adjusted for differences in: ship size, crew size, propulsion & fuel consumption, and weapons systems to develop LPD 17 estimates. (Cost estimate dated April 1996.) There is no antecedent system.

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element	AVG ANNUAL COST PER LPD CLASS HULL		
Mission Pay & Allowances	15.7		N/A
Unit Level Consumption	5.5		N/A
Intermediate Maintenance	0.3		N/A
Depot Maintenance	11.8		N/A
Contractor Support	N/A		N/A
Sustaining Support	2.9		N/A
Indirect Costs	1.5		N/A
Total	37.7		N/A

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A-12 CSSCS

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: CSSCS

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Combat Service Support Control System (CSSCS)

2. DoD Component: Army

3. Responsible Office and Telephone Number:

PM CSSCS

LTC PETER S. JANKER

ATTN: SFAE-C3S-STR-CSS

Assigned: August 1, 1997

6020 MEADE ROAD

DSN 656-5312 COMM 703-806-5312

FT BELVOIR, VA 22060-5259

jankerp@stcds2.army.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 63805 Project D2GT, D091

PROCUREMENT:

APPN 2035 ICN BS9706

APPN 2035 ICN W34600

5. References:

SAR Baseline (Production Estimate):

Army Acquisition Executive Memorandum, ASARC II, dated 26 December 1990, Subject: ASARC Acquisition Decision Memorandum (Combat Service Support Control System) and AAE Approved Acquisition Program Baseline dated 31 October 1991.

Approved Program:

SAE Approved Acquisition Program Baseline (APB) dated November 3, 1997.

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99-C-0776
(Revised)

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5. References:

SAR Baseline (Production Estimate):

Army Acquisition Executive Memorandum, ASARC II, dated 26 December 1990, Subject: ASARC Acquisition Decision Memorandum (Combat Service Support Control System) and AAE Approved Acquisition Program Baseline dated 31 October 1991.

Approved Program:

SAE Approved Acquisition Program Baseline (APB) dated November 3, 1997.

6. Mission and Description:

The Combat Service Support Control Systems (CSSCS) is an automated command and control (C2) system supporting the CSS component of the Army Battle Command System (ABCS), providing the Commander with critical logistical C2 capability for the Army's Force XXI. The CSSCS assists commanders and their staffs in the planning and execution of CSS and C2 operations by rapidly collecting, processing and distributing critical logistical, personnel, medical and transportation information. CSSCS also provides the capability to interface with all ABCS Battlefield Operating Systems (Fire Support, Air Defense, Maneuver Control and Intelligence-Electronic Warfare), and the CSS Standard Army Management Information Systems (STAMIS). The CSSCS provides CSS and C2 information to Commanders and their staffs, to include unit status, sustainment capability, supportability options, input to the "common picture", situational awareness, and support to joint and combined operations. The CSSCS is comprised of ABCS common hardware, Common Operating Environment (COE) Software and CSSCS-unique software. This hardware and software, housed in the Standard Integrated Command Post System (SICPS) family of shelters, will enable CSS commanders and staffs to receive, analyze, process, and disseminate essential and critical C2 information to more effectively manage resources to support the maneuver commander's scheme of operation. Version 3 (Block I) provides the initial automated CSS command and control capability to Corps and below users and is the recognized CSS enabler for Force XXI digitization. Version 4 (Block II) will enhance these capabilities at Corps and add additional functionality such as personnel, medical and transportation. Version 5 (Block III) will provide the objective CSSCS, further enhancing the functionality and implementing joint, allied, and coalition capabilities.

7. Executive Summary:

As 1998 began, PM CSSCS continued fielding activities in accordance with the Beyond Low Rate Initial Production (LRIP) authority granted in conjunction with the Apr 97 Milestone III (Production and Deployment) approval decision. During Jan, a total of 10 CSSCS systems were shipped to Ft. Carson, CO for fielding and training, and upgraded CSSCS systems were reissued to Ft. Hood, TX units. PM CSSCS also provided on-site support for the 4th Infantry Division (4ID) Division Support Command (DISCOM) movement to the National Training Center (NTC) and participation in NTC Exercise 98-05. In Feb 98, PM CSSCS received CG CECOM concurrence for Conditional Material Release (CMR) of 266 CSSCS systems to FORSCOM. With this CMR, PM CSSCS became the first Battlefield

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7. Executive Summary (Cont'd):

Functional Area (BFA) system to secure material release using CHS-2 equipment. During the week of 30 Mar 98, PM CSSCS successfully conducted an evaluation for the Director of Test and Evaluation, Office of the Secretary of Defense (DOT&E, OSD) at Fort Hood, TX. The test confirmed the database accuracy of 12 CSSCS devices established in a network with nodes from Brigade through Division to Corps, and was observed by the Test and Experimentation Command (TEXCOM), the Operational Test and Evaluation Command (OPTEC) and DOT&E contractors. During the month of Apr, PM CSSCS presented a briefing outlining CSSCS status and a demonstration of CSSCS functionality to LTG Coburn, the Deputy Chief of Staff Logistics, and MG Cannon, the ADCSLOG. LTG Coburn reiterated the importance of CSSCS as a key logistics enabler, and pledged his continuing support to the program. During the period 13-30 Apr 98 the CSSCS Forward Support Site provided support to the 64th Corps Support Group (CSG) during operation "Life Line", which was the third consecutive year that CSSCS was used by the CSG to conduct logistic operations in the field. On 27 Apr 98, the CSSCS Material Fielding Team completed First Digitized Division (FDD) fielding to 4ID at Fort Hood, TX. During May 98 PMO CSSCS began planning and preparation in earnest with III Corps G4 and 1st Cavalry Division (LCD) G4 concerning CSSCS support to the LCD Bosnia deployment. PM CSSCS supported the LCD deployment to Fort Polk, LA to conduct mobilization readiness training. During the week of 20 Jul 98 PM CSSCS conducted briefings and meetings with HQ US Army Europe (USAREUR) DCSLOG and the Commander, 21st Theater Army Area Command (TAACOM) concerning the LCD deployment. The effort in the LCD continued with operations to pack and prepare unit equipment (to include 15 CSSCS Systems) for shipment to Bosnia. CSSCS was successfully deployed to Bosnia with the LCD during the month of Sep 98. PM CSSCS representatives completed overseas processing/orientation at Fort Benning, GA on 13 Sep 98, and arrived in Bosnia on 15 Sep 98. CSSCS representatives continued assisting the LCD(Forward) in making CSSCS fully operational in Bosnia. On 20 Nov 98 DOT&E, OSD issued its CSSCS Operational Test and Evaluation Report to Congress. The release of the report removed all remaining Beyond LRIP limitations associated with the procurement and fielding of CSSCS. During the month of Dec 98, CSSCS actively participated in the III Corps Warfighter Exercise (WFX). The total number of CSSCS systems participating was 61, which was almost double the number played for the Division Army Warfighter Experiment (DAWE) last year. Also during this period, PM CSSCS continued support of CSSCS systems deployed to Bosnia with the 1st Brigade, LCD, and began to assist the LCD G-4 and the 2nd Brigade with the training, operational set-up and preparation for the 2nd Brigade's upcoming deployment to Bosnia. Additionally, PM CSSCS worked closely with representatives of the 46th Corps Support Group, XVIII Airborne Corps, Fort Bragg, NC on the deployment of CSSCS to support Central America humanitarian relief operations. The deployment of the main body began 15 Dec 98 from Pope Air Force Base, NC, and equipment for deployment was shipped from the port of Wilmington, NC. A total of four CSSCS systems supported this effort.

CSSCS is below 10 USC 2432 dollar thresholds, and has been removed from the Major Defense Acquisition Program (MDAP) list dated 18 Nov 98. Therefore, this will be the final SAR for CSSCS.

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8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

The CSSCS Operational Requirements Document (ORD) was revised in Apr 98, resulting in an increase of procurement quantities from 1,651 to 3,081 systems. The cost of these additional systems breaches the APB procurement threshold.

9. Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
ROC Approved	JUL 88	JUL 88	JUL 88
Solicitation Issued	JUN 90	JUN 90	JUN 90
ROC Revised	SEP 90	SEP 90	SEP 90
Milestone I/II (ASARC)	DEC 90	DEC 90	DEC 90
Dev Contract Award (V 3&4)	FEB 91	FEB 91	FEB 91
SDR Version 3	MAY 91	MAY 91	MAY 91
SRS Version 3	NOV 91	NOV 91	NOV 91
PDR Version 3	MAR 92	MAR 92	MAR 92
CDR Version 3	JUN 92	JUN 92	JUN 92
Begin Version 4 Prototyping	OCT 92	OCT 92	OCT 92
EUT&E Version 3			
Start	SEP 92	SEP 92	SEP 92
Complete	OCT 92	OCT 92	OCT 92
Tech Test Version 3			
Start	APR 93	APR 93	APR 93
Complete	JAN 94	JAN 94	JAN 94
Begin Version 4 Development	DEC 94	DEC 94	DEC 94
LUT Version 3			

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9a. Schedule (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Start	SEP 93	SEP 93	SEP 93
Complete	NOV 93	NOV 93	NOV 93
IOT&E Version 3			
Start	JUL 94	JUL 94	JUL 94
Complete	SEP 94	SEP 94	SEP 94
ASARC (LRIP)	APR 95	APR 95	APR 95
ASARC (MS III Full Production)	APR 97	APR 97	APR 97
OIPT Review	APR 97	APR 97	APR 97
Begin Version 3 Fielding	JUN 97	JUN 97	JUN 97
First Unit Equipped	OCT 97	OCT 97	DEC 97
IOC Version 3	JAN 98	JAN 98	MAR 98
SDR Version 4	DEC 95	DEC 95	DEC 95
PDR Version 4	JUN 96	JUN 96	JUN 96
CDR Version 4	JUN 96	JUN 96	JUN 96
IOT&E II Version 3			
Start	SEP 96	SEP 96	SEP 96
Complete	DEC 96	DEC 96	DEC 96
Begin Version 5 Development	OCT 98	OCT 98	OCT 98
Tech Test Version 4			
Start	APR 98	APR 98	APR 98
Complete	JUL 98	JUL 98	JUL 98
LUT Version 4			
Complete	NOV 98	NOV 98	NOV 98
PEO IPR - Version 4	SEP 98	SEP 98	SEP 98
Begin Fielding Version 4	OCT 98	OCT 98	OCT 98
PDR Version 5	JAN 99	JAN 99	JAN 99
CDR Version 5	JAN 99	JAN 99	JAN 99
Tech Test Version 5			
Start	APR 99	APR 99	APR 99
Complete	JUL 99	JUL 99	JUL 99
FOT&E Version 5			
Start	SEP 99	SEP 99	SEP 99
Complete	OCT 99	OCT 99	OCT 99
PEO IPR - Version 5	NOV 99	NOV 99	NOV 99
Begin Fielding Version 5	DEC 99	DEC 99	DEC 99
Start	SEP 98	SEP 98	
Start	N/A	N/A	APR 04 (Ch-1)

(ROC) Required Operational Concept
 (SDR) System Design Review
 (SRS) Software Requirements Specification
 (PDR) Preliminary Design Review
 (CDR) Critical Design Review
 (IOT&E) Initial Operational Test and Evaluation
 (EUT&E) Early User Test and Experimentation
 (FOT&E) Follow-on Operational Test and Evaluation
 (LUT) Limited User Test

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9a. Schedule (Cont'd):

(PEO-IPR) Program Executive Officer In-Progress Review

b. Current Change Explanations --

(Ch-1)-The CSSCS schedule has been adjusted to track two additional major milestones: First Digitized Division (FDD) IOC in Sep 00; and First Digitized Corps (FDC) IOC in Mar 04.

10. Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Operational Temp (degF)	0-+120	0-+120 / +40-+95	TBD	+40-+95
Relative Humidity (%)	10-80	10-80 / 10-80	TBD	10 - 80
Equipment Portability (no. person carry)	1	1 / 2	2	2
Mean Time Between Equipment Set-up/ Tear-down (hrs)	<=0.5	<=0.5 / <=0.5	<=0.5	<=.5
Mean Time Between Op Msn Failure (hrs)				
ACCS Hardware	220	220 / 220	TBD	220
ACCS CHS & CSSCS Software (HW&SW)	140	140 / 140	TBD	140
Automatic Msg Handling				
User Responsiveness				
Disp 24 Lines (sec)	0.7	0.7 / 5.0	.1	.1
Scroll (lines/sec)	28	28 / 20	21.6	21.6
Error Feedback (sec)	0.7	0.7 / 1.0	1.0	1.0
User Help Req (sec)	2.1	2.1 / 3.0	3.0	3.0
Auto-message handling				
Speed-in (sec)	7/500	7/500 / 10/500	6.5	6.5
Speed-out (sec)	7/1000	7/1000 / 10/1000	46 sec	46 sec
Msg Trans and Receipt				
24 hr USMTF Trans	477	477 / 334	334	334
24 hr Receipt & Process				
(million char)	9.86	9.86 / 6.9	8.4	8.4
(STAMIS msgs)	6286	6286 / 4400	5350	5350
Capable of Update (every x hrs)	2	2 / 3	2.4	2.4
Process All Info Rec (within x hrs)	2	2 / 3	.9	.9
On-Line Query Resp Time (sec/min)	5/7	5/7 / 2/3	1.6	1.6

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10a. Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Local Data File	5/7	5/7 / 5/15	6.3	6.3
Update Response Time (sec/min)				

b. Current Change Explanations -- None

11. Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	179.7	179.7	189.7
Procurement	129.6	129.6	186.9
Flyaway	(122.4)		(179.7)
Other Wpn System Costs	(2.3)		(2.3)
Peculiar Support	(0.0)		
Initial Spares	(4.9)		(4.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 97 Base-Year \$	309.3	309.3	376.6
Escalation	15.9	15.9	18.5
Development (RDT&E)	(-2.5)	(-2.5)	(-4.1)
Procurement	(18.4)	(18.4)	(22.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	325.2	325.2	395.1

The unit of measure for CSSCS is the number of systems, High Capacity Computer Units (HCU).

b. Quantity --

Development (RDT&E)	115	115	115
Procurement	1651	1651	3081
Total	1766	1766	3196

The Army Acquisition Executive (AAE) authorized PM CSSCS to enter into Low Rate Initial Production (LRIP) by an Acquisition Decision Memorandum (ADM) dated 27 March 1995. Approval was provided to the PM to procure CSSCS systems within the 10% statutory limit (165 systems). This amount was increased by the AAE in a revised ADM dated 1 December 1997, in which an additional 70 systems (total of 235) were authorized to support testing requirements of the Director, Defense Operational Test and Evaluation (DOT&E).

c. Foreign Military Sales -- None.

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11d. Total Program Cost and Quantity (Cont'd):

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (NOV 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 97 BY\$)	309.3	376.6	
(2) Quantity	1766	3196	
(3) Unit Cost	0.175	0.118	-32.57
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 97 BY\$)	129.6	186.9	
(2) Quantity	1651	3081	
(3) Unit Cost	0.078	0.061	-21.79

13. Cost Variance Analysis:

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

	RD&E	PROC	MILCON	TOTAL
Production Estimate	177.2	148.0	-	325.2
Previous Changes:				
Economic	1.2	-3.8	-	-5.0
Quantity	-	-	-	-
Schedule	-	-0.5	-	-0.5
Engineering	-	-	-	-
Estimating	+1.4	+6.7	-	+8.1
Other	-	-	-	-
Support	-	-3.2	-	-3.2
Subtotal	+0.2	-0.8	-	-0.6
Current Changes:				
Economic	-1.0	+2.0	-	+1.0
Quantity	-	+39.5	-	+39.5
Schedule	-	-8.2	-	-8.2
Engineering	+9.1	-	-	+9.1
Estimating	+0.1	+29.0	-	+29.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+8.2	+62.3	-	+70.5
Total Changes	+8.4	+61.5	-	+69.9
Current Estimate	185.6	209.5	-	395.1

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

Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	179.7	129.6	-	309.3
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.3	+4.0	-	+5.3
Other	-	-	-	-
Support	-	-0.2	-	-0.2
Subtotal	+1.3	+3.8	-	+5.1
Current Changes:				
Quantity	-	+32.6	-	+32.6
Schedule	-	-	-	-
Engineering	+8.6	-	-	+8.6
Estimating	+0.1	+20.7	-	+20.8
Other	-	-	-	-
Support	-	+0.2	-	+0.2
Subtotal	+8.7	+53.5	-	+62.2
Total Changes	+10.0	+57.3	-	+67.3
Current Estimate	189.7	186.9	-	376.6

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-1.0
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
Additional software requirements to support digitization. (Engineering)	+8.6	+9.1
Revised software development costs to reflect actuals. (Estimating)	-0.2	-0.2
RDT&E Subtotal	+8.7	+8.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-2.8
Economic adjustment for negative program change. (Economic)	N/A	+4.8
Total Quantity Variance associated with increase of 1430 units from 1651 to 3081.		
Quantity increase of 1430 units. (Quantity)	+32.6	+39.5
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	0.0	-5.7
Allocation to Estimating variance resulting from quantity change. (Estimating)	+20.4	+28.7

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

b. Current Change Explanations --

		(Dollars in Millions)	
		Base-Year	Then-Year
Acceleration of annual procurement buy profile. (Schedule)		0.0	-2.5
Adjustment for Current and Prior Inflation. (Estimating)		+0.3	+0.3
Adjustment of program estimate based on actual data on support costs incurred. (Support)		+0.2	0.0
Procurement Subtotal		+53.5	+62.3

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.18	--	-0.07	--	--	+0.01	--	--	-0.06	0.12

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.09	--	-0.03	--	--	+0.01	--	--	-0.02	0.07

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	DEC 90	DEC 90	DEC 90
Milestone II	N/A	DEC 90	DEC 90	DEC 90
Milestone III	N/A	MAR 97	APR 97	MAR 97
FUE/IOC	N/A	JUN 97	N/A	DEC 97
Total Cost	N/A	290.7	325.2	324.6
Total Quantity	N/A	1115	1766	1766
Prog Acq Unit Cost	N/A	0.26	0.18	0.18

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14b. Unit Cost and Other History (Cont'd):

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.09	--	-0.03	--	--	+0.01	--	--	-0.02	0.07

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	DEC 90	DEC 90	DEC 90
Milestone II	N/A	DEC 90	DEC 90	DEC 90
Milestone III	N/A	MAR 97	APR 97	MAR 97
FUE/IOC	N/A	JUN 97	N/A	DEC 97
Total Cost	N/A	290.7	325.2	324.6
Total Quantity	N/A	1115	1766	1766
Prog Acq Unit Cost	N/A	0.26	0.18	0.18

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

There are no major contracts being reported. This contract was completed as of 30 April 1996.

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

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

<u>Appropriation</u>	<u>Prior Years (FY87-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	142.0	11.1	8.8	23.7	185.6
Procurement	34.0	20.1	18.3	137.1	209.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	176.0	31.2	27.1	160.8	395.1

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

b. Annual Summary -- CSSCS

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				2.5	1.9
1988				4.0	3.2
1989				5.7	4.8
1990				5.1	4.4
1991				10.1	9.1
1992				23.5	21.6
1993				19.4	18.3
1994				21.5	20.6
1995				18.4	18.0
1996				11.9	11.8
1997				10.5	10.6
1998				5.3	5.4
1999				12.0	12.3
2000				10.6	11.1
2001				8.3	8.8
2002				3.4	3.7
2003				3.5	3.8
2004				3.6	4.0
2005				3.5	4.0
2006				3.5	4.1
2007				3.4	4.1
Subtotal	115			189.7	185.6

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995	73		6.0	6.0	6.0
1996	38		4.5	5.0	5.0
1997	54		5.7	6.5	6.6
1998	56		6.4	6.7	6.9
1999	105		9.0	9.1	9.5
2000	270		18.9	19.1	20.1
2001	320		16.9	17.1	18.3
2002	217		14.2	14.4	15.7
2003	388		22.9	23.1	25.6
2004	217		12.3	12.4	14.1
2005	228		15.9	15.9	18.4
2006	220		11.1	12.2	14.4
2007	235		10.3	11.3	13.6

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

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2008	230		9.4	10.4	12.8
2009	220		8.7	9.5	12.0
2010	210		7.5	8.2	10.5
Subtotal	3081		179.7	186.9	209.5

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	3196		179.7	376.6	395.1

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	115	115
Procurement	165	221

Percent Total Program Quantities Delivered: 10.5%

b. Total Expenditures To Date (In Millions of Dollars): \$ 130.4

Percent Total Program Expended: 33.0%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The concept of operation is for CSSCS to be fielded in both active and reserve units. The total manhours of operation per year for active duty units per device is 4745 hours during wartime, 2372.5 hours during peacetime, and 234 hours for reserve units. There are no new personnel costs involved, as CSSCS will be operated by personnel currently assigned to those organizations receiving these devices. The present maintenance concept for the CHS hardware is contractor logistics support for the operational life of the equipment, not to exceed ten years. Contractor will establish Regional Support Centers (RSC), which will provide all repairs above the unit level. Unit level maintenance consists of preventive maintenance, replacement of Line Replaceable Units (LRU), and replacement of expendable items (cables, batteries, fuses, and filters). Internal repair of LRUs requiring removal of covers will not be performed by U.S. Army personnel. Units will exchange unserviceable LRUs for serviceable LRUs through assigned Intermediate Direct Support (IDS) facilities. The IDS will perform fault verification and ship unserviceable LRUs to the nearest RSC for repair. There is no antecedent

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

equipment for the CSSCS. It will replace current manual and non-standard automated processes. PM CSSCS will not be provided funding for O&S costs. All O&S costs will be funded at the unit level after delivery.

The Average Annual Cost is for the entire CSSCS system and is based on sustainment from FY 97-28. Source: Army Cost Position, March 1997.

b. Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per CSSCS System	Avg Annual Cost Per Antecedent System
Mission Pay & Allowances	1.2	N/A
Unit Level Consumption	0.5	0.0
Intermediate Maintenance	N/A	0.0
Depot Maintenance	3.0	0.0
Contractor Support	N/A	0.0
Sustaining Support	1.2	0.0
Indirect Costs	0.5	N/A
Total	6.4	0.0

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A-5 ATACMS-BAT

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: ATACMS/BAT

AS OF DATE: December 31, 1998

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ATACMS/BAT

1. (U) Designation and Nomenclature (Popular Name): ATACMS/BAT

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:

Project Manager	COL R. Kelley Griswold
Army TACMS-BAT Project Office	Assigned: September 2, 1998
ATTN: SFAE-MSL-AB	DSN 746-1141; COMM 256-876-1141
Redstone Arsenal, AL 35898-5650	Kelley.Griswold@msl.redstone.army.mil

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

RDT&E:

- (U) PE 20302A (Shared) Project D685 (Shared), D686 (Shared)
- (U) PE 63754A Project D600
- (U) PE 64754A (Shared) Project D636
- (U) PE 64768A Project D2NT, D641, D686, D687, D688

PROCUREMENT:

- (U) APPN 2032 ICN CA6100 (Army)
- (U) APPN 2032 ICN CA6105 (Army)
- (U) APPN 2032 ICN CA6110 (Army)
- (U) APPN 2032 ICN CA025A (Army)

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5. (U) References:

BAT/BAT P3I

SAR Baseline (Development Estimate):

(U) Acquisition Decision Memorandum (ADM), dated May 15, 1991, approval to enter Engineering and Manufacturing Development (EMD).

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated February 22, 1999.

ATACMS BLK II/IIA

SAR Baseline (Development Estimate):

(U) AAE Acquisition Decision Memorandum (ADM) dated May 15, 1995.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated February 22, 1999.

6. (U) Mission and Description:

(U) The ATACMS Block II/BAT system supports the Army's deep fires doctrine, which calls for the delay, destruction and/or disruption of threat forces at ranges in excess of 100 kilometers. The BAT is a top attack submunition with acoustic and infrared (IR) seekers working in tandem for autonomous attack of moving armor. The Preplanned Product Improvement (P3I) BAT adds cold, stationary armor, heavy multiple rocket launchers, and surface to surface missile transporter erector launchers to the target set through seeker and warhead improvements. BAT and P3I BAT submunitions are carried deep into enemy territory by variants of the ATACMS missile, then dispensed to attack and destroy targets. Being a certified round, both the missile and submunition have a low sustainment cost. The ATACMS Block II missile system, a version of the currently fielded and combat-proven ATACMS Block I missile, will carry 13 BAT or P3I BAT submunitions. The ATACMS Block IIA missile system, an extended range version of the Block II missile, will carry 6 P3I BAT submunitions to a range of 300 kilometers. The ATACMS Block II and BAT Programs do not replace another system.

7. (U) Executive Summary:

(U) The BAT program was established in 1984 as a special access program and progressed through proof of principle to a successful Milestone II decision in May 1991. The Tri-Service Standoff Attack Missile (TSSAM) was designated as the first delivery vehicle for the BAT submunition, but upon termination of Army's participation in the TSSAM program, ATACMS Block II was designated as the carrier in December 1993. The P3I BAT received approval to continue Program Definition and Risk Reduction (PDORR) with ATACMS Block IIA as the carrier in February 1993. The ATACMS Block II Continued Development Program was approved in May 1995.

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7. (U) Executive Summary (Cont'd):

The ATACMS Block II/BAT program received approval for system-level entry into Low Rate Initial Production (LRIP), 22 Feb 99. The approved acquisition strategy provides for a single prime contractor with a directed subcontractor for the BAT submunition. The LRIP contract award is expected within the next couple of months.

The ATACMS Block II/BAT program is progressing on schedule. Pre-Production Testing (PPT) and Production Qualification Testing (PQT) were successfully completed in April 1998 and December 1998, respectively. Operational testing is scheduled to begin in July 2000.

The P3I BAT program has been restructured. In July 1998, the Electronic Sensors and Systems Division (ESSD) of Northrop Grumman Corporation was selected to continue development of the advanced dual mode seeker for P3I BAT. This selection was made after three-and-one-half years of competition between ESSD and Alliant TechSystems.

The ATACMS Block IIA program has been restructured due to lack of FY 00 funding. The Engineering and Manufacturing Development (EMD) phase is scheduled to begin in FY 01.

8. (U) Threshold Breaches:

BAT/BAT P3I

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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8. (U) Threshold Breaches (Cont'd):

ATACMS BLK II/IIA

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

BAT/BAT P3I

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
BAT			
Milestone 0	JUN 84	JUN 84	JUN 84
Milestone I	FEB 85	FEB 85	FEB 85
Milestone II	MAY 91	MAY 91	MAY 91
Preliminary Design Review	MAY 91	MAY 91	MAY 91
EMD/FSD Contract Award	JUN 91	JUN 91	JUN 91
Critical Design Review Complete	MAR 92	MAY 92	MAY 92
Prototype Production			
Start	DEC 92	N/A	APR 93
Complete	SEP 94	N/A	SEP 95
Design Verification Test			
Start	JAN 93	MAY 93	JUN 93 (Ch-1)
Complete	NOV 93	OCT 95	APR 96
First Prototype Unit Delivery	OCT 93	OCT 94	OCT 94
Contractor Development Test			
Start	NOV 93	FEB 96	JUL 96 (Ch-1)
Complete	SEP 94	DEC 97	JAN 98
Long Lead Program Review	DEC 93	N/A	N/A
Long Lead Contract Award for LRIP	JAN 94	N/A	N/A
BAT/ATACMS BL II LRIP ASARC	N/A	JAN 99	JAN 99 (Ch-1)

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

BAT/BAT P3I

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
BAT/ATACMS BL II LRIP DAB	N/A	FEB 99	FEB 99	(Ch-1)
LRIP Program Review (DAB)	NOV 94	N/A	N/A	
EMD/LRIP I Contract Award	NOV 94	N/A	N/A	(Ch-2)
LRIP First Unit Delivery	N/A	N/A	N/A	(Ch-2)
Long Lead Contract Award for Production	N/A	N/A	N/A	(Ch-2)
Milestone III	DEC 96	N/A	N/A	(Ch-2)
Production Contract Award	JAN 97	N/A	N/A	(Ch-2)
Submunition Readiness Date (IOC)	DEC 95	N/A	N/A	(Ch-2)
First Production Unit Delivery	JAN 98	N/A	N/A	(Ch-2)
BAT P3I				
P3I Phase I Study Award	N/A	OCT 93	OCT 93	
P3I Continued Development Contract Award	N/A	MAY 99	MAY 99	(Ch-3)
Block II/P3I Production Cut-In Decision (less MRL/TEL capability)	N/A	JUN 02	JUN 02	(Ch-3)
Block II/P3I Production Cut-In	N/A	NOV 02	NOV 02	(Ch-3)
Block IIA/P3I Production Cut-In (with MRL/TEL capability)	N/A	NOV 04	NOV 04	(Ch-3)
Milestone II	N/A	N/A	N/A	(Ch-4)
P3I EMD Contract Award	N/A	N/A	N/A	(Ch-4)
LRIP IPR	N/A	N/A	N/A	(Ch-4)
Milestone III	N/A	N/A	N/A	(Ch-4)

b. Current Change Explanations --

(U) (Ch-1) - These milestones have been changed to reflect actual dates:

<u>MILESTONE</u>	<u>FROM</u>	<u>TO</u>
Design Verification Test Start	May 93	Jun 93
Contractor Development Test Start	May 96	Jul 96
BAT/ATACMS BL II LRIP ASARC	Aug 98	Jan 99
BAT/ATACMS BL II LRIP DAB	Dec 98	Feb 99

(Ch-2) - These milestones are no longer applicable as they will be tracked by the ATACMS Block II/IIA program:

<u>MILESTONE</u>	<u>FROM</u>	<u>TO</u>
EMD/LRIP I Contract Award	Dec 98	N/A
LRIP First Unit Delivery	Jun 00	N/A
Long Lead Contract Award for Production	Nov 00	N/A
Milestone III	May 01	N/A
Production Contract Award	May 01	N/A

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

BAT/BAT P3I

Submunition Readiness		
Date (IOC)	Sep 01	N/A
First Production Unit		
Delivery	Sep 02	N/A

(Ch-3) - These milestones have been added to reflect the restructured P3I BAT program.

<u>MILESTONE</u>	<u>FROM</u>	<u>TO</u>
P3I Continued Development		
Contract Award	N/A	May 99
Block II/P3I Production		
Cut-In Decision (less		
MRL/TEL capability)	N/A	Jun 02
Block II/P3I Production		
Cut-In	N/A	Nov 02
Block IIA/P3I Production		
Cut-In (with MRL/TEL		
capability)	N/A	Nov 04

(Ch-4) - These milestones are no longer applicable to the P3I BAT restructured program.

<u>MILESTONE</u>	<u>FROM</u>	<u>TO</u>
Milestone II	Oct 98	N/A
P3I EMD Contract Award	Nov 98	N/A
LRIP IPR	Apr 01	N/A
Milestone III	Jun 02	N/A

ATACMS BLK II/IIA

a. Milestones --

	<u>Development</u>	<u>Approved</u>	<u>Current</u>
	<u>Estimate (SAR)</u>	<u>Program (APB)</u>	<u>Estimate</u>
BLOCK II ATACMS			
DA IPR	MAR 95	MAY 95	MAY 95
Continued Development Contract Award	MAY 95	JUN 95	JUL 95
Preliminary Design Review	MAY 96	OCT 96	OCT 96
Hardware Critical Design Review	FEB 97	MAR 97	APR 97
Software Critical Design Review	MAY 97	JUN 97	APR 97
Pre-production (PPT)			
Start	MAY 97	NOV 97	NOV 97
Complete	NOV 97	MAR 98	APR 98
EMD OT Option Award	JAN 98	MAR 98	MAR 98

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9a. (U) Schedule (Cont'd):
ATACMS BLK II/IIA

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
Production Qualification Tests (PQT)				
Start	DEC 97	JUN 98	AUG 98	(Ch-1)
Complete	JUL 98	JAN 99	DEC 98	(Ch-1)
PEO LRIP Decision	DEC 98	N/A	N/A	
Block II/BAT LRIP ASARC	N/A	JAN 99	JAN 99	(Ch-1)
Block II/BAT LRIP DAB	N/A	FEB 99	FEB 99	(Ch-1)
LRIP Contract Award	JAN 99	FEB 99	MAR 99	(Ch-2)
Combined DT/OT Test				
Start	JUL 98	APR 99	FEB 99	
Complete	DEC 98	JUN 99	APR 99	
Operational Tests (OT)				
Start	DEC 99	JUL 00	JUL 00	
Complete	MAR 00	DEC 00	DEC 00	
Long Lead Contract Award for Production	N/A	NOV 00	NOV 00	
LRIP First Delivery	JUN 00	DEC 00	DEC 00	
Organic Support Capability	SEP 00	MAR 01	MAR 01	(Ch-2)
Service Depot Support	SEP 00	MAR 01	MAR 01	(Ch-2)
MS III	SEP 00	MAY 01	MAY 01	
First Full Rate Production Contract Award	JAN 01	MAY 01	MAY 01	
IOC	SEP 00	SEP 01	SEP 01	
First Full Rate System Delivery	N/A	SEP 02	SEP 02	(Ch-3)
BLOCK IIA ATACMS				
Milestone IV P3I Review	MAR 98	N/A	N/A	
Milestone II P3I Review	N/A	N/A	N/A	(Ch-4)
Block IIA Milestone II Review	N/A	NOV 00	NOV 00	(Ch-4)
EMD Contract Award	APR 98	JAN 01	JAN 01	(Ch-4)
LRIP Decision	N/A	OCT 04	OCT 04	(Ch-5)
LRIP Contract Award	JAN 02	NOV 04	NOV 04	(Ch-4)
MS III	FEB 02	DEC 05	DEC 05	(Ch-4)
Production Contract Award	N/A	JAN 06	JAN 06	(Ch-5)
LRIP First Delivery	N/A	SEP 06	SEP 06	(Ch-5)
Service Depot Support	DEC 03	MAR 07	MAR 07	(Ch-4)
Organic Support Capability	DEC 03	MAR 07	MAR 07	(Ch-4)
First Full Rate System Delivery	N/A	SEP 07	SEP 07	(Ch-5)
IOC	MAY 03	SEP 07	SEP 07	(Ch-4)

b. Current Change Explanations --

(U) (Ch-1) - These milestones were changed to reflect actual dates:

MILESTONE	FROM	TO
Production Qualification Test		
Start	Apr 98	Aug 98
Complete	Nov 98	Dec 98
Block II/BAT LRIP ASARC	Aug 98	Jan 99

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9b. (U) Schedule (Cont'd):
ATACMS BLK II/IIA

Block II/BAT LRIP DAB Dec 98 Feb 99

(Ch-2) - These milestones were changed to reflect current estimate:

<u>MILESTONE</u>	<u>FROM</u>	<u>TO</u>
LRIP Contract Award	Jan 99	Mar 99
Organic Support Capability	Sep 01	Mar 01
Service Depot Support	Sep 01	Mar 01

(Ch-3) - The milestone "First Full Rate System Delivery" was added.

(Ch-4) - These milestones have been revised to reflect the restructured Block IIA program. Also, to clarify name, "Milestone II P3I Review" was deleted and "Block IIA Milestone II Review" was added (Block IIA formerly called P3I).

<u>MILESTONE</u>	<u>FROM</u>	<u>TO</u>
Milestone II P3I Review	Mar 99	N/A
Block IIA Milestone II Review	N/A	Nov 00
EMD Contract Award	Apr 99	Jan 01
LRIP Contract Award	Nov 02	Nov 04
Milestone III	Dec 03	Dec 05
Organic Support Capability	Oct 04	Mar 07
Service Depot Support	Oct 04	Mar 07
IOC	Mar 04	Sep 07

(Ch-5) - These milestones have been added to reflect the restructured Block IIA program.

<u>MILESTONE</u>	<u>FROM</u>	<u>TO</u>
LRIP Decision	N/A	Oct 04
Production Contract Award	N/A	Jan 06
LRIP First Delivery	N/A	Sep 06
First Full Rate System Delivery	N/A	Sep 07

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10. (U) Performance Characteristics:

BAT/BAT P3I

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
BAT				
Weight (lbs)	44	44 / 44	42.90	44
Length (stowed) (ins)	36	36 / 36	36	36
Diameter (stowed) (ins)	5.5	5.5 / 5.5	5.5	5.5
Reliability (Operational)	.90	.90 / .86	.75	.90
Useful Life (yrs)	20	20 / 10	TBD	20
Lethality				
Rolled Homogene- ous Armor (mm RHA)	N/A	N/A / N/A	N/A	N/A
Rolled Homogene- ous Armor (RHA) Penetration (Incl residual) (mm)	(b)(1)			
Range Targets				
Residual Penetra- tion (mm)				
Residual Penetra- tion Behind Range Targets (mm)				
Additional Pene- tration (mm)				
Kills/Launcher Load Large Cruise ATACMS				
BAT PRE-PLANNED PRODUCT IMPROVEMENT				
Weight (lbs)	N/A	44 / 44	TBD	44
Length (stowed) (ins)	N/A	36 / 36	TBD	36
Diameter (stowed) (ins)	N/A	5.5 / 5.5	TBD	5.5
Reliability (Oper- ational)	N/A	.90 / .86	TBD	.90
Useful Life (yrs)	N/A	20 / 10	TBD	20
Kills/launcher Load				

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10a. (U) Performance Characteristics (Cont'd):
BAT/BAT P3I

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate	AS AMENDED
ATACMS Block II	N/A	(b)(1)			
Kills/Missile Load					
ATACMS Block IIA (Armor)	N/A				
ATACMS Block IIA (TEL/MRL)	N/A				

(U) TBDs in Demonstrated Performance signify test data is not available.

b. Current Change Explanations -- None

ATACMS BLK II/IIA

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate	
BLOCK II ATACMS	(b)(1)				
Kills/launcher					
Load					
Maximum Range (km)	200	200 / >145	145	160	
Minimum Range (km)	25	25 / 35	41	32	
Payload (No. BAT/BAT P3I Submunitions)	13	13 / 12	13	13	
Accuracy	(b)(1)				
w/ GPS (meters at all ranges)					Ch-1)
Meters from min range to 107 km					Ch-1)
w/o GPS (meters from min range to 107 km)					Ch-1)
Mils at ranges beyond 107 km					
Off-Axis Launch (+/-deg)					
Reliability (Missile inflight including dispense)	.91	.91 / .91	.95	.91	
System Availability (prelaunch)	.75	.75 / .75	TBD	.75	
BLOCK IIA ATACMS					
Kills/Launcher Load	N/A	N/A / N/A	TBD	N/A	

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10a. (U) Performance Characteristics (Cont'd):

ATACMS BLK II/IIA

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Maximum Range (km)	500	500 / 300	TBD	300
Minimum Range (km)	70	70 / <130	TBD	70
Payload (No. BAT P3I Submunitions)	6	6 P3I / 6 P3I BAT / BAT	TBD	6
Accuracy	(b)(1)			
w/GPS (meters at all ranges)				
Meters from min range to 107 km				
w/o GPS (meters min range to 107 km)				
Mils at ranges beyond 107 km				
Off-Axis Launch (+/- deg)				
Reliability (Missile Inflight)	.91	.91 / .91	TBD	.91
System Availability (prelaunch)	.75	.75 / .75	TBD	.75

(U) TBDs in Demonstrated Performance signify test data is not available.

b. Current Change Explanations --

(U) (Ch-1) - ATACMS Block II/IIA numerical requirements for Accuracy were reinstated during the JROC process as CEPs, even though as defined, they are not appropriate for a Block II/IIA system. The project's technical interpretation of Block II/IIA dispense of submunitions over the target area, though reflecting CEP in the ORD, is measured as SEP.

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11. (U) Total Program Cost and Quantity (Dollars in Millions):

BAT/BAT P3I

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	702.1	1323.6	1323.6
Procurement	1569.9	1693.6	1693.6
Recurring Flyaway	(1553.6)		(1637.4)
Non-Recurring	(0.0)		(48.5)
Total Flyaway	(1553.6)		(1685.9)
Other Weapon Systems	(16.3)		(7.7)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 91 Base-Year \$	2272.0	3017.2	3017.2
Escalation	714.6	678.0	678.0
Development (RDT&E)	(29.5)	(115.2)	(115.2)
Procurement	(685.1)	(562.8)	(562.8)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2986.6	3695.2	3695.2
b. (U) Quantity --			
Development (RDT&E)	0	88	88
Procurement	30993	19554	19554
Total	30993	19642	19642

(U) BAT/BAT P3I unit of measure is a submunition.

The BAT Milestone II decision (Acquisition Decision Memo, 15 May 91) provided for an LRIP quantity of 3650 submunitions which exceeded the 10% guideline established in 10 U.S.C. 2400 (FASTA). However, the current LRIP quantity has changed from 1470 to 1266 which does not exceed the 10% guideline.

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
None.

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ATACMS/BAT, December 31, 1998

11a. (U) Total Program Cost and Quantity (Cont'd):

ATACMS BLK II/IIA

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	385.4	440.2	440.2
Procurement	1210.3	1497.0	1497.0
Recurring Flyaway	(1092.3)		(1464.4)
Nonrecurring Flyaway	(89.6)		(13.2)
Total Flyaway	(1181.9)		(1477.6)
Other Weapon System	(22.0)		(13.9)
Peculiar Support	(3.6)		(1.4)
Initial Spares	(2.8)		(4.1)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 91 Base-Year \$	1595.7	1937.2	1937.2
Escalation	705.4	620.2	620.2
Development (RDT&E)	(103.1)	(86.8)	(86.8)
Procurement	(602.3)	(533.4)	(533.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2301.1	2557.4	2557.4
b. (U) Quantity --			
Development (RDT&E)	0	6	6
Procurement	1806	1806	1806
Total	1806	1812	1812

(U) ATACMS Block II/IIA unit of measure is a missile.

The six RDT&E ATACMS Block II units were inadvertently omitted from previous SARS; however, these units were included in the original cost estimate.

The ATACMS Block II Continued Development decision (Acquisition Decision Memo, 15 May 95) provided for an LRIP I and LRIP II quantity of 150 which exceeded the 10% guideline established in 10 U.S.C. 2400 (FASTA). However, the current LRIP quantity has changed from 150 to 91 which does not exceed the 10% guideline.

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
None.

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12. (U) Unit Cost Summary:

BAT/BAT P3I

	UCR Baseline (Feb 99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 91 BY\$)	3017.2	3017.2	
(2) Quantity	19642	19642	
(3) Unit Cost	0.154	0.154	0.00
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 91 BY\$)	1693.6	1693.6	
(2) Quantity	19554	19554	
(3) Unit Cost	0.087	0.087	0.00

ATACMS BLK II/IIA

	UCR Baseline (FEB 99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 91 BY\$)	1937.2	1937.2	
(2) Quantity	1812	1812	
(3) Unit Cost	1.069	1.069	0.00
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 91 BY\$)	1497.0	1497.0	
(2) Quantity	1806	1806	
(3) Unit Cost	0.829	0.829	0.00

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ATACMS/BAT, December 31, 1998

13. (U) Cost Variance Analysis:

BAT/BAT P3I

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	731.6	2255.0	-	2986.6
Previous Changes:				
Economic	-37.4	-258.1	-	-295.5
Quantity	-	-712.7	-	-712.7
Schedule	+45.7	+194.0	-	+239.7
Engineering	+280.4	+59.7	-	+340.1
Estimating	+340.1	+333.2	-	+673.3
Other	-	-	-	-
Support	-	-6.8	-	-6.8
Subtotal	+628.8	-390.7	-	+238.1
Current Changes:				
Economic	-6.5	-38.4	-	-44.9
Quantity	-0.8	-10.1	-	-10.9
Schedule	-	+58.0	-	+58.0
Engineering	-	-0.3	-	-0.3
Estimating	+85.7	+385.3	-	+471.0
Other	-	-	-	-
Support	-	-2.4	-	-2.4
Subtotal	+78.4	+392.1	-	+470.5
Total Changes	+707.2	+1.4	-	+708.6
Current Estimate	1438.8	2256.4	-	3695.2

(U) Summary (FY 1991 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	702.1	1569.9	-	2272.0
Previous Changes:				
Quantity	-	-424.9	-	-424.9
Schedule	+33.5	-1.1	-	+32.4
Engineering	+237.3	+39.0	-	+276.3
Estimating	+281.1	+239.3	-	+520.4
Other	-	-	-	-
Support	-	-6.2	-	-6.2
Subtotal	+551.9	-153.9	-	+398.0
Current Changes:				
Quantity	-0.7	-5.7	-	-6.4
Schedule	-	-3.0	-	-3.0
Engineering	-	+0.1	-	+0.1
Estimating	+70.3	+288.6	-	+358.9
Other	-	-	-	-
Support	-	-2.4	-	-2.4
Subtotal	+69.6	+277.6	-	+347.2
Total Changes	+621.5	+123.7	-	+745.2
Current Estimate	1323.6	1693.6	-	3017.2

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

BAT/BAT P3I

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-6.5
Adjustment for Current and Prior Inflation. (Estimating)	+3.2	+3.7
Quantity decrease of 12 units from 100 to 88. (Quantity)	-0.7	-0.8
Increase due to BAT contract cost growth. (Estimating)	+7.0	+8.2
Increase due to restructure of BAT P3I program. (Estimating)	+60.1	+73.8
RDT&E Subtotal	+69.6	+78.4
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-40.6
Economic adjustment for negative program change. (Economic)	N/A	+2.2
Adjustment for Current and Prior Inflation. (Estimating)	+1.3	+1.5
Total Quantity Variance associated with decrease of 146 units.	-7.9	-13.1
Quantity decrease of 146 units from 19700 to 19554. (Quantity)	-5.7	-10.1
Allocation to Engineering variance resulting from Quantity Change. (Engineering)	+0.1	-0.3
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	+0.7	-1.7
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	-3.0	-1.0
Stretchout of annual procurement buy profile by 4 years. (Schedule)	0.0	+59.0
Change in cost estimate for data, training, and transportation. (Support)	-2.4	-2.4
Change in learning curve assumptions due to rephasing of annual buy. (Estimating)	+21.1	+27.4
Refinement of program estimate to reflect BAT hardware updates. (Estimating)	+83.7	+105.4
Refinement of program estimate to reflect P3I BAT hardware updates. (Estimating)	+118.5	+158.7
Refinement of estimate due to BAT/P3I BAT program restructure. (Estimating)	+63.3	+94.0
Procurement Subtotal	+277.6	+392.1

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

BAT/BAT P3I

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

ATACMS BLK II/IIA

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	488.5	1812.6	-	2301.1
Previous Changes:				
Economic	-31.8	-195.2	-	-227.0
Quantity	-	-	-	-
Schedule	+17.1	+17.0	-	+34.1
Engineering	-	-	-	-
Estimating	-11.6	-119.6	-	-131.2
Other	-	-	-	-
Support	-	+8.8	-	+8.8
Subtotal	-26.3	-289.0	-	-315.3
Current Changes:				
Economic	-5.4	-31.7	-	-37.1
Quantity	-	-	-	-
Schedule	-	+61.3	-	+61.3
Engineering	-	-	-	-
Estimating	+70.2	+499.2	-	+569.4
Other	-	-	-	-
Support	-	-22.0	-	-22.0
Subtotal	+64.8	+506.8	-	+571.6
Total Changes	+38.5	+217.8	-	+256.3
Current Estimate	527.0	2030.4	-	2557.4

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13a. (U) Cost Variance Analysis (Cont'd):
ATACMS BLK II/IIA

(U) Summary (FY 1991 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	385.4	1210.3	-	1595.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	+10.3	-	-	+10.3
Engineering	-	-	-	-
Estimating	-6.3	-77.9	-	-84.2
Other	-	-	-	-
Support	-	+6.7	-	+6.7
Subtotal	+4.0	-71.2	-	-67.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+50.8	+373.6	-	+424.4
Other	-	-	-	-
Support	-	-15.7	-	-15.7
Subtotal	+50.8	+357.9	-	+408.7
Total Changes	+54.8	+286.7	-	+341.5
Current Estimate	440.2	1497.0	-	1937.2

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-5.4
Adjustment for Current and Prior Inflation. (Estimating)	+1.9	+2.1
Revised estimate to reflect update of system test and evaluation requirements. (Estimating)	+2.3	+2.8
Revised estimate due to restructure of Block IIA program. (Estimating)	+46.6	+65.3
RDT&E Subtotal	+50.8	+64.8
(2) Procurement		
Revised escalation indices. (Economic)	N/A	-34.2
Economic adjustment for negative program change. (Economic)	N/A	+2.5
Adjustment for Current and Prior Inflation. (Support)	+0.1	+0.1
Adjustment for Current and Prior Inflation. (Estimating)	+0.6	+0.7
Stretchout of annual procurement buy profile by 4 years. (Schedule)	0.0	+61.3

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13b. (U) Cost Variance Analysis (Cont'd):
ATACMS BLK II/IIA

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	Base-Year	Then-Year
Refinement of cost estimate to reflect program updates. (Estimating)	+235.2	+304.8
Revised estimate due to restructure of Block II/IIA program. (Estimating)	+109.8	+158.0
Revised estimate due to additional integration risk reduction activities. (Estimating)	+6.0	+7.2
Refinement of cost estimate to reflect loss of sharing with delayed programs. (Estimating)	+22.0	+28.5
Refinement of estimate for Initial Spares. (Support)	+1.1	+1.6
Refinement of estimate for Peculiar Support (Missile Monitor Test Device [MMTD] Trainer and MMTD Modifications). (Support)	-1.2	-1.8
Refinement of estimate for data, training, support equipment, and transportation. (Support)	-15.7	-21.9
Procurement Subtotal	+357.9	+506.8

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):
BAT/BAT P3I

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.10	-0.02	+0.01	+0.02	+0.02	+0.06	--	--	+0.09	0.19

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.07	-0.02	+0.02	+0.01	--	+0.04	--	--	+0.05	0.12

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14c. (U) Unit Cost and Other History (Cont'd):

BAT/BAT P3I

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	FEB 85	N/A	FEB 85
Milestone II	N/A	MAY 91	N/A	MAY 91
Milestone III	N/A	DEC 96	N/A	N/A
FUE/IOC	N/A	DEC 95	N/A	N/A
Total Cost	N/A	2986.6	N/A	3695.2
Total Quantity	N/A	30993	N/A	19642
Prog Acq Unit Cost	N/A	0.1	N/A	0.19

(U) The BAT program began SAR reporting in Sep 91 after a successful Milestone II decision in May 91. Milestone III and FUE/IOC are no longer applicable as they will be tracked by the ATACMS Block II/IIA program.

ATACMS BLK II/IIA

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.27	-0.15	+0.01	+0.05	--	+0.24	--	-0.01	+0.14	1.41

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.00	-0.13	+0.01	+0.04	--	+0.21	--	-0.01	+0.12	1.12

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ATACMS/BAT, December 31, 1998

14c. (U) Unit Cost and Other History (Cont'd):
ATACMS BLK II/IIA

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	MAY 95	N/A	MAY 95
Milestone III	N/A	SEP 00	N/A	MAY 01
FUE/IOC	N/A	SEP 00	N/A	SEP 01
Total Cost	N/A	2301.1	N/A	2557.5
Total Quantity	N/A	1806	N/A	1812
Prog Acq Unit Cost	N/A	1.27	N/A	1.41

(U) The ATACMS Block II/IIA Program began SAR reporting in Dec 94.

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

a. RDT&E --				Initial Contract Price		
(U) BAT EMD:				<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Northrop-Grumman Corp., Hawthorne CA						
DAAH01-91-C-A017, CPIF/AF				\$383.9	N/A	0
Award: June 5, 1991						
Definitized: June 5, 1991						
Current Contract Price				Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		<u>Contractor</u>	<u>Program Manager</u>	
\$546.5	N/A	0		\$614.7	\$614.7	
Previous Cumulative Variances				<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (11/30/98)				\$-46.7	\$-9.9	
Net Change				\$-66.7	\$-2.8	
				\$-20.0	\$7.1	

Explanation of Change:

(U) The primary cause of the negative cost variance was yields and delivery rates of subcomponents, primarily the infrared (IR) seeker. Lack of deliveries caused contract extension driving up fixed costs. The positive schedule variance is due to final portions of earned value being taken as the contract neared completion.

(U) Contract Comments:

This contract's period of performance ended 30 Nov 98. All remaining work (assembly of 4 submunitions) has been transferred to the BAT Test Support Contract; therefore, this contract will not be reported in the SAR again.

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

(U) <u>BAT P3I DEM/VAL:</u>			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Northrop-Grumman Corp., Hawthorne CA			\$81.8	N/A	0
DAAH01-93-C-A014, CPIF					
Award: October 18, 1993					
Definitized: December 21, 1994					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$87.7	N/A	0	\$111.4	\$111.4	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
			\$-0.6	\$-1.8	
Cumulative Variances To Date (11/30/98)			\$2.5	\$0.0	
Net Change			\$3.1	\$1.8	

Explanation of Change:

(U) On 2 Nov 98, the project office directed the contractor to rebaseline to include Phase III of the contract. This was necessitated by changes in the direction of the P3I BAT program. In order to accomplish all program objectives within available funding, development efforts were realigned. As part of the rebaselining, the schedule variance was set to zero and the cost variance was set based on funds remaining in Management Reserve.

(U) Contract Comments:

Phase I awarded in Oct 93 and NTE option for Phase II was awarded Dec 94. Phase II was definitized on 21 Dec 94. The Contractor and Program Manager's Estimated Price at Completion includes an NTE of \$25.6M for Phase III. This NTE is excluded from the Current Contract Price; however, when negotiations are complete, it will be included. The Phase III effort began in Nov 98 and is expected to be completed in May 99.

(U) <u>ATACMS Blk II Cont Dev:</u>			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Vought Systems, Dallas, TX			\$155.2	N/A	0
DAAH01-95-C-0001, CPIF					
Award: July 12, 1995					
Definitized: July 12, 1995					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$183.9	N/A	0	\$183.9	\$183.9	

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ATACMS/BAT, December 31, 1998

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$2.3	\$-7.1
Cumulative Variances To Date (11/30/98)	<u>\$-3.1</u>	<u>\$-6.6</u>
Net Change	\$-5.4	\$0.5

Explanation of Change:

(U) The unfavorable cost variance is attributed to customized set up, machining and fitting on the center structure assembly due to bulkhead changes and engineering changes in the longitudinal channel. The favorable schedule variance is due to the completion of scheduled activities (redesign of Skin Augmentation System (SAS) and conduct of risk reduction effort on the skin severance system) which had previously slipped.

(U) Contract Comments:

The Block II current target price increase is primarily due to the Initial Operational Test and Evaluation (IOT&E) option which was exercised on 31 Mar 98 for \$19.2M.

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) BAT THC: Northrop Grumman Corp., Hawthorne CA DAAH01-98-C-0105, FPIF Award: May 1, 1998 Definitized: May 1, 1998	\$75.0	\$84.5	88

<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	\$88.9	88	\$78.9	\$78.9

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (11/20/98)	<u>\$0.4</u>	<u>\$-1.0</u>
Net Change	\$0.4	\$-1.0

Explanation of Change:

(U) The unfavorable schedule variance is due primarily to time-phasing differences between the subcontractor's baseline and the prime contractor's baseline. The baselines are expected to be synchronized in the next Contractor Cost Report.

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ATACMS/BAT, December 31, 1998

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY84-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-13)</u>	<u>Total</u>
RDT&E	1457.9	128.0	112.1	267.8	1965.8
Procurement	149.0	226.1	229.6	3682.1	4286.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1606.9	354.1	341.7	3949.9	6252.6

BAT/BAT P3I

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

<u>Appropriation</u>	<u>Prior Years (FY84-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-13)</u>	<u>Total</u>
RDT&E	1205.4	100.5	68.9	64.0	1438.8
Procurement	100.1	149.3	136.4	1870.6	2256.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1305.5	249.8	205.3	1934.6	3695.2

ATACMS BLK II/IIA

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-13)</u>	<u>Total</u>
RDT&E	252.5	27.5	43.2	203.8	527.0
Procurement	48.9	76.8	93.2	1811.5	2030.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	301.4	104.3	136.4	2015.3	2557.4

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ATACMS/BAT, December 31, 1998

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

b. Annual Summary -- BAT/BAT P3I

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY91 Dollars Nonrec	Flyaway FY91 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984				5.2	4.2
1985				18.4	15.2
1986				37.8	32.2
1987				34.2	30.0
1988				46.0	42.0
1989				46.3	44.0
1990				40.7	40.1
1991				70.2	71.9
1992				115.6	121.1
1993				106.8	114.5
1994				111.6	121.9
1995				94.6	105.3
1996				120.8	136.9
1997				82.7	94.8
1998				123.2	142.4
1999				76.0	88.9
2000				84.6	100.5
2001				57.1	68.9
2002				36.8	45.1
2003				9.4	11.8
2004				5.6	7.1
Subtotal	88			1323.6	1438.8

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY91 Dollars Nonrec	Flyaway FY91 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	420	18.8	64.4	84.3	100.1
2000	846	11.2	112.2	124.0	149.3
2001	1028	1.3	109.5	111.4	136.4
2002	1126	8.9	110.4	119.8	149.5
2003	1781	8.3	167.5	176.3	224.5
2004	1549		147.9	148.4	192.9
2005	1751		149.0	149.6	198.5
2006	1921		147.2	147.8	200.3
2007	2207		155.5	156.1	215.9
2008	2280		151.7	152.3	215.1
2009	2340		148.2	148.7	214.5
2010	2083		129.6	130.2	191.7
2011	222		44.3	32.7	49.2

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ATACMS/BAT, December 31, 1998

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

BAT/BAT P3I

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY91 Dollars Nonrec	Flyaway FY91 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2012				8.9	13.6
2013				3.1	4.9
Subtotal	19554	48.5	1637.4	1693.6	2256.4

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	19642	48.5	1637.4	3017.2	3695.2

b. Annual Summary -- ATACMS BLK II/IIA

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY91 Dollars Nonrec	Flyaway FY91 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				8.8	9.8
1996				47.2	53.5
1997				58.3	66.8
1998				71.6	82.8
1999				33.9	39.6
2000				23.2	27.5
2001				35.8	43.2
2002				42.7	52.4
2003				50.6	63.3
2004				43.0	54.9
2005				14.4	18.8
2006				5.3	7.1
2007				5.4	7.3
Subtotal	6			440.2	527.0

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY91 Dollars Nonrec	Flyaway FY91 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	30	1.2	37.5	41.2	48.9
2000	61		62.5	63.8	76.8
2001	77		73.4	76.1	93.2
2002	87		90.7	93.1	116.2

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ATACMS/BAT, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
ATACMS BLK II/IIA

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2003	112		116.2	117.4	149.5
2004	103		98.8	112.8	146.6
2005	131	12.0	127.7	130.4	173.1
2006	191		149.3	151.4	205.1
2007	224		159.4	160.6	222.2
2008	230		159.5	160.1	226.1
2009	240		156.7	157.1	226.6
2010	240		155.1	155.2	228.6
2011	80		77.6	64.3	96.7
2012				8.7	13.3
2013				4.8	7.5
Subtotal	1806	13.2	1464.4	1497.0	2030.4

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1812	13.2	1464.4	1937.2	2557.4

17. (U) Delivery/Expenditure Information:

BAT/BAT P3I

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1049.5

(U) Percent Total Program Expended: 28.4%

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ATACMS/BAT, December 31, 1998

17b. (U) Delivery/Expenditure Information (Cont'd):

ATACMS BLK II/IIA

ATACMS BLK II/IIA

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 186.2

(U) Percent Total Program Expended: 7.3%

18. (U) Operating and Support Costs:

BAT/BAT P3I

a. (U) Assumptions and Ground Rules --
The submunition is considered a certified round; therefore, O&S cost will be minimal. It will consist of stockpile reliability tests for recertification and minimal depot maintenance. Based on the Level of Repair Analysis (LORA) and the associated Economic Analysis, contractor logistic support (CLS) is planned for the BAT. There is no antecedent system.

Average Annual Cost reflects average annual cost for total BAT quantity (19554).

Cost estimate dated February 1999.

b. (U) Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost for Total BAT Qty	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.3	0.0
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	1.4	0.0
Contractor Support	0.5	0.0
Sustaining Support	1.3	0.0
Indirect Costs	0.0	0.0
Total	3.5	0.0

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ATACMS/BAT, December 31, 1998

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

ATACMS BLK II/IIA

a. (U) Assumptions and Ground Rules --
ATACMS Block II will be fired from the Multiple Launch Rocket System (MLRS) M270A1 launcher within the MLRS organizational units. Manning/crew support is provided by the MLRS organizational unit. ATACMS Block II will be a certified round. Maintenance will be determined on the basis of a Stockpile Reliability Program (SRP). There is no antecedent system.

Average Annual Cost reflects average annual cost for total ATACMS Block II quantity (1206).

Cost estimate dated February 1999.

b. (U) Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost for Total Blk II Qty	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.1	0.0
Unit Level Consumption	0.1	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	1.2	0.0
Contractor Support	0.0	0.0
Sustaining Support	3.3	0.0
Indirect Costs	0.0	0.0
Total	4.7	0.0

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N-10 F/A-18 E/F

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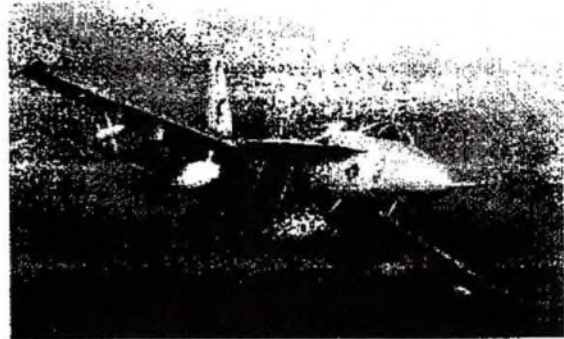
SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: F/A-18E/F

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): F/A-18E/F Naval Strike Fighter (HORNET)
2. DoD Component: Navy
3. Responsible Office and Telephone Number:
PROGRAM EXECUTIVE OFFICER CAPT J.B. GODWIN, III, USN
TACTICAL AIRCRAFT PROGRAMS (PMA 265) Assigned: April 18, 1997
47123 BUSE ROAD, UNIT#1PT DSN 757-7677; COMM (301) 757-7677
PATUXENT RIVER, MD 20670-1547 godwinjb@navair.navy.mil
4. Program Elements/Procurement Line Items:
RDT&E:
 PE 0204136N
PROCUREMENT:
 APPN 1506 ICN 014500 (Navy)
 APPN 1506 ICN 060510 (Navy)

99-C-0722
MAR 17 1999
M. J. Harell
Chief of
Naval Air Force
Department of Defense

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DIRECTORATE FOR FREEDOM OF INFORMATION
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DEPARTMENT OF DEFENSE

99-C-0722

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F/A-18E/F, December 31, 1998

5. References:

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline dated 11 June 1992.

Approved Program:

NAE Approved Acquisition Program Baseline (APB) dated October 24, 1997.

6. Mission and Description:

The F/A-18E/F will be the second major model upgrade since F/A-18 aircraft program inception. The F/A-18E (single seat) and the F/A-18F (two seat) will be a high performance twin engine, mid-wing, multi-mission tactical aircraft designed to replace F/A-18C (single seat), F/A-18D (two seat), A-6, and F-14 aircraft as they reach the end of service life and retire. The F/A-18E/F will be designed primarily to meet current Navy and Marine Corps fighter escort, interdiction, fleet air defense and close air support mission requirements. Enhancements will include the increased range, improved survivability, and improved carrier suitability required for the F/A-18 to continue its key strike fighter role against the advanced threat of the late 1990's and beyond.

7. Executive Summary:

The F/A-18E/F program is currently on cost, on schedule, and meeting all performance requirements.

Aircraft is currently 368 pounds below (better than) SPEC weight.

The airframe (EMD) contract is 98% complete and possesses a cost performance index (CPI) of 100% and a schedule performance index (SPI) of 99%. The airframe LRIP I contract is 70% complete and possesses a CPI of 107% and an SPI of 97%. The engine EMD contract is 99% complete and possesses a CPI of 92% and an SPI of 100%. The engine LRIP I contract is 85% complete and possesses a CPI of 99% and a SPI of 93%.

The FY2000 Congressional Budget submission includes the proposed multiyear procurement (MYP) covering the purchase of 222 F/A-18E/F aircraft in FY 2000 through FY2004 under a single, five year fixed price incentive fee type contract. These aircraft constitute the first five years of full rate production (FRP) of the F/A-18E/F, following three years of low rate initial production (LRIP) (FY 1997-1999) during which 62 F/A-18E/F aircraft will be produced. This MYP strategy has been structured to achieve significant savings (\$706M) while providing unprecedented quantity flexibility for emergent requirements.

Following a successful Navy Program Review, an Acquisition Decision Memorandum (ADM), dated 09 April 1998 was signed granting approval to award LRIP II full funding and LRIP III advanced funding for the F/A-18E/F program.

Full Production Qualification (FPQ) for the F414 engine was successfully completed in December 1998. The results verified that the engine configuration

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F/A-18E/F, December 31, 1998

7. Executive Summary (Cont'd):

is suitable for full production and service use in production aircraft.

The program continued the briefing path to Navy Program Review III. The engine stall issues, that have delayed FPQ and the Navy Program Review, have been resolved. All exit criteria for Navy Program Review III have been satisfied. Purpose of the review is to obtain full funding authority for Low Rate Initial Production (LRIP III), advanced procurement authority for Full Rate Production (FRP) and authorization to proceed with Multi-Year Procurement (MYP). Following a successful Navy Program Review, the ADM was signed 29 Jan 99 granting approval to fully fund LRIP III and authorize FRP Advance Acquisition Contract (AAC). Further, this decision authorized pursuing MYP.

Operational test period (OT-IIB) was successfully completed in June 1998.

First LRIP I aircraft delivery completed 18 December 1998.

Program projection indicates completion of EMD under the original cost estimate of \$4.88B (FY90\$). The current production cost estimate for an F/A-18E/F is 114% of an F/A-18C/D when normalized for production rates and inflation. This estimate is well below the 125% Congressional cost limit.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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F/A-18E/F, December 31, 1998

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
Milestone IV/II	MAR 92	MAR 92	MAY 92	
Production Readiness Review (Airframe)	APR 95	APR 95	AUG 95	
First Engine to Test	APR 93	APR 93	MAY 93	
Preliminary Design Review (Airframe)	APR 93	APR 93	JUN 93	
Critical Design Review (Airframe)	JAN 94	JAN 94	JUL 94	
Preliminary Flight Qualification (Engine)	MAR 95	MAR 95	SEP 95	
First Flight	OCT 95	OCT 95	NOV 95	
Long Lead Release for LRIP	DEC 95	DEC 95	MAR 96	
LRIP Decision Milestone	N/A	MAR 97	MAR 97	
Limited Production Qualification (Engine)	OCT 96	MAR 97	APR 97	
LRIP Contract Award	JAN 97	JAN 97	MAY 97	
Full Production Qualification (Engine)	OCT 97	AUG 98	DEC 98	(Ch-1)
LRIP First Delivery	DEC 98	DEC 98	DEC 98	(Ch-2)
Milestone III	JAN 00	JAN 00	MAR 00	
Full Rate Production Contract Award	JAN 00	JAN 00	MAR 00	
DT&E				
DT-IIA	OCT 95	OCT 95	NOV 95	
DT-IIB	NOV 96	NOV 96	DEC 96	
DT-IIC	NOV 97	NOV 97	DEC 97	
DT-IID	JUL 98	JUL 98	OCT 98	(Ch-3)
DT-IIE	OCT 98	OCT 98	APR 99	(Ch-4)
IOT&E				
OT-IIA	MAR 97	NOV 97	NOV 97	
OT-IIB	DEC 97	DEC 97	JUN 98	(Ch-5)
OT-IIC	MAR 99	MAR 99	MAY 99	
FOT&E				
DT-III	FEB 00	FEB 00	APR 00	(Ch-6)
OT-III	FEB 00	FEB 00	JUN 00	
O-Level Maintenance Capability (OPEVAL)	MAR 99	MAR 99	MAY 99	
IOC	SEP 00	SEP 00	SEP 00	
I-Level Maintenance Capability				
WRA TPS and Modified TPSs (IOC)	SEP 00	SEP 00	SEP 00	
New SRA TPS (IOC + one year)	SEP 01	SEP 01	SEP 01	
Material Support Date	OCT 02	OCT 02	APR 03	
Navy Support Date	OCT 03	OCT 03	DEC 03	
D-Level Maintenance Capability	OCT 03	OCT 03	DEC 03	

b. Current Change Explanations --

(Ch-1): FPQ was changed from Aug 98 to Dec 98. Prior to the completion of FPQ, self-clearing pop stalls were observed during degraded catapult testing at NAWC Lakehurst. These stalls were quickly determined not to be a safety of flight issue; However, completion of FPQ was delayed until analysis revealed the probable cause of the stalls and a corrective plan of action was put in place.

(Ch-2): LRIP First Delivery was changed from Jan 99 to Dec 98. The Navy

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9b. Schedule (Cont'd):

took delivery of the first LRIP aircraft (E6) a month ahead of schedule because of early completion.

(Ch-3): DT-IID changed from Nov 98 to Oct 98. The R&M and software portion of TECHEVAL began a month early in Oct 98.

(CH-4): DT-IIE was changed from Nov 98 to Apr 99. DT-IIE is scheduled to start at the completion of E&MD flight testing. The E&MD flight testing was extended to Mar 99 in order to complete required test points which had slipped due to resolution of technical challenges during the E&MD program.

(CH-5): OT-IIB was changed from Mar 98 to Jun 98. OT-IIA was completed in Nov 97. There was no appreciable change in the flight envelope in Mar 98. The decision was made to slide the start of OT-IIB to the end of the APB threshold (Jun 98) in order to assess the maximum flight envelope expansion.

(CH-6): DT-III was changed from Feb 00 to Apr 00. DT-III start is tied to the completion of the Full Rate Production Milestone which is now scheduled for Mar 00.

10. Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>	
KEY PERFORMANCE PARAMETERS (KPPs) (Specified in F/A-18E/F ORD and validated by JROC)					
Deck Spot Factor (F/A-18A/B/C/D =1.2)	1.4	1.4 / <1.5	TBD	1.46	(Ch-1)
Fighter Escort Radius (internal fuel) (Nm)	425	N/A / N/A	TBD	N/A	
Fighter Escort Radius (F/A-18E) (internal fuel) (Nm)	N/A	425 / 410	TBD	459	(Ch-1)
Interdiction Mission Radius (Nm)					
2 external tanks (retained)	400	400 / 390	TBD	432	(Ch-1)
3 external tanks (retained)	450	450 / 430	TBD	492	(Ch-1)
Combat Ceiling (max thrust) (ft)	>50000	>50000 / 50000	TBD	52,100	(Ch-1)
Carrier Suitability (Tropical Day Conditions)					

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10a. Performance Characteristics (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>	
Launch: Catapult WOD (C-13 Catapult:TCGW) (kts)	25	25 / <30	TBD	30	
Recovery: WOD (MK-7 MOD 3) (kts)	10	10 / <15	TBD	9	(Ch-1)
Approach Speed (kts)	140	140 / <150	TBD	142	(Ch-1)
Recovery Payload (lbs)	9000	9000 / 9000	TBD	9,163	(Ch-3)
Usable Load Factor (Subsonic; Nz) (G's)	+7.5	+7.5 / +7.5	TBD	+7.5	
Specific Excess Power (Max Thrust, .9M, 1G, 10kft) (fps)	650	650 / >600	TBD	644	(Ch-1)
Acceleration (.8M to 1.2M at 35kft) (sec)	60	60 / <70	TBD	64	(Ch-1)
Additional Internal Fuel Capacity (lbs) (greater than C/D)	N/A	3000 / 3000	TBD	3828	(Ch-1)
SUITABILITY PARAMETERS (Specified in F/A-18E/F ORD)					
Mean Flight Hours Between Maintenance Actions	0.6	N/A / N/A	TBD	N/A	
Mean Flight Hours Between Failures 1/	2.0	N/A / N/A	TBD	N/A	
Mean Time Between Operational Mission Failure (MTBOMF) (Replaces MFHBF)	N/A	> 3.2 / > 2.6	TBD	3.18	(Ch-1)
Maintenance Hours per flight hour (O&I-Level Unshed)	12.0	N/A / N/A	TBD	N/A	
Direct Maintenance Manhours per Flight Hour (DMMH/FH) (Replaces MH/FH)	N/A	< 5.0 / < 9.0	TBD	1.23	(Ch-1)
OTHER PARAMETERS (desired to achieve maximum performance)					
Built-In Test (All Avionics) 1/					
Fault Detection (%)	75	75 / 65	TBD	99	(Ch-2)
Fault Isolation (%)	90	90 / 85	TBD	99	(Ch-2)
False Alarm Rate (%)	30	30 / 45	TBD	27.6	(Ch-2)

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10a. Performance Characteristics (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Speed (Mach)	.98	.98 / .96	TBD	.96
Fighter Escort				
Mission Configura- tion @10,000 ft with Intermediate Rated Thrust				
Empty Weight (lbs)	29950	29950 / 31950	TBD	30196 (Ch-3)

Note: Interdiction Mission Radius (NM) payload with:

2 external tanks: 2 AIM-9 + 4 MARK 83 LD + FLIR/TIN

3 external tanks: 2 AIM-9 + 4 MARK 83 LD + FLIR/TIN and Low Drag
Pylons

b. Current Change Explanations --

(Ch-1): Key Performance Parameters (KPPs) are based on recent configuration changes and current flight-derived performance database. These changes are specified in the F/A-18E/F Operational Requirements Document (ORD) dated Dec 98.

(Ch-2): Software updates have resulted in improved Built In Test (BIT) reliability.

(Ch-3): Current estimate reflects status weight #79 as of 15 January 1999. Previous SARs reported specification (SPEC) weight.

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11. Total Program Cost and Quantity (Dollars in Millions):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	4883.3	4883.3	4853.2
Procurement	49076.3	29147.5	30771.5
Recurring Flyaway	(36450.2)		(22856.7)
Non-Recurring	(368.1)		(724.6)
Ancillary	(3858.5)		(2930.7)
Total Flyaway	(40676.8)		(26512.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(4301.9)		(3488.3)
Initial Spares	(4097.6)		(771.2)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 90 Base-Year \$	53959.6	34030.8	35624.7
Escalation	40623.4	13451.9	11383.1
Development (RDT&E)	(949.3)	(949.3)	(745.6)
Procurement	(39674.1)	(12502.6)	(10637.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	94583.0	47482.7	47007.8

Pre-development funding of \$36.6M in FY90 base year dollars is reflected in the Development (RDT&E) current estimate. The \$36.6M (BY\$) was not a part of the E&MD estimate and is not to be included in the approved \$4.883B development cap.

Cost data in this SAR reflects the Defense Planning Guidance following the Quadrennial Defense Review (QDR) which reduced total F/A-18E/F procurement from 1,000 to 548.

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	1000	548	548
Total	1000	548	548

Note: Excludes 0 RDT&E prototypes from the SAR Baseline and 7 from the Current Estimate that are not considered fully configured.

LRIP quantities approved at the 1992 DAB were 12 aircraft in FY97, 12 in FY98, and 18 in FY99. The current LRIP quantities are 12 aircraft in FY97, 20 in FY98, and 30 in FY99. This quantity was approved during the LRIP DAB in March 1997 and was below the 10% guideline for LRIP quantities. The Quadrennial Defense Review (QDR) subsequently reduced the total procurement to a range of 548 to 785 aircraft. Due to the overall aircraft quantity reduction caused by the QDR, the LRIP quantities are above the current 10% guideline. The final quantity will be determined based on future decisions for the Joint Strike Fighter. Consequently, the LRIP quantities remain as approved during the March 1997 DAB.

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11c. Total Program Cost and Quantity (Cont'd):

c. Foreign Military Sales -- None.

d. Nuclear Costs --
N/A

12. Unit Cost Summary:

	UCR Baseline (OCT 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 90 BY\$)	34030.8	35624.7	
(2) Quantity	548	548	
(3) Unit Cost	62.100	65.009	+4.68
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 90 BY\$)	29147.5	30771.5	
(2) Quantity	548	548	
(3) Unit Cost	53.189	56.152	+5.57

12 a-b. Percent change due to an inflationary decrease which increased the difference between FY90 Base Year cost and the current Then Year estimation.

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13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	5832.6	88750.4	-	94583.0
Previous Changes:				
Economic	-201.0	-7635.6	-	-7836.6
Quantity	-	-31895.2	-	-31895.2
Schedule	-143.4	+1170.6	-	+1027.2
Engineering	-	-2618.2	-	-2618.2
Estimating	+146.9	+95.3	-	+242.2
Other	-	-	-	-
Support	-	-7438.3	-	-7438.3
Subtotal	-197.5	-48321.4	-	-48518.9
Current Changes:				
Economic	-3.1	-919.5	-	-922.6
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+1208.6	-	+1208.6
Estimating	-33.2	+289.3	-	+256.1
Other	-	-	-	-
Support	-	+401.6	-	+401.6
Subtotal	-36.3	+980.0	-	+943.7
Total Changes	-233.8	-47341.4	-	-47575.2
Current Estimate	5598.8	41409.0	-	47007.8

Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	4883.3	49076.3	-	53959.6
Previous Changes:				
Quantity	-	-14908.1	-	-14908.1
Schedule	-153.6	+832.0	-	+678.4
Engineering	-	-977.3	-	-977.3
Estimating	+141.5	-158.9	-	-17.4
Other	-	-	-	-
Support	-	-4442.3	-	-4442.3
Subtotal	-12.1	-19654.6	-	-19666.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+853.2	-	+853.2
Estimating	-18.0	+194.3	-	+176.3
Other	-	-	-	-
Support	-	+302.3	-	+302.3
Subtotal	-18.0	+1349.8	-	+1331.8
Total Changes	-30.1	-18304.8	-	-18334.9
Current Estimate	4853.2	30771.5	-	35624.7

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-3.1
Congressional reductions, inflation and rate adjustments, funding realignment to improvements project. (Estimating)	-18.4	-33.7
Adjustment for current and prior year inflation. (Estimating)	+0.4	10.5
RDT&E Subtotal	-18.0	-36.3
(2) <u>Procurement</u>		
Revised inflation indices. (Economic)	N/A	-919.5
Increase due to addition of Active Electronically Scanned Array (AESA), High Speed Antiradiation Missile Command Launch Computer (HARM CLC), Shared Reconnaissance Pod (SHARP). (Engineering)	+853.2	+1208.6
Cost model updated to incorporate (FY97-FY99) Contractor Furnished Equipment (CFE) material actuals. (Estimating)	+114.1	+191.3
Increased spares cost for A/C planned upgrades, updated failure rates and utilization of more mature data, increased Facilities Management, increased Advanced Targeting FLIR PGSE. (Support)	+287.1	+383.0
Adjustment for current and prior year inflation. (Estimating)	+80.2	+98.0
Adjustment for current and prior year inflation. (Support)	+15.2	+18.6
Procurement Subtotal	+1349.8	+980.0

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14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
94.58	-15.98	+19.81	+1.87	-2.57	+0.91	--	-12.84	-8.80	85.78

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
88.75	-15.61	+14.99	+2.14	-2.57	+0.70	--	-12.84	-13.19	75.56

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	DEC 91	MAR 92	N/A	MAY 92
Milestone III	DEC 98	JAN 00	N/A	MAR 00
FUE/IOC	N/A	SEP 00	N/A	SEP 00
Total Cost	3974.4	94583	N/A	47007.8
Total Quantity	0	1000	N/A	548
Prog Acq Unit Cost	0	94.58	N/A	85.78

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

a. RDT&E --

Airframe E&MD:

MCDONNELL DOUGLAS, St. Louis, MO
N00019-92-C-0059, CPAF/IF
Award: July 20, 1992
Definitized: December 7, 1992

Initial Contract Price		
Target	Ceiling	Qty
\$3879.5	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$3878.0	N/A	0	\$3878.0	\$3888.0

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15a. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$27.5	\$22.3
Cumulative Variances To Date (12/31/98)	<u>\$4.6</u>	<u>\$18.8</u>
Net Change	\$-22.9	\$-3.5

Explanation of Change:

Since December 1997, overall cost performance has declined primarily due to Wing Drop investigations and other corrections of deficiencies discovered during flight test. On a cumulative basis, this contract is \$4.6 (0.1%) underrun. Schedule variance continued to improve to date by \$3.5M to -\$18.3M. This schedule variance recovery is attributable to successful completion of qualification testing for 65 KVA Generator, Leading Edge Flap drive unit, Engine Fuel Display.

F414-GE-404 Engine:

General Electric Company, Lynn, MA
N00019-92-C-0149, CPAF/1F EMD
Award: July 20, 1992
Definitized: December 7, 1992

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$773.8	N/A	21

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$756.8	N/A	21

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$820.0	\$820.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-49.1	\$-5.2
Cumulative Variances To Date (12/31/98)	<u>\$-57.5</u>	<u>\$-1.1</u>
Net Change	\$-8.4	\$4.1

Explanation of Change:

Since December 1997, overall cost performance has declined primarily due to redesign efforts and developmental test and evaluation issues associated with accomplishing Full Production Qualification. The schedule variance continued to improve due to completion of design and test tasks. FPQ was awarded in December 1998.

F414-GE-404 ENGINE:

General Electric Co., Lynn,, MA
N00019-96-C-0080, CPAF/IF LRIP I
Award: April 30, 1996
Definitized: September 29, 1996

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$244.1	N/A	24

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$251.6	N/A	24

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$251.6	\$251.6

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15. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (12/31/98)	<u>\$-3.9</u>	<u>\$-11.8</u>
Net Change	\$-3.9	\$-11.8

Explanation of Change:

Cost performance to date is unfavorable due to over requisitioned material and manufacturing inefficiencies in "make part" plants. Schedule variance to date is unfavorable due to problems and delays in prime outside vendor deliveries, "make part" deliveries, tooling delays, and engineering labor shortages.

<u>Airframe LRIP I:</u> Boeing, St. Louis, MO N00019-96-C-0065, CPAF/IF Award: July 20, 1992 Definitized: December 7, 1992	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$1753.0	N/A	12

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1788.6	N/A	12	\$1788.6	\$1788.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (12/31/98)	<u>\$74.8</u>	<u>\$-29.2</u>
Net Change	\$74.8	\$-29.2

Explanation of Change:

Overall cost performance has remained favorable due to improved manufacturing techniques, less than anticipated material usage and supplier tooling rework, and lower average unit cost for parts disbursed to assembly. On a cumulative basis, this contract is \$74.8 (6.9%) underrun. Schedule variance -\$29.2 is unfavorable due to parts shortages and configuration changes, however this is not expected to impact aircraft deliveries since the contractor is working to accelerate schedule. In addition, the first LRIP I aircraft was delivered to the Government one month early to the contractual delivery date.

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

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

<u>Appropriation</u>	<u>Prior Years (FY92-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	5426.1	142.6	28.6	1.5	5598.8
Procurement	7510.9	2923.8	3020.1	27954.2	41409.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	12937.0	3066.4	3048.7	27955.7	47007.8

b. Annual Summary -- F/A-18 E/F

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY90 Dollars Nonrec</u>	<u>Flyaway FY90 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1992				320.2	349.5
1993				754.1	842.1
1994				1227.4	1396.2
1995				1074.6	1246.0
1996				680.8	802.7
1997				289.4	345.4
1998				197.7	237.8
1999				169.6	206.4
2000				115.4	142.6
2001				22.8	28.6
2002				1.2	1.5
2003					
Subtotal				4853.2	5598.8

Pre-development effort of \$8.0M in FY91 is included in the F/A-18 Improvements project line and is not reflected in the RDT&E total.

Pre-development effort of \$39.9M in FY92, previously reported as a part of the F/A-18 C/D SAR, is reflected in the RDT&E total. This \$39.9M (TY\$) is not included in the \$4.883B Congressionally mandated funding cap.

Appropriation: 1506 - Aircraft Procurement, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY90 Dollars Nonrec</u>	<u>Flyaway FY90 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				195.7	233.6
1997	12	217.4	1168.2	1759.7	2119.0

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	20	175.0	1461.0	1795.9	2186.6
1999	30	266.1	1756.0	2405.9	2971.7
2000	36	164.7	1660.9	2329.4	2923.8
2001	42	232.8	1785.4	2366.7	3020.1
2002	48	314.1	1867.9	2462.4	3199.5
2003	48	336.4	1833.7	2381.5	3156.7
2004	48	333.0	1783.2	2436.1	3297.0
2005	48	355.8	1790.5	2477.9	3423.9
2006	48	360.2	1758.1	2373.7	3348.8
2007	48	271.4	1718.3	2222.0	3200.8
2008	48	268.2	1683.1	2190.9	3222.1
2009	48	244.6	1656.8	2123.6	3188.8
2010	24	115.7	933.5	1250.1	1916.6
Subtotal	548	3655.4	22856.6	30771.5	41409.0

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	548	3655.4	22856.6	35624.7	47007.8

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	1

Percent Total Program Quantities Delivered: 0.2%

b. Total Expenditures To Date (In Millions of Dollars): \$ 7161

Percent Total Program Expended: 15.2%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --
 Current Program: F/A-18E
 Flight hours per aircraft per month: 35
 Number of aircraft per squadron: 12
 Consumption rate, gallons per hour: 1154.0 POL cost, JP-5 per gallon FY90\$: \$0.60

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

Antecedent Program: F/A-18C

Flight hours per aircraft per month: 31.1

Number of aircraft per squadron: 12

Consumption rate, gallons per hour: 976.49 POL cost, JP-5, per gallon, FY90\$: \$0.60

Date of estimate: February 1997

Source: AIR-4.2 Operating & Support Cost Estimate

b. Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per F/A-18E Squadron 12 A/C Squadron	Avg Annual Cost Per F/A-18C Squadron 12 A/C Squadron
Mission Pay & Allowances	7.4	7.1
Unit Level Consumption	13.4	10.2
Intermediate Maintenance	0.5	0.4
Depot Maintenance	1.4	2.2
Contractor Support	0.0	0.0
Sustaining Support	1.8	1.5
Indirect Costs	0.5	0.4
Total	25.0	21.8

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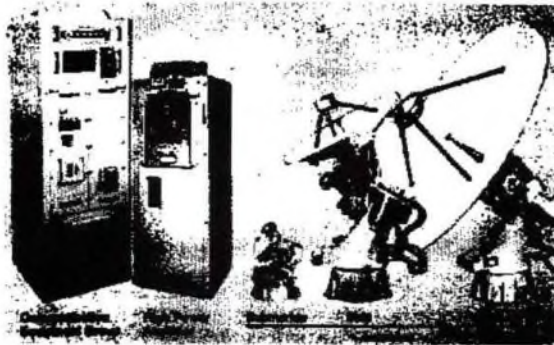
SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: Navy EHF SATCOM Prog

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Navy EHF SATCOM Program (NESP) AN/USC-38 (V)
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:
Space and Naval Warfare Systems CAPT Gary Graupmann
Command - PMW 176 Assigned: January 9, 1998
4301 Pacific Highway DSN ; COMM (619) 524-7930
San Diego, CA 92110-3217 grpmmn@spawar.navy.mil
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0303109N Project X0728
PROCUREMENT:
(U) APPN 1810 ICN 33321000 (Navy) (Shared)
(U) APPN 1810 ICN 33322000 (Navy) (Shared)
(U) APPN 1810 ICN 33902000 (Navy) (Shared)
(U) APPN 1611 ICN MULTIPLE (Navy) (Shared)
MILCON:
(U) PE 0303109N

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AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

~~Derived from: [unclear]
Downgrade instruction: [unclear] System Classification Guide September 10, 1993
Classify on: X3~~

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5. (U) References:

SAR Baseline (Production Estimate):

(U) NAE Approved Acquisition Program Baseline dated March 24, 1993.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated March 24, 1993.

6. (U) Mission and Description:

(U) The Navy Extremely High Frequency (EHF) Satellite Communications (SATCOM) Program (NESP) AN/USC-38(V) is an anti-jam, low probability of intercept communications terminal designed to accommodate a wide variety of command and control communication applications (i.e., secure voice, teletype, data, and fleet broadcast systems). As the Navy's portion of Milstar, NESP terminals are an essential part of the number one command and control communications system within DOD as identified by the Chief of Naval Operations on February 9, 1993. The terminal operates within the EHF uplink and Super High Frequency (SHF) downlink radio frequency (RF) spectrums. The terminals are interoperable with Army and Air Force terminals and will operate with Milstar satellites as well as EHF packages on board Ultra High Frequency (UHF) Follow-On (UFO) Satellites 4 - 10 and with the Fleet Satellite (FLTSAT) EHF Packages (FEP) installed on FLTSATs 7 and 8. A Medium Data Rate (MDR) applique is being developed for incorporation into the NESP terminal to allow MDR communications with Milstar II satellites. The NESP terminals will provide vital survivable wartime command and control communications for the National Command Authority, Specified/Unified CINCs, and operational commanders. NESP has three configurations: Submarine (V)1, Ship (V)2, and Shore (V)3. This system does not replace another system.

7. (U) Executive Summary:

(U) The terminal was developed to support the requirements of the Mission Elements Needs Statement (MENS), ASN (RE&S) letter of July 23, 1981, Navy Decision Coordinating Paper (NDCP) of January 21, 1982, updated April 25, 1989, and the Milstar ORD of September 1992. NESP's operational performance will meet the threat defined in the Milstar System Threat Assessment Report (STAR) updated March 1997. After a full and open competition, three companies began system definition and concept demonstration in 1979. Two companies were selected for Full Scale Development (FSD) in 1982; one company was awarded a Firm Fixed Price contract in 1986 for FSD completion and initial production. Low Rate Initial Production (LRIP) beginning in FY 90 was approved at a Milestone IIIA decision in May 1989. Operational Evaluation (OPEVAL) Phase I and OPEVAL Phase II were successfully completed in September 1990 and August 1992, respectively. Full Rate Production beginning in FY 93 was approved at a Milestone III decision in April 1993.

(U) The first Milstar satellite was launched on February 7, 1994. A production NESP terminal successfully communicated with an Air Force terminal over the on-orbit Milstar Satellite on 15 February 1994 as part of Milstar System Test

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7. (U) Executive Summary (Cont'd):

(MST)-8000. NESP Initial Operational Capability (IOC) was achieved in April 1994.

(U) NESP terminals were certified as participants in the Dedicated Asset Test (DAT) portion of the Milstar Initial Operational Test and Evaluation (IOT&E) in August 1994. This test was completed in September 1994 and all DAT performance requirements were successfully achieved by the NESP terminals. NESP terminals were also certified to initiate Follow-On Operational Test and Evaluation (FOT&E) in August 1994. In September 1994 this test was completed with all test objectives successfully achieved.

(U) Ultra High Frequency (UHF) Follow-On (UFO) Satellite Flights 4, 5, and 6, each equipped with an EHF package, were launched in 1995. Testing of the satellites with the EHF terminal was successful, providing worldwide EHF communications coverage for the DoD.

(U) The second Milstar satellite (DFS-2) was launched in November 1995. NESP terminals successfully participated in Milstar System Test (MST) 8000-2. In December 1995, the two on-orbit Milstar satellites successfully transmitted the first Milstar inter-satellite message via crosslinks.

(U) The first UFO satellite with the enhanced EHF package was launched in July 1996. The package includes enhanced beam switching capabilities, which allows for more efficient use of communications channels.

(U) Operational test event OT-IIIB, Signal Susceptibility and Vulnerability Assessment, which tested the anti-jam (AJ) and low probability of intercept (LPI) performance of the NESP terminal, was successfully completed in November 1996. During this test, EHF shore, sub and ship terminals met their respective AJ and LPI requirements. Completion of this test represented a major accomplishment in the NESP program.

(U) NESP successfully completed Milstar System Test 3500 in November 1996. This event was initial development testing between the NESP Medium Data Rate (MDR) Upgrade and the LDR/MDR satellite payload simulator.

(U) The Interim Polar EHF package, which is hosted on a classified payload, was successfully launched on 7 November 1997. This package will allow EHF communications to Naval forces operating in regions above 65N.

(U) Ground compatibility testing between the NESP terminal and the Interim Polar EHF package flight model was successfully completed in early December 1997.

(U) Flight Telemetry and Control Testing (Phase IIIB) was successfully completed in January 1998.

(U) The first operational EHF Sub Polar modification was successfully installed on the SSN 761, USS Springfield, in February 1998. IOC was completed in March 1998.

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7. (U) Executive Summary (Cont'd):

(U) An EHF equipped operational submarine (USS Springfield) successfully communicated over the Polar satellite to an EHF terminal at SOHLANT for the first time from sea on 24 March 98.

(U) The MDR Applique contract was awarded on 20 January 1998. The Applique will fit into a spare drawer in the current LDR terminal and will provide two orders of magnitude in increased data rates to the fleet.

(U) Follow-On Terminal Contract Awarded on 20 March 98. This contract supports procurement of the remaining EHF terminals to satisfy the Navy inventory objective.

(U) MST-6000 was successfully completed in August 1998. This test verified MDR command & control, LDR Regression Tests, Navy unique MDR data communications on all ports, interoperability between the AN/USC-38 NESP terminal and Army SMART-T, nuller performance, and Y2K operations over the ground-based Milstar MDR payload. All tests were successfully completed with no Navy deficiencies.

(U) Army SCAMP terminal, Navy NESP terminals and Air Force ground command post terminals located at Ft Bragg, San Diego and Ft McPherson, respectively, are participating in SCAMP FOT&E to close the interoperability COI with plain text voice, modified rhyme testing (voice intelligibility) and teletype messages being exchanged.

(U) The Advanced EHF program is currently being defined through the ORD (Dec 98) and DAB (Apr 99) process. This enhanced capability is planned for FY 06.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

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8. (U) Threshold Breaches (Cont'd):

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

MDR Operational Testing has been delayed from April 99 to November 99. Navy testing is dependent upon the Milstar Flight 3 satellite launch. Milstar Flight 3 launch originally scheduled for 27 Jan 99 has been postponed to 5 May 99.

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate	
System Definition/Concept Demo (CEB) (3 Contractors)	OCT 79	OCT 79	OCT 79	
FSD Approval (Milestone II) (2 Contractors)	JAN 82	JAN 82	JAN 82	
PDR Complete	NOV 82	NOV 82	NOV 82	
CDR Complete	JUN 84	JUN 84	JUN 84	
Downselect (1 Contractor)	MAR 86	MAR 86	MAR 86	
Factory Acceptance Test	JAN 88	JAN 88	JAN 88	
Operational Assessment (OTIIA)	MAR 88	MAR 88	MAR 88	
Program Review (Low Rate Initial Prod)	MAY 89	MAY 89	MAY 89	
Operational Evaluation (OTIIB)	JUN 90	JUN 90	JUN 90	
Low Rate Initial Production First Delivery	JUL 92	AUG 92	AUG 92	
Additional Operational Testing (OTIIC)	JUL 92	JUL 92	JUL 92	
Milestone III (Full Rate Production)	DEC 92	DEC 92	APR 93	
First Unit Equipped Start	JAN 93	JAN 93	JAN 93	
Service Depot Support Date	FEB 94	FEB 94	FEB 94	
Organic Support Capability Date	FEB 94	FEB 94	FEB 94	
Initial Operational Capability (Navy)	JAN 94	JAN 94	APR 94	
FOT&E	MAR 94	MAR 94	AUG 94	
Follow-On Procurement RFP Release	JAN 97	JAN 97	JUL 97	
MDR Applique Award	OCT 97	OCT 97	JAN 98	
MDR Operational Test	OCT 98	OCT 98	NOV 99	(Ch-1)
Milestone IV	FEB 99	FEB 99	N/A	(Ch-2)

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

b. Current Change Explanations --

(U) (Ch-1) MDR Operational Testing has been delayed from April 99 to November 99. Navy testing is dependent upon the Milstar Flight 3 satellite launch. Milstar Flight 3 launch originally scheduled for 27 Jan 99 has been postponed to 5 May 99. The Program Deviation Report and a Baseline change to follow.

(U) (Ch-2) Milestone IV is no longer a required milestone per the DOD 5000.2R. It will be deleted from the baseline in the next revision.

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10. (U) Performance Characteristics:

a. Performance --

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Survivability	(b)(1)			
Transient Overpressure (psi)				
Neutron Fluence (neutrons/cm^2)				
Gamma Dose Rate (rads) (si)/(sec)				
Total Gamma Dose (rads) (si)				
Gamma Dose Initial (rads) (si)				
Thermal Fluences				
1 MT yield (cal/cm^2)				
EMP (peak at antenna)				
Eo Field (volts/meter)				
Ho Field (amps/meter)				
Resistance to Jamming				
Shore (EIRP) (dBW)				
Shore (G/T) (dBi)				
Ship (EIRP) (dBW)				
Ship (G/T) (dBi)				
Sub (EIRP) (Wet Radome) (dBW)				
Sub (G/T) (Wet Radome) (dBi)				
Low Probability of Intercept (CEVR) (75bps/minimum power)				
Ship (nmi)				
Sub (nmi)				
Submarine				
Surface				
Shore				
Reliability (All Terminals) (hrs)				
Maintainability (MTTR) (hrs)				
Minimum Essential Communications				
Ship (1^0 Spot) (bps) (sv)				

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10a. (U) Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
1 Ship (1^0 Spot)	(b)(1)			
1 (bps) (TTY)				
1 Receive Only (bps)				
1 data				
1 Sub (1^0 Spot)				
1 (bps) (sv)				
1 Sub 3.6^0 Agile				
1 (bps) (TTY)				
1 Shore (EC) (bps)				
1 (sv)				
1 Send Only (bps)				
1 data				
1 Send Only (bps)				
1 (TTY)				
1 FLTB CST (bps) (TTY)				
1 Medium Data Rate				
1 Effective Isotropic				
1 Radiated Power (EIRP)				
1 Shore (10 Ft. Ant.)				
1 (dBw)				
1 Shore (6 Ft. Ant.)				
1 (dBw)				
1 Ship (4 Ft. Ant.)				
1 (dBw)				
1 Ship (3 Ft. Ant.)				
1 (dBw)				
1 Sub (9.5 in. Ant.)				
1 (dBw) (Wet Radome)				
1 G/T				
1 Shore (10 Ft. Ant.)				
1 (dBk)				
1 Shore (6 Ft. Ant.)				
1 (dBk)				
1 Ship (4 Ft. Ant.)				
1 (dBk)				
1 Ship (3 Ft. Ant.)				
1 (dBk)				
1 Sub (9.5 in. Ant.)				
1 (dBk) (Wet Radome)				
1 Maximum Aggregate				
1 Data Rate				
1 Shore (10 Ft. Ant.)				
1 (kBPS)				
1 Shore (6 Ft. Ant.)				
1 (kBPS)				
1 Ship (4 Ft. Ant.)				
1 (kBPS)				

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10a. (U) Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
1 Ship (3 Ft. Ant.) (kBPS)	(b)(1)			
2 Sub (9.5 in. Ant.) (kBPS)	(b)(1)			

(U) The results of the OT-111B are documented in COMOPTEVFOR report Scr. 611/5049 of December 19, 1996. OT-111B test results verified that the performance of the NESF terminal meets or exceeds APB Thresholds.

(b)(1)

(U) Entries shown for Performance Characteristics under "Demonstrated Performance" have been tested at values equal to or better than the Approved Program Objective/Threshold.

(U) Acronyms:

bps - bits per second

cal - calories

cm - centimeters

CEVR - Circular Equivalent Vulnerability Radius

dBi - logarithmic ratio of directional power relative to a spherical (isotropic) radio frequency radiator

dBW - logarithmic ratio relative to one watt

EIRP - effective isotropic radiated power

G/T - antenna receive gain/temperature of receive system (figure of merit)

nmi - nautical miles

sec - seconds

rads(si)/sec - radiation dose (square inches)/second

sv - secure voice

TTY - Teletype

hrs - hours

FLTBCST - Fleet Broadcast

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10b. (U) Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	457.4	457.4	494.4
Procurement	1395.2	1395.2	1315.0
Terminals	(991.7)		(1002.6)
Other Weapon Sys	(127.9)		(100.1)
Peculiar Support	(40.7)		(34.4)
Initial Spares	(234.9)		(177.9)
Construction (MILCON)	24.0	24.0	7.7
Acquisition O&M	0.0	0.0	0.0
Total FY 90 Base-Year \$	1876.6	1876.6	1817.1
Escalation	497.1	497.1	267.8
Development (RDT&E)	(6.0)	(6.0)	(16.5)
Procurement	(486.3)	(486.3)	(250.4)
Construction (MILCON)	(4.8)	(4.8)	(0.9)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2373.7	2373.7	2084.9
b. (U) Quantity --			
Development (RDT&E)	7	7	7
Procurement	386	386	352
Total	393	393	359

(U) Note: RDT&E units are fully configured

[U] A total of 116 EHF terminals were procured under LRIP, exceeding 10% of total production. Three one-year LRIPs were approved by the Navy Acquisition Executive as the Navy terminal program was ahead of Milstar Satellite schedules as well as Army and Air Force terminal program schedules.

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
None.

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12. (U) Unit Cost Summary:

	UCR Baseline (MAR 93 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 90 BY\$)	1876.6	1817.1	
(2) Quantity	393	359	
(3) Unit Cost	4.775	5.062	+6.01
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 90 BY\$)	1395.2	1315.0	
(2) Quantity	386	352	
(3) Unit Cost	3.615	3.736	+3.35

(U) None.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	463.4	1881.5	28.8	2373.7
Previous Changes:				
Economic	-6.3	-178.0	-0.6	-184.9
Quantity	-	+22.0	-	+22.0
Schedule	+23.9	+39.3	-	+63.2
Engineering	+35.5	+33.7	-	+69.2
Estimating	-2.9	+26.8	+0.8	+24.7
Other	-	-	-	-
Support	-	-86.7	-20.4	-107.1
Subtotal	+50.2	-142.9	-20.2	-112.9
Current Changes:				
Economic	-1.4	-10.5	-	-11.9
Quantity	-	-142.9	-	-142.9
Schedule	-	+7.5	-	+7.5
Engineering	-	-	-	-
Estimating	-1.3	+32.2	-	+30.9
Other	-	-	-	-
Support	-	-59.5	-	-59.5
Subtotal	-2.7	-173.2	-	-175.9
Total Changes	+47.5	-316.1	-20.2	-288.8
Current Estimate	510.9	1565.4	8.6	2084.9

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

(U) Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	457.4	1395.2	24.0	1876.6
Previous Changes:				
Quantity	-	+18.7	-	+18.7
Schedule	+12.1	+23.6	-	+35.7
Engineering	+24.3	+23.8	-	+48.1
Estimating	+0.6	+15.3	+0.5	+16.4
Other	-	-	-	-
Support	-	-49.5	-16.8	-66.3
Subtotal	+37.0	+31.9	-16.3	+52.6
Current Changes:				
Quantity	-	-96.5	-	-96.5
Schedule	-	+5.5	-	+5.5
Engineering	-	-	-	-
Estimating	-	+20.5	-	+20.5
Other	-	-	-	-
Support	-	-41.6	-	-41.6
Subtotal	-	-112.1	-	-112.1
Total Changes	+37.0	-80.2	-16.3	-59.5
Current Estimate	494.4	1315.0	7.7	1817.1

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised inflation indices. (Economic)	N/A	-1.4
Adjustment for current and prior year inflation. (Estimating)	0.0	+0.2
Revised estimate for terminal upgrades in the outyears. (Estimating)	0.0	-1.5
RDT&E Subtotal	0.0	-2.7
(2) <u>Procurement</u>		
Revised inflation indices. (Economic)	N/A	-16.7
Quantity decrease of 49 terminals, 19 MDR appliques, and 64 NECCs. (Quantity)	-96.5	-142.9
Revised procurement schedule for terminals and other equipment. (Schedule)	+5.5	+7.5
Revised estimates for hardware procurement based on contract data and installation costs for MDR appliques based on detailed installation analysis. (Estimating)	+20.5	+30.2
Economic adjustment for negative program change. (Economic)	N/A	+6.2
Revised initial spares costs associated with reduced terminal quantities. (Support)	-41.6	-59.5

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

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

Adjustment for current and prior year
inflation. (Estimating)

0.0 12.0

Procurement Subtotal

-112.1 -173.2

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.04	-0.55	+0.24	+0.20	+0.19	+0.15	--	-0.46	-0.23	5.81

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.87	-0.54	+0.14	+0.13	+0.10	+0.17	--	-0.42	-0.42	4.45

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	JAN 82	JAN 82
Milestone III	N/A	N/A	DEC 92	APR 93
FUE/IOC	N/A	N/A	JAN 94	APR 94
Total Cost	N/A	N/A	2373.7	2084.9
Total Quantity	N/A	N/A	393	359
Prog Acq Unit Cost	N/A	N/A	6.04	5.81

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

a. Procurement --
 (U) EHF Terminals:
 RAYTHEON COMPANY, MARLBOROUGH, MA
 N00039-82-C-0146, FFP
 Award: February 14, 1990
 Definitized: February 14, 1990

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$83.7	N/A	24

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$414.0	N/A	269	\$414.0	\$414.0

Explanation of Change:

(U) The current contract Price and Estimated Price At Completion increased in 1998 as a result of a modification to the Production Contract to exercise an option to procure additional terminals.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY82-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-07)	<u>Total</u>
RDT&E	410.5	8.5	7.4	84.5	510.9
Procurement	1053.0	152.0	99.8	260.6	1565.4
MILCON	8.6	-	-	-	8.6
O&M	-	-	-	-	-
Total	1472.1	160.5	107.2	345.1	2084.9

b. Annual Summary -- NAVY EHF SATCOM PROGRAM

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY90 Dollars Nonrec</u>	<u>Flyaway FY90 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1982				22.3	17.2
1983				30.2	24.4
1984				29.7	24.8
1985				38.0	32.8
1986				23.9	21.2

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				37.4	34.2
1988				42.8	40.4
1989				27.9	27.4
1990				19.8	20.3
1991				16.2	17.2
1992				30.3	33.1
1993				23.2	25.9
1994				12.7	14.5
1995				17.1	19.8
1996				11.4	13.4
1997				11.4	13.6
1998				12.3	14.8
1999				12.7	15.5
2000				6.9	8.5
2001				5.9	7.4
2002				5.3	6.7
2003				6.0	7.8
2004				6.0	8.0
2005				6.1	8.2
2006				38.9	53.8
Subtotal	7			494.4	510.9

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990	3		6.6	4.0	4.3
1991	1		2.0	1.2	1.3
1992	1		2.2	2.0	2.3
1993	9		19.6	12.0	13.9
1994	7		26.7	11.5	13.7
1995				6.7	8.0
1996	3		7.2	15.0	18.2
1997				4.9	6.0
1998	15		27.3	19.4	24.3
1999	1		1.8	5.6	7.1
2000	4		6.7	8.0	10.3
2001	2		3.2	5.2	6.8
2002	6		10.6	9.6	12.9
2003	5		7.9	11.8	16.2
2004	6		9.4	8.5	11.9
2005	2		3.4	5.1	7.3

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

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2006				2.9	4.3
2007				1.2	1.8
Subtotal	65		134.6	134.6	170.6

(U) "Flyaway" costs include installation amounts in the year in which the equipment is procured. "Total Base Year" and "Total Then Year" costs reflect installation in the year in which funds are budgeted.

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989		4.3	4.5	8.8	9.1
1990	21	17.4	44.7	119.2	127.5
1991	37	2.8	71.5	98.2	106.9
1992	53	1.8	118.9	137.2	154.0
1993	54	1.0	110.5	111.0	126.0
1994	58	0.4	138.6	93.3	107.4
1995			1.1	48.2	56.5
1996	7		16.7	46.2	54.8
1997		7.8	5.0	61.7	74.0
1998	1	7.2	21.9	39.6	48.0
1999	15	1.8	57.2	73.1	89.7
2000	14	1.0	77.1	113.6	141.7
2001	15		61.5	73.4	93.0
2002	7		31.5	61.3	79.1
2003	3		36.7	53.9	70.9
2004	2		24.5	32.9	44.2
2005			0.6	8.8	12.0
Subtotal	287	45.5	822.5	1180.4	1394.8

(U) "Flyaway" costs include installation in the year in which equipment is procured. "Total Base Year" and "Program" costs reflect installation in the year in which funds are budgeted. Also, "Flyaway Rec" numbers include production of upgrades such as MDR upgrades for retrofit into NESF terminals in the year in which the funds are budgeted.

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

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				7.7	8.6
Subtotal				7.7	8.6

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	359	45.5	957.1	1817.1	2084.9

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	7	7
Procurement	246	246

(U) Percent Total Program Quantities Delivered: 70.5%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1153.3

(U) Percent Total Program Expended: 55.3%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

(U) Operating and support costs are the sum of all costs resulting from the operation, maintenance, and support of the terminals after acceptance into the Navy inventory. The operating costs are the sum of the cost of operating personnel and facilities, in addition to energy and software maintenance. The prime equipment inventory objective consists of 211 Ship, 72 Submarine, 60 Shore, and 9 Training.

(U) Support costs include the following: (1) corrective maintenance labor and material at Organizational/Intermediate (O/I) and depot levels, (2) packaging and shipping costs incurred as a result of shipping failed and repaired items between organizational and depot level maintenance facilities, (3) preventive maintenance labor and material costs, (4) Support and Test equipment maintenance and material costs, (5) O/I and depot level maintenance shop spare costs, (6) O/I and depot level inventory storage costs, (7) documentation maintenance costs, (8) replenishment spare costs, (9) supply system management costs and, (10) the cost of training operators and O/I and depot level maintenance personnel.

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

(U) Source of data: Program Life Cycle Cost Estimate (PLCCE) prepared for MS III approval decision granted April 1993.

(U) There is no Antecedent System for this program.

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg. Annual Cost Per Terminal	N/A
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	18.0	0.0
Intermediate Maintenance	39.0	0.0
Depot Maintenance	41.0	0.0
Contractor Support	0.0	0.0
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	98.0	0.0

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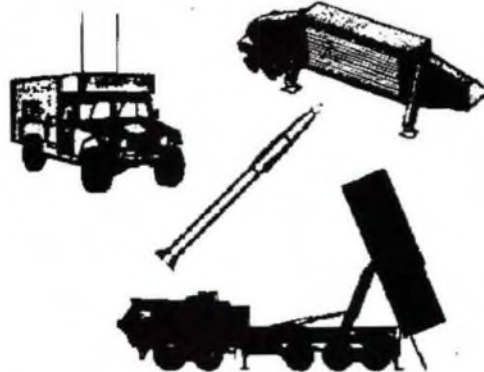
SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: THAAD System

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Theater High Altitude Area Defense (THAAD) System

2. (U) DoD Component: BMDO

Joint Participants:

The Department of the Army is the Executing Agency

3. (U) Responsible Office and Telephone Number:

THAAD Project Office	COL Louis P. Deeter
P.O. Box 1500	Assigned: May 17, 1996
Huntsville, AL 35807-3801	DSN 645-2169; COMM (256) 955-2169
	deeterl@thaad-md.army.mil

(U) Ballistic Missile Defense Organization, The Pentagon	LTG Lester Lyles, USAF
Washington, DC 20301-7100	Assigned: August 1, 1996
	DSN 223-3025 COMM (703) 693-3025

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

RDT&E:

(U)	PE 0603216C (Shared)	Project A2104, A2210, A3304
(U)	PE 0603861C	Project A2260, M2260
(U)	PE 0603862C	Project A2154
(U)	PE 0603872C	
(U)	PE 0604218C (Shared)	Project , S2260

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4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) PE 0604861C Project M2260

5. (U) References:

SAR Baseline (Planning Estimate):

(U) ADM, dated January 28, 1992, subject: ADM for Upper Tier Theater Missile Defense System (UTMDS) Program

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated March 10, 1998.

6. (U) Mission and Description:

(U) The mission of the Theater High Altitude Area Defense (THAAD) System is to defend against Theater Ballistic Missiles (TBMs) at long ranges and high altitudes. THAAD's long range capability will protect U.S. and allied Armed Forces, broadly dispersed assets and population centers against TBM attacks. THAAD's capability to intercept at high altitudes allows multiple intercept opportunities and will significantly mitigate the effects of weapons of mass destruction. The THAAD System consists of missiles, launchers, radars, battle management/command, control, communications, and intelligence (BM/C3I) units, and support equipment. The THAAD radar utilizes state-of-the-art radar technology to accomplish its required functions of threat attack early warning, threat type classification, interceptor fire control, external sensor cueing, launch and impact point estimation, and kill assessment after intercept. The User Operational Evaluation System (UOES) consists of 4 launchers, 2 BM/C3I units, 2 radars, and support equipment. The Program Definition & Risk Reduction contract option for acquisition of UOES missiles will not be exercised and has been replaced with a Risk Reduction/contingency (RR/c) program. The RR/c program is focused on reducing risk in the development of the objective system missile and making needed design improvements for testability, reliability, and producibility. Up to twenty RR/c missiles will be acquired to support ground testing and RR/c flight testing planned in early Engineering, Manufacturing and Development. The UOES will be used for early operational assessment and testing, allowing the user to influence the design in the development process. Additionally, the UOES will be available (with the best missiles available at the time) for a Commander-in-Chief to consider deploying during a national emergency. The THAAD System does not replace another system.

7. (U) Executive Summary:

(U) The Theater High Altitude Area Defense (THAAD) System (formerly Upper Tier Theater Missile Defense System) requirement was initiated as a Concept Definition Program in 1990. The THAAD System was approved at Milestone Decision Review I in January 1992 for the Demonstration/Validation (Dem/Val) Acquisition Phase I.

The Ground Based Radar (GBR) Program evolved from the Ballistic Missile Defense

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7. (U) Executive Summary (Cont'd):

Organization (BMDO) Terminal Imaging Radar (TIR) Project which supported the BMDO in their sensor programs. The TIR program changed into the GBR-X in January 1988 and was again restructured to support near term goals of the Missile Defense Act of 1991 to include Theater Missile Defense (TMD) and Strategic Defense System protection against limited attacks.

The THAAD and TMD-GBR Project Offices merged on June 30, 1995, forming the THAAD System Project Office.

A \$2.1B reduction in funding over the Future Years Defense Plan in the FY 1997 President's Budget resulted in a major restructure of the program. This restructure redefined the Objective System design and delayed the First Unit Equipped (FUE) from FY 2002 to FY 2006.

The lack of an intercept on Flight Test 07 resulted in another restructure of the program. Based on the recommendations of Independent Review Teams, the number of Program Definition & Risk Reduction (PDRR) flights increased from eleven to thirteen.

THAAD has conducted eight flight tests to date. Flight Tests 01-03 were non-intercept missions. Beginning with Flight Test 03, THAAD began the process of integrating the segments into the flights, so that starting with Flight Test 07 the integrated system has been tested. While an intercept has not been achieved, valuable data have been collected from each flight and incorporated into the program. The lack of an intercept on Flight Test 08 resulted in further reviews that concluded the missile design is sound.

The December 22, 1998 OSD budget decision, received January 26, 1999, provided guidance resulting in a restructure of the THAAD program. This restructure reflects the impact of the Flight Test 08 failure and fiscal constraints. As a result, the RDT&E period of performance was extended and FUE is delayed from FY 2006 to FY 2007. THAAD is currently undergoing extensive rebaselining activities. The availability of missiles to support a contingency deployment during a national emergency prior to FUE is still subject to the results of the restructuring effort. Additionally, the guidance realigned THAAD and Navy Upper-Tier funding to establish a new "Upper-Tier" Program Element (0604218C). By November 2000, the Department will evaluate the progress of these programs and make a decision to designate a "lead" program and allocate funding required to achieve an objective FUE of FY 2007.

Consistent with this approach, the THAAD program has adopted a strategy for success based upon successful flight test results in the remainder of the PDRR phase. If THAAD is designated as the "Lead" Upper Tier program, the funding necessary to ensure an FUE in 2007 will be allocated from the Upper Tier Program Element. Prior to receiving the OSD budget decision, THAAD had received verbal direction to go from an FUE 2006 to an FUE 2008 based on expected FY 1999 reduced funding and fiscal constraints. The funds from the Upper Tier Program are required to accelerate THAAD from an FUE 2008 program to the desired FUE 2007 program. The estimate for RDT&E funding in this report reflects this strategy and includes the President's Budget lines for THAAD PDRR

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7. (U) Executive Summary (Cont'd):

and Engineering, Manufacturing and Development, the THAAD portion of the Upper Tier Program Element, and a portion of the remaining Upper Tier funding line.

The restructured program, with an FUE in FY 2007, results in a breach to the RDT&E cost and to the schedule baselines. Through the Integrated Product Team (IPT) process, the program is being rebaselined and cost reduction initiatives are being aggressively explored. Some of the most promising candidates for cost reduction have begun, or funding support is being actively sought. Those not yet decided on include: Radar low cost T/R module development, Prime Vendor Support, and hardware reductions. Over 75% of the Missile trade studies for the Missile Requirements Review are directed at cost reduction. The THAAD Project Office is working directly with Lockheed Martin Missiles & Space (LMMS), in a partnering arrangement, to ensure a lower cost system. A joint THAAD/LMMS CAIV Implementation Plan has been developed. This partnering effort is a new Acquisition Reform initiative that promises to forge a "Best Product at Least Cost" business arrangement.

The next THAAD flight test (Flight Test 09) is currently scheduled for second Quarter FY 1999. Considerable effort has been expended on review of components and system checkout in preparation for Flight Test 09.

This is an RDT&E-only SAR in accordance with Title 10, United States Code, Section 2432, "Selected Acquisition Reports".

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Schedule: Adjustments were required to accommodate schedule delays due to Flight Test program results. Flight Test 08 failure, the resulting

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8c. (U) Threshold Breaches (Cont'd):

investigation and implementation of new engineering fixes and quality control measures; and fiscal constraints contributed to the schedule slip. The proposed extension of the Program Definition & Risk Reduction (PDRR) test program, combined with fiscal constraints, causes a breach to the APB schedule parameters for Low Rate Initial Production Review, Milestone III, and Full Rate Production Contract Award.

RDT&E Cost: The Current Estimate reflects the budget requirements for the Project Manager's First Unit Equipped 2007 program. When final adjustments are made to the budget, in the FY 2001 budget submission, the APB RDT&E cost threshold will be breached as shown. A new APB reflecting the program restructure is being developed and will undergo departmental review and staffing through the Integrated Product Team (IPT) process to be submitted no later than May 28, 1999 in accordance with the Under Secretary of Defense Acquisition and Technology memorandum of February 25, 1999.

9. (U) Schedule:

a. Milestones --

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Army Concept Definition Studies Complete	MAY 92	MAY 92	MAY 92
Milestone I Review	JAN 92	JAN 92	JAN 92
THAAD Dem/Val Contract Award	JUN 92	JUN 92	SEP 92
GBR Dem/Val Contract Award	JUN 92	SEP 92	SEP 92
Integrated System Test Start	JUL 95	OCT 95	SEP 95
System Delivery Complete (Less Missiles and Radars)	JUL 96	N/A	N/A
Delivery of Optional 40 UOES Missiles Complete	TBD	N/A	N/A
Milestone II DAB Review	JUL 96	JUL 99	APR 00 (Ch-1)
THAAD EMD Contract Award	AUG 96	JUL 99	MAY 00 (Ch-1)
GBR EMD Contract Award	AUG 96	N/A	N/A
LRIP Review	FEB 99	JAN 04	APR 05 (Ch-1)
Milestone III DAB Review	JUL 01	JAN 07	OCT 08 (Ch-1)
Full Rate Production Contract Award	N/A	FEB 07	JAN 09 (Ch-1)
FUE	JUL 01	SEP 06	AUG 07 (Ch-1)
IOC	TBD	TBD	TBD

(U) Project Manager's current estimate reflects a preliminary First Unit Equipped (FUE) 2007 program resulting from current OSD funding guidance.

FUE - one firing battery
IOC - will be identified at MSII

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

b. Current Change Explanations --

(U) (Ch-1) Due to delays in the flight test schedule, Milestone II DAB Review was changed from JUL 1999 to APR 2000, THAAD EMD Contract Award changed from JUL 1999 to MAY 2000. Additionally, due to fiscal constraints, LRIP Review changed from JAN 2004 to APR 2005, Milestone III changed from JAN 2007 to OCT 2008, Full Rate Production Contract Award changed from FEB 2007 to JAN 2009, and FUE changed from SEP 2006 to Aug 2007.

10. (U) Performance Characteristics:

a. Performance --

	Planning Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
Protection	(b)(1)			
Effectiveness (Kill % Probability of success %) (Non-air- breathing Threat)				
Defended Radius (km)				
Single Shot Engagement Kill Probability (%)				
Simultaneous Engagements				
Chemical, Biological and/or Conventionally Armed				
Nuclear Armed				
Track Handling Capacity				
Threat Range (km)				
Threat Reentry Velocity (km/sec)				
ATBM Lethality				
High Altitude Air- breathing Threat (Hard Kill)				
System Response Time (min)	3	N/A	/ N/A	TBD
Transportability	C130	N/A	/ N/A	TBD
Operational Availability (Ao)	(b)(1)			
Manpower	1200	N/A	/ N/A	TBD
Nuclear Survivability	TBD	N/A	/ N/A	TBD

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10a. (U) Performance Characteristics (Cont'd):

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(1) Degree of Protection (Leakage)	(b)(1)			
(2) Defended Area-Battery (Equivalent Area)				
(3) Target Set				
(4) Lethality				
Interoperability	N/A	Integ- / TADIL J ration / as the into a / Proto- Joint / col for Compos- / Joint ite / TBMD Track- / Mes- ing / sages Network /	TBD	Tadil J ***

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10a. (U) Performance Characteristics (Cont'd):

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(S) Lethality	(b)(1)			

(U) * These performance characteristics are not among the six KPPs validated by the JROC on January 15, 1998 and thus were not included in the revised APB approved on March 10, 1998. Although they are still ORD requirements for the system, they are no longer required for program tracking purposes.

** These performance characteristics were renamed and are provided in the JROC validated six KPPs of the new ORD.

*** These six KPPs were validated by the JROC on January 15, 1998 and included in the revised APB approved on March 10, 1998. These KPPs supercede Approved Performance Characteristics from previous APBs.

b. Current Change Explanations -- None

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11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	3165.2	5499.6	6434.9
Procurement	0.0	N/A	
Total Flyaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 88 Base-Year \$	3165.2	5499.6	6434.9
Escalation	1158.5	1851.2	2257.9
Development (RDT&E)	(1158.5)	(1851.2)	(2257.9)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	4323.7	7350.8	8692.8
b. (U) Quantity --			
Development (RDT&E)	0	40	0
Procurement	<u>0</u>	<u>N/A</u>	<u>0</u>
Total	0	40	0

(U) RDT&E development quantity. The User Operational Evaluation System missile concept has been modified from an option to build 40 missiles of the Program Definition & Risk Reduction (PDRR) design, to a plan to develop, test and build up to 20 missiles of the Risk Reduction/contingency (RR/c) missile design, which is on the Objective System design growth path and increases reliability, testability and producibility. The RR/c missiles will be to support ground testing and RR/c flight testing planned in early Engineering & Manufacturing Development (EMD).

c. (U) Foreign Military Sales --

The potential exists for Foreign Military Sales of the THAAD System, where European, Mideast, or Asian countries would use THAAD as an upper tier capability essentially providing defense of entire countries. There has been considerable interest from various countries. These interests will be developed at the appropriate time.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	4323.7	-	-	4323.7
Previous Changes:				
Economic	-449.6	-	-	-449.6
Quantity	-	-	-	-
Schedule	+1136.5	-	-	+1136.5
Engineering	+1241.6	-	-	+1241.6
Estimating	+1098.6	-	-	+1098.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+3027.1	-	-	+3027.1
Current Changes:				
Economic	-66.2	-	-	-66.2
Quantity	-235.6	-	-	-235.6
Schedule	+1053.3	-	-	+1053.3
Engineering	+139.6	-	-	+139.6
Estimating	+450.9	-	-	+450.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1342.0	-	-	+1342.0
Total Changes	+4369.1	-	-	+4369.1
Current Estimate	8692.8	-	-	8692.8

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

(U) Summary (FY 1988 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	3165.2	-	-	3165.2
Previous Changes:				
Quantity	-	-	-	-
Schedule	+707.0	-	-	+707.0
Engineering	+850.8	-	-	+850.8
Estimating	+776.6	-	-	+776.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+2334.4	-	-	+2334.4
Current Changes:				
Quantity	-168.4	-	-	-168.4
Schedule	+684.3	-	-	+684.3
Engineering	+102.5	-	-	+102.5
Estimating	+316.9	-	-	+316.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+935.3	-	-	+935.3
Total Changes	+3269.7	-	-	+3269.7
Current Estimate	6434.9	-	-	6434.9

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-81.7
Economic adjustment for negative program change. (Economic)	N/A	+15.5
Reduced planned number of User Operational Evaluation System missiles from 40 to 0 due to decision not to exercise contract option. (Quantity)	-168.4	-235.6
21 month extension of RDT&E period of performance (POP): extend PDRR 10 mos (JUL99 to APR00) due to FT-8 impact; extend EMD POP/further delay start of EMD flight tests 11 mos (NOV03 to OCT04) (Schedule)	+684.3	+1053.3
Engineering change to provide for up to 20 RR/c test missiles as a transition to the objective system design. (Engineering)	+102.5	+139.6
Adjustment for Current and Prior Inflation. (Estimating)	+17.0	+22.2
Rephased radar development and revised cost estimates using PDRR actuals. (Estimating)	+299.9	+428.7
RDT&E Subtotal	+935.3	+1342.0

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	JAN 92	N/A	N/A	JAN 92
Milestone II	JUL 96	N/A	N/A	APR 00
Milestone III	JUL 01	N/A	N/A	OCT 08
FUE/IOC	JUL 01	N/A	N/A	AUG 07
Total Cost	4323.7	N/A	N/A	8692.8
Total Quantity	N/A	N/A	N/A	0
Prog Acq Unit Cost	N/A	N/A	N/A	0

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

(U) The TMD Targets Program Contract DASG60-92-C-0217 meets the 90% complete criteria to discontinue reporting, and as a result, is not included in the December 1998 SAR.

a. RDT&E --

(U) THAAD PDRR:

Lockheed Martin Msl&Space, Sunnyvale CA
DASG60-92-C-0101, CPFF
Award: September 4, 1992
Definitized: September 4, 1992

Initial Contract Price
Target Ceiling Qty

\$688.9 N/A 0

Current Contract Price
Target Ceiling Qty
\$1342.1 N/A 0

Estimated Price At Completion
Contractor Program Manager
\$2130.0 \$2183.1

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THAAD System, December 31, 1998

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-11.0	\$-10.6
Cumulative Variances To Date (12/27/98)	<u>\$-53.4</u>	<u>\$-2.0</u>
Net Change	\$-42.4	\$8.6

Explanation of Change:

(U) Additional flight failure analysis, program analysis by independent review teams, and delays in equipment deliveries and flight schedule have contributed to the negative cost variance. The negative variance in Program Definition and Risk Reduction has been somewhat offset by the positive variances for risk mitigation efforts resulting from underruns due to delays in staffing up to the proper level of support required.

Schedule variance indicates an improvement, primarily due to a program replan to reflect the revised flight test program. Remaining schedule variance is due to flight test delays.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY92-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RD&E	3740.9	611.6	559.7	3780.6	8692.8
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3740.9	611.6	559.7	3780.6	8692.8

b. Annual Summary -- THAAD System

Appropriation: 0400 - RD&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY88 Dollars Nonrec</u>	<u>Flyaway FY88 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1992				101.0	119.6
1993				325.0	393.6
1994				567.7	701.1
1995				515.7	649.3
1996				395.9	506.5
1997				424.4	549.6
1998				296.6	387.3

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THAAD System, December 31, 1998

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

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY88 Dollars Nonrec	Flyaway FY88 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999				328.3	433.9
2000				455.7	611.6
2001				410.4	559.7
2002				652.7	905.0
2003				528.0	745.9
2004				470.8	679.1
2005				369.0	543.4
2006				280.3	421.5
2007				181.8	279.1
2008				118.9	186.3
2009				12.7	20.3
Subtotal				6434.9	8692.8

(U) Funding Explanation:

Per OSD guidance, a new program element (Upper-Tier Program) was established with outyear funds realigned from the THAAD Program and the Navy Upper-Tier. THAAD Program performance will be assessed in early FY 2001, at which time the Upper-Tier Program funds will be available for completion of the THAAD Program. This estimate reflects the use of RDT&E funds in the Upper-Tier Program Element 0604218C (FY 2002 - FY 2009) as part of the RDT&E budget for the First Unit Equipped FY 2007 THAAD program.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total				6434.9	8692.8

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 2905.9

(U) Percent Total Program Expended: 33.4%

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THAAD System, December 31, 1998

18. (U) Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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N-15 MIDS-LVT

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: MIDS-LVT

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Multifunctional Information Distribution System - Low Volume Terminal (MIDS-LVT)

2. (U) DoD Component: Navy

Joint Participants:
Army/Air Force

3. (U) Responsible Office and Telephone Number:

PEO for Space, Comms & Sensors
MIDS Program (PMW 101)
4201 Pacific Highway
San Diego, CA 92110-3215

CAPT Thomas B. Russell
Assigned: May 28, 1998
DSN 524-7776; COMM 619-524-7776
russellt@spawar.navy.mil

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MAR 17 1999

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

RDT&E:

(U)	PE 0205604N (Shared)	LINK-16 Project P2126
(U)	PE 0207130F (Shared)	F-15 Project
(U)	PE 0207133F (Shared)	F-16 Project
(U)	PE 0207134F (Shared)	ESC Project
(U)	PE 0603713A (Shared)	Project , D370
(U)	PE 0604503N (Shared)	Project X1411
(U)	PE 0604771D (Shared)	Project P773

PROCUREMENT:

(U)	APPN 3080 ICN 0207130F (Air Force) (Shared)
(U)	APPN 3010 ICN 0207133F (Air Force) (Shared)

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

No Security
to Class
action
MAR 17 1999
Office
Naval
Dept.

Derived from: ~~MIDS Security Classification Guide, dated 10 JUN 94~~
~~Downgrade instructions: OADR~~
~~Declassify on: OADR X1~~

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MIDS-LVT, December 31, 1998

4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) APPN 3010 ICN 0207134F (Air Force) (Shared)
(U) APPN 2035 ICN 0208864C (Army) (Shared)
(U) APPN 1506 ICN 3105250000 (Navy) (Shared)
(U) APPN 1611 ICN 3321220000 (Navy) (Shared)
(U) APPN 1611 ICN 3330360000 (Navy) (Shared)
(U) APPN 1810 ICN 3426140000 (Navy) (Shared)
(U) APPN 1810 ICN 3431300000 (Navy) (Shared)

5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline dated March 8, 1994.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated May 4, 1998.

6. (U) Mission and Description:

(U) The Multifunctional Information Distribution System (MIDS) is a Joint Service (Army, Air Force and Navy) multinational (U.S., France, Germany, Italy and Spain) cooperative development program established to design, develop and deliver low volume, lightweight tactical information system terminals for U.S. and Allied fighter aircraft, bombers, helicopters, ships, submarines, and ground sites. MIDS is designed as a Pre-Planned Product Improvement (P3I) to the JTIDS Time Division Multiple Access (TDMA) Class 2 terminal. The goal of the MIDS program is to produce a terminal that is smaller, lighter, highly reliable, interoperable with JTIDS Class 2, compatible with all the Participants' designated platforms, affordable, and reconfigurable to individual user needs and budgets. To this end, three principal configurations of the MIDS terminal are being developed using an open, modular architecture. MIDS-LVT (1) includes voice, TACAN, and variable power transmission with maximum power of 200 watts, as defined in U.S. Navy MIDS ORD 337(1)-06-95. MIDS-LVT (2) is an Army variant of MIDS tailored to be a functional replacement for the more expensive JTIDS Class 2M, as defined in the Army ORD 08023 dated 15 July 1996. MIDS-LVT (3) is a reduced function terminal for the Air Force (no voice, no TACAN, and a maximum power of 50 watts), as defined in Air Force ORD CAF 315-92-I-A. The MIDS architecture will allow the cost effective tailoring of other production variants to specific user needs.

The MIDS-LVT terminal does not replace an existing DoD system.

7. (U) Executive Summary:

(U) The MIDS program is primarily structured around two contractual efforts, a Joint Service, International Engineering, Manufacturing and Development (EMD) contract and a separate contract for the Air Force to procure a reduced function, MIDS terminal.

The EMD contract was awarded to an international consortium composed of

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7. (U) Executive Summary (Cont'd):

companies from the U.S., France, Italy, Germany, and Spain. The governments of the EMD participants are committed to cooperative development as documented in the Program Memorandum of Understanding (PMOU). The PMOU identifies the U.S. as the host nation, governs program management, and delineates cost share allocation. The U.S. share of the cost allocation is 41%. The Milestone II DAB ADM was signed December 17, 1993, authorizing contract award, initiating a 6-month study of options to reduce Engineering, Manufacturing and Development (EMD) phase program cost and schedule, and directing the incorporation of Measures of Effectiveness (MOEs) into the MIDS TEMP. The contract was awarded on March 18, 1994. The program was restructured and the MIDS contract modified to incorporate the results of the six-month study. New exit criteria was promulgated in a USD(A&T) memorandum of October 5, 1994. Army memorandum (PEO-COMMS) of April 11, 1995 requested development of a MIDS variant to replace the more costly JTIDS Class 2M.

The Air Force procurement for the MIDS-LVT (3), Fighter Data Link (FDL), was competitively awarded to Data Link Solutions, a joint venture of GEC-Marconi-Hazeltine and Rockwell Collins, on September 30, 1996. The contract qualifies and produces a reduced function LINK-16 terminal for the F-15C/D/E aircraft platforms; uses the JTIDS software and interfaces previously developed for the F-15C/D aircraft. The contract contains not-to-exceed (NTE) priced options for the initial qualification program, pilot and rate production lots (up to 500 terminals), warranty through April 2002, and Contractor Logistics Support (CLS) for five years after the warranty expires.

A contract modification with Data Link Solutions was exercised to award 50 Pilot Production terminals on September 14, 1998. An RFP was released January 20, 1999 for the first production option award of 200 terminals; award expected August/September 1999. Fifty-one of the 200 terminals are planned by the Air Force Air National Guard (ANG) for ANG F-15 A/B aircraft.

To date, 33 MIDS EMD terminals have been delivered, 19 of which have been provided to the contractor for CDT&E. These terminals are being used in support of contractor testing and government integration, installation, and test programs. MIDS-LVT (1) Electromagnetic Environmental Effects (E3) testing in the F/A-18 aircraft completed on December 7, 1998. First flight for TACAN performance verification was conducted in January 1999. Carrier Suitability and initial Environmental Control System (ECS) testing is scheduled to complete in February 1999. Integration and testing activities are progressing for U.S. platforms. EMD terminal first flight on the F/A-18 was completed January 1999.

The MIDS-LVT (3) has completed an Early Operational Assessment of MIDS along with COMSEC, TEMPEST, Reliability and preliminary qualification tests (EMC, vibration, temperature, and crash safety). COMSEC certification was granted by the National Security Agency (NSA) for the MIDS-LVT (3) on 16 September 1998. In addition, demonstration of the EMC features was successfully completed on 6 October 1998. Reliability testing of two MIDS-LVT (3) qualification terminals is progressing. As of December 1998, the total cumulative hours exceed 2000 on two terminals with no significant failures.

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7. (U) Executive Summary (Cont'd):

The EMD contract is Cost Plus Incentive Fee/Award Fee (CPIF/AF) and has continued to experience a negative cost growth during the past year, consistent with the variance initially recognized in May 1996. The Program Manager's current estimate at completion projects a worst case cost variance of \$70M, of which the U.S. share is 41%, \$28.7M. The EMD contract has continued to experience schedule slips in planned work completion, warranting increased efforts and reassessment of priorities to ensure conclusion of all key requirements within the EMD contract performance period ending December 31, 1999.

Restructuring of the program has generated significant changes in the fiscal year quantities, budget profile, and program cost estimate for the MIDS Program, which are reflected throughout the data contained within this report. Of note is a recent change to the FY99 OPN appropriation for the procurement of MIDS. Due to the restructured program, the plan to procure eight MIDS terminals for ships using FY99 funds has been revised to procure Joint Tactical Information Distribution System (JTIDS) units for near term requirements. The MIDS replacement units have been added to the procurement profiles for FY07 and FY08.

A revision to the Acquisition Strategy Report (ASR) is near completion and will be disseminated for final review and approval at the end of February 1999. Although the revised ASR has not yet been approved, it is based on concurrence from the MIDS Overarching Integrated Product Team (OIPT) in November 1998 to restructure the production acquisition strategy that was approved December 1996. Accordingly, this report reflects the contents of the revised ASR, which plans a Low Rate Initial Production (LRIP) decision in February 2000 and a production contract award in March 2000. Currently, the European entity is planning a sole source contract for production in early calendar year 2000 that will be awarded by the U.S. contracting agency. Throughout production, the Europeans will still maintain co-sharing with the U.S. of other production support elements including configuration management and software support. These arrangements are currently being negotiated as part of Supplement 3 to the PMOU.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

As of December 31, 1998, the MIDS Program expects the completion of several schedule elements to deviate by more than six months from the current approved baseline. No cost deviations are expected. The Program Manager presented a revised production acquisition strategy to the Overarching Integrated Product Team (OIPT) November 10, 1998. The revised strategy is driven by the MIDS EMD contractor's slips in terminal delivery schedule, contractor testing, and Technical Data Package (TDP) development. The OIPT concurred with canceling the January 1999 LRIP decision meeting, and postponement of a competitive contract award until FY00.

A revised Acquisition Strategy Report is being finalized with the participation of the Integrating Integrated Product Team (IIPT). Upon approval, the current APB will be updated to reflect the restructured program. A Program Deviation Report (PDR) is in process and will be submitted to ASN (RD&A) by March, 1999.

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MIDS-LVT, December 31, 1998

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
	DEC 93	DEC 93	DEC 93	
Milestone II (DAB)				
Development Contract Award				
LVT Contract Award	DEC 93	MAR 94	MAR 94	
LVT(2) Modification	N/A	AUG 95	AUG 95	(Ch-1)
LVT(3) Qual Contract Award	N/A	SEP 96	SEP 96	(Ch-1)
F/A-18 Integration Contract Award (NAVAIR)	MAR 94	N/A	N/A	(Ch-2)
Critical Design Review (MIDS Terminal)	DEC 95	N/A	N/A	(Ch-2)
Critical Design Review				
LVT	N/A	NOV 95	NOV 95	(Ch-1)
LVT(2)	N/A	FEB 97	FEB 97	(Ch-1)
First EMD Terminal Delivery				
LVT	N/A	DEC 97	FEB 98	
LVT(2)	N/A	MAY 98	OCT 98	(Ch-1)
LVT(3)	N/A	FEB 98	MAY 98	(Ch-1)
First EMD Flight	JUN 98	N/A	N/A	(Ch-2)
Initial Carrier Suitability	N/A	NOV 98	FEB 99	(Ch-1)
IOT&E Complete				
LVT	N/A	SEP 99	JAN 00	(Ch-1)
LVT(2)	N/A	APR 99	OCT 99	(Ch-1)
LVT(3)	N/A	AUG 98	JUL 99	(Ch-1)
TECHEVAL				
Start	JUN 00	N/A	N/A	(Ch-3)
Complete	JUN 00	N/A	N/A	(Ch-3)
OPEVAL				
Start	DEC 00	N/A	N/A	(Ch-3)
Complete	DEC 00	N/A	N/A	(Ch-3)
Low-Rate Initial Production First Delivery	OCT 00	N/A	N/A	(Ch-3)
Program Review DAB for LRIP	JUN 01	DEC 98	FEB 00	(Ch-2)
LRIP Production Contract Award	N/A	APR 99	MAR 00	(Ch-1)
Milestone III (Navy)				
LVT	N/A	DEC 99	OCT 00	(Ch-1)
LVT (2)	N/A	JUL 99	OCT 00	(Ch-1)
LVT (3)	N/A	DEC 99	DEC 99	(Ch-1)
Full Rate Production Contract Award	JUN 01	N/A	N/A	(Ch-3)
Initial Operational Capability				
LVT	N/A	DEC 00	OCT 01	(Ch-2)
LVT(2)	N/A	SEP 00	NOV 01	(Ch-1)
LVT(3)	N/A	APR 00	JUN 00	(Ch-1)
Organic Support Capability Date	JUN 03	N/A	N/A	(Ch-3)
Service Depot Support Date	JAN 04	JAN 04	MAR 05	(Ch-2)

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MIDS-LVT, December 31, 1998

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

b. Current Change Explanations --

(U) (Ch-1) Reflects the schedule milestones that were added by the revised APB approved May 4, 1998. These milestones address changes to the restructured MIDS program that resulted from adding Air Force and Army requirements to the existing Navy program.

Milestone

Development Contract Award	
LVT (2) Modification	Aug 95
LVT (3) Qual Contract Award	Sep 96
Critical Design Review	
LVT	Nov 95
LVT (2)	Feb 97
First EMD Terminal Delivery	
LVT (2)	Oct 98
LVT (3)	May 98
Initial Carrier Suitability	Feb 99
IOT&E Complete	
LVT	Jan 00
LVT (2)	Oct 99
LVT (3)	Jul 99
LRIP Production Contract Award	Mar 00
Milestone III (Navy)	
LVT	Oct 00
LVT (2)	Oct 00
LVT (3)	Dec 99
Initial Operational Capability	
LVT (2)	Nov 01
LVT (3)	Jun 00

(Ch-2) Primarily reflects changes to the current estimate that resulted from restructuring the existing Navy program to address Air Force and Army requirements. The estimated change for Program Review DAB for LRIP, Initial Operational Capability, and Service Depot Support Date result from canceling the January 1999 LRIP decision and postponement of a competitive contract award until FY00.

Milestone

	<u>From</u>	<u>To</u>
F/A-18 Integration Contract Award	Jul 94	N/A
Critical Design Review (MIDS terminal)	Nov 95	N/A
First EMD Flight	Jul 98	N/A
Program Review DAB for LRIP	Dec 98	Feb 00
Initial Operational Capability		
LVT	Dec 00	Oct 01
Service Depot Support Date	Jan 04	Mar 05

(Ch-3) These milestone dates were formerly Navy specific dates for the F/A-18 platform, program now encompasses Air Force, Army, and Navy

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MIDS-LVT, December 31, 1998

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

requirements for all three variants of MIDS.

<u>Milestone</u>	<u>From</u>	<u>To</u>
TECHEVAL		
Start	May 99	N/A
Complete	Jun 99	N/A
OPEVAL		
Start	Jul 99	N/A
Complete	Aug 99	N/A
Low Rate Initial Production		
First Delivery	Sep 00	N/A
Full Rate Production Contract Award	Dec 99	N/A
Organic Support Capability Date	Jul 03	N/A

10. (U) Performance Characteristics:

a. Performance --

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>		<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>	
Link 16 Waveform	N/A	STANAG	/ STANAG	TBD	STANAG	(Ch-1)
		4175	/ 4175		4175	
Message Standard	N/A	STANAG	/ STANAG	TBD	STANAG	(Ch-1)
		5516	/ 5516		5516	
Maximum Power						
Transmission (w)						
LVT	N/A	200	/ 200	TBD	200	(Ch-1)
LVT(2)	N/A	200	/ 200	TBD	200	(Ch-1)
LVT(3)	N/A	50	/ 40	TBD	50	(Ch-1)
Coded Data Rate (Kbps)						
Standard Packing	28.8	28.8	/ 28.8	TBD	28.8	
Packed 2 DP	57.6	57.6	/ 57.6	TBD	57.6	
Packed 4 DP	115.2	115.2	/ 115.2	TBD	115.2	
Relay Range (nm)	1200	1200	/ 500	TBD	1200	
Communication Range (NM)	300	300	/ 300	TBD	300	
Voice Channels	2	2	/ 1	TBD	2	
Coded Message Error Probability (%)	1	1	/ 2	TBD	1	
Jam Resistance (db)	(b)(1)	(b)(1)		TBD	(b)(1)	
Ao	.9	.9	/ .9	TBD	.9	
MTBF (hr) (lab)						
LVT	1000	1000	/ 1000	TBD	1000	(Ch-1)
LVT(2)	N/A	1000	/ 1000	TBD	1000	(Ch-1)
LVT(3)	N/A	1500	/ 1000	TBD	1500	(Ch-1)
MFHBMCF (hr) (field)	300	N/A	/ N/A	TBD	N/A	(Ch-1)
MTTR (O-level) (min)	30	30	/ 30	TBD	30	
Volume (dm3)	16.4	16.4	/ 16.4	TBD	16.4	
Weight (kg)						
LVT	29.5	29.5	/ 29.5	26.8	29.5	(Ch-1)

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MIDS-LVT, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>	
LVT(2)	N/A	40.0 / 40.0	40.0	40	(Ch-1)
LVT(3)	N/A	23.6 / 29.5	TBD	23.6	(Ch-1)

(U) Acronyms:

DM3 - Cubic Decimeters

DP - Double Pulse

KBPS - Kilobytes per second

KG - Kilograms

MFHBMCF - Mean Flight Hours Between Mission Critical Failures

MTBF - Mean Time Between Failures

MTTR - Mean Time to Repair

NM - Nautical miles

b. Current Change Explanations --

(U) (Ch-1) Reflects the revised APB approved May 4, 1998. The revised APB addresses unique characteristics of each variant of the MIDS and also adds and deletes performance characteristics in accordance with current requirements:

<u>Performance Characteristics</u>	<u>From</u>	<u>To</u>
Link 16 Waveform	N/A	STANAG 4175
Message Standard	N/A	STANAG 5516
Maximum Power Transmission (w)		
LVT	N/A	200
LVT (2)	N/A	200
LVT (3)	N/A	50
MTBF (hr) (lab)	1000	N/A
LVT	1000	1000
LVT (2)	N/A	1000
LVT (3)	N/A	1500
MFHBMCF (hr) (field)	300	N/A
Weight	29.5	N/A
LVT	29.5	29.5
LVT (2)	N/A	40.0
LVT (3)	N/A	23.6

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11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	481.1	593.5	601.2
Procurement	443.8	615.9	550.5
Prime Mission Eqmt (PME)	(313.7)		(471.3)
Production Support	(10.5)		(11.6)
Total Flyaway	(324.2)		(482.9)
Other Wpn Sys	(55.7)		(20.4)
Peculiar Support	(6.6)		(2.5)
Initial Spares	(57.3)		(44.7)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 92 Base-Year \$	924.9	1209.4	1151.7
Escalation	194.6	225.9	200.4
Development (RDT&E)	(51.9)	(69.2)	(64.5)
Procurement	(142.7)	(156.7)	(135.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	1119.5	1435.3	1352.1
b. (U) Quantity --			
Development (RDT&E)	42	63	64
Procurement	630	2358	2374
Total	672	2421	2438

(U) Note: The total planned MIDS procurement quantities experienced a slight increase in 1998, although the procurement quantity for the Army decreased.

Procurement costs reflect the costs for which the MIDS program office and PEO-SCS have direct responsibility for execution; these are terminal development, terminal production and support, and the integration and test of MIDS in U.S. Navy platforms. Costs of platform installation and platform kits, and USAF and Army platform integration and testing of MIDS, are to be included in the respective budgets and baseline agreements of the various platforms which are implementing MIDS.

Low Rate Initial Production (LRIP) quantities will be procured for platforms that have not completed operational testing; Full Rate Production (FRP) will be authorized for those platforms that have successfully completed operational testing. The total planned LRIP quantity is 452 terminals, 19% of the total planned procurement, and is comprised of the following quantities per platform. The F/A-18 quantities in FY99, FY01, and FY02 will be LRIP for a total of 199 terminals. The F-16 quantities in FY99, FY01, and FY02 will be LRIP for a total of 217 terminals. The Army LVT(2) terminals in FY99 will be LRIP for a total of 36 terminals. All of the USN ship totals starting in FY01 are FRP quantities.

The LRIP quantities will facilitate the transition from development to

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MIDS-LVT, December 31, 1998

11b. (U) Total Program Cost and Quantity (Cont'd):

production and provide the initial production base required to support installation and fielding by the three branches of the military on an array of platforms. Both the LRLP and FRP decisions are platform dependent, and FRP will be requested when a MIDS platform has successfully completed its operational test.

c. (U) Foreign Military Sales --

The following data represents RDT&E funding received from the MIDS International Program Office (IPO) European participants in accordance with the Program Memorandum of Understanding and accompanying Supplements.

(\$M's)					
Years	<u>1994-96</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>Total</u>
France	77.0	26.7	12.0	3.1	118.8
Italy	37.6	20.9	31.9	7.1	97.5
Germany	18.0	5.8	6.6	1.6	32.0
Spain	11.7	8.2	10.2	2.8	32.9
NETMA	10.6	4.1	8.3	0.0	23.0

The current European production strategy provides for a sole source production contract to be awarded in FY00 to a European manufacturer. The Navy will serve as the contracting agency (Space and Naval Warfare Systems Command) and the MIDS IPO will provide acquisition management services. Estimated contract quantities are 1157 MIDS-LVTs including spares at a cost of \$436M (then year). Alternative European production strategies are being pursued, however, that may result in an independent European contract action and reduce the U.S. support currently planned.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

	UCR Baseline (MAY 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 92 BY\$)	1209.4	1151.7	
(2) Quantity	2421	2438	
(3) Unit Cost	0.500	0.472	-5.60
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 92 BY\$)	615.9	550.5	
(2) Quantity	2358	2374	
(3) Unit Cost	0.261	0.232	-11.11

(U) The PAUC and APUC decreases are attributed to the unfunded requirements for the Air Force and Army. Corrective adjustments to provide full funding for required quantities or to reduce quantities to current funding levels will generate an increase in the PAUC and APUC.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	533.0	586.5	-	1119.5
Previous Changes:				
Economic	-12.2	-45.1	-	-57.3
Quantity	-1.3	+663.9	-	+662.6
Schedule	-	-8.8	-	-8.8
Engineering	-6.7	-69.2	-	-75.9
Estimating	+149.9	-320.6	-	-170.7
Other	-	-	-	-
Support	-	-34.1	-	-34.1
Subtotal	+129.7	+186.1	-	+315.8
Current Changes:				
Economic	-4.4	-1.7	-	-6.1
Quantity	-	-251.9	-	-251.9
Schedule	-	+21.5	-	+21.5
Engineering	+6.7	+27.7	-	+34.4
Estimating	+0.7	+151.1	-	+151.8
Other	-	-	-	-
Support	-	-32.9	-	-32.9
Subtotal	+3.0	-86.2	-	-83.2
Total Changes	+132.7	+99.9	-	+232.6
Current Estimate	665.7	686.4	-	1352.1

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

(U) Summary (FY 1992 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	481.1	443.8	-	924.9
Previous Changes:				
Quantity	-0.9	+506.8	-	+505.9
Schedule	-	-	-	-
Engineering	-5.5	-49.5	-	-55.0
Estimating	+118.8	-259.0	-	-140.2
Other	-	-	-	-
Support	-	-26.2	-	-26.2
Subtotal	+112.4	+172.1	-	+284.5
Current Changes:				
Quantity	-	-190.2	-	-190.2
Schedule	-	-	-	-
Engineering	+5.9	+19.8	-	+25.7
Estimating	+1.8	+130.8	-	+132.6
Other	-	-	-	-
Support	-	-25.8	-	-25.8
Subtotal	+7.7	-65.4	-	-57.7
Total Changes	+120.1	+106.7	-	+226.8
Current Estimate	601.2	550.5	-	1151.7

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-5.2
Economic adjustment for negative program change. (Economic)	N/A	+0.8
Increase in funding due to platform support and test requirements (Army). (Engineering)	+5.9	+6.7
Adjustment for Current and Prior Inflation. (Estimating)	+2.4	+2.8
Increased funds needed to extend Production Readiness Agreements due to delays in completing EMD (Defense Agencies). (Estimating)	+2.3	+2.9
Increased funds required for EMD completion and pre-operational support (Defense Agencies). (Estimating)	+8.5	+10.4
Decrease attributed to LINK 16 initiatives (Defense Agencies). (Estimating)	-13.3	-16.5
Increased funds provided to mitigate the impact to F/A-18 installation and integration program caused by delay in production contract award (Navy). (Estimating)	+10.3	+11.8
Decrease attributed to IT-21 initiatives (Navy). (Estimating)	-8.1	-9.6

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Net adjustment due to delta between cost estimate and actual funding (Air Force). (Estimating)	-0.3	-1.1
RDT&E Subtotal	+7.7	+3.0
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-15.2
Economic adjustment for negative program change. (Economic)	N/A	+13.5
Quantity increase of 10 units (Navy). (Quantity)	+3.9	+5.1
Allocation to Schedule variance resulting from Quantity Change (Air Force, Army, Navy). (Schedule)	0.0	+3.5
Allocation to Engineering variance resulting from Quantity Change (Air Force, Army, Navy). (Engineering)	+19.8	+27.7
Allocation to Estimating variance resulting from Quantity Change (Air Force, Army, Navy). (Estimating)	+103.5	+128.4
Quantity decrease of 50 units (Army). (Quantity)	-25.5	-35.9
Quantity decrease of 359 units (Air Force). (Quantity)	-168.6	-221.1
Stretchout of annual procurement buy profile for ships, FY06 through FY08 (Navy). (Schedule)	0.0	+18.0
Adjustment for Current and Prior Inflation. (Estimating)	+2.2	+2.6
Net decrease attributed to changes in cost estimating methodology (Navy). (Estimating)	-4.3	-7.1
Variance attributed to restructured program and delay in contract award (Navy). (Estimating)	-9.5	-12.2
Net increase attributed to changes in cost estimating methodology (Army). (Estimating)	0.0	+0.2
Net funding reduction for administrative costs incurred due to delays in contract award (Army). (Estimating)	-3.2	-3.8
Reallocation of costs related to the planned procurement of 415 MIDS-LVT(3) for the F-15. These costs are now reported separately under appropriation 3080 (Air Force). (Estimating)	-20.9	-25.4

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

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Net adjustment due to delta between cost estimate and the actual funding planned for the procurement of 640 MIDS-LVT for the F-16 (Air Force). (Estimating)	-32.1	-42.7
Reallocation of costs previously reported under appropriation 3010 for the planned procurement of 415 MIDS-LVT(3) for the F-15 (Air Force). (Estimating)	+95.1	+111.1
Reduced sparing requirements as a result of acquisition reform initiatives (Air Force, Army, Navy). (AR)(Support)	-29.8	-39.7
Decreased initial training and reduced hardware requirements for the Software Support Activity (Navy). (Support)	-2.6	-3.1
Increased production support and software maintenance costs (Air Force, Army, Navy). (Support)	+6.6	+9.9
Procurement Subtotal	-65.4	-86.2

AR = Acquisition Reform related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.67	-0.03	-1.04	+0.01	-0.02	-0.01	--	-0.03	-1.12	0.55

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.93	-0.02	-0.51	+0.01	-0.02	-0.07	--	-0.03	-0.64	0.29

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14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	DEC 93	N/A	DEC 93
Milestone III	N/A	N/A	N/A	DEC 99
FUE/IOC	N/A	N/A	N/A	JUN 00
Total Cost	N/A	1119.5	N/A	1352.1
Total Quantity	N/A	672	N/A	2438
Prog Acq Unit Cost	N/A	1.67	N/A	0.55

(U) NOTE: There are three separate MS III and IOC events, one for each variant of the MIDS-LVT. The completion date for each is identified below:

<u>Milestone III</u>	<u>Date</u>
LVT	Oct 00
LVT (2)	Oct 00
LVT (3)	Dec 99
<u>IOC</u>	
LVT	Oct 01
LVT (2)	Nov 01
LVT (3)	Jun 00

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

a. RDT&E --	Initial Contract Price		
(U) <u>MIDS-LVT EMD:</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
MIDSCO, Inc., Wayne, NJ	\$360.1	N/A	60
N00039-94-C-0008, CPIF/AF			
Award: March 18, 1994			
Definitized: March 31, 1994			
Current Contract Price		Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>
\$363.1	N/A	\$474.9	\$483.0
		<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances		\$-31.7	\$-11.9
Cumulative Variances To Date (12/31/98)		\$-53.4	\$-18.1
Net Change		\$-21.7	\$-6.2

Explanation of Change:

(U) The contract value reflects the international effort, including U.S., France, Italy, Germany, and Spain. The EMD contract is 79 percent complete based upon budget at completion. The Contract Budget Baseline (CBB) has increased by \$38.9 million from the previous SAR due to the

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

extension of the contract period of performance from March 1999 until December 1999. The extension modification includes additional technical scope of work changes, additional equipment required for integration of the nations and pre-operational support coverage as approved by the MIDS International Steering Committee.

The Schedule Performance Index (SPI) decreased 0.01 from the previously reported 0.96 to 0.95 which reflects the significant impact of re-planning the performance baseline in accordance with the modification to extend the contract period of performance nine months for EMD. The Cost Performance Index (CPI) has decreased by 0.04 from the previously reported 0.89 to 0.85. This is consistent with the Variance at Completion (VAC) projection.

The PM's current estimates are the result of a joint IPT comprised of IPO, DCMC and the prime contractor MIDSCO. The Variance at Completion is expected to be \$70 million, of which the U.S. share is 41%, \$28.7M. Growth is expected for the MIS (V2 & V3), Core Software, and the Power Amplifier. The November 1998 Steering Committee approved descoping MIS V3 in an effort to contain \$2.7M projected future growth. This decision is under review and may be rescinded in part by the February 1999 Steering Committee which may add back approximately \$1.6M in MIS (V3) scope.

(U) <u>F/A-18 INTEGRATION:</u>			Initial Contract Price		
Boeing, St. Louis, MO			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00019-91-G-0091, CPFF			\$22.5	N/A	0
Award: July 1, 1994					
Definitized: March 1, 1996					

Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$26.8	N/A	0	\$26.8	\$26.8	

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$1.2	\$-1.4
Cumulative Variances To Date (11/30/98)	\$-0.2	\$-0.7
Net Change	\$-1.4	\$0.7

Explanation of Change:

(U) F/A-18: The F/A-18 integration contract (CPFF) was awarded to McDonnell Douglas Aerospace (MDA), now Boeing, to perform the F/A-18 hardware development and integration of the MIDS-LVT A-Kit in July 1994. The contract was definitized in March 1996 at approximately \$22.5 million. A subsequent modification for the development of the Interface Blanking Unit (IBU) increased the target cost to \$26.3 million. The contractor re-baselined the program in July 1998 and increased the contract cost from

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

\$26.3 million to \$26.8 million.

The re-baselined contract reflects a revised period of performance, remaining scope of work on the EMD contract, and additional scope for flight test support activities. The contract baseline reflects the Navy's current plan for ground and flight testing which began in 1998. The reported cumulative cost variance decreased to a negative \$0.2M and the schedule variance improved to a negative \$0.7M. The schedule variance due to delays in Amplifier Control Intercommunications (ACI) testing caused by Digital Communications System (DCS) changes had minimal impact on the overall program.

Extensive software development, integration and test are being performed through a basic ordering agreement between NAWC-WD, China Lake, and Boeing. The software effort is extensive, with an estimate of nearly 100,000 lines of code involved in the integration of MIDS into the F/A-18. A PDR and CDR for the software development has been completed. This effort is also reported to be on schedule for the revised F/A-18 software build and test plan.

b. Procurement --
(U) Data Link Solutions:
Data Link Solutions, Wayne, NJ
N00039-96-C-0038, FFP
Award: September 30, 1996
Definitized: September 30, 1996

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>

\$125.0	N/A	506
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Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$137.0	N/A	512

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$158.0	\$158.0

Explanation of Change:

(U) The MIDS-LVT (3) Fighter Data Link (FDL) contract was competitively awarded to Data Link Solutions, a joint venture of GEC-Marconi-Hazeltine and Rockwell-Collins, on September 30, 1996. The contract qualifies and produces a reduced function Link-16 terminal for the F-15C/D/E aircraft platforms, using the JTIDS interface software previously developed for the F-15C/D aircraft. This contract supports Air Combat Command's urgent need date for reduced function F-15 Link-16 terminals. The competitively awarded contract contains not-to-exceed (NTE) priced options for the initial qualification program, pilot and rate production lots (up to 500 terminals), warranty through April 2002, and Contractor Logistics Support (CLS) for 5 years after the warranty expires.

The initial qualification phase consists of \$3.0M in government costs with the contractor providing all additional required funding (expected \$9.0M of internal contractor financing). This phase provides both the engineering required to certify and qualify the terminal for the F-15C/D/E aircraft, and 6 terminals for government testing.

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

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years (FY90-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	521.2	69.0	30.7	44.8	665.7
Procurement	125.8	27.0	71.2	462.4	686.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	647.0	96.0	101.9	507.2	1352.1

b. Annual Summary -- MIDS-LVT

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990				9.4	9.0
1991				5.1	5.0
1992				16.2	16.5
1993				22.9	23.9
1994				22.0	23.3
1995				45.9	49.6
1996				38.8	42.7
1997				33.1	36.9
1998				40.3	45.2
1999				24.1	27.4
2000				21.8	25.1
2001				10.5	12.3
2002				6.4	7.6
2003				5.7	6.9
Subtotal	26			302.2	331.4

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990				3.0	2.9
1991				4.8	4.7
1992				9.8	10.0
1993				11.9	12.4
1994				21.7	23.0
1995				17.0	18.4
1996				28.2	31.0
1997				25.3	28.2
1998				35.5	39.8
1999				41.9	47.5
2000				38.1	43.9
2001				15.7	18.4
2002				11.2	13.3
2003				14.0	17.0
Subtotal	13			278.1	310.5

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				0.4	0.5
1998				2.1	2.4
1999				5.5	6.3
Subtotal	3			8.0	9.2

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				3.6	4.0
1998				6.8	7.7
1999				2.5	2.9
Subtotal	22			12.9	14.6

(U) NOTE: An estimated USAF shortfall in FY99 of \$10.5M exists to fully fund 9 planned terminals and MIDS production support requirements, including nonrecurring costs.

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	48	12.3	20.4	38.7	44.6
2000					
2001	68	3.0	20.1	28.3	33.7
2002	83	2.8	17.2	24.7	29.9
2003	112		20.5	26.5	32.8
2004	130		22.9	27.8	35.1
2005	112		19.4	21.7	28.0
2006	130		21.9	24.2	31.8
2007	130		23.6	25.8	34.6
2008	117		21.9	24.3	33.3
2009	48		12.0	14.1	19.7
2010	24		8.4	8.9	12.7
Subtotal	1002	18.1	208.3	265.0	336.2

(U) NOTE: This USN appropriation identifies the MIDS-LVT that will be procured for the F/A-18C/D/E/F.

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001	6		1.7	1.8	2.3
2002	6		1.2	1.3	1.7
2003	6		1.0	1.2	1.6
2004	3		0.5	0.6	0.8
2005	4		0.7	0.8	1.1
2006	5		0.8	0.9	1.3
2007	6		1.0	1.3	1.8
2008	7		1.2	1.2	1.8
Subtotal	43		8.1	9.1	12.4

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001	4		1.1	1.8	2.1
2002	11		2.2	2.4	2.9
2003	22		3.8	4.4	5.4
2004	38		6.4	6.9	8.7

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

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2005	40		6.6	7.0	9.0
2006	32		5.1	5.5	7.2
2007	21		3.6	4.0	5.3
2008	7		1.2	1.4	1.9
Subtotal	175		30.0	33.4	42.5

(U) NOTE: Excludes FY99 OPN funding authorized for MIDS-LVT that, as a result of the restructured program, will be used to procure 8 Joint Tactical Information Distribution System (JTIDS) units.

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	36	1.1	8.1	10.4	11.9
2000					
2001					
2002					
2003					
2004					
2005	6		0.7	1.2	1.5
2006	42		7.2	8.9	11.6
2007	6		1.6	2.9	3.9
2008	6		1.6	2.9	3.9
2009	3		1.2	2.4	3.4
Subtotal	99	1.1	20.4	28.7	36.2

(U) NOTE: An estimated shortfall exists in FY99 through FY05 of \$19.3M to fully fund 42 planned terminals and the Army's prorated share of MIDS Program production support requirements, including nonrecurring costs.

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001	66	1.1	14.1	17.5	20.9
2002	142	1.3	25.4	29.4	35.8
2003	153		25.5	28.1	34.9
2004	110		14.2	15.8	20.1

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

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2005	110		13.3	14.6	18.9
2006	59		7.0	7.9	10.4
Subtotal	640	2.4	99.5	113.3	141.0

(U) NOTE: The Air Force procurement quantities include MIDS-LVT for the F-16. An estimated shortfall exists in FY99 through FY05 of \$29.5M to fully fund 640 planned terminals for the F-16 and the Air Force's prorated share of MIDS Program production support requirements, including nonrecurring costs.

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996	6	2.8		2.8	3.1
1997					
1998	46	10.7	15.3	26.8	30.6
1999	149		28.6	30.7	35.6
2000	118		21.3	22.9	27.0
2001	54		9.4	10.2	12.2
2002					
2003					
2004	42		6.9	7.6	9.6
Subtotal	415	13.5	81.5	101.0	118.1

(U) NOTE: This USAF appropriation identifies the MIDS FDL terminals for the F-15C/D/E that are being procured on a separate contract. The quantity funded in FY99 of 149 does not include 51 additional units available on the contract option that may be funded by the USAF Air National Guard F-15A/B platform.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	26			302.2	331.4
Navy	1233	18.1	246.4	585.6	701.6
Army	102	1.1	20.4	36.7	45.4
USAF	1077	15.9	181.0	227.2	273.7
Grand Total	2438	35.1	447.8	1151.7	1352.1

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17b. (U) Delivery/Expenditure Information: (Cont'd):

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	27	14
Procurement	6	6

(U) Percent Total Program Quantities Delivered: 0.8%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 359.9

(U) Percent Total Program Expended: 26.6%

(U) Note: RDT&E deliveries to date are from MIDSCO, Inc. for the MIDS-LVT (1) and MIDS-LVT (2). Procurement deliveries to date are from Data Link Solutions for the MIDS-LVT (3).

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
The O&S Cost portion of the Program Manager Life Cycle Cost Estimate depicted a 13-year support period of 2438 MIDS-LVT terminals installed on numerous U.S. platforms associated with each Service's Link 16 requirement. This period included a phase-in, steady state, and phase-down profile with a terminal operational life estimated to be 20 years. The annual operating hours per aircraft, both Navy and Air Force, for peace time deployment were estimated to be 400. The annual operating hours per ship for peace time deployment was estimated to be 3977. The annual operating hours per Army Ground Air Defense station is estimated to be 2212. The maintenance concept analyzed is based on platform requirements. For Navy aircraft, and Army platforms it is a three level structure (i.e., Organizational, Intermediate/Direct Support, and Depot). For Navy ships and Airforce aircraft platforms it is a two level structure (i.e., Organizational and Depot). Navy aircraft support costs assume the use of the Consolidated Automated Support System (CASS) at the Intermediate level of maintenance. The terminal reliability and maintainability characteristics used are consistent with the requirements contained in the Operational Requirements Document. Other pertinent cost estimates include use of values experienced by analogous systems including JTIDS and the AN/ARC-182 radio. The program office will analyze alternative life cycle support strategies concurrent with preparation for production, with the objective of reducing per unit Operating and Support costs.

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

b. (U) Costs -- (FY 1992 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per MIDS - LVT	Avg Annual Cost Per N/A
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	0.1	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.4	0.0
Contractor Support	5.1	0.0
Sustaining Support	1.5	0.0
Indirect Costs	0.0	0.0
Other ILS	0.0	0.0
Total	7.1	0.0

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: JASSM

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Joint Air-to-Surface Standoff Missile (JASSM)

2. (U) DoD Component: USAF

Joint Participants:
 USAF, USN

3. (U) Responsible Office and Telephone Number:

AAC/YV	SES Terry R. Little
JASSM System Program Office	Assigned: January 2, 1996
102 West D Ave, Suite 300	DSN 872-4785 x3046
Eglin AFB, FL 32542-6807	COMM 850-882-4785 x3046
	little@eglin.af.mil

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

RDT&E:

(U) PE 0207325F
 (U) PE 0604312N
 (U) PE 0604611F

PROCUREMENT:

(U) APPN 3020 ICN 0207325F (Air Force)

SAF/PAS

99--0157

CONGRESSIONAL

99-0547

~~Classified by JASSM Security Classification Policy, 15 Jan 97~~
~~Downgrade instructions Section 1.5.(e)~~
~~Declassify Not Subject to Automatic Downgrade~~

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5. (U) References:

SAR Baseline (Planning Estimate):

(U) Approved Acquisition Program Baseline (Planning) dated June 13, 1996.
No Approved Acquisition Program Baseline (Development) as this is a transition from Planning to Development submission.

Approved Program / Development Estimate (DE):

(U) DAE Approved Acquisition Program Baseline (APB) dated November 9, 1998.

6. (U) Mission and Description:

(U) The Joint Air-to-Surface Standoff Missile (JASSM) is a next generation air-to-surface missile that will enable Air Force and Navy bombers and fighters to destroy the enemy's war-sustaining capabilities from outside the ranges of enemy air defenses. The autonomous precision strike weapon will attack both fixed and relocatable targets ranging from non-hardened above ground to moderately hardened buried point targets. The system will offer reliable performance in world-wide operational environments. The system will also offer low operational support costs. The JASSM does not replace any existing weapon system.

7. (U) Executive Summary:

(U) This is a transition SAR from Planning to Development which includes RDT&E and Production. It is the initial Production submission. The previous submission was RDT&E-only in accordance with 10 USC 2432.

The JASSM program has a central theme: to get the best value for the Government by meeting the users' requirements at an affordable cost and on schedule. The Defense Acquisition Executive (DAE) designated JASSM as a flagship program to demonstrate Cost as an Independent Variable (CAIV). The CAIV concept calls for continuous cost/performance trades throughout the program life cycle in order to strike a balance between performance and affordability.

JASSM downselected to one contractor in April 1998 concurrent with the completion of the Analysis of Alternatives (AoA). JASSM was the clear winner in the AoA. The SECDEF certified the requirement for JASSM to Congress on 9 April, 1998. DoD then released the remainder of the FY98 JASSM/JSLAM funds and the Air Force awarded Lockheed Martin the contract. The contract was for the remainder of Program Definition and Risk Reduction (PDRR) with priced options for Engineering and Manufacturing Development (EMD) and Production Lots 1-5.

Lockheed Martin continued to make good progress completing PDRR efforts prior to Milestone II. Lockheed Martin's accomplishments included a series of flying test bed flights to collect seeker data on representative target scenes in varying weather conditions, warhead sled tests to include Insensitive Munition (IM) testing, structural proof testing and jettison testing for safe separation. Additionally, Lockheed successfully conducted initial catapult and

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7. (U) Executive Summary (Cont'd):

arrested landing testing on the F/A-18 C/D. Catapult and arrested landing testing was particularly important because of its linkage to the carrier operability Key Performance Parameter. In January 1998, an anomaly occurred during a JASSM jettison test on the F-16. The jettison vehicle exhibited an unexpected nose-up attitude shortly after aircraft separation and began to ascend rather than descend. Additionally, the simulation failed to predict what actually happened. Lockheed conducted engineering analysis, altered the airframe's strake design to produce a more nose down attitude at separation, successfully tested the redesign, and corrected the simulation.

The JASSM missile is Y2K compliant. However, the system was required to integrate its mission planning software on the Air Force's Combat Intelligence System (CIS), which is not Y2K compliant. The follow-on to CIS, the Theater Battle Management Core System (TBMCS), is scheduled to be Y2K compliant. The Air Force identified required funding and the migration plan was approved at Milestone II.

JASSM successfully passed Milestone II on 9 November 1998, with an extended EMD schedule, increased EMD budget, and significant decrease in production funding. Shortly before Milestone II, JASSM's Program Director proposed extending the development schedule by six months, from 34 months to 40 months. Low Rate Initial Production was also moved from June 2000 to January 2001. The reasons for the extension included (1) adding more time for ground and captive flight testing before beginning flight test, (2) allowing more time between flight tests for analyzing data and correcting deficiencies and (3) additional time margin for developing B-52 flight software, migrating mission planning software to the TBMCS and maturing JASSM's production configuration. The Overarching Integrated Product Team (OIPT) supported the change as one that would reduce overall program risk. The Air Force funded the schedule extension using funds made available by slipping production into the next fiscal year. Even with the extension, JASSM's development schedule is still only one half the historical experience for weapons of equivalent complexity, and the JASSM program returned more than \$300 million to the Air Force compared with the FY99 President's Budget. By the second quarter of FY99 the program and Lockheed Martin contract will be restructured to incorporate the Milestone II direction.

JASSM continues to realize the benefits of acquisition reform, CAIV initiatives, and the very competitive FFP options for production Lots 1-5. Lockheed Martin as part of their commercial bid strategy offered relatively flat line prices for the contract baseline quantities for Lots 1-5. Lockheed Martin also provided a price matrix for +/- 20% of contract baseline quantities.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program:DE	Current Estimate
Milestone 0	SEP 95	SEP 95	SEP 95
Milestone I	JUN 96	JUN 96	JUN 96
PDRR Contract Award	JUN 96	JUN 96	JUN 96
Milestone II	JUN 98	NOV 98	NOV 98 (Ch-2)
EMD Contract Award	JUN 98	NOV 98	NOV 98
LRIP Decision/Contract Award	JAN 00	JAN 01	JAN 01 (Ch-2)
Lot II Contract Award	APR 01	JAN 02	JAN 02 (Ch-1)
Milestone III	APR 01	JUL 02	JUL 02 (Ch-2)
RAA/B-52	JUN 01	SEP 02	SEP 02 (Ch-2)
RAA/F-16	JAN 03	DEC 03	DEC 03

(U) PDRR - Program Definition and Risk Reduction

RAA - Required Assets Available

RAA for the B-52 is 42 missiles. This is a change from 45 units in the previous SAR and reflects the current ORD.

RAA for the F-16 is 25 missiles

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

b. Current Change Explanations --

(U) The Approved Program represents the Milestone II approved APB.

(Ch-2) The Milestone II decision slipped from September 98 to November 98 due to scheduling conflicts among DAB participants. LRIP Decision/Contract Award moved from June 00 to January 01, Milestone III moved from January 02 to July 02 and RAA/B-52 moved from December 01 to September 02 due additional risk reduction efforts added at Milestone II and subsequent impact on production.

(Ch-1) Lot II Contract Award moved from April 01 to January 02 due to additional risk reduction efforts added at Milestone II and subsequent impact on production.

Notes: Approved APB thresholds for LRIP Decision/Contract Award, Milestone III, RAA/B-52 and RAA/F-16 are one year, not six months. All Current Estimates are within approved thresholds.

10. (U) Performance Characteristics:

a. Performance --

	Planning Estimate (SAR)	Approved Program; DE Obj/Threshold	Demon- strated Perf	Current Estimate
(U) Missile Operational Range (NM)	(b)(1)			
(U) Missile Mission Effectiveness				
Carrier Operability	Yes	Yes	/ Yes	TBD
				Yes

(Ch-1)

b. Current Change Explanations --

(Ch-1) The Program Manager's Current Estimate for MME changed from 24 to 19.8 to correspond with the Contractor's System Performance Specification.

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11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Planning Estimate (SAR)	Approved Program:DE	Current Estimate
a. (U) Cost --			
Development (RDT&E)	732.4	771.1	771.9
Procurement	0.0	960.0	957.1
Flyaway	(0.0)		(910.0)
Other Wpn System Costs	(0.0)		(47.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	18.4	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 95 Base-Year \$	732.4	1749.5	1729.0
Escalation	78.9	323.8	277.1
Development (RDT&E)	(78.9)	(67.5)	(55.9)
Procurement	(0.0)	(249.6)	(221.2)
Construction (MILCON)	(0.0)	(6.7)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	811.3	2073.3	2006.1

(U) Approved Program (APB) represented the Milestone II APB.

Note: Procurement funding does not include Seek Eagle funding of \$19.3M (\$6.4M in FY01, \$3.4M in FY02, \$3.7M in FY04 and \$2.9M in FY05)

b. (U) Quantity --

Development (RDT&E)	44	69	61
Procurement	N/A	2400	2400
Total	44	2469	2461

(U) NOTE: The Development quantity represents the 61 fully-configured RDT&E units for EMD (10 Contractor Development Test and Evaluation (CDT&E) units, 9 Initial Operational Test and Evaluation (IOT&E) units and 42 pre-production operational test units (PPOTUs)). This is a Congressionally-directed decrease of 8 PPOTUs from the Milestone II APB.

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
None.

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12. (U) Unit Cost Summary:

	UCR Baseline (NOV 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	1749.5	1729.0	
(2) Quantity	2469	2461	
(3) Unit Cost	0.709	0.703	-0.85
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	960.0	957.1	
(2) Quantity	2400	2400	
(3) Unit Cost	0.400	0.399	-0.25

(U) This is a transition from Planning to Development submission.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	811.3	-	-	811.3
Previous Changes:				
Economic	-8.9	-	-	-8.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-56.3	-	-	-56.3
Estimating	-143.9	-	-	-143.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-209.1	-	-	-209.1
Current Changes:				
Economic	-7.5	-10.3	-	-17.8
Quantity	+3.6	-	-	+3.6
Schedule	+26.8	+20.8	-	+47.6
Engineering	-	-	-	-
Estimating	+202.7	-41.8	-	+160.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+225.6	-31.3	-	+194.3
Total Changes	+16.5	-31.3	-	-14.8
Adjustments	-	+1209.6	-	+1209.6
Current Estimate	827.8	1178.3	-	2006.1

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

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	732.4	-	-	732.4
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-47.4	-	-	-47.4
Estimating	-125.0	-	-	-125.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-172.4	-	-	-172.4
Current Changes:				
Quantity	+3.4	-	-	+3.4
Schedule	+24.0	+14.8	-	+38.8
Engineering	-	-	-	-
Estimating	+184.5	-17.7	-	+166.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+211.9	-2.9	-	+209.0
Total Changes	+39.5	-2.9	-	+36.6
Adjustments	-	+960.0	-	+960.0
Current Estimate	771.9	957.1	-	1729.0

(U) Note: This is a transition from Planning to Development submission. The Procurement costs approved at Milestone II are being reported for the first time and are reflected by the Adjustment line.

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-7.5
Increase in EMD test assets from 52 to 69 to align with winning contractor's proposal (Quantity)	+6.2	+6.6
Congressional reduction of 8 test assets (Quantity)	-2.8	-3.0
Six Month Development Schedule Increase (Schedule)	+24.0	+26.8
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
Additional funding for Analysis of Alternatives (AOA) (Estimating)	+1.4	+1.5
Adjustment to Navy Program Office support for carrier suitability (Estimating)	+3.6	+4.2

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Adjustment for Current and Prior Inflation. (Estimating)	+4.4	+4.5
Revised Air Force estimate (Estimating)	-9.1	-9.4
Release of Joint Surface Launched Attack Missile (JSLAM) funds to JASSM PE (Estimating)	+38.2	+40.3
Program restructure due to FY98 Congressional budget cut (Estimating)	+53.6	+60.3
Funding alignment with winning contractor proposal (Estimating)	+26.5	+29.0
Additional funding added for risk reduction activities at Milestone II (Estimating)	+65.8	+72.2
 RDT&E Subtotal	 +211.9	 +225.6

(2) Procurement

Revised escalation indices. (Economic)	N/A	-10.3
Revised Air Force estimate. (Estimating)	-17.7	-41.8
Adjustment in Procurement profile due to inflation cuts. (Schedule)	+14.8	+20.8
 Procurement Subtotal	 -2.9	 -31.3

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Plan Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A	--	--	--	--	--	--	--	-17.62	0.82

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Plan Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A	--	--	--	--	--	--	--	--	0.49

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14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	JUN 96	JUN 96	N/A	JUN 96
Milestone II	JUN 98	NOV 98	N/A	NOV 98
Milestone III	APR 01	JUL 02	N/A	JUL 02
FUE/IOC	JUN 01	SEP 02	N/A	SEP 02
Total Cost	811.3	2073.3	N/A	2006.1
Total Quantity	44	2469	N/A	2461
Prog Acq Unit Cost	18.44	0.84	N/A	0.82

(U) SAR Planning Estimate is RDT&E only and as a result of Milestone II, the Development Estimate and the Current Estimate include Production.

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

a. RDT&E --
(U) JASSM PDRR:
Lockheed Martin, Orlando, FL
F08626-96-C-0002, CPFF
Award: June 17, 1996
Definitized: June 17, 1996

Initial Contract Price		
Target	Ceiling	Qty
\$110.1	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$153.4	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$153.4	\$153.4

Previous Cumulative Variances
Cumulative Variances To Date
Net Change

Cost Variance	Schedule Variance
N/A	N/A
N/A	N/A
N/A	N/A

Explanation of Change:

None.

(U) Contract Comments:
Contract Price includes PDRR Phase I and II. Cost Reporting was limited to actuals due to implementation of cost cap. This contract is more than 90% complete and will no longer be reported in the SAR.

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

(U) JASSM PDRR:
McDonnell Douglas Corp., St. Louis MO
F08626-96-C-0281, CPFF
Award: June 17, 1996
Definitized: June 17, 1996

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$126.3	N/A	0

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$125.3	N/A	0

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$125.3	\$125.3

Previous Cumulative Variances
Cumulative Variances To Date
Net Change

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

Explanation of Change:

None.

(U) Contract Comments:

Contract Price includes PDRR Phase I. Cost Reporting was limited to actuals due to implementation of cost cap. This contract is more than 90% complete and will no longer be reported in the SAR.

This contractor's legal name for the PDRR effort is now McDonnell Douglas Corporation, a wholly-owned subsidiary of the Boeing Company.

(U) JASSM EMD:
Lockheed Martin, Orlando, FL
F08626-96-C-0002, CPAF
Award: November 13, 1998
Definitized: November 13, 1998

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$172.5	N/A	0

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$169.5	N/A	0

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$169.5	\$169.5

Previous Cumulative Variances
Cumulative Variances To Date
Net Change

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

Explanation of Change:

None.

(U) Contract Comments:

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

This is the first time this contract is being reported in the SAR. The contract is currently being restructured to include additional risk reduction activities directed at Milestone II. Cost Performance reporting will begin after contract restructure is complete.

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

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

<u>Appropriation</u>	<u>Prior Years (FY96-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-09)</u>	<u>Total</u>
RDT&E	488.3	168.4	73.0	98.1	827.8
Procurement	-	-	45.9	1132.4	1178.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	488.3	168.4	118.9	1230.5	2006.1

b. Annual Summary -- JASSM

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY95 Dollars Nonrec</u>	<u>Flyaway FY95 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1998				5.0	5.3
1999				2.0	2.1
2000				1.8	2.0
2001				1.8	2.0
2002				1.8	2.0
2003				1.8	2.0
2004				1.8	2.1
2005				1.8	2.1
Subtotal				17.8	19.6

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY95 Dollars Nonrec</u>	<u>Flyaway FY95 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				26.7	27.6
1997				153.5	160.7
1998				155.4	163.8
1999				120.8	128.8
2000				153.8	166.4
2001				64.5	71.0

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002				47.9	53.6
2003				18.5	21.1
2004				7.9	9.2
2005				5.1	6.0
Subtotal	61			754.1	808.2

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001	87		35.3	41.0	45.9
2002	91		37.3	43.1	49.1
2003	242		83.3	89.2	103.7
2004	340		114.3	119.5	141.8
2005	346		117.8	123.0	149.1
2006	360		144.6	149.5	184.9
2007	360		144.4	149.2	188.4
2008	360		144.0	148.8	191.9
2009	214		89.0	93.8	123.5
Subtotal	2400		910.0	957.1	1178.3

(U) Note: Procurement funding does not include Seek Eagle funding of \$19.3M (\$6.4M in FY01, \$3.4M in FY02, \$3.7M in FY04 and \$2.9M in FY05)

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy				17.8	19.6
USAF	2461		910.0	1711.2	1986.5
Grand Total	2461		910.0	1729.0	2006.1

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17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 334

(U) Percent Total Program Expended: 16.6%

(U) Expenditures reflect Program Office information as of 31 January 1999.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

Note: This is a transition from Planning to Development submission.

Assumptions: The estimate includes only Air Force requirements. The Navy requirements are not defined. Shelf life is assumed to be 20 years after which the JASSM units will be returned for disposal. JASSM is issued to the Government with a 15 year warranty that covers all failures except acts of God and natural disasters. Included under the warranty are Contractor performed Organizational BIT surveillance testing, Depot level repairs, all repair-induced transportation within CONUS, all systemic defect induced retrofits and software maintenance. WSEP surveillance testing is based on four live firings per year for the life cycle of the weapons. Second destination transportation is based on 65 percent of the weapons remaining in CONUS and 35 percent OCONUS.

b. (U) Costs -- (FY FY95 Constant (Base-Year) Dollars in Millions)

Cost Element	Average Annual Cost Per JASSM	N/A
Mission Pay & Allowances	0.0	N/A
Unit Level Consumption	1.1	N/A
Intermediate Maintenance	0.3	N/A
Depot Maintenance	0.3	N/A
Contractor Support	0.0	N/A
Sustaining Support	1.1	N/A
Indirect Costs	0.1	N/A
Total	2.9	N/A

A-11 CRUSADER

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: Crusader

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Crusader Field Artillery System, XM2001 (Self-Propelled Howitzer) and XM2002 (Resupply Vehicle)

2. DoD Component: Army

3. Responsible Office and Telephone Number:

Project Manager Crusader	COL Charles Cartwright
Attention: SFAE-GCSS-CR	Assigned: July 16, 1998
Picatinny Arsen, NJ 07806-5000	DSN 880-4588; COMM 973/724-4588
	cartwright@pica.army.mil

4. Program Elements/Procurement Line Items:

RD&E:

PE 6.36.45.A	Project D409, DB88
PE 6.38.54.A	Project D505, DC68
PE 6.48.54.A	Project D2KT, D503

5. References:

SAR Baseline (Planning Estimate):

DAE Approved Acquisition Program Baseline dated January 4, 1995.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated October 23, 1997.

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6. Mission and Description:

Crusader will be the indirect fire support system providing direct and general support fires to the maneuver forces on the battlefield. Crusader consists of a self-propelled howitzer (SPH), and a resupply vehicle (RSV). Crusader responds to the battlefield deficiencies identified in the Close Combat Battlefield Functional Mission Area and the Fire Support Battlefield Functional Mission Area and fulfills the need for an indirect fire weapon system that has increased range and can survive through autonomous operations.

Crusader's SPH will provide close, tactical, and operational fires during offensive and defensive operations; have a 155mm primary armament with significantly increased capabilities over the current M109-series fleet; provide increased rate-of-fire, hold more ammunition, be more responsive and survivable on the battlefield, with reduced manpower requirements; provide increased lethality; be deployable worldwide; and, provide for forward maintenance and employ future maintenance concepts.

The companion vehicle to the SPH will be Crusader's RSV. The RSV will sustain the SPH with ammunition and fuel as it provides close, tactical, and operational fires; be a self-propelled armored vehicle with significantly increased capabilities over the current system, the M992A1 FAASV; automate resupply functions; provide increased payload capability, and increased survivability with reduced manpower requirements; enable the SPH to achieve increased lethality levels and achieve independent mission execution; be deployable worldwide; and, provide forward maintenance support and employ future maintenance concepts.

7. Executive Summary:

Early in fiscal year 1995, the Principal Deputy Under Secretary of Defense (Acquisition & Technology) signed the Acquisition Decision Memorandum which approved Crusader to proceed into Program Definition and Risk Reduction (PDRR) phase. The ADM directed the Army plan for a Milestone II DAB or equivalent review, incorporating as many acquisition reform measures as practical.

The Government entered into an Undefined Contract Action to initiate the PDRR efforts of requirements analysis and concepting early in Fiscal Year 1995. The effort was subsequently definitized for the design, fabrication, testing and delivery of two prototype Crusader systems in 1999 and 2000 and completion of PDRR in 2001. The contract engages the expertise of United Defense Armament Systems Division (Minneapolis, Minnesota) as prime contractor, and United Defense Ground Systems Division (San Jose, California), General Dynamics Land Systems (Muskegon, Michigan and Sterling Heights, Michigan), General Dynamics Defense Systems (Pittsfield, Massachusetts), General Dynamics Armament Systems (Burlington, Vermont), Raytheon (Fort Wayne, Indiana and El Segundo, California), Honeywell (Clearwater, Florida and Albuquerque, New Mexico), Alliant (Hopkins, Minnesota), and Electronic Data Systems (Herndon, Virginia) as major subcontractors. The Army Tank-automotive and Armaments Command (TACOM) provides the armament development effort to United Defense, the prime development contractor, through a Memorandum of Agreement between the two parties. The contract is based upon streamlined acquisition initiatives, and integrated product development with "Team Crusader" consisting of each of the contractor team players, the Tank-automotive and Armaments Command, the Army's Project Management Office (Picatinny Arsenal, New Jersey), and the Training and Doctrine Command System Manager (Ft. Sill,

Crusader, December 31, 1998

7. Executive Summary (Cont'd):

Oklahoma).

In March 1996, the Army changed the armament system for Crusader from a liquid propellant-based system to a solid propellant-based system. The solid propellant system selected by United Defense was the congressionally directed Crusader backup armament system developed by the Army Tank-automotive and Armaments Command (Picatinny Arsenal, New Jersey) and Benet Weapons Laboratory (Watervliet, New York). This change was made with due consideration given to the potential benefits of liquid propellant and the technical performance, schedule, and cost risks associated with the development and weaponization of that technology. The PDRR contract was refocused addressing necessary requirements, maturation, and development efforts for a solid propellant-based Crusader.

Crusader continued to apply the concepts of Cost as an Independent Variable (CAIV), which have had a significant impact on program cost estimates. To date, the CAIV efforts on Crusader resulted in attaining 35% of the Design-To-Unit-Rollaway-Costs (DTURC) reduction goal. Additional cost reduction initiatives continue to be identified. There are currently over 100 initiatives in various stages of evaluation. The initiatives have the potential to further reduce cost resulting in a high level of confidence in meeting Crusader's DTURC goal. Intensive management efforts this year have resulted in (a) defining the peacetime OPTEMPO levels that represent significant reductions from the current system, (b) building a Crusader battalion that reflects significant reductions in personnel, and (c) utilizing an Auxiliary Power Unit in lieu of the main engine resulting in reduced fuel usage and maintenance. These results are all indicative of a proactive process whereby cost is a key criterion in all design and programmatic decisions.

The Crusader system development continued to demonstrate significant progress during 1998:

- The PEO/Commandant Review, conducted in March 1998, served to authorize continuation from simulation-based Crusader development to hardware manufacturing and assembly. The predominant accomplishment was the completion of preliminary design and transition to detail design.
- The first Crusader Crew Station trainer was delivered and shown at the Association of the US Army in Washington DC.
- The first objective cannon and turret were delivered to the System Integration Facility (SIF). The cannon was integrated into the turret and testing was initiated.
- Two hulls for PDRR prototype vehicles completed fabrication, and were undergoing assembly. The other two PDRR prototype hulls were in fabrication.
- Three engines and three transmissions were in testing. One engine was mated to a transmission and was undergoing testing as an integrated powerpack in the Propulsion Integration Laboratory at the TACOM in Detroit, Michigan.
- Objective projectile handling equipment was delivered to the SIF and integrated into the subsystem test stand. This equipment was being tested using

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Crusader, December 31, 1998

7. Executive Summary (Cont'd):

emulations based on the actual control algorithms.

- The second System Level Review (SLR2) was conducted in November 1998 to review the technical and program achievements of 1998. The development team concluded at SLR2 that more time was required for electronics and software development. A corrective action plan was jointly developed between the Government and industry to seek alternative approaches. The Program Definition and Risk Reduction efforts will resultantly extend an additional four months.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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9. Schedule:

a. Milestones --

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
ORD Approval	JUN 93	JUN 93	JUN 93
Milestone I ASARC	OCT 94	OCT 94	OCT 94
Milestone I DAB Review	NOV 94	NOV 94	NOV 94
Development Phase I & II Contract Award	JUN 95	DEC 94	DEC 94
First Prototype Delivered	OCT 99	N/A	N/A
Early User Test			
Start	OCT 99	NOV 00	NOV 00
Complete	JAN 00	JAN 01	APR 01 (Ch-1)
Milestone II	APR 00	OCT 00	FEB 01 (Ch-1)
EMD Continuation Decision	N/A	MAR 01	AUG 01 (Ch-1)
Phase III Contract Award	APR 00	MAR 01	FEB 01 (Ch-1)
Critical Design Review (CDR)	JUN 00	N/A	N/A
First Pre-Production Delivery	APR 02	N/A	N/A
Pre-Production Qualification Test			
Start	APR 02	JAN 02	JAN 02
Complete	JUL 03	JUL 03	JUL 03
LRIP IPR	AUG 03	AUG 03	AUG 03
LRIP Contract Award	OCT 03	OCT 03	OCT 03
LRIP First Delivery	OCT 04	N/A	N/A
IOT&E			
Start	JAN 05	MAR 05	MAR 05
Complete	APR 05	JUL 05	JUL 05
First Unit Equipped (FUE)	JUL 05	SEP 05	SEP 05
Organic Support Capability	SEP 05	N/A	N/A
Milestone III DAB Review	OCT 05	NOV 05	NOV 05
Full Rate Production Contract Award	OCT 05	NOV 05	NOV 05
Service Depot Support Date	DEC 06	N/A	N/A
First Full Rate Production Delivery	FEB 07	N/A	N/A

b. Current Change Explanations --

(Ch-1) As a result of the current status of the Program Definition and Risk Reduction efforts, the following milestones have changed from the 1997 SAR:

Milestone	1997 SAR Current Estimate	1998 SAR Current Estimate
Early User Test		
Complete	Jan 01	Apr 01
Milestone II	Oct 00	Feb 01
EMD Continuation Decision	Mar 01	Aug 01
Phase III Contract Award	Mar 01	Feb 01

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Crusader, December 31, 1998

10. Performance Characteristics:

a. Performance --

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
AFAS				
Maximum rate of fire (rds/min)	12 for 3-5 mins	12 for / 10 for 3-5 / 3-5 mins / mins	TBD	10.1-11 (Ch-1) rds for 3-5 mins
Maximum range assisted (km)	50	50 / 40	TBD	40
Cross Country Mobility (with rolling resis- tance of 90 kg per metric ton) (km/hr)	48	48 / 39	TBD	47 (Ch-2)
Highway Mobility (on level hard surface) (km/hr)	78	78 / 67	TBD	67
Mean Time Between System Abort (MTBSA) (hrs)	68	68 / 62	TBD	68
FARV				
Rearm AFAS	60 complet e rds in less than 12 mins	60 / 60 complet/ complet e rds in/ e rds in less / 12 mins than 12/ mins /	TBD	60 complet e rds in 12 mins
Cross Country Mobility (with rolling resis- tance of 90 kg per metric ton) (km/hr)	48	48 / 39	TBD	47 (Ch-2)
Highway Mobility (on hard surface road) (km/hr)	78	78 / 67	TBD	67
Mean Time Between System Abort (MTBSA)	116	116 / 104	TBD	116

Maximum rate of fire varies based upon cannon elevation and propellant charge.

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10b. Performance Characteristics (Cont'd):

b. Current Change Explanations --

(Ch-1) The PM's estimate for maximum rate of fire was changed from 10 rounds for 3 to 5 minutes to 10.1 to 11 rounds for 3 to 5 minutes based upon latest timeline analyses.

(Ch-2) The PM's estimate for cross country speed for the SPH and the RSV was updated from 41 KPH to 47 KPH. The increase in cross country speed resulted from design changes that improved vehicles' cooling system capabilities allowing faster cross country mobility performance.

11. Total Program Cost and Quantity (Dollars in Millions):

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. Cost --			
Development (RDT&E)	2357.0	2471.0	2658.8
Procurement	0.0	N/A	
Total Sailaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 95 Base-Year \$	2357.0	2471.0	2658.8
Escalation	423.0	449.3	246.2
Development (RDT&E)	(423.0)	(449.3)	(246.2)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2780.0	2920.3	2905.0
b. Quantity --			
Development (RDT&E)	0	9	9
Procurement	N/A	N/A	N/A
Total	N/A	9	9

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2780.0	-	-	2780.0
Previous Changes:				
Economic	-195.0	-	-	-195.0
Quantity	+140.0	-	-	+140.0
Schedule	+183.1	-	-	+183.1
Engineering	-	-	-	-
Estimating	+50.8	-	-	+50.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+178.9	-	-	+178.9
Current Changes:				
Economic	-42.4	-	-	-42.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-11.5	-	-	-11.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-53.9	-	-	-53.9
Total Changes	+125.0	-	-	+125.0
Current Estimate	2905.0	-	-	2905.0

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

Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2357.0	-	-	2357.0
Previous Changes:				
Quantity	+118.6	-	-	+118.6
Schedule	+156.2	-	-	+156.2
Engineering	-	-	-	-
Estimating	+38.0	-	-	+38.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+312.8	-	-	+312.8
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-11.0	-	-	-11.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-11.0	-	-	-11.0
Total Changes	+301.8	-	-	+301.8
Current Estimate	2658.8	-	-	2658.8

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-42.7
Economic adjustment for negative program change. (Economic)	N/A	+0.3
Adjustment for Current and Prior Inflation. (Estimating)	+8.9	+9.8
Refinement of estimate due to distributed congressional reductions. (Estimating)	-19.9	-21.3
RDT&E Subtotal	-11.0	-53.9

Crusader, December 31, 1998

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	NOV 94	N/A	N/A	NOV 94
Milestone II	APR 00	N/A	N/A	FEB 01
Milestone III	OCT 05	N/A	N/A	NOV 05
FUE/JOC	JUL 05	N/A	N/A	SEP 05
Total Cost	2780	N/A	N/A	2905
Total Quantity	0	N/A	N/A	N/A
Prog Acq Unit Cost	0	N/A	N/A	N/A

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

a. RDT&E --

Crusader Ph I/II Develop:

United Defense, Minneapolis, MN

DAAE30-95-C-0009, CPIF/AF

Award: December 29, 1994

Definitized: January 29, 1997

Initial Contract Price		
Target	Ceiling	Qty
\$61.4	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$1129.2	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$1184.5	\$

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-22.3	\$-18.5
Cumulative Variances To Date (12/25/98)	\$-41.8	\$-43.1
Net Change	\$-19.5	\$-24.6

Explanation of Change:

Current Contract Price increased by \$12.5 million to \$1,129.2 million. The increase was to incorporate additional contract scope for a Crew Station Trainer and advanced Production Planning.

The increase in schedule variance this reporting period was primarily the result of additional efforts required in defining the software requirements to the element level, multiple design iterations in the powerpack and hull structure configuration needed to attain the required cooling efficiencies, and more time than anticipated for design of the vehicle electronics. These

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15. Contract Information (Cont'd):

delays will likely result in four additional months to complete the Program Definition and Risk Reduction phase of development.

The change to the cumulative cost variance was essentially driven this past year by additional efforts needed to finalize the design and fabricate the armament subsystems, more engineering than anticipated to design the vehicle hull, additional design iterations to attain the cooling necessary for the powerpack, and more efforts than planned to define and develop the system software.

The refinement in the Contractor's Estimated Price at Completion was the result of actual costs to date and better definitions of remaining efforts during the estimating process. The Project Manager's Estimated Price at Completion was omitted because of pending negotiation of authorized unpriced efforts; and, disclosure could jeopardize the negotiating position.

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

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

<u>Appropriation</u>	<u>Prior Years (FY94-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-07)</u>	<u>Total</u>
RDT&E	1096.6	343.9	436.9	1027.6	2905.0
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1096.6	343.9	436.9	1027.6	2905.0

b. Annual Summary -- Crusader

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994				3.8	3.8
1995				64.0	65.0
1996				175.6	181.5
1997				221.4	231.5
1998				285.7	301.2
1999				293.9	313.6
2000				317.4	343.9
2001				396.8	436.9
2002				367.4	411.3
2003				229.2	261.4
2004				258.3	300.8
2005				37.1	44.1
2006				7.8	9.5

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

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2007				0.4	0.5
Subtotal	9			2658.8	2905.0

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	9			2658.8	2905.0

17. Delivery/Expenditure Information:

a. Deliveries To Date - None.

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 844.8

Percent Total Program Expended: 29.1%

18. Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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AF-13 JPATS

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SELECTED ACQUISITION REPORT (WCS: DD-A&T(Q&A)823)
PROGRAM: JPATS

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1. Designation and Nomenclature (Popular Name): Joint Primary Aircraft Training System/JPATS

2. DoD Component: USAF

Joint Participants:
USAF/USN

3. Responsible Office and Telephone Number:

Aeronautical System Center/YT
Wright-Patterson AFB
Dayton, OH 45433-7014

COL ROBERT C. HOOD
Assigned: May 15, 1996
DSN 785-2896; COMM (937) 255-2896
robert.hood@yt.wpafb.af.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 060320BN (Shared) Project H1150
PE 0604233F (Shared) Project 654102
PE 64233F (Shared) Project 644102

PROCUREMENT:

APPN 3010 ICN 0804740F (Air Force)
APPN 1506 ICN 0804745N (Navy)

MILCON:

PE 0804741F
PE 0805796N

O&M:

PE 0804741F

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5. References:

SAR Baseline (Development Estimate):

Program Management Directive 1104(15)

PE64233F/PE84740F/84741F Dated April 24, 1996

Operational Requirements Document dated August 15, 1993, Change 2 dated June 6, 1994.

DAE Approved Acquisition Program Baseline dated August 4, 1995

Approved Program:

cae Approved Acquisition Program Baseline (APB) dated December 31, 1997.

6. Mission and Description:

The Joint Primary Aircraft Training System (JPATS) is a joint USAF/USN program to replace the USAF's T-37B aircraft and the USN's T-34C aircraft and their associated Ground Based Training Systems (GBTS). The aircraft and GBTS will be used to train entry-level students in the fundamentals of flying so they can transition into advanced training tracks leading to qualification as military pilots, navigators, and Naval Flight Officers.

The program includes the purchase of aircraft, simulators, associated ground-based training devices, training management systems, instructional courseware, and logistics support. The USAF will train at 5 bases and the USN at 3 bases. The USAF will have contractor logistics support for the off-aircraft equipment maintenance. The GBTS will be a total contractor logistics support (CLS) effort. The on-equipment maintenance will be performed by third party contractor or organically supported. The USN will employ total CLS for the entire aircraft and GBTS.

7. Executive Summary:

Program History

In Feb 89 the DoD Trainer Masterplan was approved documenting the Joint Air Force/Navy near and long term primary aircraft training requirements.

In Dec 90 the Mission Need Statement was validated by the Joint Requirements Oversight Council. The Joint Services Operational Requirements Document was published.

In Jan 93 the DAB conducted a Milestone 0/I Review. Milestone 0 was approved with the Air Force designated lead service. Milestone I was approved contingent upon completion of several actions prior to Request for Proposal (RFP) release.

In Jan 94 the Updated Operational Requirements Document (ORD) II was released.

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7. Executive Summary (Cont'd):

In May 94 the Source Selection began with the RFP release to industry. The flight evaluation phase began in Jul 94, and was successfully completed in Sep 94. In Jun 95 the Source Selection Authority was briefed and the winner, Raytheon Aircraft Company (RAC), was announced on 22 Jun 95, by the Secretary of the Air Force. Protests (2) were filed following the announcement and the contract award was delayed.

In Aug 95 the JPATS Milestone II DAB was conducted and all documentation was approved. The ADM was signed on 9 Aug 95, allowing the JPATS contract award to proceed once the protests were resolved. JPATS was redesignated an Acquisition Category 1C program.

In Nov 95 the GAO released its decision on the Rockwell protest, all allegations were denied. In Feb 96 the GAO released their decision on the Cessna protest, all allegations were denied and the contract was awarded. The first production lot option (Lot II for 3 aircraft) was exercised on 14 Feb 96.

In May 96, SAE/AQ approved the GBTS strategy of RAC conducting a dual-competitor, seven month effort to refine GBTS component requirements through analysis and early prototyping. RAC selected Flight Safety Services Corporation (FSSC) as their GBTS subcontractor and the development effort started in Jul 97.

A successful Air Vehicle Preliminary Design Review (Jun 96) and Critical Design Review (Nov 96) were conducted.

The Lot III production option (6 aircraft) was awarded in Sep 96.

ORD II Rev 1 (May 96) increased aircraft procurement quantities from 711 to 740 with no service specific quantity breakout.

The Lot IV production option (15 aircraft) was awarded in Apr 97.

Bombardier of Canada reached an agreement with RAC in Dec 97 to purchase 24 T-6A aircraft for NATO Flight Training Canada (NFTC).

Program Activity Since Last Report

The program office awarded the Lot V option on 20 Feb 98 for 22 aircraft.

Rollout of aircraft T-1 (PT-4) was completed on 29 May 98 and the first flight of T-1 was completed on 15 Jul 98. P-1, the second aircraft (first production aircraft), rolled off the production line on 14 Aug 98 and successfully completed a full acceptance flight on 1 Sep 98 with no write-ups. P-2 rolled off the production line on 16 Sep 98 and completed its first engine run on 20 Sep 98 and its first flight on 14 Oct 98. P-3 became the first aircraft to be painted (30 Oct 98) and is expected to complete first flight in Feb 99. P-4 through P-13 are in various stages of assembly on the factory floor.

The GBTS System Design Review (SDR) was completed on 4 Mar 98. The Aircrew

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7. Executive Summary (Cont'd):

Training Devices and Operational Support Segment Preliminary Design Reviews (PDRs) were conducted. The JPPT syllabus PDR and Critical Design Review were completed.

The program completed final egress system sled tests for specification compliance at China Lake NAS. Detailed data analysis has been completed and the weight range of pilots for safe ejection is being expanded to 103 - 245 pounds.

FY99 Appropriations Act cut \$10M of \$36.2M from AF procurement funds for the Ground Based Training System (GBTS). This level of funding will not allow the execution of FY99 contract options as planned to install Training Information Management System (TIMS) at all 7 AETC pilot training bases. TIMS supports all flight training (not just T-6A training) and was planned for full operation at all bases in FY01. Program office and AETC are prioritizing TIMS installations; Navy installations are not affected but Navy costs may increase. Execution of the directed program content requires restoral of funds; schedule has already been impacted because funds were not restored in FY00.

RAC demonstrated the T-6A aircraft and examples of the courseware and simulator visuals to the Hellenic Air Force (HAF) from 31 Aug to 4 Sep 1998. RAC announced on 9 Oct 98 that they were selected as the winner of the competition and will produce 45 aircraft and associated GBTS elements for the HAF.

NOTE: The new procurement quantities identified in ORD II, Rev 1 are NOT reflected in the current SAR. The revised ORD calls for the purchase of 740 aircraft without specifying service quantities. This SAR documents the last official position (USAF - 372 aircraft, USN - 339 aircraft). Upon resolution of service quantities, the PMS estimate will be updated to match ORD II (Rev 1).

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8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

Total Procurement Costs exceed APB threshold (5%) by 1%. A Program Deviation Report and revised APB will be submitted within 90 days.

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
Milestone 0/I	JAN 93	N/A	JAN 93	
Milestone II	AUG 95	N/A	AUG 95	
Low Rate Initial Production Option (LRIP) Exercise Award	FEB 95	N/A	N/A	
Aircraft Critical Design Review (CDR)	JUN 96	JUN 96	NOV 96	
DD 250 of T-1 (Test Aircraft)	MAY 98	NOV 98	MAY 99	(Ch-1)
Milestone III	SEP 99	DEC 99	FEB 00	(Ch-2)
Initial Operational Capability (AF)	FEB 01	AUG 01	AUG 01	
Initial Operational Capability (Navy)	JUL 03	JUL 03	JUL 03	

b. Current Change Explanations --

Change-1 - DD250 of T-1 slipped from Jan 99 to May 99 due to late aircraft rollouts and the impacts of the Federal Aviation Administration (FAA) conformity issue. An FAA audit of RAC's process for certifying that test articles match design drawings resulted in RAC's voluntary suspension of all ground and flight testing on 25 Aug 98. RAC and FAA representatives developed a new, more detailed inspection process and restarted testing on 22 Sep 98. RAC has been granted an extension to the Type Certification deadline of 10 Mar 99 by the FAA to Jan 00. RAC's one year extension is not representative of any projected schedule slip, but is an appropriate

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9b. Schedule (Cont'd):

action to preserve management's flexibility to respond to schedule changes. The May 99 DD250 of T-1 has significant risk and puts pressure on the May APB Milestone. The SPO is monitoring closely and will initiate breach notification procedures if required.

Change 2 - Milestone III slipped from Jan 00 to Feb 00 due to the delay of DD-250 of T-1 (see change 1) impacting downstream flight test activities. These activities have slipped the Multiservice Operational Test and Evaluation (MOT&E) start date pushing Milestone III to the right.

10. Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Syllabus Maneuvers	Accomp-	Accomp- / Accomp-	Accomp-	Accomp-
Mission Profiles	lish all	lish all/ lish all	lish all	lish all
(Contact,	five	five / five	five	five
Familiarization,	mission	mission/ mission	mission	mission
Precision Aero-	profiles	profiles/ profiles	profiles	profile
batics, Instrument,				s
and Navigation -				
High and Low)				
Sustained Speed at	270	270 / 250 (270	250(270	250 (270
1000 ft MSL, hot day		/ Dash)	Dash)	Dash)
(KTAS)				
Operational G	+7 to -3	+7 to -3/ +6 to -3	+6 to -3	+6 to -3
Envelope (Gs)	sym-	sym- / sym-	sym-	sym-
	metric	metric / metric;	metric;	metric;
		/ +4 to 0	+4 to 0	+4 to 0
		/ asym-	asym-	asym-
		/ metric	metric	metric
Pressurization (PSI	5.0	5.0 / 3.5	3.5	3.5
Differential)				
Bird Strike Capabil-	Max Low	Max Low / 270	270	270
ity (4 lb bird, no	Level	Level /		
catastrophic damage)	Airspeed	Airspeed/		
(KTAS)				
Ejection Seat with	0/0	0/0 / 0/60	0/0	0/0 (Ch-1)
Survival Kit				
(Altitude/Airspeed				
in Knots)				
Able To Perform an	Unpre-	Unpre- / Runway	Runway	Runway
Engine Out Landing	pared	pared /		
	surface	surface/		

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10a. Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Anthropometric Accommodation (Sitting Height in inches)	31.0 to 40.0	31.0 to / 32.8 to 40.0 / 40.0	31.0 to 40	31.0 to (Ch-2) 40
Cockpit Configuration	able to be operatio nally flown from either cockpit	Inter- / Yes change- / able / Instruc/ - / tor/ / Student /	Inter- change- able Instruc- tor/ Student	Yes
Cockpit Seating Configuration	0 Degree Over-the -Nose Visi- bility from the Rear Cockpit at Design Eye Height	0 / Stepped DEGREES / Tandem OVER-THE/ NOSE / VISIBILI/ TY FROM / THE REAR/ COCKPIT / AT / DESIGN / EYE / HEIGHT /	Stepped Tandem	Stepped Tandem
Exterior Noise	FAR Part 36, Most Restric- tive App- licable Standar d	FAR Part/ 36, Most/ Restric-/ tive / App- / licable / Standar/ d / d	FAR Part 36, Most Restric- tive App- licable Standard	FAR Part 36, Most Restric- tive App- licable Standard
Takeoffs/Touch & Go/Land (Wx, Weight, Configuration) at Main Operating Bases (Runway Length - FT)	4000	4000 / 5000	5000	5000
IFR Certified Instrumentation	All Digital except Backups	All / IFR Digital/ Cert- except / ified Backups / (Select / - able / EADI/ / EHSI)	IFR Cert- ified (Select- able EADI/ EHSI)	IFR Cert- ified (Select- able EADI/ EHSI)

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10a. Performance Characteristics (Cont'd):

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Visual System For	Yes	YES / Provide	Yes	Yes
IFT/OFT		/ a visual		
		/ field of		
		/ view		
		/ commensu		
		/ rate		
		/ with the		
		/ JPPT		
		/ syllabus		
		/ training		
		/ requirem		
		/ ents		

b. Current Change Explanations --

Change-1: The ejection seat current estimate changed from 0/60 to 0/0 based on the ejection seat qualification testing completed at China Lake NAS.

Change-2: Based on the Anthropometric evaluations conducted, the current estimate has changed from 32.8 - 40.0 to 31.0 - 40.0.

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11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	314.7	263.4	263.8
Procurement	4718.4	2802.1	2951.2
Navy	(825.5)		(1185.0)
Air Force	(974.6)		(1215.6)
Air Force	(974.6)		(1215.6)
Air Force	(974.6)		(0.0)
Total Fy			(0.0)
Total Flyaway	(3749.3)		(2400.6)
Navy GBTS	(163.8)		(119.1)
Air Force GBTS	(178.2)		(125.2)
Air Force GBTS	(178.2)		(125.2)
Navy Mission Support	(11.5)		(18.2)
Navy Mission Support	(11.5)		(18.2)
Air Force Mission Suppo	(35.3)		(55.6)
Air Force Mission Suppo	(35.3)		(55.6)
Air Force Other Support	(35.5)		(54.3)
Air Force Other Support	(35.5)		(54.3)
Navy Other Support	(7.7)		(27.2)
Navy Other Support	(7.7)		(27.2)
Total Other Wpn Sys	(700.2)		(399.6)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(268.9)		(151.0)
Construction (MILCON)	63.2	37.1	35.5
Acquisition O&M	0.0	0.0	0.0
Total FY 95 Base-Year \$	5096.3	3102.6	3250.5
Escalation	-1045.7	894.4	654.8
Development (RDT&E)	(48.6)	(19.8)	(14.1)
Procurement	(-1115.0)	(865.9)	(634.6)
Construction (MILCON)	(20.7)	(8.7)	(6.1)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	4050.6	3997.0	3905.3
b. Quantity --			
Development (RDT&E)	1	1	1
Procurement	711	711	711
Total	712	712	712

JPATS' RDT&E aircraft is fully configured.

The Low Rate Initial Production Rate (LRIP) quantities authorized by the Milestone II ADM (9 Aug 95) are up to a maximum of 108 aircraft (through Lot 7) LRIP establishes an initial production base and permits an orderly increase in the production to lead to full-rate production upon successful completion of operational testing. The program office will execute subsequent production contracts for the remaining aircraft with a maximum anticipated production rate of seven per month.

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11b. Total Program Cost and Quantity (Cont'd):

The new procurement quantities identified in the ORD II Rev 1 are not reflected in the current SAR.

c. Foreign Military Sales --

The Bombardier of Canada procurement is a direct sale from RAC with deliveries scheduled to begin in Dec 99.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (DEC 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	3102.6	3250.5	
(2) Quantity	712	712	
(3) Unit Cost	4.358	4.565	+4.75
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	2802.1	2951.2	
(2) Quantity	711	711	
(3) Unit Cost	3.941	4.151	+5.33

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13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	363.3	3603.4	83.9	4050.6
Previous Changes:				
Economic	-3.6	-444.1	-3.3	-451.0
Quantity	-	-	-	-
Schedule	-	-33.6	-2.9	-36.5
Engineering	-	-	-	-
Estimating	-79.6	+714.4	-36.8	+598.0
Other	-	-	-	-
Support	-	-159.1	-	-159.1
Subtotal	-83.2	+77.6	-43.0	-48.6
Current Changes:				
Economic	-3.0	-94.7	-0.7	-98.4
Quantity	-	-	-	-
Schedule	-	-11.3	+0.0	-11.3
Engineering	-	-	-	-
Estimating	+0.8	+73.3	+1.4	+75.5
Other	-	-	-	-
Support	-	-62.5	-	-62.5
Subtotal	-2.2	-95.2	+0.7	-96.7
Total Changes	-85.4	-17.6	-42.3	-145.3
Current Estimate	277.9	3585.8	41.6	3905.3

Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	314.7	2501.0	63.2	2878.9
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-2.7	-2.7
Engineering	-	-	-	-
Estimating	-51.2	+542.5	-26.5	+464.8
Other	-	-	-	-
Support	-	-111.6	-	-111.6
Subtotal	-51.2	+430.9	-29.2	+350.5
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	0.0	0.0
Engineering	-	-	-	-
Estimating	+0.3	+58.1	+1.4	+59.8
Other	-	-	-	-
Support	-	-38.7	-	-38.7
Subtotal	+0.3	+19.4	+1.4	+21.1
Total Changes	-50.9	+450.3	-27.8	+371.6
Current Estimate	263.8	2951.3	35.4	3250.5

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

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-3.0
Navy Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
Navy Refinement of RDT&E Estimate. (Estimating)	-0.2	-0.2
Air Force Adjustment for Current and Prior Inflation. (Estimating)	+1.6	+1.7
Air Force revised program requirements estimate. (Estimating)	-1.2	-0.8
RDTE Subtotal	+0.3	-2.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-105.4
Economic adjustment for negative program change. (Economic)	N/A	+10.7
Navy Acceleration of annual procurement buy profile.	0.0	-13.3
(Schedule)		
Air Force Stretchout of annual procurement buy profile. (Schedule)	0.0	+2.0
Navy Refinement of Manufacturing Assumptions. (Estimating)	+32.3	+42.2
Air Force Adjustment for Current and Prior Inflation. (Estimating)	+3.3	+3.5
Air Force Refinement of Manufacturing Assumptions. (Estimating)	+32.0	+37.7
Air Force Refinement of Mission Support Requirements. (Estimating)	-0.3	-0.4
Air Force Adjustment to Report Actual Costs. (Estimating)	-9.2	-9.7
Navy Refinement of Initial Spares estimate. (Support)	-70.0	-106.6
Navy Refinement of Ground Based Training System estimate. (Support)	-2.3	-3.1
Navy Refinement of Mission Support estimate. (Support)	+5.7	+8.7
Refinement of Navy Other Support estimate. (Support)	+15.3	+23.3
Air Force Adjustment for Current and Prior Inflation. (Support)	+1.3	+1.4

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

b. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Air Force Refinement of Initial Spares estimate. (Support)	+3.8	+4.8
Air Force Refinement of GBTS estimate. (Support)	-0.5	-0.3
Air Force Mission Support estimate refinement. (Support)	+7.8	+9.1
Refinement of Air Force Other Support estimate. (Support)	+0.2	+0.2
Procurement Subtotal	+19.4	-95.2

(3) MILCON

Revised escalation indices. (Economic)	N/A	-0.7
Navy Replanning/Rephasing of requirements. (Schedule)	0.0	0.0
Navy Revision/Refinement of Estimate (Estimating)	+1.2	+1.2
Air Force Refinement of Requirements. (Estimating)	+0.2	+0.2
MILCON Subtotal	+1.4	+0.7

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
5.69	-0.77	-0.01	-0.07	--	+0.95	--	-0.31	-0.21	5.48

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
5.07	-0.76	-0.01	-0.06	--	+1.11	--	-0.31	-0.03	5.04

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14c. Unit Cost and Other History (Cont'd):

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	JAN 93	JAN 93	N/A	JAN 93
Milestone II	JUN 94	AUG 95	N/A	AUG 95
Milestone III	JUN 98	SEP 99	N/A	FEB 00
FUE/IOC	MAR 00	FEB 01	N/A	AUG 01
Total Cost	277.3	4050.6	N/A	3905.3
Total Quantity	2	712	N/A	712
Prog Acq Unit Cost	138.65	5.69	N/A	5.48

Air Force IOC is Aug FY01; Navy IOC is Jul FY03.

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

a. RDT&E --		Initial Contract Price		
JPATS:		Target	Ceiling	Qty
Raytheon Aircraft Company, Wichita KS				
F33657-94-C-0006, FPIF		\$84.8	\$101.0	1
Award: February 5, 1996				
Definitized: February 5, 1996				
Current Contract Price		Estimated Price At Completion		
Target	Ceiling	Qty	Contractor	Program Manager
\$161.9	N/A	1	\$176.8	\$180.2
Previous Cumulative Variances		Cost Variance Schedule Variance		
Cumulative Variances To Date		\$-4.6	\$-3.2	
Net Change		\$-14.8	\$-7.1	
		\$-10.2	\$-3.9	

Explanation of Change:

Variance data is taken from the December 1998 Cost Performance Report and was reflected in the January 1999 DAES report.

Variance Analysis:

The MD contract is now 58% complete. The elimination of the ceiling price is due to the inclusion of two cost plus line items within the GBTS subcontract.

The negative cost variance increase was primarily driven by differences in the general and administrative rate (driven by lower foreign sales than planned), rework, absorption of sustaining labor costs driven by delays in other lots, material cost increases in the factory, and unplanned tests. The program manager is concerned about the material cost variances and their impact on future lots.

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15. Contract Information (Cont'd):

The negative schedule variance is due to subcontractor delays in completing drawings for training devices, reprioritizations of TIMS efforts, reliability development testing for the first flight data recorder, and in completing airframe structural test articles in the factory. As of the 21 Dec 98 report, the contractor did not project any delays to the contract delivery milestones. Based on the impact of the FAA Conformity issue, a delay to DD250 of T-1 is anticipated.

The contractor's estimate at completion results in a variance at completion of -\$22.7M. The program manager's estimate for best case (\$178.6M) is based on a detailed CPI forecast at the cost account level. This also includes some adjustments for known factors and risks. The current estimate (\$180.2M) includes the impact of perceived test and schedule risk for the remainder of the MD program.

b. Procurement --
JPATS PROD LOT 2:
 Raytheon Aircraft Company, Wichita KS
 F33657-94-C-0006, FPIF
 Award: February 14, 1996
 Definitized: February 14, 1996

Initial Contract Price		
Target	Ceiling	Qty
\$43.9	\$49.0	3

Current Contract Price		
Target	Ceiling	Qty
\$43.2	\$48.2	3

Estimated Price At Completion	
Contractor	Program Manager
\$45.5	\$48.2

Previous Cumulative Variances
 Cumulative Variances To Date
 Net Change

Cost Variance	Schedule Variance
\$-1.3	\$-2.3
<u>\$-11.4</u>	<u>\$-0.9</u>
\$-10.1	\$1.4

Explanation of Change:

Variance data is taken from the December 1998 Cost Performance Report and was reflected in the January 1999 DAES report.

Variance Analysis:

Lot 2 is 69% complete at this time.

The schedule variance is primarily due to a delay in completing the system durability test article and some parts being returned to the vendor for rework.

The cost variance has increased slightly. Indirect costs, such as overhead and the general and administrative rate, make up over 40% of this variance and can be attributed to lack of volume. Other significant variances are driven by factory fabrication of parts, multiple set-ups, higher use of machined parts, use of overtime to recover schedule, and higher quality assurance costs. The program manager's best estimate is based on a

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15. Contract Information (Cont'd):

detailed CPI forecast at the cost account level, with adjustments for risk. (It should be noted that the contractor still has \$4.7M in management reserve, a significant amount that should be excluded from top level EAC calculations.) The contractor's EAC is viewed as too optimistic; the program office estimates that the Lot II cost will go to ceiling.

			Initial Contract Price		
			Target	Ceiling	Qty
<u>JPATS PROD LOT 3:</u>					
Raytheon Aircraft Company, Wichita KS					
F33657-94-C-0006, FPIF			\$31.2	\$34.3	6
Award: September 23, 1996					
Definitized: September 23, 1996					
			Current Contract Price		
			Target	Ceiling	Qty
			\$31.4	\$34.6	6
			Estimated Price At Completion		
			Contractor	Program Manager	
			\$26.8	\$34.6	
			Cost Variance Schedule Variance		
Previous Cumulative Variances			\$-0.8	\$-0.8	
Cumulative Variances To Date			\$-7.2	\$-4.2	
Net Change			\$-6.4	\$-3.4	

Explanation of Change:

Variance data is taken from the December 1998 Cost Performance Report and was reflected in the January 1999 DAES report.

Variance Analysis:

Lot 3 is now 63% complete.

The schedule variance is due to a delay in ejection seat and engine deliveries.

Indirect costs, such as overhead and the general and administrative rate, make up over 40% of the cost variance and can be attributed to lack of volume. Other significant variances are driven by fabrication of parts, multiple set-ups, higher use of machined parts, use of overtime to recover schedule, and higher quality assurance costs. The program manager's best estimate is based on an average of a CPI forecast at the cost account level, a CPI forecast at the top level, and a forecast using the weighted formula 80%CPI/20%SPI. (It should be noted that the contractor still has \$8.4M in management reserve, a very significant amount that should be excluded from top level EAC calculations. This equates to about 54% of work remaining.) Excluding MR results in a best case estimate of \$27.8M. The program manager's current estimate is \$29.1M. The contractor's EAC of \$26.8M is viewed as too optimistic. Lots 2, 4, and 5 are projected to go to ceiling and the PM has sufficient funding to cover these costs. Lot 3 is currently projected to overrun target cost by \$1.4M (which results in a projected funding shortfall of \$2M at the price level). The PM does not currently project that Lot 3 will reach ceiling.

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15. Contract Information (Cont'd):

JPATS PROD LOT 4:
Raytheon Aircraft Company, Wichita KS
F33657-94-C-0006, FPIF
Award: April 18, 1997
Definitized: April 18, 1997

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$62.9	\$69.3	15

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$62.9	\$69.3	15

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$77.6	\$66.2

Previous Cumulative Variances
Cumulative Variances To Date
Net Change

<u>Cost Variance</u>	<u>Schedule Variance</u>
\$-0.5	\$-0.7
<u>\$-3.1</u>	<u>\$-10.1</u>
\$-2.6	\$-9.4

Explanation of Change:

Variance data is taken from the December 1998 Cost Performance Report and was reflected in the January 1999 DAES report.

Variance Analysis:

Lot IV is now 23% complete. The schedule variance is due to a delay in deliveries of engines and avionics. The cost variance is due to higher costs for factory fabrication of parts, multiple set-ups, and higher use of machined parts, as well as the lack of volume impact to general and administrative costs. The PM's best estimate is a CPI forecast at the cost account level with adjustments for known risk. The PM's current estimate is an average of a 6-month CPI estimate, cum CPI forecast, and a weighted CPI/SPI forecast.

JPATS PROD LOT 5:
Raytheon Aircraft Company, Wichita KS
F33657-94-C-0006, FPIF
Award: February 20, 1998
Definitized: February 20, 1998

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$60.0	\$66.2	22

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$60.0	\$66.2	22

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$77.6	\$66.2

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15. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	\$-0.2	\$-1.9
Net Change	\$-0.2	\$-1.9

Explanation of Change:

Variance data is taken from the December 1998 Cost Performance Report and was reflected in the January 1999 DAES report.

Variance Analysis:

The contract is 1% complete. The program manager's estimate at completion will be included when the lot is at the 15% completion point. The contractor has requested an Over Target Baseline of \$65.8M (over target amount of \$12.7M) due to the lack of foreign sales.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY92-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-14)	<u>Total</u>
RDT&E	214.1	33.9	21.9	8.0	277.9
Procurement	335.8	133.0	179.5	2937.5	3585.8
MILCON	3.9	9.4	5.2	23.1	41.6
O&M	-	-	-	-	-
Total	553.8	176.3	206.6	2968.6	3905.3

b. Annual Summary -- JPATS

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY95 Dollars Nonrec</u>	<u>Flyaway FY95 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994				3.6	3.6
1995				3.6	3.7
1996				1.1	1.1
1997				1.6	1.7
1998				0.3	0.3
1999				0.6	0.6
2000				0.3	0.3
Subtotal				11.1	11.3

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				0.9	0.9
1993				1.9	1.9
1994				2.6	2.6
1995				34.9	35.4
1996				26.1	27.0
1997				39.3	41.1
1998				49.0	51.6
1999				40.0	42.6
2000				31.1	33.6
2001				19.9	21.9
2002				1.7	1.9
2003				1.8	2.0
2004				1.7	2.0
2005				1.8	2.1
2006					
2007					
2008					
2009					
2010					
2011					
Subtotal	1			252.7	266.6

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	8		19.6	40.6	44.8
2001	24		57.6	73.4	82.3
2002	24		80.8	93.8	107.1
2003	24		80.4	99.5	115.9
2004	24		79.8	96.2	114.5
2005	24		80.3	86.5	105.1
2006	24		82.4	97.3	120.6
2007	24		86.0	99.2	125.6
2008	24		87.9	111.6	144.3
2009	24		89.5	113.1	149.3
2010	24		90.5	105.9	142.8
2011	24		90.8	101.2	139.2
2012	24		91.1	97.8	137.4
2013	24		92.7	99.4	142.6
2014	19		75.6	81.2	118.9
Subtotal	339		1185.0	1396.7	1790.4

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

Navy Procurement Flyaway Costs also include Award Fee.

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995	3		26.2	77.5	80.4
1996	6		32.1	14.2	14.9
1997	15		55.8	57.7	61.3
1998	22		65.5	68.6	73.3
1999	22		60.0	97.6	105.9
2000	21		50.3	80.0	88.2
2001	27		64.7	86.7	97.2
2002	49		165.6	184.0	210.1
2003	56		188.1	263.9	307.4
2004	58		193.4	234.8	279.4
2005	58		193.8	237.4	288.4
2006	35		120.1	142.2	176.3
2007				5.1	6.4
2008				4.8	6.2
Subtotal	372		1215.6	1554.5	1795.4

Flyaway exceeds total program costs in FY96 due to OSD direction to roll funds to procure Aircraft. OSD directed the use of \$40.5M of FY95 excess funds to procure 6 A/C in FY96. OSD further directed the use of \$15.3M of FY96 funds to procure 3 A/C of the next lot (15 A/C) in FY97.

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997					
1998				1.3	1.4
2000				5.6	6.2
2001				4.7	5.2
2002				0.5	0.6
2007				7.9	10.0
2008				0.5	0.7
2011				0.7	0.9

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

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal				21.2	25.0

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				2.3	2.5
2000				2.9	3.2
2003				2.8	3.2
2005				3.0	3.6
2006				3.3	4.1
Subtotal				14.3	16.6

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	339		1185.0	1429.0	1826.7
USAF	373		1215.6	1821.5	2078.6
Grand Total	712		2400.6	3250.5	3905.3

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 160.7

Percent Total Program Expended: 4.1%

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18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The operations and support costs are based on the purchase of 711 aircraft, Aircrew Training Devices (ATDs), Training Integration Management System (TIMS), development and conversion courseware, and CLS which will be provided by Raytheon Aerospace.

Section 18b consists of five elements. Mission Personnel includes the cost of military and civilian system-related personnel involved in the operation of this system. Unit-Level Consumption includes the cost of fuel resources and unit level consumables. Sustaining Support includes the costs of replacement support equipment, modification kits, sustaining engineering, software maintenance, and simulator operations for the aircraft system. Indirect Support includes the costs of personnel support for specialty training, permanent changes of station and medical care. Finally, Program Management includes the cost of managing the system by the Air Force Flight Training System Program Office.

Section 18c consists of costs for contract labor, materials, and overhead incurred in providing the logistics support required by an aircraft system, subsystem or associated support equipment. Aircraft CLS covers depot maintenance for both the Air Force and the Navy, and covers organizational and intermediate maintenance activities for the Navy. GBTS CLS support is provided separately.

Typically, CLS is estimated in Base Year (BY) and not converted to Then Year due to the length of the O&S support relative to the number of years for which inflation indices are available. Due to the lack of inflation indices through 2038, the dollar amounts in this section are in BY95.

This reflects the information briefed by the OSD Cost Analysis Improvement Group at the DAB reflecting the JPATS Most Probable Life Cycle Cost documenting the Source Selection dated 25 Jul 95.

* The antecedent systems are the T-37B for the Air Force and T-34C for the Navy.

At the JPATS Milestone I decision, the requirement for a Cost/Operational Effectiveness Analysis (COEA) was waived due to the streamlining initiatives for pilot programs. Thus, the direct comparison to the antecedent systems was not prepared.

b. Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per JPATS PROGRAM	Avg Annual Cost Per *
Mission Pay & Allowances	85.0	0.0
Unit Level Consumption	15.7	0.0

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

b. Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per JPATS PROGRAM	Avg Annual Cost Per *
Intermediate Maintenance	4.9	0.0
Depot Maintenance	35.1	0.0
Contractor Support	5.9	0.0
Sustaining Support	N/A	0.0
Indirect Costs	N/A	N/A
Total	146.6	0.0

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N-21 STRATEGIC SEALIFT

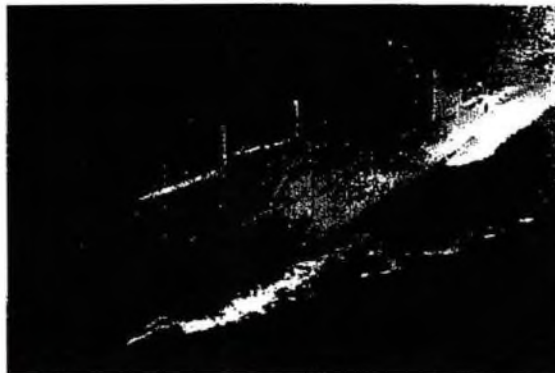
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: SEALIFT

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): STRATEGIC SEALIFT

2. DoD Component: Navy

3. Responsible Office and Telephone Number:

PMS 385 STRATEGIC SEALIFT PROGRAM	R. S. LISIEWSKI
NAVAL SEA SYSTEMS COMMAND	Assigned: June 5, 1995
2531 JEFFERSON DAVIS HWY	DSN 332-9127; COMM 703-602-9127
ARLINGTON, VA 22242-5160	

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0604567N

PROCUREMENT:

APPN 4557 ICN 240208036N (DCA/DNA)

National Defense Sealift Fund account executed by the Naval Sea Systems Command under procedures directed by the National Defense Sealift Fund Charter dated October 15, 1994. This SAR addresses the Sealift Ship Acquisition Program financed by the NDSF.

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FOR OPEN PUBLICATION

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AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

No Security Objection
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(AS AMENDED)

99-00136

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Office of the Chief of
Naval Operations
1000 19th Street, NW
Washington, DC 20374

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99-C-0752

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5. References:

SAR Baseline (Development Estimate):

Approved Acquisition Program Baseline dated July 20, 1993.

Approved Program:

NAE Approved Acquisition Program Baseline (APB) dated April 10, 1998.

6. Mission and Description:

To carry Army equipment for afloat prepositioning and to transport ARMY/USMC or other services surge equipment to include wheeled/tracked vehicles, helicopters and cargo from CONUS to contingency area. The Strategic Sealift Program will provide the U.S. Navy with nineteen large, medium-speed, self-sustaining, roll-on/roll-off (LMSR) ships.

7. Executive Summary:

The JCS Mobility Requirement Study (MRS) defined overall Strategic Sealift requirements. The Acting ASN(RD&A) accepted the Navy Program Decision Memorandum (NPDM) of August 17, 1992 as the Milestone I Decision Meeting in his memorandum signed on June 9, 1993. The FY93 Defense Authorization Act established the National Defense Sealift Fund (NDSF). The Program was designated ACAT IC by USD(A) on March 5, 1993. Milestone II approval was granted for Conversions on July 30, 1993 and New Construction on August 30, 1993. The Acquisition Program Baseline (APB) was approved on July 20, 1993. MacGregor-NAVIRE (USA) was awarded a FFP/AF contract on March 29, 1993 for procurement of one ship set of Class Standard Equipment (CSE) with options for up to nineteen additional ship sets. On July 30, 1993 Newport News Shipbuilding (NNS) and National Steel and Shipbuilding Company (NASSCO) were awarded FPI contracts for detail design and conversion of a total of five foreign built ships (two at NNS and three at NASSCO). On September 2, 1993 Avondale Industries, Inc. (AII) and on September 15, 1993 NASSCO were awarded FPI contracts for detail design and construction of one ship each with options for five more ships each for a total of 12 new construction ships under contract.

The calendar year 1994, 1995, 1996, 1997 and 1998 options were exercised for a total of 5 additional ships each at Avondale Industries, Inc. and NASSCO.

A limited competition between Avondale and NASSCO was conducted for the two remaining hulls (ships 18 & 19) which resulted in the award of a seventh ship on May 23, 1997 to NASSCO. The FY99 option for the seventh ship to the Avondale contract was exercised on December 18, 1998.

The TAKR 310 (USNS Watson), NASSCO's first new construction ship was delivered on June 23, 1998, five months earlier than contract delivery date of October 28, 1998. The TAKR 300 (USNS Bob Hope) Avondale's first new construction ship was delivered on November 18, 1998, ten months later than contract delivery date of January 31, 1998. The TAKR 311 (USNS Sisler) was delivered on December 1, 1998, five months earlier than the contract delivery date of May

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7. Executive Summary (Cont'd):

28, 1999. The TAKR 302 (USNS Seay) was christened on June 20, 1998 and launched on June 25, 1998. The TAKR 312 (USNS Dahl) was christened and launched on October 2, 1998.

The total nineteen ship (LMSR) program control of \$5,795.5M (TY\$) is currently from the National Defense Sealift Fund (NDSF). Last year the FY 99 President's Budget request identified \$251.4M in the SCN appropriation and \$100M in the NDSF. Congressional action during the FY 99 budget process realigned all of the funding into NDSF.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
NPDM	AUG 92	AUG 92	AUG 92
Milestone I	SEP 92	SEP 92	SEP 92 (Ch-1)
CSP/S-24 Conversion Engineering Design Award	OCT 92	OCT 92	OCT 92
CSP/S-24 New Construction Engineering Design Award	NOV 92	NOV 92	NOV 92
Class Standard Equipment Contract Award	MAR 93	MAR 93	MAR 93
Milestone II Conversion	JUN 93	JUN 93	JUN 93
CSP/S-24 Conversion Contract Award	JUL 93	JUL 93	JUL 93

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9a. Schedule (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>	
Milestone II New Construction	AUG 93	AUG 93	AUG 93	
CSP/S-24 New Construction Contract Award	SEP 93	SEP 93	SEP 93	
Conversion Acceptance Trials	NOV 94	FEB 96	APR 96	
OT&E For Conversion	MAY 95	JUN 96	SEP 96	
Organic Support Capability (First Conversion Ship)	NOV 95	JUN 96	SEP 96	
New Construction Acceptance Trials	AUG 97	APR 98	MAY 98	
IOC (New Construction First Ship Delivery)	OCT 97	MAY 98	JUN 98	
OT&E For New Construction	APR 98	APR 99	OCT 99	(Ch-2)
Milestone III (Total Program)	AUG 98	AUG 99	JAN 00	(Ch-3)
Organic Support Capability (First New Construction Ship)	AUG 98	AUG 98	AUG 98	
FOC (New Construction Ships)	JUL 00	JUL 00	JUL 00	
Service Depot Support (Total Program)	SEP 00	SEP 00	SEP 00	

b. Current Change Explanations --

(CH-1) Correction of Milestone I date from Aug 92 to Sep 92 to reflect actual date.

(CH-2) OT&E for New Construction has been changed from Apr 99 to Oct 99 due to Avondale test program delays and a defect in Peck and Hale cloverleaf fittings.

(CH-3) Milestone III has been changed from Jul 99 to Jan 00 since the requirement is to complete OPEVAL prior to conducting Milestone III.

10. Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
RO/RO CAPACITY				
Total Cargo:				
(After broken stow)				
(M sqft)				
PREPO	2	2 / 2	TBD	2
SURGE	2	3 / 3	TBD	3
Cargo capacity per ship (K sqft)				
Usable before broken stow)				
New Construction				
SURGE	400	400 / 380	393	390
PREPO	350	350 / 300	356	335
Conversion				
SURGE	400	400 / 300	300	320
PREPO	350	350 / 225	275	270

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10a. Performance Characteristics (Cont'd):

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Lift/Cargo Handling Capability				
Crane Sets	2	2 / 2	2	2
Stern Ramp	Slewing	Slewing / Slewing	Slewing	Slewing
Side Port	2	2 / 2	2	2
Cargo Onload/Offload Times (hrs-not to exceed)				
Combined Load/Offload at Pier	N/A	96 / 96	96	96
Load at Pier	48	N/A / N/A	N/A	N/A
Offload at Pier	48	N/A / N/A	N/A	N/A
Sustained Speed (knots)	>24	>24 / 24	24	24
Range (nm)	17500	17500 / 12000	12000	12000
Ship Size Limitation	<PANAMAX	<PANAMAX/ PANAMAX	PANAMAX	PANAMAX

b. Current Change Explanations -- None

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11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	39.3	38.1	39.2
Procurement	2882.7	4781.8	5037.0
New Construction Prepo	(2882.7)		(2071.2)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 92 Base-Year \$	2922.0	4819.9	5076.2
Escalation	3666.4	905.2	759.2
Development (RDT&E)	(0.6)	(1.8)	(0.7)
Procurement	(3665.8)	(903.4)	(758.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	6588.4	5725.1	5835.4

The total nineteen ship LMSR program control of \$5,795.5M (TY\$) is from the National Defense Sealift Fund. The FY99 President's Budget for NDSF is \$351.4M and when added to prior appropriation reflects a total of \$5,795.5M(TY\$).

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	20	19	19
Total	20	19	19

The quantity of 19 ships represents the procurement of 5 conversion and 14 new construction ships (8 prepo and 6 surge).

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

	UCR Baseline (SEP 95 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 92 BY\$)	4819.9	5076.2	
(2) Quantity	19	19	
(3) Unit Cost	253.679	267.168	+5.32
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 92 BY\$)	4781.8	5037.0	
(2) Quantity	19	19	
(3) Unit Cost	251.674	265.105	+5.34

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	39.9	6548.5	-	6588.4
Previous Changes:				
Economic	+1.2	+148.9	-	+150.1
Quantity	-	-351.5	-	-351.5
Schedule	-	+260.4	-	+260.4
Engineering	-	-	-	-
Estimating	-1.2	-810.8	-	-812.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+0.0	-753.0	-	-753.0
Current Changes:				
Economic	-1.1	-36.3	-	-37.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.1	+36.3	-	+37.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	+0.0	-753.0	-	-753.0
Current Estimate	39.9	5795.5	-	5835.4

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

Summary (FY 1992 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	39.3	5654.5	-	5693.8
Previous Changes:				
Quantity	-	-238.6	-	-238.6
Schedule	-	+137.2	-	+137.2
Engineering	-	-	-	-
Estimating	-1.2	-547.0	-	-548.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1.2	-648.4	-	-649.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.1	+30.9	-	+32.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1.1	+30.9	-	+32.0
Total Changes	-0.1	-617.5	-	-617.6
Current Estimate	39.2	5037.0	-	5076.2

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-1.1
Adjustment for Current and Prior Inflation. (Estimating)	+1.1	+1.1
RDT&E Subtotal	+1.1	0.0
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-36.3
Adjustment for Current and Prior Inflation. (Estimating)	+30.9	+36.3
Procurement Subtotal	+30.9	0.0

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14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
329.42	+12.99	-1.16	+13.71	--	-40.62	--	--	-15.08	314.34

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
329.42	+5.93	-1.16	+13.71	--	-40.77	--	--	-22.29	307.13

b. Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
327.43	+12.93	-1.27	+13.71	--	-40.55	--	--	-15.19	312.24

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
327.43	+5.93	-1.28	+13.71	--	-40.76	--	--	-22.40	305.03

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	MAY 93	SEP 92	N/A	SEP 92
Milestone II	JUN 93	JUL 93	N/A	JUL 93
Milestone III	AUG 98	AUG 98	N/A	JAN 00
FUE/IOC	OCT 97	OCT 97	N/A	JUN 98
Total Cost	6588.4	6588.4	N/A	5835.4
Total Quantity	20	19	N/A	19
Prog Acq Unit Cost	329.42	346.76	N/A	307.13

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

a. Procurement --			Initial Contract Price		
<u>Class Standard Equip.:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
MacGregor-NAVIRE (USA), Cranford NJ					
N00024-93-C-2220, FFP/AF			\$13.2	N/A	1
Award: March 29, 1993					
Definitized: March 29, 1993					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$207.7	N/A	19	\$202.1	\$207.7	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$4.7	\$-0.2	
Cumulative Variances To Date (11/30/98)			<u>\$6.5</u>	<u>\$-0.1</u>	
Net Change			\$1.8	\$0.1	

Explanation of Change:

Nothing significant.

Contract Comments:

There are currently no Program Manager's challenges on this contract.

<u>NEW CONSTRUCTION:</u>			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
AVONDALE IND., INC., NEW ORLEANS LA					
N00024-93-C-2205, FPI 50/50 SHARE			\$262.0	\$303.0	1
Award: September 2, 1993					
Definitized: September 2, 1993					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$1342.4	\$1580.1	6	\$1371.2	\$1417.5	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$20.2	\$-13.8	
Cumulative Variances To Date (11/30/98)			<u>\$20.1</u>	<u>\$-29.9</u>	
Net Change			\$-0.1	\$-16.1	

Explanation of Change:

The cumulative cost variance of +20.1M is due to favorable (+109.7M cost variance) material purchases on TAKRs 301, 302, 303, 304 and 305 in the areas of steel, piping and machinery offset by major negative variance on TAKR 300 and follow ships (TAKRs 301, 302 and 303) in overhead due to the rework of cloverleaf tiedown fittings, and lead ship test and trial difficulties.

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15. Contract Information (Cont'd):

The negative schedule variance of -\$29.9M is attributable to late lead ship delivery and its impact to the follow ships (TAKRs 301 through 304).

Contract Comments:

The quantity and pricing information does not reflect the option exercise of the 7th ship (TAKR 306). The next SAR submission will report seven ships.

The Program Manager's challenge will be to achieve delivery of the second Avondale new construction ship by the projected mid-Jun 99 delivery date and subsequent ships at the proposed LRE by the shipbuilder. The Government continues to team with the contractor to ensure that the current ship delivery schedule will occur at the lowest cost to the Government.

<u>NEW CONSTRUCTION:</u>			<u>Initial Contract Price</u>	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
NASSCO, SAN DIEGO, CA				
N00024-93-C-2203, FPI 50/50 share	\$267.1	\$315.8	1	
Award: September 15, 1993				
Definitized: February 1, 1994				

<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>
\$1576.4	\$1836.2	7	\$1563.8	\$1571.3

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$-22.7
Cumulative Variances To Date (11/29/98)	<u>\$-8.3</u>	<u>\$0.8</u>
Net Change	\$-8.3	\$23.5

Explanation of Change:

The cumulative \$-8.3 cost variance is due to increased overhead rates offset by favorable production labor costs.

The cumulative \$.8 schedule variance is attributable to material purchased earlier than planned.

Contract Comments:

The Program Manager's challenge will be to achieve delivery of TAKR 312 (USNS Dahl), the third new construction ship to the contractor's proposed accelerated delivery date of mid-May 99 at the LRE proposed by the shipbuilder. All five remaining ships expected to deliver early and at or below target price and will include performance bonus if that occurs.

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

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

<u>Appropriation</u>	<u>Prior Years (FY92-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	39.9	-	-	-	39.9
Procurement	5795.5	-	-	-	5795.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	5835.4	-	-	-	5835.4

b. Annual Summary -- SEALIFT

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992		38.1		39.2	39.9
Subtotal		38.1		39.2	39.9

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY92 Dollars Nonrec	Flyaway FY92 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993	7		2212.4	2212.4	2463.5
1994	2		253.2	253.2	288.8
1995	2		473.3	473.3	546.4
1996	2		510.3	510.3	596.1
1997	3		732.9	732.9	867.9
1998	2		567.2	567.2	681.4
1999	1		287.7	287.7	351.4
Subtotal	19		5037.0	5037.0	5795.5

The appropriation name in Section 16c. should reflect "4557 National Defense Sealift Fund (NDSF)" vice "1611 Shipbuilding and Conversion, Navy".

The total nineteen ship LMSR program control of \$5,795.5M (TY\$) is currently from the National Defense Sealift Fund. Last year the FY 99 President's Budget request identified \$251.4M in the SCN appropriation and \$100M in NDSF. Congressional action during the FY 99 budget process realigned all of the funding into NDSF.

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	19	38.1	5037.0	5076.2	5835.4

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDTE&E	0	0
Procurement	8	8

Percent Total Program Quantities Delivered: 42.1%

b. Total Expenditures To Date (In Millions of Dollars): \$ 3727.6

Percent Total Program Expended: 63.9%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

CSP-24. The CSP-24 is prepositioned with military cargo. In Prepositioning Mode, the ship will be deployed with cargo in the holds in a forward area. The cargo hold environmental control system will be used to maintain the cargo holds within the required temperature and humidity range. The ship will be maintained in Full Operating Status (FOS). The ship will participate in occasional fleet exercises. Port facilities may or may not have services such as shore power and steam. For calculating fuel consumption, the ship will not be on shore services and the summer environmental condition is assumed year round. The CSP-24 will operate 33 percent of the time underway and 67 percent of the time in port. While underway, 67 percent of the time the ship will operate at 15 knots and 33 percent of the time will operate at 24 knots.

CSS-24. The CSS-24 is maintained in Reduced Operating Status (ROS). In ROS, the CSS-24 will be maintained without cargo and can be activated within four days (ROS-4). Full crews will be kept on alert and a skeleton crew (approximately 9) will be aboard at all times. For calculating fuel consumption, the ship will be on shore services and the summer environmental condition is assumed 50 percent of the in port and underway periods and assumed to be in the winter environmental condition 50 percent of the in port and underway periods. The CSS-24 will operate 15 percent of the time underway and 85 percent of the time will be in port. While underway, 60 percent of the time will be at 15 knots and 40 percent of the time will be at 24 knots.

During a mobilization (such as, war, crisis, deployment, or redeployment), the CSP-24 and CSS-24 will operate as point-to-point ships. They will transit at maximum attainable speed from port of embarkation to port of debarkation.

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

The operating and support costs in section 18.b. were developed by the NAVSEA Cost and Estimating Office (SEA017) in June 1992.

b. Costs -- (FY 1992 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per CSP-24 Ship	Avg Annual Cost Per CSS-24 Ship
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	6.1	1.6
Intermediate Maintenance	4.0	1.6
Depot Maintenance	1.5	1.3
Contractor Support	0.2	0.1
Sustaining Support	0.1	0.1
Indirect Costs	0.9	1.3
Total	12.8	6.0

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A-24 SMART-T

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)
PROGRAM: SMART-T

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T)

2. DoD Component: Army

Joint Participants:

U.S. Air Force, U.S. Marine Corps, Joint Communications
Support Element, Other DoD

3. Responsible Office and Telephone Number:

Project Manager Milsatcom	Mr. Henry I. Jehan, Jr.
PEO C3 Systems	Assigned: March 5, 1999
ATTN: SFAE-C3S-MSA	DSN 992-9767 x4001
Fort Monmouth, NJ 07703-5508	COMM (732) 532-9767 x4001
	hjehan@c3smail.monmouth.army.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0303142* (Shared) D455/D384/D2PT

PROCUREMENT:

APPN 3080 ICN 21131F (Air Force) (Shared) **
APPN 2035 ICN 28612A (Army) (Shared) **
APPN 3080 ICN 33601F (Air Force)
APPN 3080 ICN 33601F *** (Air Force)
APPN 1109 ICN 402700 (Navy) (Shared) USMC Terminal Buy
APPN 2035 ICN BC4002**** (Army)
APPN 2035 ICN BS9720 (Army)

CLEARED

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*SMART-T FY92 and FY93 R&D funds were part of Project D455, which reflected funding for the four Army Milstar programs. Starting in FY94, SMART-T is funded under Project D384. Operational test was funded under Project D2PT.

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4. Program Elements/Procurement Line Items (Cont'd):

**The Joint Communications Support Element (JCSE) requirements are funded with Army and Air Force funds managed by JCSE.

***Air Force ICN 33601F (Shared) funds all Air Force Milstar terminal requirements.

**** The Other DoD terminals are funded under Army ICN BC4002.

5. References:

SAR Baseline (Development Estimate):

AAE Acquisition Program Baseline (APB) dated 22 May 1992.

ASARC ADM Approval for Milestone II dated 26 May 1992.

Approved Program / Production Estimate (PdE):

AAE Approved Acquisition Program Baseline (APB) dated February 19, 1999.

6. Mission and Description:

This program responds to Congressional direction to increase the tactical utility of the Milstar System. The SMART-T provides range extension capability to the Army's Mobile Subscriber Equipment (MSE). Specifically, it provides a satellite interface to permit uninterrupted voice/data communication as advancing forces move beyond the line-of-sight capability of MSE. This program supports Echelons Corps and Below (ECB) and special contingency operations. This equipment communicates at both low and medium data rates. It provides the security, mobility, and anti-jam capability required to defeat the threat and satisfy the critical need stated above. The SMART-T has inherent Low Probability of Interception and Low Probability of Detection (LPI/LPD) capability to avoid being targeted for destruction, jamming or eavesdropping. The prime mover is a High Mobility Multi-Purpose Wheeled Vehicle (HMMWV) which carries all electronics, power generation and a self-erectable antenna. The SMART-T program does not replace another; however, it operationally displaces the AN/TSC-85s and 93s (Ground Mobile Forces (GMF) Super High Frequency (SHF) terminals) at Echelon Corps and Below (ECB). The GMF displaced terminals move to support Echelons Above Corps (EAC).

7. Executive Summary:

In the National Defense Authorization Act for FY1990, Congress directed the restructure of Milstar to substantially reduce costs, increase utility for tactical users, and eliminate unnecessary protracted nuclear warfighting capabilities. This led to actions improving Force Projection for Command, Control, Communications, Computer and Intelligence (C4I) support, to include development and procurement of a new Medium Data Rate (MDR) Secure, Mobile, Anti-jam, Reliable, Tactical Terminal (SMART-T). Following a successful ASARC

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7. Executive Summary (Cont'd):

Milestone II Decision Review on 18 May 1992, the program entered into Phase II, Engineering and Manufacturing Development (EMD). Dual development contracts were awarded on 9 Nov 1992 to Raytheon Company (Marlborough, MA) and Rockwell International (Richardson, TX). Both contractors completed a comprehensive development test program as part of the development contract.

On 19 Jan 1996, MG William Campbell, Program Executive Officer for Command, Control, and Communications (PEO C3S), approved initiation of SMART-T Low Rate Initial Production (LRIP). Project Manager Milstar (Army), together with the Communications-Electronics Command (CECOM) awarded a Firm Fixed Price Low Rate Initial Production (LRIP) contract with Full Rate Production (FRP) options to Raytheon Company (Marlborough, MA) on 7 Feb 1996. The LRIP/FRP contract includes options for a total of 387 terminals supporting all services and special users. A total of 52 terminals (43 Army) were procured during LRIP.

The total joint service and special user requirement for SMART-T is now 320 terminals. In FY1996, each of the participating services revalidated its operational requirement for SMART-T. As a result of this revalidation the total SMART-T requirements were adjusted to 313. The procurement profiles were realigned so that only the FY2001 FRP option would be affected. Also affecting the FY2001 option was Program Budget Decision (PBD) 729 dated 18 Dec 1998, which added funding to the SMART-T Army procurement appropriation to procure 7 additional terminals for Other DoD. A contract modification will be negotiated prior to exercising the FY2001 option.

A Milestone III Army Systems Acquisition Review Council (ASARC) Integrated Product Team (IPT) was formed in Jan 1998. In accordance with the program schedule, an Initial Operational Test and Evaluation (IOT&E) was completed in June 1998. A paper Milestone III Decision Review was recommended by the Military Deputy (MILDEP) Lieutenant General Paul J. Kern in Nov 1998. On 25 January 1999, Mr. Paul J. Hooper, the Army Acquisition Executive (AAE) signed the SMART-T Milestone III Acquisition Decision Memorandum (ADM). The ADM authorized the SMART-T program to proceed into Full Rate Production (FRP), and approved the Type Classification "Standard". Specifically, the ADM authorized the award of the first FRP option, with subsequent FRP option awards based on the successful completion of Follow On Test and Evaluation (FOT&E). Post-Milestone III Milestone Decision Authority was also delegated to Program Executive Officer, Command Control and Communications Systems following successful completion of FOT&E. The first FRP option was exercised on 29 January 1999.

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8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program/PdF	Current Estimate
MDR Study	FEB 91	FEB 91	FEB 91
Market Survey	SEP 91	SEP 91	SEP 91
LDR Technology Demonstrated (SCOTT Terminal Acceptance)	DEC 91	DEC 91	DEC 91
Milestone II ASARC Review	MAY 92	MAY 92	MAY 92
Development Contract Award	SEP 92	NOV 92	NOV 92
Preliminary Design Review	JUL 93	MAY 93	MAY 93
Critical Design Review	MAR 94	MAR 94	MAR 94
DT&E			
Start	JAN 95	SEP 94	SEP 94
Complete	OCT 95	DEC 95	DEC 95
EDM Deliveries	NOV 95	FEB 96	FEB 96
LRIP Decision	DEC 95	JAN 96	JAN 96
Low Rate Production Contract Award	JAN 96	FEB 96	FEB 96
FAT			
Start	AUG 97	SEP 97	SEP 97
Complete	JAN 98	JUN 98	JUN 98
LRIP First Delivery	JAN 98	MAR 98	APR 98
LDR IOT&E			
Start	FEB 98	JUN 98	MAY 98
Complete	MAY 98	JUN 98	JUN 98
Milestone III ASARC Review	SEP 98	NOV 98	NOV 98
Full Scale Production Award	NOV 98	NOV 98	JAN 99 (Ch-1)
MDR FOT&E			
Start	SEP 99	SEP 99	OCT 99 (Ch-2)

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9a. Schedule (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved <u>Program/PdE</u>	Current <u>Estimate</u>
Complete	NOV 99	NOV 99	NOV 99
Terminal IOC 1/	DEC 99	DEC 99	DEC 99
DAMA ECP Award	N/A	JAN 99	MAR 99 (Ch-3)
AEHF Development Initiated	N/A	JAN 02	JAN 02 (Ch-4)
AEHF Production of Retrofit Kits	N/A	JAN 05	JAN 05 (Ch-4)

ACRONYMS:

ASARC - Army Systems Acquisition Review Council
LDR - Low Data Rate
MDR - Medium Data Rate
SCOTT - Single Channel Objective Tactical Terminal
DT&E - Development Test and Evaluation
EDM - Engineering Development Model
LRIP - Low Rate Initial Production
FAT - First Article Test
IOT&E - Initial Operational Test and Evaluation
FOT&E - Follow-On Test and Evaluation
IOC - Initial Operational Capability

1/ Date when initial training and provisioning will be completed.

b. Current Change Explanations --

- (Ch-1) - Full Rate Production (FRP) Award: The change from Nov 98 to Jan 99 was due to a delay in the receipt of necessary external reports required for the Acquisition Decision Memorandum (ADM) to be signed. The first FRP option was awarded on 29 Jan 99.
- (Ch-2) - MDR FOT&E (Start): The change from Sep 99 to Oct 99 was due to a scheduling change by the Operational Test and Evaluation Command (OPTEC).
- (Ch-3) - DAMA ECP Award: The change from Jan 99 to Mar 99 was precipitated by the delay in the Full Rate Production (FRP) Award. This is a new schedule milestone added as part of the Milestone III Decision Review process, and included in the new Acquisition Program Baseline (APB) dated February 1999.
- (Ch-4) - These are new schedule milestone added as part of the Milestone III Decision Review process, and included in the new Acquisition Program Baseline (APB) dated February 1999.

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10. Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program; PdE <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>	
Set-up Benign Environment (min)	30	30 / 30	27	30	
Set-up MOPP 4 Gear (min)	45	45 / 45	32	45	
Tear-down Benign Environment (min)	30	30 / 30	15	30	
Tear-down MOPP 4 Gear (min)	45	45 / 45	18	45	
MTBF (hrs) (80%LCL) / (Point estimate)	800	800 / 400	525	800	(Ch-1)
Aggregate Data Rate (kbps)	1544	1544 / 1024	1024	1544	
Interface Capability	With MSE	With MSE / With MSE	With MSE	With MSE	
Configuration (Full System)	HMMWV	HMMWV / HMMWV	HMMWV	HMMWV	
System Weight NTE(lbs) (Integrated on HMMWV)	3177	3177 / 3177	2486	3177	
TRANSEC with Over the Air Rekey Capability	Required	Required/ Required	Demo'd	Required	
Bit Error Rate (BER) Airlift	10 ^-5	10 ^-5 / 10 ^-3	10 ^-5	10 ^-5	
Transportability					
System Only (By)	UH-60	UH-60 / UH-60	UH-60	UH-60	
System and HMMWV (By)	CH-47	CH-47 / CH-47	CH-47	CH-47	
Power Sources					
Prime (VDC)	28	28 / 28	28	28	
Alternate AC Power (VAC) @ 50-60 Hz	110-220	110-220 / 110-220	110-220	110-220	
Back-up (Vehicular) (Volts)	20-30	20-30 / 20-30	20-30	20-30	
DAMA					
Reduce satellite resources req'd to support MSE by a factor of	N/A	3 / 2	TBD	3	(Ch-2)
AEHF					
Aggregate Data Rate (Mbps)	N/A	8 / 8	TBD	8	(Ch-2)
Configuration	N/A	Full System / Full System on HMMWV/ on HMMWV (1097) / (1097)	TBD	Full System on HMMWV (1097)	(Ch-2)
Bit Error Rate (BER)	N/A	10-7 / 10-5	TBD	10-7	(Ch-2)

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10a. Performance Characteristics (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved Program;PdE <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Interface Capability	N/A	WIN / WIN based / based MSE / MSE	TBD	WIN (Ch-2) Based MSE

ACRONYMS:

HMMWV - High Mobility Multi-Purpose Wheeled Vehicle
LCL - Lower Confidence Level
min - Minutes
MOPP - Mission Oriented Protective Posture
MSE - Mobile Subscriber Equipment
MTBF - Mean Time Between Failure
NTE - Not To Exceed
TRANSEC - Transmission Security

MTBF: A phased approach was approved to achieve the objective MTBF by FOT&E (ie, 400 hours [point estimate] MTBF by the end of LRIP, and 800 hours MTBF [80% LCL] by FOT&E).

AIRLIFT TRANSPORTABILITY: Airlift Transportability will be tested using the UH-60/CH-47 during First Article Test (FAT).

b. Current Change Explanations --

(Ch-1) - The MTBF was updated from 410 to 525 hours at 80% LCL. The 525 hrs at 80% LCL represents the reliability demonstrated by the latest growth configuration scored by the Army. This configuration reflects the IOTE fixes and incorporated soldiers as operators in the DT environment.

Note: A 50 hrs point estimate Mean Time Between Failure (MTBF) was reported in the January 1999 DOTE BLRIP report. This number was based on data collected in the June 1998 IOTE. In accordance with the approved SMART-T acquisition strategy, IOTE is an event to obtain data to ensure the reliability requirement is met at FOTE. There is no reliability requirement for IOTE. In addition, the approved strategy requires the PMO to continue to grow the SMART-T reliability to the required 800 hrs at 80% LCL prior to FOTE.

(Ch-2) - New performance characteristics added as part of the Milestone III Decision Review process and included in Acquisition Program Baseline (APB) dated Feb 99.

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11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	Development Estimate (SAR)	Approved Program: PdE	Current Estimate
Development (RDT&E)	234.5	315.2	309.1
Procurement	680.4	451.3	441.6
Recurring Rollaway	(451.7)		(252.9)
Other Rollaway	(136.1)		(124.5)
Software Anomaly Adj			(-33.5)
Total Rollaway	(587.8)		(377.4)
Support Cost	(2.2)		(18.1)
Other System Cost	(34.3)		(23.0)
Total Other Wpn Sys	(36.5)		(41.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(56.1)		(23.1)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 99 Base-Year \$	914.9	766.5	750.7
Escalation	112.3	13.9	13.5
Development (RDT&E)	(-9.1)	(-7.9)	(-5.5)
Procurement	(121.4)	(21.8)	(19.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	1027.2	780.4	764.2
b. Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	364	313	320
Total	364	313	320

The unit of measure for SMART-T is terminals.

Note: Excludes 12 Engineering Manufacturing Development (EMD) terminals produced under the SMART-T Development contracts that are not fully configured and will not be fielded.

Note: The LRIP quantities approved at Milestone II are 20 (1st year) and 32 (2nd year). The LRIP quantity exceeds 10% of the total planned buy to optimize the utilization of the Milstar MDR payload immediately upon launch in FY99.

c. Foreign Military Sales --
None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

	UCR Baseline (FEB 99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 99 BY\$)	766.5	750.7	
(2) Quantity	313	320	
(3) Unit Cost	2.449	2.346	-4.21
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 99 BY\$)	451.3	441.6	
(2) Quantity	313	320	
(3) Unit Cost	1.442	1.380	-4.30

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	225.4	801.8	-	1027.2
Previous Changes:				
Economic	-10.3	-49.0	-	-59.3
Quantity	-	-52.7	-	-52.7
Schedule	-	+22.0	-	+22.0
Engineering	+22.5	+38.9	-	+61.4
Estimating	+34.7	-338.1	-	-303.4
Other	-	-	-	-
Support	-	-15.4	-	-15.4
Subtotal	+46.9	-394.3	-	-347.4
Current Changes:				
Economic	-30.7	-48.6	-	-79.3
Quantity	-	+6.8	-	+6.8
Schedule	-	+0.2	-	+0.2
Engineering	+39.0	+59.1	-	+98.1
Estimating	+23.0	+50.9	-	+73.9
Other	-	-	-	-
Support	-	-15.3	-	-15.3
Subtotal	-31.3	+53.1	-	+84.4
Total Changes	+78.2	-341.2	-	-263.0
Current Estimate	303.6	460.6	-	764.2

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

Summary (FY 1999 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	234.5	680.4	-	914.9
Previous Changes:				
Quantity	-	-34.6	-	-34.6
Schedule	-	+3.0	-	+3.0
Engineering	+18.6	+32.3	-	+50.9
Estimating	+24.2	-237.8	-	-213.6
Other	-	-	-	-
Support	-	-14.4	-	-14.4
Subtotal	+42.8	-251.5	-	-208.7
Current Changes:				
Quantity	-	+6.5	-	+6.5
Schedule	-	+0.0	-	+0.0
Engineering	+36.0	+57.0	-	+93.0
Estimating	+24.1	+45.8	-	+69.9
Other	-	-	-	-
Support	-	-14.0	-	-14.0
Subtotal	+60.1	+95.3	-	+155.4
Total Changes	+102.9	-156.2	-	-53.3
Adjustments	-28.3	-82.6	-	-110.9
Current Estimate	309.1	441.6	-	750.7

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-30.7
Additional Development efforts related to planned SMART-T terminal upgrades (Engineering)	+36.0	+39.0
Adjustment for Current and Prior Inflation. (Estimating)	+26.7	+25.6
Refinement of SMART-T development efforts (Estimating)	-2.6	-2.6
RDT&E Subtotal	+60.1	+31.3
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-50.5
Economic adjustment for negative program change. (Economic)	N/A	+1.9
Total Quantity Variance associated with increase of 7 units.	+3.6	+3.8
Quantity increase from 313 to 320 units. (Quantity)	+6.5	+6.8
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	0.0	+0.2

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Allocation to Engineering variance resulting from Quantity Change. (Engineering)	+0.5	+0.4
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	-3.4	-3.7
Revised estimate of various engineering change proposals related to SMART-T upgrades (Engineering)	+24.5	+25.8
Revised estimate of various terminal modifications related to the planned SMART-T upgrades (Engineering)	+32.0	+32.9
Adjustment for Current and Prior Inflation. (Estimating)	+21.1	+24.6
Adjustment to reconcile flyaway and support. (Estimating)	+28.1	+30.0
Adjustment to reconcile flyaway and support (Support)	-28.1	-30.0
Adjustment for Current and Prior Inflation. (Support)	+4.3	+4.3
Revised initial spares estimate based on latest information (Support)	+2.8	+3.0
Revised logistics support estimate based on latest information (Support)	+2.6	+2.7
Revised estimate of training costs based on latest information (Support)	+4.4	+4.7
Procurement Subtotal	+95.3	+53.1

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.82	-0.43	+0.25	+0.07	+0.50	-0.72	--	-0.10	-0.43	2.39

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14b. Unit Cost and Other History (Cont'd):

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.20	-0.30	+0.16	+0.07	+0.31	-0.90	--	-0.10	-0.76	1.44

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	MAY 92	N/A	MAY 92
Milestone III	N/A	SEP 98	N/A	NOV 98
FUE/IOC	N/A	DEC 99	N/A	DEC 99
Total Cost	N/A	1027.2	N/A	764.2
Total Quantity	N/A	364	N/A	320
Prog Acq Unit Cost	N/A	2.82	N/A	2.39

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

a. Procurement --
SMART-T LRIP/FRP:
 Raytheon Company, Marlborough, MA
 DAAB07-96-C-A757, FFP
 Award: February 7, 1996
 Definitized: N/A

Initial Contract Price
Target Ceiling Qty
 \$212.8 \$0.0 387

Current Contract Price Estimated Price At Completion
Target Ceiling Qty Contractor Program Manager
 \$253.4 \$0.0 387 \$253.4 \$253.4

Explanation of Change:

Current Contract Price and Estimated Price at Completion changed from \$212.8 to \$253.4 to reflect several significant contract modifications. This includes development efforts associated with Demand Assigned Multiple Access (DAMA) and the Training Device.

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

In FY1996, each of the participating services revalidated its operational requirement for SMART-T. As a result of this revalidation, the United States Marine Corps (USMC) reduced its SMART-T requirement from 48 to 25, and the US

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15. Contract Information (Cont'd):

Air Force, DoD Special Users, and Navy deleted requirements for which funding was deferred beyond the Future Year Defense Plan (FYDP). PBD 729 dated 18 Dec 1998 added funding to the SMART-T Army procurement appropriation to procure 7 additional terminals in FY2001 for Other DoD. The total joint service requirement for SMART-T is now 320 terminals. A contract modification will be negotiated prior to exercising the FY2001 option, which is the only option year affected by the change in requirements.

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

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

<u>Appropriation</u>	<u>Prior Years (FY92-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-17)</u>	<u>Total</u>
RDT&E	228.6	13.9	17.4	43.7	303.6
Procurement	202.6	83.3	63.8	110.9	460.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	431.2	97.2	81.2	154.6	764.2

b. Annual Summary -- SMART-T

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY99 Dollars Nonrec</u>	<u>Flyaway FY99 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1992				22.1	20.0
1993				47.7	44.3
1994				60.0	56.7
1995				31.2	30.1
1996				20.9	20.5
1997				16.0	15.9
1998				16.9	16.9
1999				23.9	24.2
2000				13.5	13.9
2001				16.7	17.4
2002				14.2	15.1
2003				13.4	14.5
2004				6.5	7.2
2005				6.1	6.9
Subtotal				309.1	303.6

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

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY99 Dollars Nonrec	Flyaway FY99 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	2		1.1	1.2	1.2
2000	2		1.1	1.3	1.3
2001	2		1.1	1.3	1.4
2002				0.1	0.1
2003				0.1	0.1
Subtotal	6		3.3	4.0	4.1

The 0300 Appropriation funds the JCSE requirements (6).

Appropriation: 1109 - Procurement, Marine Corps

Fiscal Year	Qty	Flyaway FY99 Dollars Nonrec	Flyaway FY99 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	24		13.8	14.7	15.0
2000	1		0.6	0.6	0.6
2001				0.5	0.5
2002				0.2	0.2
2003				0.3	0.3
Subtotal	25		14.4	16.3	16.6

The 1109 appropriation funds the U.S. Marine Corps (USMC) requirements.

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY99 Dollars Nonrec	Flyaway FY99 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996	20	22.9	26.5	52.0	51.4
1997	23	18.6	11.2	34.7	34.7
1998		15.1	0.1	21.6	21.8
1999	45	16.0	36.7	57.5	58.8
2000	77	17.7	40.0	59.7	61.8
2001	51	8.5	87.2	47.1	49.6
2002		6.8		20.7	22.2
2003		4.9		13.4	14.7
2004		2.9		30.6	34.2
2005		2.8		18.7	21.3
2006		2.2		3.1	3.6
2007		2.1		3.1	3.7
2008				0.4	0.5

SMART-T, December 31, 1998

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

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY99 Dollars Nonrec	Flyaway FY99 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2009				0.5	0.6
2010				0.5	0.6
2011				0.5	0.6
2012				0.5	0.6
2013				0.4	0.6
2014				0.4	0.5
2015				0.4	0.5
2016				0.2	0.3
2017				0.1	0.1
Subtotal	216	120.5	201.7	366.1	382.7

The 2035 appropriation funds the Army requirements (209) and the Other DoD requirements (7).

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY99 Dollars Nonrec	Flyaway FY99 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997	9		4.5	5.1	5.1
1998			0.2	0.3	0.3
1999	20	1.1	9.0	14.0	14.3
2000	26	1.5	11.6	18.9	19.6
2001	18	0.9	8.2	11.7	12.3
2002		0.2		2.0	2.1
2003		0.2		2.4	2.6
2004		0.1		0.8	0.9
Subtotal	73	4.0	33.5	55.2	57.2

The 3080 appropriation funds the requirements for the U.S. Air Force (73).

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Army	216	120.5	201.7	675.2	686.3
OSD	6		3.3	4.0	4.1
Navy	25		14.4	16.3	16.6
USAF	73	4.0	33.5	55.2	57.2
Grand Total	320	124.5	252.9	750.7	764.2

SMART-T, December 31, 1998

17. Delivery/Expenditure Information:

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	12	10

Percent Total Program Quantities Delivered: 3.1%

b. Total Expenditures To Date (In Millions of Dollars): \$ 431.2

Percent Total Program Expended: 56.4%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The following assumptions and ground rules used to develop the operating and support costs for the SMART-T program are based on the November 1998 SMART-T Program Office Estimate (POE) prepared in association with the Milestone III Decision Review.

A three-level maintenance structure is the framework for SMART-T maintenance planning, Unit Level, Direct Support (DS) and Depot Level Maintenance. The SMART-T program assumes contractor support over the life of the program (15 years). The contractor accomplishes all depot level repairs under a five-year failure free warranty. It is assumed that the warranty will be renewed over the remaining life of the terminal. Each complete terminal will be overhauled twice during its lifetime just prior to the subsequent warranty renewals. The conditions under which the SMART-T maintenance costs are calculated include using the annual operating hours per terminal of 1797 hours as extracted from the Operational Mode Summary (OMS) and Mission Profile (MP) section of the MAST ORD dated 10 MAR 1992. The assumptions are based on a peacetime scenario.

There is no antecedent system.

b. Costs -- (FY 1992 Constant (Base-Year) Dollars in Thousands)

Cost Element	Average Annual SMART-T	Avg Annual Cost Per Terminal (Antecedent)
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	25.2	0.0
Intermediate Maintenance	7.4	0.0
Depot Maintenance	23.4	0.0
Contractor Support	11.6	0.0
Sustaining Support	1.1	0.0
Indirect Costs	15.5	N/A
Total	84.2	0.0

AF-14 JSIPS

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(0&A)823)
PROGRAM: JSIPS (CIGSS)

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Joint Service Imagery Processing System (JSIPS) Common Imagery Ground Surface System ((CIGSS))

2. DoD Component: USAF

Joint Participants:
USMC, Army, and Navy

3. Responsible Office and Telephone Number:

Electronic Systems Center/IYG
50 Griffiss St.
Hanscom AFB
MA 01731-1625

Lt Col Tracy E. Tynan
Assigned: May 4, 1998
DSN 478-1186 ext 8958; COMM 781-271-8958
tynant@hanscom.af.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0206625M
PE 0207217F Project 3652
PE 0305154D (Shared)
PE 0305208D
PE 0305208F (Shared)
PE 0305208N
PE 0603261N
PE 0603730A

PROCUREMENT:

APPN 3080 ICN 456GC3453 (Air Force) (Shared)
APPN 1810 ICN 461500 (Navy)
APPN 2035 ICN BZ7320 (Army)
APPN 0300 ICN DARO000001 (DCA/DNA) (Shared)

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5. References:

JSIPS

SAR Baseline (Development Estimate):

FY 94 Amended President's Budget dated April 8, 1993.

Approved Program:

AFAE Approved Acquisition Program Baseline (APB) dated December 17, 1998.

Navy TIS

SAR Baseline (Development Estimate):

FY94 Amended President's Budget dated April 8, 1993.

Approved Program:

Approved Acquisition Program Baseline (APB) dated August 15, 1996.

6. Mission and Description:

JSIPS' mission is to provide imagery-derived, time-sensitive, battle management information to the field commanders in near-real-time. JSIPS is the DOD common mobile ground station for processing and exploiting imagery received from a variety of sources. The system employs the following seven functional segments: National Input Segment (NIS), Tactical Input Segment (TIS), Softcopy Exploitation Segment (SES), Hardcopy Exploitation Segment (HES), Imagery Exploitation Support Segment (IESS), Communication Support Segment (CSS), and System Support Segment (SSS). The SES, ESS and CSS are "Core" segments required for basic system operation. The system, however, is modular in design so that the services (USAF, USMC, USA, and USN) can select the input and processing segments that they require based upon their mission. The Navy elected to use a Tactical Input Segment derivative, called the Navy TIS, to process ATARS imagery from the F/A-18. Other existing shipboard assets (i.e. Digital Imagery Workstation-afloat) were used to satisfy the overall Navy JSIPS requirements.

7. Executive Summary:

The JSIPS Block III upgrade, which includes the delivery of Tactical Air Reconnaissance Systems (TARS), Unmanned Aerial Vehicle (UAV), and Deployable Transit Case Systems (DTS) was awarded on January 13, 1998. This block upgrade will provide an open architecture, COTS-based system, which will include provisions for Y2K compliance. The systems will be moved from Shaw AFB, SC and Davis Monthan AFB, AZ to Langley AFB, VA and Beale AFB, CA, respectively. These upgraded systems are planned to be delivered in the July 1999 (Langley AFB) and September 1999 (Beale AFB) time frame. This effort is part of the modifications which are considered to be a separate acquisition because JSIPS is no longer in production.

JSIPS Block II OUE findings were published in December 1997. A corrective

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JSIPS (CIGSS), December 31, 1998

7. Executive Summary (Cont'd):

action plan addressing these findings was developed with Raytheon and HQ ACC. This plan was coordinated with ESC/CC in late January 1998 and briefed to AF/TE & DOT&E in February 1998. This meeting initiated the parallel paths of (1) developing and implementing Block II software fixes and (2) planning a viable test program for Block III. Block II software fixes were incrementally implemented for 9th AF, 12th AF, and Camp Pendleton during 3Q/4Q FY 98. Additionally, the JSIPS Program Office provided ongoing support to HQ ACC to ensure spares adequacy, tech data accuracy, and training sufficiency. Field RMA data for Block II have steadily improved and now indicate a minimum of 95% operational availability. Block III test planning, under a Combined Test Force (CTF) approach, is underway and will oversee the migration to a COTS/GOTS solution.

The JSIPS prime contractor submitted a series of Claims/Requests for Equitable Adjustments (REAs) totaling \$65.7M at price. The Government and Raytheon E-Systems reached an agreement on a mutually acceptable basis for settlement of the four claims in early July 1997. The Army's, Air Force's, and Marine Corps'/Navy's share was determined to be \$9.167M each. The Army and the Air Force provided their full shares, but the Navy's position was that the Limitation of Government Obligation (LOGO) clause prevented the use of expired funds to pay the JSIPS claims and current year funds were required. The Air Force General Counsel agreed with the Navy's position. This required replacing \$1.4M of expired funds for the Air Force and \$9.167M of expired funds for the Army. The Air Force and the Army will make journal voucher changes to the accounting records. The Marine Corps/Navy provided FY96/FY97 funding to settle their portion of the claim. A contract modification was done to obligate the funds on January 26, 1999.

Reconnaissance/Intelligence Ground Stations (R/IGS) Products and Services (RPS) contracts were awarded to Lockheed-Martin and Raytheon E-Systems on December 4, 1996. Joint contractor delivery orders have produced the Risk Reduction Imagery Processor (RRIP) to support the TEG systems deployment and the System Manager and Screening Workstation for the integration of the CIP into the CIGSS testbed. The Joint R/IGS Migration Facility (RMF) was moved into the ESC CUBE in September 1998 to provide a capability to perform prototyping, demonstrations, and integration and interoperability studies with other C2 systems. A study effort to investigate Commercial Video Enhancement Tools was initiated with other studies planned that will benefit RPS developed systems. Product delivery orders issued under RPS include: Tactical Exploitation Group (TEG) systems for the USMC, Tactical Input Segment (TIS) systems for the Navy, JSIPS Block III for the USAF and USMC, Deployable Transit Case Systems (DTS) for the USAF, and Squadron Ground Stations (SGS) for the USMC.

The TEG delivery order for three production systems was awarded to Raytheon E-Systems under the RPS contract on April 30, 1997. Four Program Management Reviews have been held by the contractor to date, and one more is scheduled for February 1999. The program experienced several schedule slips in 1998 due to problems with the integration and development of screening workstation software and availability of Government-Furnished Equipment/Information. In our efforts to mitigate these problems, the TEG program has implemented several contractual

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JSIPS (CIGSS), December 31, 1998

7. Executive Summary (Cont'd):

changes to deliver all three TEG systems to the users in Q3-Q4 FY 99. Change three to the APB was signed by Ms Darleen Druyun on December 18, 1998 adjusting the APB schedule objective for delivery of the initial system to June 1999 and the threshold to December 1999.

From January 1998 - April 1998, the Navy Tactical Input Segment (TIS) hardware and software integration continued under a delivery order on the RPS contract with Lockheed Martin Western Development Labs. Under this delivery order, the contractor is responsible to fabricate, assemble, integrate, and test TIS Units 1 and 2. The original GFE imagery processor for this effort was the Risk Reduction Imagery Processor. On April 30, 1998, the TIS customer, PMA-281, directed the program office to shift TIS integration to the Common Imagery Processor (CIP). The new schedule associated with the change in GFE called for a TIS to be available for operational assessment in October 1998 and for the final TIS DD250 with all CIP capabilities to be available in February 1999. An operational assessment was conducted on TIS from the 2nd - 7th of November 1998. The final report from COMOPTEVFOR, the U.S. Navy Operation Test and Evaluation Force, is expected in January 1999. In December 1998, the customer, PMA-281, informed the program office that TIS purchases will be pushed back to coincide with development and production of the SHARED Reconnaissance Pod (SHARP). Meetings are scheduled for January 1999 to determine the final funding and schedule profile for this shift.

Funding for FY 99-05 was transferred to the services as part of the DARO divestiture.

We intend this to be the final JSIPS SAR. The JSIPS program is over 90% expended. The Navy TIS is included in the overall Navy JSIPS-N program, which is an ACAT III program and does not require this reporting. A letter was sent to SAF/AQXR on November 23, 1998, informing them of our intent to file a final SAR.

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8. Threshold Breaches:

JSIPS

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

Navy TIS

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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JSIPS (CIGSS), December 31, 1998

9. Schedule:

JSIPS

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Milestone I Decision	N/A	JUL 86	JUL 86
Dem/Val Contract Award	N/A	JUL 86	JUL 86
Milestone II Decision	N/A	AUG 87	AUG 87
EMD Contract Award	N/A	AUG 87	AUG 87
Critical Design Review Complete	N/A	MAR 89	MAR 89
Service Final DT&E (Start)	N/A	NOV 90	NOV 90
USAF LRIP (9th AF) System Decision	APR 93	APR 93	APR 93
USAF LRIP (9th AF) Contract Award	AUG 93	SEP 93	SEP 93
Army System Production Decision	JAN 94	N/A	N/A
USMC LRIP Approval	AUG 94	N/A	N/A
Service Final DT&E (Finish)	N/A	AUG 94	AUG 94
Initial Operational Capability	N/A	DEC 94	DEC 94
USAF LRIP Delivery (First Delivery)	OCT 95	N/A	N/A
USAF Full Rate Decision	JUL 96	N/A	N/A
Navy Subsystem Production Decision	JAN 96	N/A	N/A
USAF LRIP System Decision	N/A	N/A	APR 96
USMC TEG Prototype Start	N/A	APR 95	APR 95
USAF LRIP (12th AF) Contract Award	N/A	AUG 95	AUG 95
USMC TEG Prototype Delivery	N/A	OCT 96	DEC 96
USMC TEG Production Decision	N/A	OCT 96	JAN 97
USMC TEG Production Contract Award	N/A	OCT 96	APR 97
USAF LRIP (12th AF) Delivery	N/A	FEB 97	APR 97
USMC TEG Production Delivery (Initial System)	N/A	JUN 99	JUN 99 (Ch-1)

b. Current Change Explanations --

(Ch-1) The USMC TEG Production Delivery (Initial System) was changed from December 1998 to June 1999 to reflect the program manager's current estimate. Change three to the APB was signed by Ms Darleen Druyun on December 18, 1998 adjusting the APB schedule objective for delivery of the initial system to June 1999 and the threshold to December 1999.

Navy TIS

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Milestone I Decision	N/A	JUL 86	JUL 86
Milestone II Decision	N/A	AUG 87	AUG 87
Navy TIS Study	N/A	MAR 91	MAR 91
Navy TIS EMD Decision	N/A	APR 91	APR 91
Navy TIS EMD Contract Award	N/A	SEP 93	SEP 93
Navy TIS EMD Delivery	N/A	MAR 96	MAR 96
RPS Contract Award/2	N/A	NOV 96	DEC 96

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JSIPS (CIGSS), December 31, 1998

9a. Schedule (Cont'd):

Navy TIS

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
TIS Delivery Order (Initial Production Units)	N/A	FEB 97	APR 97
TIS Delivery (Initial Production Units)	N/A	JUN 98	MAY 98 (Ch-1)

b. Current Change Explanations --

(Ch-1) The current estimate for the TIS Delivery (Initial Production Units) was changed from December 1998 to May 1998 because the DD 250 for the first unit was signed in May 1998. The unit was shipped to Fallon, NV for testing purposes.

10. Performance Characteristics:

JSIPS

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Multiple Sensor Inputs (images/24hrs)				
National	120	120 / 120	120	120
Tactical	N/A	240 / 240	TBD	240
Combined	N/A	360 / 360	YES	N/A
ISO Shelters	N/A	Yes / Yes	Yes	Yes
Reliability, Maintainability (% Operational availability)	95	95 / 95	95	95 (Ch-1)
Energy Management Compatible with both commercial and organic power.	Yes	Yes / Yes	Yes	Yes
Mobility/Deployability - Modular, segmentable, and transportable	Yes	N/A / N/A	Yes	Yes

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JSIPS (CIGSS), December 31, 1998

10b. Performance Characteristics (Cont'd):
JSIPS

b. Current Change Explanations --

(Ch-1) Current estimate was changed from TBD to 95% in reliability, maintainability to reflect that field RMA data for Block II now indicate a minimum of 95% operational availability.

Navy TIS

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Multiple Sensor Inputs (Tactical)	240	240 / 240	TBD	240
Compatible with ATARS	N/A	Yes / Yes	TBD	Yes
ICD (ICD-F/A-18-064)				
Reliability,	95	95 / 90	TBD	95
Maintainability		/		
(% Operational		/		
availability)		/		
		/		
		/		
Energy Management	Yes	Yes / Yes	Yes	Yes
Compatible with				
Shipboard power				
Shipboard Operations	N/A	Yes / Yes	TBD	Yes

b. Current Change Explanations -- None

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JSIPS (CIGSS), December 31, 1998

11. Total Program Cost and Quantity (Dollars in Millions):
JSIPS

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	311.3	278.3	278.0
Procurement	190.9	168.2	136.2
Flyaway	(166.9)		(111.2)
Total Other Wpn Sys			(0.0)
Peculiar Support	(11.2)		(11.2)
Initial Spares	(12.8)		(13.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 86 Base-Year \$	502.2	446.5	414.2
Escalation	151.0	129.8	102.3
Development (RDT&E)	(58.8)	(56.6)	(54.2)
Procurement	(92.2)	(73.2)	(48.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	653.2	576.3	516.5
b. Quantity --			
Development (RDT&E)	3	1	1
Procurement	9	5	5
Total	12	6	6

The 6 JSIPS units are the following:

- 1 Development TEG (Refurbished to Prod Configuration.)
- 2 Refurbished units (2 JSIPS units)
- 2 Production TEGs
- 1 LRIP (JSIPS)

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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JSIPS (CIGSS), December 31, 1998

11a. Total Program Cost and Quantity (Cont'd):

Navy TIS

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	10.7	6.2	6.4
Procurement	73.4	69.5	76.7
Flyaway	(64.3)		(67.6)
Total Other Wpn Sys			(0.0)
Peculiar Support	(4.3)		(3.1)
Initial Spares	(4.8)		(6.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 86 Base-Year \$	84.1	75.7	83.1
Escalation	25.3	35.8	41.1
Development (RDT&E)	(9.8)	(2.0)	(1.8)
Procurement	(15.5)	(33.8)	(39.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	109.4	111.5	124.2
b. Quantity --			
Development (RDT&E)	1	1	0
Procurement	<u>14</u>	<u>28</u>	<u>29</u>
Total	15	29	29

Note: The RDT&E unit was disassembled and the hardware was recapitalized.
Unit no longer exists.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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JSIPS (CIGSS), December 31, 1998

12. Unit Cost Summary:

JSIPS

	UCR Baseline (AUG 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 86 BY\$)	446.5	414.2	
(2) Quantity	6	6	
(3) Unit Cost	74.417	69.033	-7.23
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 86 BY\$)	168.2	136.2	
(2) Quantity	5	5	
(3) Unit Cost	33.640	27.240	-19.02

Navy TIS

	UCR Baseline (AUG 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 86 BY\$)	75.7	83.1	
(2) Quantity	29	29	
(3) Unit Cost	2.610	2.866	+9.81
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 86 BY\$)	69.5	76.7	
(2) Quantity	28	29	
(3) Unit Cost	2.482	2.645	+6.57

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JSIPS (CIGSS), December 31, 1998

13. Cost Variance Analysis:
JSIPS

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	370.1	283.1	-	653.2
Previous Changes:				
Economic	-1.4	-2.7	-	-4.1
Quantity	-	-65.7	-	-65.7
Schedule	-	+0.1	-	+0.1
Engineering	-3.9	-	-	-3.9
Estimating	-3.2	+9.4	-	+6.2
Other	-	-	-	-
Support	-	-12.5	-	-12.5
Subtotal	-8.5	-71.4	-	-79.9
Current Changes:				
Economic	+0.1	-0.8	-	-0.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-29.5	-35.1	-	-64.6
Other	-	-	-	-
Support	-	+8.5	-	+8.5
Subtotal	-29.4	-27.4	-	-56.8
Total Changes	-37.9	-98.8	-	-136.7
Current Estimate	332.2	184.3	-	516.5

Summary (FY 1986 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	311.3	190.9	-	502.2
Previous Changes:				
Quantity	-	-42.6	-	-42.6
Schedule	-	-	-	-
Engineering	-3.0	-	-	-3.0
Estimating	-10.3	+10.0	-	-0.3
Other	-	-	-	-
Support	-	-4.7	-	-4.7
Subtotal	-13.3	-37.3	-	-50.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-20.0	-23.1	-	-43.1
Other	-	-	-	-
Support	-	+5.7	-	+5.7
Subtotal	-20.0	-17.4	-	-37.4
Total Changes	-33.3	-54.7	-	-88.0
Current Estimate	278.0	136.2	-	414.2

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JSIPS (CIGSS), December 31, 1998

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-0.7
Economic adjustment for negative program change. (Economic)	N/A	+0.8
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.4
Deletion of modifications considered to be a separate acquisition effort because JSIPS is no longer in production. (Estimating)	-20.3	-29.9
RDT&E Subtotal	-20.0	-29.4
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-1.7
Economic adjustment for negative program change. (Economic)	N/A	+0.9
Adjustment for Current and Prior Inflation. (Estimating)	+0.9	+1.2
Deletion of modifications considered to be a separate acquisition effort because JSIPS is no longer in production. (Estimating)	-24.0	-36.3
Change in Initial Spares (Support)	+3.6	+5.3
Change in Peculiar Support (Support)	+2.1	+3.2
Procurement Subtotal	-17.4	-27.4

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JSIPS (CIGSS), December 31, 1998

13. Cost Variance Analysis (Cont'd):

Navy TIS

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	20.5	88.9	-	109.4
Previous Changes:				
Economic	+0.3	-4.6	-	-4.3
Quantity	-	+18.7	-	+18.7
Schedule	-	+5.3	-	+5.3
Engineering	-0.7	-	-	-0.7
Estimating	-11.9	-15.0	-	-26.9
Other	-	-	-	-
Support	-	+11.9	-	+11.9
Subtotal	-12.3	+16.3	-	+4.0
Current Changes:				
Economic	-	+0.4	-	+0.4
Quantity	-	-	-	-
Schedule	-	+12.6	-	+12.6
Engineering	-	-	-	-
Estimating	-	+0.7	-	+0.7
Other	-	-	-	-
Support	-	-2.9	-	-2.9
Subtotal	-	+10.8	-	+10.8
Total Changes	-12.3	+27.1	-	+14.8
Current Estimate	8.2	116.0	-	124.2

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JSIPS (CIGSS), December 31, 1998

13a. Cost Variance Analysis (Cont'd):
Navy TIS

Summary (FY 1986 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	10.7	73.4	-	84.1
Previous Changes:				
Quantity	-	+10.8	-	+10.8
Schedule	-	+1.5	-	+1.5
Engineering	-0.5	-	-	-0.5
Estimating	-3.8	-15.4	-	-19.2
Other	-	-	-	-
Support	-	+2.3	-	+2.3
Subtotal	-4.3	-0.8	-	-5.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+5.9	-	+5.9
Engineering	-	-	-	-
Estimating	-	+0.5	-	+0.5
Other	-	-	-	-
Support	-	-2.3	-	-2.3
Subtotal	-	+4.1	-	+4.1
Total Changes	-4.3	+3.3	-	-1.0
Current Estimate	6.4	76.7	-	83.1

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-1.5
Economic adjustment for negative program change. (Economic)	N/A	+1.9
Restructure/Stretchout of annual procurement buy profile. (Schedule)	+5.9	+12.6
Adjustment for Current and Prior Inflation. (Estimating)	+0.5	+0.7
Adjustment for Current and Prior Inflation. (Support)	+0.1	+0.1
Change in Initial Spares (Support)	-1.6	-2.0
Change in Peculiar Support (Support)	-0.8	-1.0
Procurement Subtotal	+4.1	+10.8

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14. Unit Cost and Other History (Then-Year Dollars in Millions):
JSIPS

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
54.43	-0.80	+43.48	+0.02	-0.65	-9.73	--	-0.67	+31.65	86.08

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
31.46	-0.70	+12.02	+0.02	--	-5.14	--	-0.80	+5.40	36.86

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	JUL 86	JUL 86	N/A	JUL 86
Milestone II	AUG 87	AUG 87	N/A	AUG 87
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	N/A	DEC 94
Total Cost	762.6	653.2	N/A	573.3
Total Quantity	12	12	N/A	6
Prog Acq Unit Cost	63.55	54.43	N/A	95.55

Navy TIS

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
7.29	-0.13	-2.89	+0.62	-0.02	-0.90	--	+0.31	-3.01	4.28

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14b. Unit Cost and Other History (Cont'd):
Navy TIS

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.35	-0.14	-2.65	+0.62	--	-0.49	--	+0.31	-2.35	4.00

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	JUL 86	N/A	JUL 86
Milestone II	N/A	AUG 87	N/A	AUG 87
Milestone III	N/A	APR 97	N/A	APR 97
FUE/IOC	N/A	JUL 96	N/A	JUL 96
Total Cost	N/A	111.5	N/A	113.4
Total Quantity	N/A	29	N/A	29
Prog Acq Unit Cost	N/A	3.84	N/A	3.91

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

Note: Currently there are no other major contracts.

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

Total Program

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

Appropriation	Prior Years (FY86-99)	Budget Year (FY00)	Budget Year (FY01)	Balance To Complete (FY02-05)	Total
RDT&E	340.4	-	-	-	340.4
Procurement	219.8	-	7.0	73.5	300.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	560.2	-	7.0	73.5	640.7

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

JSIPS

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

<u>Appropriation</u>	<u>Prior Years (FY86-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	332.2	-	-	-	332.2
Procurement	184.3	-	-	-	184.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	516.5	-	-	-	516.5

Navy TIS

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

<u>Appropriation</u>	<u>Prior Years (FY91-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	8.2	-	-	-	8.2
Procurement	35.5	-	7.0	73.5	116.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	43.7	-	7.0	73.5	124.2

b. Annual Summary -- JSIPS

Appropriation: 0400 - RDT&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY86 Dollars Nonrec</u>	<u>Flyaway FY86 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1995				11.8	15.7
1996				9.8	13.3
1997				12.7	17.4
1998				8.2	11.3
Subtotal				42.5	57.7

JSIPS funding for FY 99 and beyond was deleted because the funds are for modifications. In accordance with para 1.4.5.2 of DoD 5000.2-R, chg 3, modifications are considered separate efforts if the program is no longer in production. This is the case with JSIPS.

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16b. Program Funding Summary (Cont'd):
JSIPS

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				12.5	13.6
1989				11.5	13.1
1990				7.0	8.2
1991				10.5	12.8
1992				11.0	13.8
1993				3.9	5.0
1994				4.2	5.5
Subtotal				60.6	72.0

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986				3.7	3.8
1987					
1988				20.8	22.7
1989				6.5	7.4
1990				16.5	19.4
1991				2.9	3.6
1992				7.5	9.4
1993				1.7	2.2
1994				6.5	8.5
Subtotal				66.1	77.0

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986				11.0	11.2
1987				13.5	14.3
1988				13.1	14.3
1989				13.8	15.8
1990				28.9	34.1
1991				12.2	14.9
1992				4.8	6.0
1993				6.7	8.6
1994				4.8	6.3
Subtotal				108.8	125.5

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JSIPS (CIGSS), December 31, 1998

16b. Program Funding Summary (Cont'd):
JSIPS

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995	2	5.2	13.5	21.0	28.4
1996	1	2.2	20.0	25.6	35.1
1997	1	2.2	19.7	25.2	35.1
1998		14.7		17.1	24.0
Subtotal	4	24.3	53.2	88.9	122.6

JSIPS funding for FY 99 and beyond was deleted because the funds are for modifications. In accordance with para 1.4.5.2 of DoD 5000.2-R, chg 3, modifications are considered separate efforts if the program is no longer in production. This is the case with JSIPS.

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992	1	3.6	14.5	20.7	26.6
1993		15.6		17.9	23.3
1994					
1995				8.7	11.8
Subtotal	1	19.2	14.5	47.3	61.7

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	4	24.3	53.2	131.4	180.3
Navy				60.6	72.0
Army				66.1	77.0
USAF	2	19.2	14.5	156.1	187.2
Grand Total	6	43.5	67.7	414.2	516.5

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JSIPS (CIGSS), December 31, 1998

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

b. Annual Summary -- Navy TIS

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995					
1996					
1997					
1998					
Subtotal					

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991				0.9	1.1
1992				1.7	2.2
1993				1.6	2.0
1994				2.2	2.9
Subtotal				6.4	8.2

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996		3.3		3.9	5.3
1997		4.4		5.1	7.1
1998		3.1		3.6	5.1
Subtotal		10.8		12.6	17.5

Navy funding after FY 98 was transferred from appropriation 0300 to Navy appropriation 1810. This is due to the DARO divestiture.

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	6	1.3	10.7	12.6	18.0
2000					
2001	2	0.4	3.2	4.7	7.0

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JSIPS (CIGSS), December 31, 1998

16b. Program Funding Summary (Cont'd):
Navy TIS

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002	2	0.4	4.0	4.7	7.0
2003	1	0.2	1.1	2.3	3.5
2004	7	1.7	12.0	15.7	24.5
2005	11	2.8	19.0	24.1	38.5
Subtotal	29	6.8	50.0	64.1	98.5

The six units in FY 99 are four production units and two retrofit units.

Navy funding after FY 98 was transferred from appropriation 0300 to Navy appropriation 1810. This is due to the DARO divestiture.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD		10.8		12.6	17.5
Navy	29	6.8	50.0	70.5	106.7
Grand Total	29	17.6	50.0	83.1	124.2

17. Delivery/Expenditure Information:

JSIPS

a. Deliveries To Date	Plan	Actual
RDT&E	1	1
Procurement	2	2

Percent Total Program Quantities Delivered: 50.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 476.4

Percent Total Program Expended: 92.2%

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JSIPS (CIGSS), December 31, 1998

17b. Delivery/Expenditure Information (Cont'd):

Navy TIS

Navy TIS

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	1	1
Procurement	0	0

Percent Total Program Quantities Delivered: 3.4%

b. Total Expenditures To Date (In Millions of Dollars): \$ 14.3

Percent Total Program Expended: 11.5%

Navy RDT&E unit was disassembled and the hardware was recapitalized. Unit no longer exists.

18. Operating and Support Costs:

JSIPS

a. Assumptions and Ground Rules --

The O&S cost estimate was completed in October, 1993 and has been updated annually. Reliability and Maintainability (R&M) are primary JSIPS design parameters. To achieve our high R&M objectives, the maintenance concept is focused on modularity and inherent fault isolation capabilities through Built-in-Test (BIT) and Built-in-Test-Equipment (BITE) features. A three level maintenance concept is planned with the bulk of system maintenance being accomplished at the organization and depot levels. The operating tempo for the system is different for each service. USAF is 21 hours a day, 365 days per year and the USMC is 8 hours per day, 5 days per week. The personnel cost is a summary cost of pay and allowances for officer, enlisted, and civilian personnel required to operate, maintain, and support the system. The consumption cost is a summary cost of fuel and energy resources: operations, maintenance and support materials consumed at the unit level; stock fund reimbursements for depot-level repairables; transportation in support of system operation and maintenance, temporary additional duty/temporary duty, and other unit-level consumption costs, such as purchased services for equipment lease and service contracts. The depot maintenance cost is a summary cost of labor, material, and overhead incurred in performing major overhauls or maintenance on the system, its components, and associated support equipment at centralized repair depots, contractor repair facilities, or on site by depot teams. The Contractor support cost is a summary of contractor labor, materials, and overhead incurred in providing all or part of the logistics support required by the system. The sustaining support cost is a summary cost of replacement support equipment, modification kits, sustaining engineering, and software maintenance support. The indirect support cost is a summary of personnel support for specialty training, permanent changes of station and medical care. There is no antecedent program.

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JSIPS (CIGSS), December 31, 1998

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

b. Costs -- (FY 1986 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per System	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.0	0.0
Unit Level Consumption	0.3	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.3	0.0
Contractor Support	0.8	0.0
Sustaining Support	0.6	0.0
Indirect Costs	0.3	0.0
O & S Consumables	0.0	0.0
Direct Depot Maintenance	0.0	0.0
Sustaining Investment	0.0	0.0
Mission Personnel	1.5	0.0
Indirect Costs	N/A	N/A
Total	3.8	0.0

Navy TIS

a. Assumptions and Ground Rules --

The O&S cost estimate was completed in October, 1993 and has been updated annually. Reliability and Maintainability (R&M) are primary N-TIS design parameters. To achieve our high R&M objectives, the maintenance concept is focused on modularity and inherent fault isolation capabilities through Built-in-Test (BIT) and Built-in-Test-Equipment (BITE) features. A three level maintenance concept is planned with the bulk of system maintenance being accomplished at the organization and depot levels. The operating tempo for the USN is 8 hours per day for 335 days and 30 days at 24 hours per day. The personnel cost is a summary of pay and allowances for officer, enlisted, and civilian personnel required to operate, maintain, and support the system. The consumption cost is a summary cost of fuel and energy resources: operations, maintenance and support materials consumed at the unit level; stock fund reimbursements for depot-level repairables; transportation in support of system operation and maintenance, temporary additional duty/temporary duty, and other unit-level consumption costs, such as purchased services for equipment lease and service contracts. The depot maintenance cost is a summary of labor, material, and overhead incurred in performing major overhauls or maintenance on the system, its components, and associated support equipment at centralized repair depots, contractor repair facilities, or on site by depot teams. The Contractor support cost is a summary of contractor labor, materials, and overhead incurred in providing all or part of the logistics support required by the system. The sustaining support cost is a summary cost of replacement support equipment, modification kits, sustaining engineering, and software maintenance support. The indirect support cost is a summary of personnel support for specialty training, permanent changes of station and medical care. There is no antecedent program.

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JSIPS (CIGSS), December 31, 1998

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

Navy TIS

b. Costs -- (FY 1986 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per N-TIS System	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.0	N/A
Unit Level Consumption	0.0	N/A
Intermediate Maintenance	0.0	N/A
Depot Maintenance	0.1	N/A
Contractor Support	0.1	N/A
Sustaining Support	0.1	N/A
Indirect Costs	0.1	N/A
Unit Level Consumption	N/A	N/A
Direct Depot Maintenance	0.0	0.0
Sustaining Investment	0.0	0.0
Mission Personnel	0.1	0.0
Total	0.5	0.0

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A-1 ABRAMS UPGRADE

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)8231)
PROGRAM: M1A2 ABRAMS UPGRADE

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Tank, Combat, Full Tracked,
M1A2 (M1A2 Abrams Tank)

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:
U.S. Army Tank-Automotive Command COL JAMES R MORAN
ATTN: SFAE-GCSS-W-AB Assigned: July 1, 1998
Warren, MI 48397-5000 DSN 786-6885; COMM (810) 574-6885

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

RDT&E:
(U) PE 23735 (Shared) For M1A2 Development Project D330 (Shared)
(U) PE 23758 (Shared) Horiz Btlfld Digit'n Project D374
(U) PE 63639 (Shared) Armament Project Project DC315

PROCUREMENT:
(U) APPN 2033 ICN G82917 (Army)
(U) APPN 2033 ICN GA0151 (Army)
(U) APPN 2033 ICN GA0750 (Army)
(U) APPN 2033 ICN GA0755 (Army)
(U) APPN 2033 ICN GB1302 (Army)
(U) APPN 2033 ICN GC0161 (Army)
(U) APPN 2033 ICN GE0161 (Army)

O&M:
(U) PE 118207 (Shared) M1 Overhaul

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MAR 17 1999

Classified by: Derived from Security Classification Guide for Abrams Tank
Downgrade instruction: Downgraded UNCLASSIFIED, then separated from classified pages
Declassify on: declassify on Exemption 3 Date of Source 24 July 1999

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M1A2 ABRAMS UPGRADE, December 31, 1998

5. (U) References:

SAR Baseline (Production Estimate):

(U) AAE Approved Acquisition Program Baseline dated January 15, 1995.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated January 15, 1995.

6. (U) Mission and Description:

(U) The mission of the M1A2 Abrams tank is to close with and destroy enemy forces on the integrated battlefield using firepower, maneuver, and shock effect. The M1A2 has completed low rate production and production continues on the M1A2 Upgrade Program. Selected M1 tanks are being overhauled and replaced with M1A2 tanks in order to make them more survivable, fightable, and lethal. Improvements include the combat proven M1A1 features [the 120mm main gun; Nuclear, Biological, and Chemical (NBC) protection; and heavy armor] and the new enhancements linked by the digital distributed data and power architecture of the M1A2. The Inter-vehicular Information System (IVIS) and Position Navigation (POS/NAV) equipment provide improved battlefield command, control, and communications over the M1A1. The new Commander's Independent Thermal Viewer (CITV) also speeds up the target acquisition process so that the gunner may engage more targets in a shorter time interval. The M1A2 Abrams tank replaces the M1A1 tank in the CONUS Contingency Force.

7. (U) Executive Summary:

(U) The M1A2 Abrams tank program is the successor to the M1 and M1A1 tank acquisition programs. Ten M1A2 prototypes were delivered to Army test sites in 1991. An Early User Test & Evaluation (EUT&E), using five of these prototypes, was conducted from June through December 1991. The other prototypes were used to assess ballistic and nuclear vulnerability, system reliability, and logistic supportability. The first of five M1A2 pilot production vehicles was delivered in March 1992. Based on the results of a special ASARC held on March 21, 1992, the Army Acquisition Executive (AAE) decided to proceed with low rate initial production (LRIP) of 62 M1A2 tanks. The Congress then directed the Defense Department to proceed with a program to upgrade the M1 tank to the M1A2 configuration.

An Acquisition Decision Memorandum (ADM), signed on December 18, 1992 by the Deputy to the USD(A), approved the Army's first Acquisition Program Baseline for the Abrams Upgrade Program. M1A2 Live Fire Testing, New Equipment Training, the Initial Operational Test and Evaluation (IOT&E), and the Production Qualification Test (PQT) were completed during 1993 and 1994. The last of the 62 low rate initial production M1A2 tanks was delivered in March 1994. The M1A2 Milestone III Army System Acquisition Review Council (ASARC) was held on April 8, 1994. The resultant Acquisition Decision Memorandum (ADM), approving the M1A2 for full scale production and deployment, was signed by the Army Acquisition Executive (AAE) on April 20, 1994.

The M1A2 underwent its Initial Operational Test & Evaluation (IOT&E) during the period from September to December 1993. The Army Operational Test and Evaluation Command (OPTEC) and the Operational Evaluation Command's independent evaluator

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M1A2 ABRAMS UPGRADE, December 31, 1998

7. (U) Executive Summary (Cont'd):

found the vehicle to be operationally suitable and operationally effective; however, the Director, Operational Test and Evaluation (DOT&E) evaluation of the operational testing found that the vehicle was operationally effective but not operationally suitable and there were several safety shortcomings.

The first production M1A2 upgraded from the M1 configuration was delivered in October 1994. The First Unit Equipped (FUE) milestone was reached on October 21 1995. The new Acquisition Program Baseline reflecting the Milestone III ASARC decision was approved by the AAE on January 15 1995. The Defense Acquisition Executive (DAE) recertified the Abrams Upgrade Program on May 7, 1995. A contract for the System Enhancement Package (SEP) (battlefield digitization) development and the 2nd Generation Forward Looking Infra-Red (FLIR) integration was awarded on August 18, 1995.

The first year of the 5 year Multi Year Procurement (MYP) contract for M1A2 production was awarded on July 10, 1996 with definitization occurring on September 25, 1996. The M1A2 Follow-On Production Test (FPT) on two M1A2 Army Upgrade Tanks (AUT) at Aberdeen Proving Ground (APG) was completed in July 1996. The Follow-On Test and Evaluation (FOT&E) began in September 1995 and was successfully completed in July 1996. A Full Materiel Release was approved for the M1A2 by CG TACOM, on 29 September 1997.

The Army Long Term Modernization Strategy has future combat system deliveries starting in the FY20-25 timeframe. The modernization plan is to only procure 1174 tanks in the M1A2 SEP configuration and retain 1535 Legacy M1A1's. Force XXI will consist of this mixed fleet until replaced by AAN systems in the 2020-35 time period. The current configuration of both the M1A1 and M1A2 fleets of vehicles will be aging without significant modifications until FY06/07 timeframe.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

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M1A2 ABRAMS UPGRADE, December 31, 1998

8. (U) Threshold Breaches (Cont'd):

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Block II ASARC Approval	FEB 85	FEB 85	FEB 85
Award Block II Preliminary System Development Contract	JUL 85	JUL 85	JUL 85
Award ICWS/SE #3 Preliminary Engineering Development Contract	SEP 86	SEP 86	SEP 86
Award CO2 LRF Preliminary Engineering Development Contract	SEP 86	SEP 86	SEP 86
Award Block II Advanced System Development Contract	DEC 87	DEC 87	DEC 87
M1A2 Milestone II Decision Review	DEC 88	DEC 88	DEC 88
Award Block II FSD Contract	DEC 88	DEC 88	DEC 88
DAB Program Review	AUG 89	AUG 89	AUG 89
Special M1A2 ASARC	MAR 90	MAR 90	MAR 90
First Prototype Delivery (FSED)	JAN 91	JAN 91	JAN 91
Technical Test			
Start	JAN 91	JAN 91	JAN 91
Complete	MAR 92	MAR 92	MAR 92
User Test			
Start	JUN 91	JUN 91	JUN 91
Complete	DEC 91	DEC 91	DEC 91
LRIP Decision (62 Tanks)	MAR 92	MAR 92	MAR 92
Mod FY91 M1A1 Production Contract (Incorporating Block II Changes)	MAY 92	MAY 92	MAY 92
First M1A2 Production Delivery	NOV 92	NOV 92	NOV 92
Live Fire Test			
Start	JAN 93	JAN 93	JAN 93
Complete	JUL 93	JUL 93	OCT 93
Production Qualification Test			
Start	FEB 93	FEB 93	FEB 93
Complete	AUG 94	AUG 94	DEC 94
IOC (Training Base)	FEB 93	FEB 93	FEB 93
Initial Operational Test and Evaluation			
Start	SEP 93	SEP 93	SEP 93
Complete	DEC 93	DEC 93	DEC 93
First Upgrade Pilot Delivery	MAR 94	MAR 94	MAR 94
M1A2 MS III Decision	APR 94	APR 94	APR 94
First Unit Equipped (CONUS)	JUN 95	JUN 95	OCT 95
Depot Support Established	SEP 97	SEP 97	SEP 97

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M1A2 ABRAMS UPGRADE, December 31, 1998

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

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	Production <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Maximum Width (inches)	144	144 / 144	144	144
Maximum Height (inches) (grnd to center of turret roof)	96	96 / 96	96	96
Maximum Combat Weight (tons)	68.5	68.5 / 69.5	68.5	68.7
Minimum Range (miles)				
Paved Roads				
With NBC	257	257 / 243	290	243
Without NBC	270	270 / 256	305	256
Maximum Speed (mph)				
Paved Roads	41.5	41.5 / 41.5	42.5	41.5
(0% slope)				
Cross Country	30	30 / 30	30	30
Acceleration (0-20 mph) (sec)				
Paved				
Roads (0% slope)				
With NBC	7.5	7.5 / 9.0	7.0	7.5
Without NBC	7.2	7.2 / 9.0	6.9	7.2
Combat Mission	360	360 / 320	449	360
Reliability (MMBF)				
System Maintainability (Maintenance Ratio)	1.04	1.04 / 1.40	0.95	1.25
Track Life (miles)	2000	2000 / 1000	1509	1509
Air Transportability	C5A, C17	C5A, C17 / C5A, C17	C5A	C5A, C17
Fightability-Improved	40	40 / 25	25	25
Commander's Weapon Station Visibility over M1A1 (%)				
Location Determination (% of distance traveled)	+/-2	+/-2 / +/-3	+/-0.6	+/- 3
Heading error (after 1 hr) (deg-RMS)	+/-1	+/-1 / +/-3	+/-0.88	+/- 3
Testability (BIT) (%)				
On-Board System	95	95 / 95	99	95
Level Detection				
Capability				
LRU Fault Isolation	95	95 / 90	96	90
Maximum False Alarm Rate	5	5 / 10	9.6	10

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M1A2 ABRAMS UPGRADE, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Targets Acquired/Unit	(b)(1)			
Time Over MIA1 (%)				
Average 1st Round Hit				
Probabilities (Round/				
Condition/Ranges)				
Heat/S-S/1500-				
3000m				
Heat/S-M/1500-				
2500m				
Heat/M-S/1500-				
2500m				
Heat/M-M/1500-				
2500m				
KE/S-S/1500-3000m				
KE/S-M/1500-2500m				
KE/M-S/1500-2500m				
KE/M-M/1500-2500m				
Armor Protection vs				
Threat (deg)				
Heat Rounds:				
127mm ATGM (Hull &				
Turrent Side Crew				
Areas Bustle and				
Hull Ammo				
Compartment)				
81mm HHIW (Hull				
Ammo				
Compartment)				
81mm HHIW (Turret				
Bustle				
Compartment)				
150mm ATGM (Turret				
& Hull Front)				
Kinetic Energy				
Rounds:				
125mm APFSDS @				
800-1200mm				
(Turret Front)				
115mm APFSDS (Hull				
Front)				
115mm APFSDS				
(Hull/Turret Side				
Crew Areas,				
Bustle/Hull Ammo				
Comp)				

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(U) The values for the 1st Round Hit Probabilities for the moving tank/moving target (M-M) scenario have been replaced by "TBD" until the completion of the

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M1A2 ABRAMS UPGRADE, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

official evaluation of the Follow-On Production Testing (FPT) at the Aberdeen Proving Ground (APG). Due to manpower cuts and priority changes, the Aberdeen Test Center (ATC) has fallen many months behind in the preparation and completion of all their test reports. ATC has promised that the final report containing the analysis of 1st Round Hit Probabilities will be provided to PM Abrams before the end of 3QFY98, however, live round check fire has already demonstrated outstanding performance.

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	755.4	755.4	898.5
Procurement	6028.6	6028.6	6626.8
Rollaway	(4968.9)		(0.0)
Rollaway			(5462.4)
Total Rollaway	(4968.9)		(5462.4)
Other Wpn System	(791.1)		(0.0)
Other Wpn System			(765.3)
Total Other Wpn Sys	(791.1)		(765.3)
Peculiar Support	(108.5)		(158.2)
Initial Spares	(160.1)		(240.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	207.9	207.9	85.3
Total FY Base-Year \$	6991.9	6991.9	7610.6
Escalation	970.0	970.0	482.0
Development (RDT&E)	(-84.8)	(-84.8)	(-65.8)
Procurement	(1020.8)	(1020.8)	(546.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(34.0)	(34.0)	(1.7)
Total Then Year \$	7961.9	7961.9	8092.6
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	1060	1060	1155
Total	1060	1060	1155

Note: Excludes 10 RDT&E prototypes from the SAR Baseline and 10 from the Current Estimate that are not considered fully configured.

(U) Also excluded are an additional 5 production pilots and 4 upgrade pilots that are not considered fully configured end items. The total procurement quantity of 1155 M1A2 tanks includes 62 Low Rate Initial Production (LRIP) new production M1A2 tanks, which were all delivered in FY93, and 1093 M1A2 tanks upgraded from M1 tanks.

c. (U) Foreign Military Sales --

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M1A2 ABRAMS UPGRADE, December 31, 1998

11c. (U) Total Program Cost and Quantity (Cont'd):

COUNTRY	QUANTITY/MODEL	CASE VALUE
Saudi Arabia	315/M1A2 Abrams Tanks	\$2.7 Billion
Kuwait	218/M1A2 Abrams Tanks	\$1.9 Billion

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (JAN 95 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY BY\$)	6991.9	7610.6	
(2) Quantity	1060	1155	
(3) Unit Cost	6.596	6.589	-0.11
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY BY\$)	6028.6	6626.8	
(2) Quantity	1060	1155	
(3) Unit Cost	5.687	5.737	+0.88

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M1A2 ABRAMS UPGRADE, December 31, 1998

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	670.6	7049.4	-	241.9	7961.9
Previous Changes:					
Economic	+6.3	-348.7	-	-1.1	-343.5
Quantity	-	+444.8	-	-	+444.8
Schedule	-	-187.5	-	-10.5	-198.0
Engineering	+5.0	-	-	-	+5.0
Estimating	+98.3	-214.2	-	-143.3	-259.2
Other	-	-	-	-	-
Support	-	-69.5	-	-	-69.5
Subtotal	+109.6	-375.1	-	-154.9	-420.4
Current Changes:					
Economic	-1.1	-77.7	-	-0.3	-79.1
Quantity	-	+133.9	-	-	+133.9
Schedule	-	+5.7	-	-	+5.7
Engineering	+15.9	-	-	-	+15.9
Estimating	+37.7	+261.8	-	+0.3	+299.8
Other	-	-	-	-	-
Support	-	+174.9	-	-	+174.9
Subtotal	+52.5	+498.6	-	-	+551.1
Total Changes	+162.1	+123.5	-	-154.9	+130.7
Current Estimate	832.7	7172.9	-	87.0	8092.6

(U) Summary (FY 95 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	755.4	6028.6	-	207.9	6991.9
Previous Changes:					
Quantity	-	+377.7	-	-	+377.7
Schedule	-	-	-	-	-
Engineering	+4.6	-	-	-	+4.6
Estimating	+89.8	-205.6	-	-122.8	-238.6
Other	-	-	-	-	-
Support	-	-34.2	-	-	-34.2
Subtotal	+94.4	+137.9	-	-122.8	+109.5
Current Changes:					
Quantity	-	+111.1	-	-	+111.1
Schedule	-	-	-	-	-
Engineering	+14.5	-	-	-	+14.5
Estimating	+34.2	+210.3	-	+0.2	+244.7
Other	-	-	-	-	-
Support	-	+138.9	-	-	+138.9
Subtotal	+48.7	+460.3	-	+0.2	+509.2
Total Changes	+143.1	+598.2	-	-122.6	+618.7
Current Estimate	898.5	6626.8	-	85.3	7610.6

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M1A2 ABRAMS UPGRADE, December 31, 1998

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-1.1
Additional System Enhancement Package (SEP)/Direct Support Electrical System Test Set (DSESTS) requirements & Improved Armor (Engineering)	+10.0	+11.0
Battlefield Combat Identification System (BCIS) (Engineering)	+4.5	+4.9
Adjustment for Current and Prior Inflation. (Estimating)	+1.1	+1.1
DA Directed Live Fire/Survivability Test for Abrams Tank 2000 (Estimating)	+33.1	+36.6
RDT&E Subtotal	+48.7	+52.5
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-77.7
Total Quantity Variance associated with increase of 24 units.	+103.5	+124.7
Quantity increase of 24 units. (Quantity)	+111.1	+133.9
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	0.0	-4.3
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	-7.6	-4.9
Stretchout of annual procurement buy profile to FY05. (Schedule)	0.0	+10.0
Adjustment for Current and Prior Inflation. (Estimating)	+22.1	+23.4
Refinement of cost to close unique tank industrial base. (Estimating)	+53.0	+78.9
Increased Hdwr Cost/refinement of estimates (Majority is due to increase in cost of gun tubes manufactured at Watervliet Arsenal) (Estimating)	+142.8	+164.4
Adjustment for Current and Prior Inflation. (Support)	+4.9	+5.1
Change in Initial Spares due to increased quantity and support for SEP retrofit vehicles (Support)	+111.6	+141.5
Change in Peculiar Support (Support)	+16.7	+21.9
Change in Other Wpn System (Support)	+5.7	+6.4
Procurement Subtotal	+460.3	+498.6
(3) <u>O&M</u>		
Revised escalation indices. (Economic)	N/A	-0.3

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Adjustment for Current and Prior Inflation. (Estimating)	+0.2	+0.3
O&M Subtotal	+0.2	0.0

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
7.51	-0.37	-0.11	-0.17	+0.02	+0.04	--	+0.09	-0.50	7.01

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.65	-0.37	-0.04	-0.16	--	+0.04	--	+0.09	-0.44	6.21

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdF)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	DEC 88	DEC 88
Milestone III	N/A	N/A	APR 94	APR 94
FUE/IOC	N/A	N/A	JUN 95	OCT 95
Total Cost	N/A	N/A	7961.9	8092.6
Total Quantity	N/A	N/A	1060	1155
Prog Acq Unit Cost	N/A	N/A	7.51	7.01

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M1A2 ABRAMS UPGRADE, December 31, 1998

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

a. RDT&E --
 (U) ABRAMS Upgrade:
 General Dynamics Corp., Warren, MI
 DAAE07-95-C-0292, FFP
 Award: March 10, 1995
 Definitized: September 25, 1996

		Initial Contract Price	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$1324.0	\$0.0	600

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1384.0	\$0.0	600	\$1412.0	\$1412.0

Explanation of Change:

(U) The majority of the change in contract cost from the previous submission is due to the addition of SEP Long Lead Requirements not previously included in the Abrams Upgrade Multiyear Contract.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

This contract was converted from the Long Lead Materiel (LLM) funding contract to a 5 year Multiyear production contract starting in FY96. Since this is an FFP contract, cost and schedule variance information is not required.

(U) M1A2 SEP Dev/FLIR Integ:
 General Dynamics Corp., Warren, MI
 DAAE07-94-C-0727, CPFF
 Award: August 18, 1995
 Definitized: August 18, 1995

		Initial Contract Price	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$0.0	\$115.2	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$0.0	\$144.9	0	\$136.0	\$137.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-12.8	\$-11.7
Cumulative Variances To Date (09/30/97)	\$-12.8	\$-11.7
Net Change	\$0.0	\$0.0

Explanation of Change:

(U)
 Phase I of the SEP/Gen II FLIR program (\$7M), concept and trade study phase, was completed in August 1995 with Phase II portion of the initial contract price being \$108.2M. The current contract price and estimated price

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M1A2 ABRAMS UPGRADE, December 31, 1998

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

at completion reflect only Phase II efforts of the SEP/Gen II FLIR program.

Because of funding constraints a Stop Work Order (SWO) was issued to GDLS on 19 Nov 97 which included Cost Performance Reports (CPR), Logistics Quality Assurance, Component Qualification Subtests, Computer software Configuration Item Testing, Packaging development Engineering and IPRs. The last CPR was received in Oct 97 with data as of September 97.

While the CPR is an important management tool, PM Abrams relies on a variety of management tools, which include weekly IPT feedback and review by government technical experts of work remaining. These tools are being used on a day to day basis, and provide more effective feedback than the CPR data given that the contract is 93% complete.

Schedule problems remain on the contract. We anticipate a 3 month contract extension to complete logistics activities and qualification tests with no effect on the delivery of the first SEP/GEN II FLIR tanks in August 99.

b. Procurement --	Initial Contract Price		
(U) <u>Transmission Upgrade:</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Allison Transmission Div, Indianapolis IN			
DAAE07-97-CT537, FFP	\$23.5	\$0.0	120
Award: September 29, 1997			
Definitized: September 29, 1997			
Current Contract Price			
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	Estimated Price At Completion
\$47.7	\$0.0	240	<u>Contractor</u> <u>Program Manager</u>
			\$47.7 \$47.7

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years (FY85-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	781.5	12.1	19.3	19.8	832.7
Procurement	3850.8	654.2	512.5	2155.4	7172.9
MILCON	-	-	-	-	-
O&M	87.0	-	-	-	87.0
Total	4719.3	666.3	531.8	2175.2	8092.6

b. Annual Summary -- ABRAMS Upgrade

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY95 Dollars Nonrec</u>	<u>Flyaway FY95 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1985				47.9	36.2
1986				29.2	22.7
1987				30.6	24.5
1988				89.3	74.4
1989				142.9	123.9
1990				84.2	75.8
1991				126.3	117.9
1992				76.2	72.8
1993				8.0	7.8
1994				32.9	32.8
1995				16.6	16.9
1996				49.8	51.5
1997				66.3	69.3
1998				35.1	37.0
1999				16.9	18.0
2000				11.2	12.1
2001				17.5	19.3
2002				10.1	11.3
2003				7.5	8.5
Subtotal				898.5	832.7

Appropriation: 2033 - Proc of Weapons & Tracked Combat Veh

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY95 Dollars Nonrec</u>	<u>Flyaway FY95 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1986		6.3		6.3	5.1
1987		0.7		0.7	0.6
1988					
1989					

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

Appropriation: 2033 - Proc of Weapons & Tracked Combat Veh

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990		107.3		196.1	182.3
1991	62	91.8	258.0	496.3	475.3
1992				239.0	233.7
1993				163.2	162.8
1994	172	34.5	587.3	131.1	133.1
1995	34		101.6	289.4	298.9
1996	100		352.8	545.3	570.8
1997	120		410.3	458.1	483.8
1998	120		452.3	559.6	598.2
1999	120		541.7	655.8	706.2
2000	120		537.3	597.7	654.2
2001	80		401.1	460.5	512.5
2002	80		482.5	518.1	587.0
2003	80		324.9	425.5	491.8
2004	43		308.2	314.6	377.3
2005	24	6.4	149.4	149.6	180.3
2006		204.8		228.2	280.7
2007		103.2		126.0	158.3
2008				22.4	28.7
2009				21.9	28.7
2010				21.4	28.6
Subtotal	1155	555.0	4907.4	6626.8	7172.9

Appropriation: 2020 - Operation & Maintenance, Army

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				2.2	2.1
1994				17.3	17.2
1995				21.9	22.1
1996				20.1	20.7
1997				23.8	24.9
Subtotal				85.3	87.0

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1155	555.0	4907.4	7610.6	8092.6

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M1A2 ABRAMS UPGRADE, December 31, 1998

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	536	536

(U) Percent Total Program Quantities Delivered: 46.4%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 3330.6

(U) Percent Total Program Expended: 41.2%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The O&S costs shown below are derived from the Program Office Estimate (POE) for the M1A2 Upgrade program, dated January 25, 1994. A conversion quantity of 998 tanks was used in this study. The total O&S cost projected in the study is based on a mix of M1s, M1A1s, and M1A2s operating for 20 years in active units, reserve units, and in the training base. Tanks in the active units are assumed to be driven for 800 miles per year, while tanks in the reserve units and training base are assumed to be driven 288 miles per year. Four dedicated crew members are assumed for each active vehicle. The depot maintenance costs are based on a minimal vehicle overhaul program supplemented by the Inspect and Repair Only as Necessary (IRON) program.

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per M1A2 in an Active Army Battalion	Avg Annual Cost Per M1A1 in an Active Army Battalion
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	102.1	78.9
Intermediate Maintenance	21.3	18.0
Depot Maintenance	4.1	4.1
Contractor Support	67.8	67.8
Sustaining Support	29.2	18.4
Indirect Costs	126.1	126.1
Maintenance Personnel-PA	28.0	37.7
Indirect Support Personn	100.1	105.7
Training (OPA, MPA, OMA)	108.3	105.1
War Reserve Ammo	0.0	0.0
Modification Kits	27.4	8.2
Other MPA, OMA; DBOF	6.6	2.6
Total	621.0	572.6

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DoD-2 NAVY AREA TBMD

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: Navy Area TBMD

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Navy Area Theater Ballistic Missile Defense (TBMD)

2. (U) DoD Component: BMDO

Joint Participants:
U.S. Navy

3. (U) Responsible Office and Telephone Number:

PEO, Theater Surface Combatants	Mr. Jerry LaCamera
PMS 451	Assigned: January 5, 1999
2531 Jefferson Davis Highway	DSN NA; COMM 703-892-7940
Arlington, VA 22242-5170	lacamera jerryl@hq.navy.mil

(U) Ballistic Missile Defense	LTGen Lester Lyles, USAF
Organization, The Pentagon	Assigned: August 1, 1996
Washington, DC 20301-7100	DSN 223-3025 COMM (703) 693-3025

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

RDT&E:

(U) PE 0603867C
(U) PE 0604867C

PROCUREMENT:

(U) APPN 0300 ICN 0208867C (DCA/DNA)
(U) APPN 1507 ICN 2234 (Navy) (Shared)

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99-C-0784

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5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline (APB) dated February 22, 1997.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated February 22, 1997.

6. (U) Mission and Description:

(U) The Navy Area Theater Ballistic Missile Defense (TBMD) project builds on the national investment in AEGIS ships, weapon systems, and Navy STANDARD Missile II (SM-2) Block IV missiles. Two classes of ships continue to be deployed with the AEGIS combat system: the CG-47 Ticonderoga-class cruisers and the DDG-51 Burke-class destroyers. Navy Area TBMD will take advantage of the attributes of naval forces including overseas presence, mobility, flexibility, and sustainability in order to provide protection to debarkation ports, coastal airfields, amphibious objective areas, Allied forces ashore, and other high value sites. Navy assets will provide an option for initial TBMD assets and other expeditionary forces in an opposed environment. This program does not replace another system.

7. (U) Executive Summary:

(U) The role of the U.S. Navy in U.S. Ballistic Missile Defense programs was initially addressed in 1991. A Mission Needs Statement (MNS) for Theater Missile Defense was validated by the JROC in November of 1991, and supplemented by a Chief of Naval Operations approved MNS for a sea-based TBMD in February of 1993. Operational Requirements Documents (ORDs) for both AEGIS TBMD and SM-2 Block IVA were approved in December of 1992, subsequently revised on 6 April 1998 by the JROC.

The following major events occurred since the last submission of the Selected Acquisition Report. (1) Navy Area TBMD Program is in the process of undergoing a total program rebaselining. A new Program Life Cycle Cost Estimate (PLCCE) is in the process of being finalized. A Program Deviation Report (PDR) has been forwarded as a result of schedule changes to DT/OT, Tactical First Unit Equipped Acquisition Milestone III and unit cost deviations. (2) Mr. LaCamera was assigned as Program Manager on January 5, 1999. (3) RADM William Cobb was assigned as Program Executive Officer on 3 December 1998. (4) Successfully completed LFT&E Phase I SM-2 Blk IVA Warhead Arena Tests. (5) LINEBACKER Autumn Events were held at the Pacific Missile Range Facility (PMRF) in November 1998. The USS Lake Erie (CG-70) and USS Port Royal (CG-73) successfully tracked two Theater Ballistic Missile (TBM) targets, Terrier Missile Target (TMT-2) and Target Test Vehicle (TTV-1), during two separate events and relayed track LINK 16 data to participating CONUS based PATRIOT, THAAD, and USMC systems. (6) Completed Phase I SM-2 Blk IVA Warhead Sled Track Test. (7) Completed Navy Area TBMD SM-2 Blk IVA Initial Preproduction Reliability Design Review on 20 November 1998. (8) Conducted White Sands Missile Range OT HERA Target PDR on 27 January 1999. (9) An AEGIS Weapon System Baseline 6 Phase III Critical Design Review (CDR) was completed 17 December 1998. (10) An AWS Baseline 7

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7. (U) Executive Summary (Cont'd):

Phase I Preliminary Design Review (PDR) was conducted on 31 November 1998 through 3 December 1998. The funding for 326 missiles was changed from BMDO budget to Navy missile funding.

The Navy Area Program has recently fielded the LINEBACKER Computer Program on two AEGIS cruisers on time and within cost and was successfully demonstrated in October 1998. As well as having cost control criterion in the award fee clauses in our development contracts, several initiatives to reduce schedule risk and improve cost efficiencies have begun. A Total Ownership Cost (TOC) Plan for the SM-2 BLK IVA has been generated. The plan describes the various initiatives that are being implemented for the SM-2 BLK IVA. Those with near term impact (LRIP) include various Value Engineering Change Proposals (VECP) and the Design to Unit Procurement Cost (DTUPC) objectives defined in the EMD contract. We are working with senior management at Raytheon and Lockheed Martin, to communicate our insistence on continued engineering discipline and cost control. The Navy and BMDO have chartered an Ad Hoc Cost Review Group to conduct an independent cost review of the SM-2 BLK IVA Program.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The exception Selected Acquisition Report of September 1998 identified scheduled changes of TECHEVAL, OPEVAL, First Unit Equipped, and Milestone III Review. For this reporting period, WSMR Flight Testing has changed as follows: Complete Date from Jul 00 to Nov 00. The Procurement Cost, Average Procurement Unit Cost and Program Acquisition Unit Cost increased as a result of extending missile production three additional years and the addition of risk mitigation funds. The Program Deviation Report (PDR) should be submitted to the Defense Acquisition Executive (DAE) in March 1999; and a new Acquisition Program Baseline

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8c. (U) Threshold Breaches (Cont'd):

will be submitted for approval to the DAE in April/May 1999.

Based on a preliminary estimate, increased shortfalls are being experienced above those known at PB00 submission. The PM is working to mitigate near-term shortfalls in FY99 and FY00.

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
	FEB 97	FEB 97	FEB 97
Milestone II Review			
WSMR Flight Testing (DTIIC)			
Start	FEB 99	FEB 99	JUL 99 (Ch-1)
Complete	FEB 00	FEB 00	NOV 00 (Ch-1)
TECHEVAL (DTIID)			
Start	NOV 00	NOV 00	MAY 02
Complete	DEC 00	DEC 00	JUN 02
OPEVAL (OTII)			
Start	MAR 01	MAR 01	NOV 02
Complete	MAR 01	MAR 01	NOV 02
First Unit Equipped	JUN 01	JUN 01	DEC 02
Milestone III Review	AUG 01	AUG 01	APR 03

b. Current Change Explanations --

(U) WSMR Flight Testing dates were changed from FEB 99 to JUL 99 (start) and from JUL 00 to NOV 00 (complete) due to hardware integration and sub-system test requirements.

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
(U) Defended Area (km)	(b)(1)			
(U) Keep Out Altitude (km)				
(U) Defended Area (km)				
(U) Keep Out Altitude (km)				
(U) Probability of Negation within the defended area (Pn)				
(U) Defended Footprint				
(U) Front Range (km)				
(U) Cross Range (km)				
(U) Interoperability				
	LINK 15	LINK 16 / LINK 16	TBD	LINK 16

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10a. (U) Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
Keep Out Altitude (km)	(b)(1)			

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	1845.0	1845.0	2028.4
Procurement	3216.0	3216.0	3572.6
	(3044.7)		(3382.6)
Nonrecurring Flyaway	(71.8)		(84.8)
Total Flyaway	(3116.5)		(3467.4)
Other Weapon Systems	(0.0)		(0.0)
Other Weapon System Cos	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(99.5)		(105.2)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 94 Base-Year \$	5061.0	5061.0	5601.0
Escalation	1169.0	1169.0	1108.6
Development (RDT&E)	(205.0)	(205.0)	(170.7)
Procurement	(964.0)	(964.0)	(937.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	6230.0	6230.0	6709.6
b. (U) Quantity --			
Development (RDT&E)	N/A	N/A	0
Procurement	1500	1500	1500
Total	1500	1500	1500

(U) An LRIP quantity of 185 (12.3%), as approved at the Milestone II Review, exceeds 10 percent of the total production quantity. The LRIP is required to establish an initial production base for the common missile and permit an orderly increase in the production rate for the common missile sufficient to lead to full-rate production upon successful completion of testing.

c. Foreign Military Sales -- None.

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11d. (U) Total Program Cost and Quantity (Cont'd):

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (FEB 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 94 BY\$)	5061.0	5601.0	
(2) Quantity	1500	1500	
(3) Unit Cost	3.374	3.734	+10.67
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 94 BY\$)	3216.0	3572.6	
(2) Quantity	1500	1500	
(3) Unit Cost	2.144	2.382	+11.10

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	2050.0	4180.0	-	6230.0
Previous Changes:				
Economic	-33.4	-180.8	-	-214.2
Quantity	-	-	-	-
Schedule	-	+142.3	-	+142.3
Engineering	-	-	-	-
Estimating	+56.9	-186.8	-	-129.9
Other	-	-	-	-
Support	-	+32.0	-	+32.0
Subtotal	+23.5	-193.3	-	-169.8
Current Changes:				
Economic	-21.6	-101.2	-	-122.8
Quantity	-	-	-	-
Schedule	-	+31.7	-	+31.7
Engineering	-59.0	-	-	-59.0
Estimating	+206.2	+611.5	-	+817.7
Other	-	-	-	-
Support	-	-18.2	-	-18.2
Subtotal	+125.6	+523.8	-	+649.4
Total Changes	+149.1	+330.5	-	+479.6
Current Estimate	2199.1	4510.5	-	6709.6

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Navy Area TBMD, December 31, 1998

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

(U) Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	1845.0	3216.0	-	5061.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+52.0	-63.6	-	-11.6
Other	-	-	-	-
Support	-	+28.2	-	+28.2
Subtotal	+52.0	-35.4	-	+16.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-53.1	-	-	-53.1
Estimating	+184.5	+414.5	-	+599.0
Other	-	-	-	-
Support	-	-22.5	-	-22.5
Subtotal	+131.4	+392.0	-	+523.4
Total Changes	+183.4	+356.6	-	+540.0
Current Estimate	2028.4	3572.6	-	5601.0

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) RD&E

Revised escalation indices. (Economic)	N/A	-21.6
Adjustment for Current and Prior Inflation. (Estimating)	+9.1	+9.7
Increase for additional EMD contract costs and AEGIS Weapon System estimating changes and software requirements. (Estimating)	+175.4	+196.5
Returned funding to BMDO due to extension of AEGIS Baseline 6 Phase III computer program development. (Engineering)	-53.1	-59.0
RD&E Subtotal	+131.4	+125.6

(2) Procurement

Revised escalation indices. (Economic)	N/A	-101.2
Adjustment for Current and Prior Inflation. (Estimating)	+1.5	+1.6
Rephasing of annual buy profiles to meet funding availability. (Schedule)	0.0	+31.7
Returned funding to BMDO due to extension of AEGIS Baseline 6 Phase III computer program development. (Estimating)	-59.9	-69.0

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Navy Area TRMD, December 31, 1998

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Refinement of estimate for production support in FY10-FY12 associated with moving 326 missiles from BMDO funding to Navy Funding. (Estimating)	+115.0	+151.6
Budget increase for non-recurring cost to fund BMDO requirements. (Estimating)	+29.5	+32.0
Refinement of estimate of rate effect due to extending missile procurement (FY10-FY12) and changing lot size. (Estimating)	+328.4	+485.3
Reduction of initial spares requirements as a result of reduced BMDO quantities. (Support)	-5.4	-5.8
Adjustment for Current and Prior Inflation. (Support)	+0.1	+0.1
Increased requirement for initial spares. (Support)	+26.5	+39.0
Correction of previous estimate for peculiar support. (Support)	-43.7	-51.5
Procurement Subtotal	+392.0	+523.8

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.15	-0.22	-0.01	+0.12	-0.04	+0.46	--	+0.01	+0.32	4.47

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.79	-0.19	--	+0.12	--	+0.28	--	+0.01	+0.22	3.01

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14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	FEB 97	N/A	FEB 97
Milestone III	N/A	AUG 01	N/A	APR 03
FUE/IOC	N/A	JUN 01	N/A	DEC 02
Total Cost	N/A	6230	N/A	6709.6
Total Quantity	N/A	1500	N/A	1500
Prog Acq Unit Cost	N/A	4.15	N/A	4.47

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

a. RDT&E --

(U) B/L UPGRADE TI 107:
 LOCKHEED MARTIN, MOORESTOWN, NJ
 N00024-95-C-5159, CPAF
 Award: March 15, 1995
 Definitized: March 1, 1996

Initial Contract Price		
Target	Ceiling	Qty
\$47.6	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$47.6	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$47.6	\$47.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-0.3	\$-0.7
Cumulative Variances To Date (11/23/98)	\$-0.6	\$-0.3
Net Change	\$-0.3	\$0.4

Explanation of Change:

(U) The cumulative schedule variance is \$-312K with a Schedule Performance Index (SPI) of 0.98. There were no significant Cost Variance or Schedule Variance drivers on this effort during this reporting period.

(U) TMD - Targets Program:
 COLEMAN RESEARCH CORP, ORLANDO, FL
 DASC50-92-C-0217, CPFF
 Award: October 14, 1992
 Definitized: October 14, 1992

Initial Contract Price		
Target	Ceiling	Qty
\$168.9	N/A	25

Current Contract Price		
Target	Ceiling	Qty

Estimated Price At Completion	
Contractor	Program Manager

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

\$238.7	N/A	25	\$226.6	\$226.6
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			\$-6.9	\$0.0
Cumulative Variances To Date (01/25/98)			<u>\$-6.9</u>	<u>\$0.0</u>
Net Change			\$0.0	\$0.0

Explanation of Change:

(U) Original Coleman Contract scheduled production of twenty-five HERA class targets at a rate averaging six to eight targets produced annually. MDAP schedule slips have slowed production rates and raised the total per-target cost of production. PM has received no additional contract information to date. This is the last time being reported since we are no longer buying targets off this contract.

(U) SM-2 BLOCK IVA EMD:
STANDARD MISSILE COMPANY, MCLEAN VA
N00024-97-C-5357, CPAF
Award: September 29, 1997
Definitized: September 29, 1997

Initial Contract Price		
Target	Ceiling	Qty
\$407.7	\$	52

Current Contract Price		
Target	Ceiling	Qty
\$407.1	\$	52

Estimated Price At Completion	
Contractor	Program Manager
\$415.5	\$468.2

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-20.4	\$-18.0
Cumulative Variances To Date (11/25/98)	<u>\$-30.3</u>	<u>\$-27.3</u>
Net Change	\$-9.9	\$-9.3

Explanation of Change:

(U) The technical difficulties have continued to impact hardware and software deliveries to guidance section integration, adding risk to achieving the contract flight dates and causing erosion of projected RFI dates for CTVs. For the most part, variances are driven by technical issues associated with the engineering evaluations of the proof of design hardware added and costs of various test equipment. The technical issues are being managed; however, additional resources are being utilized to minimize the impact on schedule performance adding to the cost. Priority is being placed on items critical to the CTV configuration rounds. In general, the test equipment issues are being worked without impact to the overall program schedule. Additional cost is being incurred to bring the engineering equipment online to support the initial DSP flight hardware and duplicate sets of Hybrid test equipment are being fabricated to support the EMD schedule requirements.

Estimated price at completion for the contractor is lower than the PMs

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

because Raytheon is projecting their EAC only through December 1998. Will provide complete contract EAC upon completion of replan/rebaseline assessment. First reporting will appear in 2Q99. The Program Managers estimated price at completion reflects a \$60.5M cost overrun in remaining fees available.

(U) B/L Upgrade TI 115:
Lockheed Martin GES, Moorestown NJ
N00024-95-C-5159, CPAF
Award: October 1, 1997
Definitized: October 1, 1997

Initial Contract Price		
Target	Ceiling	Qty
\$128.4	N/A	

Current Contract Price		
Target	Ceiling	Qty
\$128.4	N/A	

Estimated Price At Completion	
Contractor	Program Manager
\$128.4	\$128.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-0.6	\$-4.2
Cumulative Variances To Date (11/23/98)	\$-1.2	\$-7.1
Net Change	\$-0.6	\$-2.9

Explanation of Change:

(U) The negative schedule and cost trends continue to exist in the System Engineering and AEGIS Development Program areas. The existing Performance Measurement Baseline (PMB) is no longer valid due to the number of scope and technical changes this effort has incurred. A formal re-plan has been initiated and will be implemented after the March 1999 IPR.

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

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

Appropriation	Prior Years (FY93-99)	Budget Year (FY00)	Budget Year (FY01)	Balance To Complete (FY02-12)	Total
RDT&E	1441.5	268.4	226.8	262.4	2199.1
Procurement	103.5	146.0	133.6	4127.4	4510.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1545.0	414.4	360.4	4389.8	6709.6

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

b. Annual Summary -- Navy Area TBMD System

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				35.3	35.1
1994				148.0	150.1
1995				135.3	139.9
1996				267.9	281.6
1997				282.4	300.4
1998				272.3	292.1
1999				223.2	242.3
2000				243.4	268.4
2001				202.4	226.8
2002				56.4	64.2
2003				44.4	51.5
2004				28.4	33.6
2005				22.0	26.6
2006				17.6	21.8
2007				12.3	15.5
2008				11.1	14.3
2009				9.8	12.9
2010				8.7	11.7
2011				7.5	10.3
Subtotal				2028.4	2199.1

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995		8.5	5.3	13.8	14.5
1996		7.0	6.8	13.8	14.6
1997		8.5		8.5	9.1
1998		5.6	8.2	13.8	14.9
1999		6.1	33.4	39.5	43.2
2000	7	6.2	42.4	49.5	55.0
2001	4	1.4	52.2	54.1	61.1
2002	20		103.2	105.2	121.0
2003	28		112.1	114.6	134.4
2004	33		124.6	127.2	152.3
2005	46		145.1	148.4	181.4
2006	67		161.9	161.9	202.0
2007	69		156.6	156.6	199.5
2008			29.0	29.0	37.3
2009			16.0	16.0	21.1

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

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2010			15.2	15.2	20.4
2011			2.5	2.5	3.4
Subtotal	274	43.3	1014.5	1069.6	1285.2

(U) Recurring Flyaway dollars reflect AEGIS upgrades for FY95, FY96, FY98 through FY11 and missile procurements starting in FY00.

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999		6.5		6.5	7.2
2000	16	26.4	52.8	81.3	91.0
2001	18	8.6	53.0	63.7	72.5
2002	47		118.9	123.6	143.3
2003	83		182.7	190.0	224.8
2004	116		221.2	230.0	277.8
2005	127		225.9	234.9	289.7
2006	128		216.0	224.7	282.9
2007	130		210.6	219.1	281.7
2008	117		200.1	207.9	272.9
2009	89		151.8	157.9	211.6
2010	90		157.7	164.1	224.5
2011	152		306.6	318.3	444.6
2012	113		270.8	281.0	400.8
Subtotal	1226	41.5	2368.1	2503.0	3225.3

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	274	43.3	1014.5	3098.0	3484.3
Navy	1226	41.5	2368.1	2503.0	3225.3
Grand Total	1500	84.8	3382.6	5601.0	6709.6

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17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 858.9

(U) Percent Total Program Expended: 12.8%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
The Operations and Support Cost Estimates below assume a 30 year program life, procurement of 1500 SM-2 Block IVA missiles, and computer program and adjunct processor updates to 79 AEGIS Cruisers and Destroyers creates no requirement for additional ship-board or ground-based personnel and has no impact on the operating tempo of the ships. Unit Level Consumption includes the cost to conduct four training mission years after the eight year warranty period expires as well as the cost to dispose of missiles at the end of their life (assumed to be 24 years). Sustaining Support includes the cost of AEGIS Weapon System software maintenance and a missile mid-life refurbishment of the rocket motors and batteries. Indirect costs include technical support provided by Navy facilities during the support phase. There is no antecedent system, therefore column two for cost is left blank. This estimate was prepared November 1998.

b. (U) Costs -- (FY 1994 Constant (Base-Year) Dollars in Thousands)

Cost Element	NAVY AREA TBMD TOTAL COST	N/A
Mission Pay & Allowances	0.0	N/A
Unit Level Consumption	120.0	N/A
Intermediate Maintenance	785.0	N/A
Depot Maintenance	69.4	N/A
Contractor Support	0.0	N/A
Sustaining Support	502.5	N/A
Indirect Costs	60.1	N/A
Total	1537.0	N/A

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A-13 FAAD C2I

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)8231)

PROGRAM: FAAD C2I

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Forward Area Air Defense Command, Control and Intelligence

2. DoD Component: Army

3. Responsible Office and Telephone Number:

TOCS/AMDCCS Project Office
ATTN: SFAE-C3S-AD
Redstone Arsenal, AL 35898-5600

COL Gary D. Jerauld
Assigned: February 18, 1999
DSN 788-3441; COMM 256-895-3441
jerauld@doim6.monmouth.army.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 64741 Project D126, D2JT
PE 64817 Project D356, D494
PE 64820 Project 2IT, E10

PROCUREMENT:

APPN 2035 ICN AD5050 (Army)
APPN 2035 ICN AD5051 (Army)
APPN 2035 ICN AD5090 (Army)
APPN 2035 ICN BA9702 (Army)
APPN 2035 ICN BA9732 (Army)
APPN 2035 ICN WK5053 (Army)
APPN 2035 ICN WK5057 (Army)

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FAAD C2I, December 31, 1998

5. References:

Block II

SAR Baseline (Production Estimate):

SDDM, 14 August 1986; ROC 19 July 1986; Non-Cooperative Target Recognition (NCTR) NCTR-1 Development Specification Forward Area Air Defense (FAAD), Electronic Support Measures (ESM) NCTR System dated October 1990; NCTR-2 Development Specification FAAD, Non-Imaging Sensor, NCTR system dated May 1989.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated March 15, 1999.

Blocks III/IV

SAR Baseline (Production Estimate):

SDDM, 14 August 1986; ROC 19 July 1986; Non-Cooperative Target Recognition (NCTR) NCTR 1 Development Specification Forward Area Air Defense (FAAD), Electronic Support Measures (ESM) NCTR System dated October 1990; NCTR-2 Development Specification FAAD, Non-Imaging Sensor, NCTR system dated May 1989.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated March 15, 1999.

6. Mission and Description:

As the air defense node of the Army Tactical Command and Control System (ATCCS), the Forward Area Air Defense Command, Control, and Intelligence (FAAD C2I) System provides critical short range (formerly forward area) air defense information to support the command and control decision process at various levels of command. The FAAD C2I System ties weapons together by a C2I network and integrates the Forward Area Air Defense System (FAADS) into the Army Battle Command System (ABCS) architecture. The C2I initiative incorporates a family of sensors and identification equipment (ground and aerial, active and passive) with automated data processing distribution capability. The missions will be accomplished through collection, digital processing and dissemination of target information, air threat warning, and command and control information. The FAAD C2I System will also provide target data processing and display capabilities at the Air Battle Management Operations Center (ABMOC), the Army Airspace Command and Control (A2C2) element, Sensor/Command and Control (C2) node, Battery (BTRY), Platoon/Section (PLT/SEC), and Fire Unit (FU) levels. The FAAD C2I System integrates weapons, sensors, communications, and command, control and intelligence (C2I) architecture to counter the entire spectrum of the air threat to the divisional forward area through the 90s and beyond. The acquisition strategy relies heavily on non-developmental items (NDI) and evolutionary software development to rapidly overcome our current air defense command, control, and intelligence deficiencies and to keep pace with the

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6. Mission and Description (Cont'd):

advancing technologies.

The FAAD C2I Block I provided an early air defense command and control capability for light and special divisions. The FAAD C2 System performs the overall FAAD C2I mission via the development of unique engagement operations software and the integration of: (1) ATCCS Common Hardware/Software (CHS) processors, displays and associated peripherals; (2) Tactical Radio Communication Systems (TRCS) JTIDS; (3) combat net radios Single Channel Ground and Airborne Radio System (SINCGARS); (4) LSDIS; (5) Airborne Warning and Control System (AWACS); (6) FAAD weapon systems; and (7) High Frequency Radios (Voice).

The FAAD C2I Block II provided an air defense command and control capability for heavy divisions. The FAAD C2 System performs the overall FAAD C2I mission via the development of unique engagement operations software and the integration of: (1) ATCCS Common Hardware/Software (CHS-1) processors, displays and associated peripherals; (2) TRCS/JTIDS; (3) combat net radios (SINCGARS); (4) Sentinel; (5) Airborne Warning and Control System (AWACS); (6) FAAD weapon systems; (7) combined arms interface; and (8) HIMAD interface.

The FAAD C2I Block III provides the objective air defense command and control capability for all active and selective reserve component air defense units. The FAAD C2 System will perform the overall FAAD C2I mission via the development of unique engagement operations (EO) software (air battle management), system hardware/software enhancements, and the integration of: (1) ATCCS CHS-2 processors, displays, Tactical Communication Interface Nodule (TCIM), and associated peripherals; (2) TRCS/JTIDS; (3) combat net radios (SINCGARS); (4) Mobile Subscriber Equipment (MSE); (5) AWACS; (6) FAAD weapon systems; (7) Sentinel; (8) Force XXI Battle Command Brigade & Below (FBCB2 Applique); (9) Low Level Air Picture Interface (LLAPI).

Block IV will provide pre-planned product improvements (P3I) to existing Block III capabilities to ensure compliance with Army Technical Architecture (ATA) guidance. Command and control on the move, commensurate with the supported force is planned for the Battalion Command Post, A2C2 and Battery Command Post through the utilization of improved CHS Systems. The FAAD C2I interfaces with the Air Defense Mission/Staff Planner called Air and Missile Defense Workstation (AMDWS) for horizontal (Army and Joint) interoperability. This increased capability provides for Battlefield mission planners (i.e., Aviation Intelligence and Others). Increased capabilities to access intelligence data includes: incorporating interfaces to the Joint Intelligence Net (Commander's Tactical Terminal-Hybrid (CTTH)), establishing data links to the Air Force (AWACS, JSTARS), and enhanced A2C2 interoperability. FAAD C2I incorporates the capability to automatically receive, process, and display elements of the Airspace Coordination Order (ACO) as issued by the Air Force.

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FAAD C2I, December 31, 1998

7. Executive Summary:

Personnel participated in the All Service Combat Identification (ASCIET) 99 Mid Planning Conference, 6-9 Oct 98, Fort Stewart, GA. The FAAD C2I subsystems using V5.1 software participated in ASCIET 99 which was conducted 1-12 Mar 99. This event is the primary event leading to an operational assessment for V5.1 software and subsequent materiel release.

Successfully participated in an end-to-end system level demonstration of the Year 2000 (Y2K) transition effects. The FAAD C2 system worked flawlessly and as expected throughout the transition and passed the air track and the command and control information to the weapon systems.

All current FAAD C2 contracts have provisions for Y2K compliance. All Y2K performance and contractual requirements have been verified and validated for the FAAD C2 software. All Y2K performance and contractual requirements have been verified and validated for the Sentinel and Identification Friend or Foe (AN-TPX-56). The Y2K compliance for the training system is complete and a contract modification for the clause has been awarded for the trainer.

The Block II portion of the FAAD C2I program is over 90 percent expended, therefore this may be the final SAR.

8. Threshold Breaches:

Block II

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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FAAD C2I, December 31, 1998

8. Threshold Breaches (Cont'd):

Blocks III/IV

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

Block II

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
BLOCK II (Heavy Div.)			
Milestone II	JUL 86	JUL 86	JUL 86
Contract Award	AUG 92	AUG 92	AUG 92
CDR Complete	JUN 93	JUN 93	JUN 93
Block II DT			
Start	JUN 94	JUN 94	JUN 94
Complete	JUL 94	JUL 94	JUL 94
LOT&E			
Start	OCT 94	OCT 94	OCT 94
Complete	NOV 94	NOV 94	NOV 94
Milestone III (Full Rate Production)	MAR 95	MAR 95	MAR 95
First Unit Equipped	AUG 95	AUG 95	AUG 95
First Production Delivery	JUN 96	JUN 96	JUN 96
Initial Operational Capability	AUG 96	AUG 96	AUG 96
Organic Support Capability	OCT 94	OCT 94	OCT 94
Depot Support Capability	OCT 94	OCT 94	OCT 94
GBS Enhancement	AUG 95	AUG 95	OCT 95

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FAAD C2I, December 31, 1998

9b. Schedule (Cont'd):

Block II

b. Current Change Explanations -- None

Blocks III/IV

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
BLOCK III (Objective)			
S/W Development Contract Award	SEP 94	SEP 94	SEP 94
CDR Complete	NOV 96	MAR 01	MAR 01
System Certification Test	JUL 98	APR 02	APR 02
Block III IPR	MAR 99	JAN 03	JAN 03
FUE	JUN 99	APR 03	APR 03
IOC	JUN 00	APR 04	APR 04
Organic Support Capability	JUN 00	APR 04	APR 04
Depot Support Capability	JUN 00	APR 04	APR 04
BLOCK IV			
Contract Award	SEP 99	SEP 02	SEP 02
CDR Complete	OCT 00	OCT 03	OCT 03
System Certification Test	AUG 03	AUG 06	AUG 06
FUE	MAY 04	MAY 07	MAY 07
IOC	AUG 05	AUG 08	AUG 08
Organic Support Capability	SEP 05	SEP 08	SEP 08
Depot Support Capability	SEP 05	SEP 08	SEP 08
FIRST DIGITIZED DIV	N/A	SEP 00	SEP 00 (Ch-1)
FIRST DIGITIZED CORPS	N/A	APR 04	APR 04 (Ch-1)

b. Current Change Explanations --
(Ch-1)- Added to the revised APB.

10. Performance Characteristics:

Block II

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
BLOCK II (Heavy Div.)				

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10a. Performance Characteristics (Cont'd):

Block II

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Target	158-390	158-390 / 204-449	117-178	158-390
(non-maneuvering)	(x,y)	(x,y) / (x,y)	(x,y)	(x,y)
positional accuracy	165-559	165-559 / 257-4000	132-149	165/559
reported to a Fire	(z)	(z) / (z)	(z)	(z)
Unit (FU) with				
range of air				
defense sensor				
inputs				
(Path-Sensor->				
C**2-> FU) (m) w/l				
sigma)				
Initial track	6.0	6.0 / 6.0	<=1.5	6.0
report delivery				
time to FU				
(sec)				
Air Defense	30	30 / 30	<=7.5	30
Warning				
Weapons Control	30	30 / 30	<=1.5	30
Order				
Sensor Management	30	30 / 30	<=7.5	30
Probability of	.90	.90 / .90	<=.91	.90
correct target ID				
passed to FU				
Shelterized	30	30 / 30	<=30	30
subsystem march				
order and emplace-				
ment 90% of time,				
non-remoted equip				
(less EPLRS and				
JTIDS mast antenna)				
(min)				
Identification	AWACS	AWACS / AWACS	MET	AWACS
Friend or Foe	Proced-	Proced- / Proced-		Proced-
Methods	ural	ural / ural		ural
	Mark	Mark / Mark XII		Mark
	XII	XII /		XII
Simultaneous Air	210	210 / 110	210	210
Vehicle Track &				
Display @ ABMOC				

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10b. Performance Characteristics (Cont'd):

Block II

b. Current Change Explanations -- None

Blocks III/IV

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
BLOCK III (OBJECTIVE)				
Target (Non- maneuvering)	158-390 {x,y}	158-390 / 204-449 {x,y} / {x,y}	TBD	158-390 {x,y}
positional accuracy reported to a Fire Unit (FU) with range of air defense sensor inputs (Path=Sensor-> C**->FU) (m) w/l sigma	165-559 {z}	165-559 / 257-4000 {z} / {z}		165-559 {z}
Initial Track Report delivery time to FU (sec)	6.0	6.0 / 6.0	TBD	6.0
Battle Management Information delivery speed to wpn system (sec)				
Air Defense Warning	30	30 / 30	TBD	30
Weapons Control Order	30	30 / 30	TBD	30
Sensor Management	30	30 / 30	TBD	30
Probability of correct target ID	.9	.9 / .9	TBD	.9
Identification of Friend or Foe	AWACS Precedur al Mark XII	AWACS / AWACS Precedur/ Precedur al Mark / al Mark XII / XII	TBD	AWACS Precedu r al Mark XII 210
Simultaneous Air Vehicle track and display @ ABMOC	210	210 / 210	TBD	210
BLOCK IV (P3I)				

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FAAD C2I, December 31, 1998

10a. Performance Characteristics (Cont'd):

Blocks III/IV

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Target (non- maneuvering)	158-390	158-390 / 204-449	TBD	158-390
positional	{x,y}	{x,y} / {x,y}		{x,y}
accuracy reported	165-559	165-559 / 257-4000		165-559
to a Fire Unit	{z}	{z} / {z}		{z}
(FU) with range of air defense sensor inputs (Path= Sensor->C**21-> FU) (m) w/l sigma				
Initial track	6.0	6.0 / 6.0	TBD	6.0
report delivery time to FU (sec)				
Battle Management Information				
delivery speed to wpn system (sec)				
Air Defense	30	30 / 30	TBD	30
Warning				
Weapon Control	30	30 / 30	TBD	30
Order				
Sensor Management	30	30 / 30	TBD	30
Probability of	.9	.9 / .9	TBD	.9
providing correct target ID to FU				
Identification of	AWACS	AWACS / AWACS	TBD	AWACS
Friend or Foe	Procedur al Mark XII	Procedur/ al Mark / al Mark XII / XII		Procedu r al Mark XII
Simultaneous Air	210	210 / 210	TBD	210
Vehicle track and display @ ABMOC				

b. Current Change Explanations -- None

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FAAD C2I, December 31, 1998

11. Total Program Cost and Quantity (Dollars in Millions):

Block II

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	292.9	287.7	287.7
Procurement	16.2	16.6	16.7
Flyaway	(8.1)		(8.6)
Other Wpn System Costs	(8.1)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(8.1)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	309.1	304.3	304.4
Escalation	-26.5	-26.4	-26.4
Development (RDT&E)	(-26.5)	(-26.3)	(-26.3)
Procurement	(0.0)	(-0.1)	(-0.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	282.6	277.9	278.0

There are no LRIP quantities involved in Block II. FAAD C2I units are defined as organizational units. FAAD C2I Block II units equate to air defense units and vary in size and cost based on specific mission requirements of the type of units.

b. Quantity

Development (RDT&E)	1	1	N/A
Procurement	N/A	N/A	N/A
Total	1	1	N/A

c. Foreign Military Sales -- None.

d. Nuclear Costs - None.

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FAAD C2I, December 31, 1998

11a. Total Program Cost and Quantity (Cont'd):

Blocks III/IV

a. Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	173.3	231.4	207.4
Procurement	577.4	1213.8	1295.4
Flyaway	(473.2)		(1047.3)
Other Weapon System Costs	(66.4)		(186.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(37.8)		(61.3)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	750.7	1445.2	1502.8
Escalation	93.9	213.9	195.0
Development (RDT&E)	(18.0)	(21.5)	(16.6)
Procurement	(75.9)	(192.4)	(178.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	844.6	1659.1	1697.8
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	14	40	N/A
Total	14	40	0

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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FAAD C2I, December 31, 1998

12. Unit Cost Summary:

Block II

	UCR Baseline (JAN 99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	304.3	304.4	
(2) Quantity	2	2	
(3) Unit Cost	152.150	152.200	+0.03
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	16.6	16.7	
(2) Quantity	1	1	
(3) Unit Cost	16.600	16.700	+0.60

Blocks III/IV

	UCR Baseline (JAN 99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	1445.2	1502.7	
(2) Quantity	40	40	
(3) Unit Cost	36.130	37.568	+3.98
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	1213.8	1295.3	
(2) Quantity	40	40	
(3) Unit Cost	30.345	32.383	+6.72

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FAAD C2I, December 31, 1998

13. Cost Variance Analysis:
Block II

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	266.4	16.2	-	282.6
Previous Changes:				
Economic	-3.0	-10.2	-	-13.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-2.0	+10.6	-	+8.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-5.0	+0.4	-	-4.6
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-5.0	+0.4	-	-4.6
Current Estimate	261.4	16.6	-	278.0

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	292.9	16.2	-	309.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-5.2	-	-	-5.2
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-5.2	-	-	-5.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+0.5	-	+0.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+0.5	-	+0.5
Total Changes	-5.2	+0.5	-	-4.7
Current Estimate	287.7	16.7	-	304.4

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FAAD C2I, December 31, 1998

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

Block II

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) Procurement

Refined estimate to reflect actuals.
(Estimating)

+0.5 0.0

Procurement Subtotal

+0.5 0.0

Blocks III/IV

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	191.3	653.3	-	844.6
Previous Changes:				
Economic	-4.5	-20.5	-	-25.0
Quantity	-	+512.4	-	+512.4
Schedule	-	-38.6	-	-38.6
Engineering	+7.6	+112.4	-	+120.0
Estimating	+58.5	+118.3	-	+176.8
Other	-	-	-	-
Support	-	+68.8	-	+68.8
Subtotal	+61.6	+752.8	-	+814.4
Current Changes:				
Economic	-2.9	-42.0	-	-44.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-26.0	-9.9	-	-35.9
Other	-	-	-	-
Support	-	+119.6	-	+119.6
Subtotal	-28.9	+67.7	-	+38.8
Total Changes	+32.7	+820.5	-	+853.2
Current Estimate	224.0	1473.8	-	1697.8

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FAAD C2I, December 31, 1998

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

Blocks III/IV

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	173.3	577.4	-	750.7
Previous Changes:				
Quantity	-	+438.0	-	+438.0
Schedule	-	-20.6	-	-20.6
Engineering	+11.2	+80.1	-	+91.3
Estimating	+47.1	+83.7	-	+130.8
Other	-	-	-	-
Support	-	+55.8	-	+55.8
Subtotal	+58.3	+637.0	-	+695.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-24.2	-7.1	-	-31.3
Other	-	-	-	-
Support	-	+88.1	-	+88.1
Subtotal	-24.2	+81.0	-	+56.8
Total Changes	+34.1	+718.0	-	+752.1
Current Estimate	207.4	1295.4	-	1502.8

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-2.9
Adjustment made for P3I funding. (Estimating)	-24.2	-26.0
RDT&E Subtotal	-24.2	-28.9
(2) Procurement		
Revised escalation indices. (Economic)	N/A	-42.0
Refined estimate for computer rebuy. (Estimating)	-7.1	-10.0
Revised estimate for increased Initial Spares and other weapon systems requirements. (Support)	+88.1	+119.6
Procurement Subtotal	+81.0	+67.6

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14. Unit Cost and Other History (Then-Year Dollars in Millions):

Block II

a. Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
75.15		--	--	--	--	--	--	--	75.15

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A			--	--	--	--	--	-143.60	139.00

b. Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
47.82	--	--	--	--	--	--	--	--	47.82

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A	--	--	--	--	--	--	--	--	16.60

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	AUG 86	JUL 86	JUL 86
Milestone III	N/A	MAR 95	MAR 95	MAR 95
FUE/IOC	N/A	AUG 95	AUG 95	AUG 95
Total Cost	N/A	1313.9	282.6	278
Total Quantity	N/A	N/A	1	1
Prog Acq Unit Cost	N/A	N/A	282.6	278

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14a. Unit Cost and Other History (Cont'd):

Blocks III/IV

a. Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
--	--	--	--	--	--	--	--	--	--

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
60.33	-1.75	-26.40	-0.97	+3.00	+3.52	--	+4.71	-17.89	42.44

b. Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
--	--	--	--	--	--	--	--	--	--

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
46.66	-1.56	17.52	-0.97	+2.81	+2.71	--	+4.71	-9.82	36.84

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14c. Unit Cost and Other History (Cont'd):

Blocks III/IV

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	N/A	MAY 07
Total Cost	N/A	N/A	844.6	1697.7
Total Quantity	N/A	N/A	40	40
Prog Acq Unit Cost	N/A	N/A	21.12	42.44

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

a. Procurement --

Sentinel:

Raytheon Company, Fullerton, CA

DAAH01-91-C-0002, FFP

Award: January 31, 1995

Definitized: January 31, 1995

Initial Contract Price
Target Ceiling Qty

\$208.2 \$ 89

Current Contract Price
Target Ceiling Qty
\$208.2 \$ 89

Estimated Price At Completion
Contractor Program Manager
\$208.2 \$208.2

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

FAAD C2I (f/Blk III):

TRW Defense Systems Group, Carson City CA

DAAH01-94-C-S199, CPIF

Award: September 8, 1994

Definitized: August 29, 1995

Initial Contract Price
Target Ceiling Qty

\$43.9 N/A 0

Current Contract Price
Target Ceiling Qty
\$46.4 N/A 0

Estimated Price At Completion
Contractor Program Manager
\$59.6 \$58.8

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15. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.9	\$-1.1
Cumulative Variances To Date (12/30/98)	\$0.9	\$-1.1
Net Change	\$0.0	\$0.0

Explanation of Change:

Schedule unfavorable variance is due to late government furnished equipment, software problems, and realignment of schedule due to F2BC2 requirements being moved forward.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY80-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-14)</u>	<u>Total</u>
RDT&E	368.4	12.6	16.7	87.7	485.4
Procurement	498.0	64.1	52.5	875.8	1490.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	866.4	76.7	69.2	963.5	1975.8

Block II

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

<u>Appropriation</u>	<u>Prior Years (FY87-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	261.4	-	-	-	261.4
Procurement	16.6	-	-	-	16.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	278.0	-	-	-	278.0

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

Blocks III/IV

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-14)</u>	<u>Total</u>
RDT&E	107.0	12.6	16.7	87.7	224.0
Procurement	481.4	64.1	52.5	875.8	1473.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	588.4	76.7	69.2	963.5	1697.8

b. Annual Summary - Block II

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY96 Dollars Nonrec</u>	<u>Flyaway FY96 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1987				5.7	4.5
1988				40.1	32.8
1989				45.3	38.5
1990				25.2	22.2
1991				9.0	8.2
1992				60.0	56.2
1993				59.3	56.9
1994				43.1	42.1
Subtotal	1			287.7	261.4

Appropriation: 2035 - Other Procurement, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY96 Dollars Nonrec</u>	<u>Flyaway FY96 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990		0.5		0.5	0.5
1991					
1992					
1993					
1994	1		7.6	16.2	16.1
Subtotal	1	0.5	7.6	16.7	16.6

	<u>Qty</u>	<u>Flyaway Dollars Nonrec</u>	<u>Flyaway Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
Grand Total	2	0.5	7.6	304.4	278.0

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

b. Annual Summary -- Blocks III/IV

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				28.2	28.1
1996				21.5	21.8
1997				19.1	19.6
1998				23.6	24.4
1999				12.5	13.1
2000				11.9	12.6
2001				15.5	16.7
2002				17.6	19.3
2003				8.6	9.6
2004				8.5	9.7
2005				8.6	10.0
2006				8.7	10.3
2007				15.7	19.1
2008				2.0	2.5
2009				0.9	1.2
2010				0.9	1.2
2011				0.9	1.2
2012				0.9	1.2
2013				0.9	1.2
2014				0.9	1.2
Subtotal				207.4	224.0

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995	1	0.8	59.7	78.8	79.8
1996	4	0.6	95.5	110.0	112.4
1997	3	0.2	106.2	115.2	119.2
1998	2		70.5	79.7	83.3
1999	2		59.3	82.0	86.7
2000	2		44.9	59.9	64.1
2001	2		40.8	48.2	52.5
2002	2		38.8	47.3	52.4
2003	2		48.8	53.6	60.5
2004	3		71.2	87.7	101.1
2005	2		86.3	112.7	132.7
2006	5		108.2	120.9	145.3
2007	5		76.7	92.3	113.3
2008	5		60.6	69.8	87.5

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

Blocks III/IV

Appropriation: 2035 Other Procurement, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2009			17.8	41.9	53.6
2010			32.4	25.6	33.4
2011			7.5	18.0	24.0
2012			7.0	17.6	24.0
2013			6.5	17.3	24.0
2014			7.0	16.9	24.0
Subtotal	40	1.6	1045.7	1295.4	1473.8

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	40	1.6	1045.7	1502.8	1697.8

17. Delivery/Expenditure Information:

Block II

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	1	1
Procurement	1	1

Percent Total Program Quantities Delivered: 100.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 278

Percent Total Program Expended: 100.0%

Blocks III/IV

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 356.4

Percent Total Program Expended: 21.0%

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18. Operating and Support Costs:

Block II

a. Assumptions and Ground Rules -- None.

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Blk II	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.2	N/A
Unit Level Consumption	0.2	0.0
Intermediate Maintenance	0.1	0.0
Depot Maintenance	0.3	0.0
Contractor Support	0.3	0.0
Sustaining Support	0.3	0.0
Indirect Costs	N/A	N/A
Total	1.4	0.0

Blocks III/IV

a. Assumptions and Ground Rules -- None.

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element		
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	N/A	N/A

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N-2 AIM-9X

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: AIM-9X

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): AIM-9X/Short Range
Air-to-Air Missile
2. (U) DoD Component: Navy
Joint Participants:
Air Force
3. (U) Responsible Office and Telephone Number:
Program Executive Officer (PMA259) CAPT Thomas MacKenzie
47123 Buse Road Unit IPT, Suite 451 Assigned: January 31, 1995
Patuxent River, MD 20670-1547 DSN 757-7311; COMM (301)757-7311
MACKENZIE@NAVAIR.NAVY.MIL
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0207161F Project 4132
(U) PE 0207161N Project 0457
(U) PE 0603715D Project W0456

No Security Objection
to Open Publication
(AS AMENDED)
99-C-0154
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Office of the Chief of
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Dept. of the Navy

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Downgrade instructions: Sidewinder
Declassify on: X3

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DEPARTMENT OF DEFENSE

99-C-0800

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5. (U) References:

SAR Baseline (Development Estimate):

(U) USD(A&T) AIM-9X Acquisition Decision Memorandum dated December 16, 1994.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated January 15, 1997.

6. (U) Mission and Description:

(U) The AIM-9 Sidewinder short-range air-to-air (SRM) is a launch and leave, air combat munition that uses passive infrared (IR) energy for acquisition and tracking and complements the Advanced Medium Range Air-to-Air Missile. Air superiority in the SRM arena is essential and includes first shot, first kill opportunity against an enemy employing IR countermeasures. The AIM-9X is a long-term evolution to the AIM-9, a fielded system, qualifying this as a research category operational systems development. Improvements in missile seeker and kinematics allow retrofit of components to current missiles to the maximum extent possible. Retrofitting of components will extend the operational effectiveness of existing inventories at an affordable cost while continuing evolution of the AIM-9 series.

7. (U) Executive Summary:

(U) Demonstration/Validation contracts were awarded December 20, 1994 to Raytheon Company and Hughes Aircraft Company and completed June 30, 1996. Ground-to-Air (GTA) tests 1, 2 and 3 were conducted at NAWC, China Lake in June, August and October 1995 and were successful. Captive Flight Testing (CFT) was initiated in December 1995 at NAWC, China Lake. Design-to-Cost contract modifications were executed in response to the Acquisition Decision Memorandum. The contractors and the Government converged on a Average Unit Production Cost while incorporating producibility parameters.

The Acquisition Decision Memorandum (ADM) dated December 3, 1996, approved the program entry into Engineering and Manufacturing Development (E&MD). A contract with Hughes Aircraft Company for E&MD was awarded December 13, 1996. The Acquisition Program Baseline (APB) was staffed in accordance with direction from the ADM that the cost and schedule sections be revised after the contract was awarded.

Critical Design Review (CDR) was completed on February 25, 1998. An OSD program protection policy resulted in an AIM-9X anti-tamper requirement. The System Functional Review for the anti-tamper effort was completed in April 1998. The final phase Developmental Test (DT-IIA) was completed in September 1998. Developmental Test (DT-IIB/C) has commenced with four (as of December 4, 1998) of 133 sorties complete. Control Actuator System (CAS) hardware technical issues have impacted the Separation Test Vehicle (SCTV) and Engineering Development Model (EDM) testing that is scheduled as part of DT-IIB/C. The impact has been a seven month delay in the SCTV schedule and a three month delay in the EDM schedule (critical path). Long term impacts on other critical path activities are being investigated.

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7. (U) Executive Summary (Cont'd):

Raytheon has made a corporate decision to close its Raytheon Texas Instruments Systems facility in Lewisville, Texas. This facility was responsible for development of the AIM-9X tracker and production of AIM-9X Circuit Card Assemblies (CCA). The impact of this decision is not fully known, however, the loss of key personnel has negatively impacted tracker and CCA development and testing.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone IV/I	DEC 94	DEC 94	DEC 94
DEM/VAL Contract Award	DEC 94	DEC 94	DEC 94
Early Operational Assessment			
Start	FEB 95	FEB 95	MAR 95
Complete	FEB 96	FEB 96	MAY 96
Milestone II	OCT 96	OCT 96	DEC 96
EMD Contract Award	JAN 97	JAN 97	DEC 96
Critical Design Review	JUL 98	JUL 98	MAR 98
IOT&E			
Complete	AUG 01	AUG 01	AUG 01

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

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
LRIP DAB Decision	APR 00	APR 00	MAY 00 (Ch-1)
Milestone III SAE Review	MAR 02	MAR 02	MAY 02 (Ch-1)
(b)(1) Initial Operational Capability	(b)(1)		

b. Current Change Explanations --

(U) (CH-1) LRIP DAB Decision revised from April 2000 to May 2000 and Milestone III SAE Review revised from March 2002 to May 2002 due to technical difficulties with the Control Actuation System (CAS). Late delivery of CAS has forced delays in the Separation Control Test Vehicles and Engineering Development Model launches. This has caused a delay in critical path activities.

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Day/Night Capability	Yes	Yes / Yes	TBD	Yes
(b)(1) Infrared counter counter measures (IRCCM)	(b)(1)			
Aircraft Interface				
Missile Weight (lbs)	<.or.= 192	<.or.= / <.or.= 192 / 210	TBD	<.or.= 192
Missile Size				
Length (in.)	<.or.= 115	<.or.= / <.or.= 115 / 123	TBD	<.or.= 115
Box Size (in.)	<.or.= 12.5 x 12.5	<.or.= / <.or.= 12.5 x / 12.5 x 12.5 / 12.5	TBD	<.or.= 12.5 x 12.5
Diameter (in.)	5	5 / <.or.= 7	TBD	5
Digital Interface	Employ from current fighter aircraft without digital inter- face	Employ / Employ from / from current / future/ fighter / current aircraft/ fighter without / aircraft digital / with inter- / digital face / inter- / face	TBD	Employ from current fighter aircraft without digital inter- face

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10a. (U) Performance Characteristics (Cont'd):

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Off Boresight Capability Cueing/Verification	Inter- face to all current and planned aircraft systems which provide accurate Line of Site to target	Inter- / Inter- face to / face all / with current / current/ and / planned planned / aircraft aircraft/ radar systems / systems which / and provide / planned accurate/ Helmet Line of / Mounted Site to / Cueing target / System	TRD	Inter- face to all current and planned aircraft systems which provide accurate Line of Site to target
(U) Acquisition (deg.)	(b)(1)			
(U) Track (deg.)				
(U) Launch (deg.)				
(U) Probability of Kill				
(U) Captive Carry Reliability (hr.)	(b)(1)			
(U) Incoming Missile Reliability				

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10a. (U) Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Detect Non-Operational Missile (BIT) All Components	>.or.= 0.80	>.or.= / >.or.= 0.80 / 0.60	TBD	>.or.= 0.80
Detect Non-Operational Missile (BIT-able Components)	>.or. 0.95	>.or. / >.or.= 0.95 / 0.90	TBD	>.or.= 0.95
False Alarm Rate	<.or.= .01	<.or.= / <.or.= .01 / 0.01	TBD	<.or.= .01
BIT Time (sec)	<.or.=20	<.or.=20/ <.or.=20	TBD	<.or.=20

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	531.4	531.4	535.6
Procurement	1932.6	1932.6	1998.4
Flyaway	(1677.2)		(1937.7)
Other Weapons Systems	(138.2)		(0.0)
Peculiar Support	(78.1)		(47.0)
Initial Spares	(39.1)		(13.7)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 97 Base-Year \$	2464.0	2464.0	2534.0
Escalation	768.9	768.9	559.1
Development (RDT&E)	(22.1)	(22.1)	(11.6)
Procurement	(746.8)	(746.8)	(547.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3232.9	3232.9	3093.1

(U) Note: The LRIP quantities approved at Milestone II are 150 (1st year) and 250 (2nd year). This does not represent more than 10% of the planned program buy.

Funding for Seek Eagle is not included here and is in a separate program element and managed at Eglin.

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11b. (U) Total Program Cost and Quantity (Cont'd):

b. (U) Quantity --

Development (RDT&E)	49	49	49
Procurement	<u>10000</u>	<u>10000</u>	<u>10080</u>
Total	10049	10049	10129

c. (U) Foreign Military Sales --

There has been considerable international interest in the AIM-9X. Introductory briefs have been given to Australia, Norway, Belgium, Denmark, the Netherlands, Sweden, Canada, and Switzerland. Policy documents are in review for AIM-9X releasability. In February 1998, Australia made a selection of the Advanced Short Range Air to Air Missile (ASRAAM) program in lieu of the AIM-9X. Delays in obtaining a definitized international release policy have prevented complete response to some foreign customers.

d. (U) Nuclear Costs --

None.

12. (U) Unit Cost Summary:

	UCR Baseline (DEC 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 97 BY\$)	2464.0	2533.8	
(2) Quantity	10049	10129	
(3) Unit Cost	0.245	0.250	+2.04
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 97 BY\$)	1932.6	1998.4	
(2) Quantity	10000	10080	
(3) Unit Cost	0.193	0.198	+2.59

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11b. (U) Total Program Cost and Quantity (Cont'd):

b. (U) Quantity --

Development (RDT&E)	49	49	49
Procurement	<u>10000</u>	<u>10000</u>	<u>10080</u>
Total	10049	10049	10129

c. (U) Foreign Military Sales --

There has been considerable international interest in the AIM-9X. Introductory briefs have been given to Australia, Norway, Belgium, Denmark, the Netherlands, Sweden, Canada, and Switzerland. Policy documents are in review for AIM-9X releasability. In February 1998, Australia made a selection of the Advanced Short Range Air to Air Missile (ASRAAM) program in lieu of the AIM-9X. Delays in obtaining a definitized international release policy have prevented complete response to some foreign customers.

d. (U) Nuclear Costs --

None.

12. (U) Unit Cost Summary:

	UCR Baseline (DEC 96 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 97 BY\$)	2464.0	2533.8	
(2) Quantity	10049	10129	
(3) Unit Cost	0.245	0.250	+2.04
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 97 BY\$)	1932.6	1998.4	
(2) Quantity	10000	10080	
(3) Unit Cost	0.193	0.198	+2.59

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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	553.5	2679.4	-	3232.9
Previous Changes:				
Economic	-12.7	-169.4	-	-182.1
Quantity	-	-	-	-
Schedule	+8.9	-	-	+8.9
Engineering	+19.1	+149.4	-	+168.5
Estimating	-33.1	+240.1	-	+207.0
Other	-	-	-	-
Support	-	-184.3	-	-184.3
Subtotal	-17.8	+35.8	-	+18.0
Current Changes:				
Economic	-4.1	-62.0	-	-66.1
Quantity	-	+16.8	-	+16.8
Schedule	-	-	-	-
Engineering	-	+1.5	-	+1.5
Estimating	+15.6	-29.3	-	-13.7
Other	-	-	-	-
Support	-	-96.3	-	-96.3
Subtotal	+11.5	-169.3	-	-157.8
Total Changes	-6.3	-133.5	-	-139.8
Current Estimate	547.2	2545.9	-	3093.1

(U) Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	531.4	1932.6	-	2464.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	+8.5	-	-	+8.5
Engineering	+18.4	+114.8	-	+133.2
Estimating	-37.8	+143.8	-	+106.0
Other	-	-	-	-
Support	-	-118.7	-	-118.7
Subtotal	-10.9	+139.9	-	+129.0
Current Changes:				
Quantity	-	+11.3	-	+11.3
Schedule	-	-	-	-
Engineering	-	+1.2	-	+1.2
Estimating	+15.1	-10.4	-	+4.7
Other	-	-	-	-
Support	-	-76.2	-	-76.2
Subtotal	+15.1	-74.1	-	-59.0
Total Changes	+4.2	+65.8	-	+70.0
Current Estimate	535.6	1998.4	-	2534.0

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-4.1
Adjustment for Current and Prior Inflation. (Estimating)	+3.6	+3.9
Funds were added to the program for Pre-Planned Product Improvement (P3I). (Estimating)	+35.0	+37.9
Funds were reprogrammed to the F/A-18 and the LAU-7 APN account from the AIM-9X program. (Estimating)	-23.5	-26.2
RDT&E Subtotal	+15.1	+11.5
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-72.4
Economic adjustment for negative program change. (Economic)	N/A	+10.4
Engineering Change Orders were downscoped and the Estimate at Complete (EAC) was revised. (Estimating)	-96.0	-141.1
Revised estimate of initial spares and peculiar support. (Support)	+7.9	+13.0
Correction to previous SAR. Revised acquisition of test equipment and bit reprogrammer should have been support variance. (Support)	-84.1	-109.3
Correction to previous SAR. Revised acquisition of test equipment and bit reprogrammer should have been a support variance. (Estimating)	+84.1	+109.3
Quantity increase of 80 missiles from 5000 to 5080 (Air Force). (Quantity)	+11.3	+16.8
Allocation to engineering variance resulting from quantity change of 80 missiles. (Engineering)	+1.2	+1.5
Allocation to estimating variance resulting from quantity increase of 80 missiles. (Estimating)	+1.5	+2.5
Procurement Subtotal	-74.1	-169.3

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.32	-0.02	--	--	+0.02	+0.02	--	-0.03	-0.01	0.31

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.27	-0.02	--	--	+0.01	+0.02	--	-0.03	-0.02	0.25

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	DEC 94	DEC 94	N/A	DEC 94
Milestone II	OCT 96	OCT 96	N/A	DEC 96
Milestone III	SEP 02	MAR 02	N/A	MAY 02
FUE/IOC	(b)(1)	(b)(1)	N/A	(b)(1)
Total Cost	695	3232.9	N/A	3093.4
Total Quantity	0	10049	N/A	10129
Prog Acq Unit Cost	0	0.32	N/A	0.31

(U) Milestone III revised from March 2002 to May 2002 due to technical difficulties with the Control Actuation System (CAS). Late delivery of CAS has forced delays in the Separation Control Test Vehicles and Engineering Development Model launches. This has cause a delay in critical path activities.

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

a. RDT&E --			Initial Contract Price		
(U) AIM-9X:			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Hughes Aircraft Co., Tuscon, AZ					
N00019-97-C-0027, CPIF/AF			\$169.2	\$0.0	49
Award: December 13, 1996					
Definitized: December 13, 1996					

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$193.5	\$0.0	49	\$181.9	\$199.5

Previous Cumulative Variances	<u>Cost Variance</u>	<u>Schedule Variance</u>
	\$-0.8	\$-2.8
Cumulative Variances To Date (11/16/98)	<u>\$-5.4</u>	<u>\$-7.3</u>
Net Change	\$-4.6	\$-4.5

Explanation of Change:

(U) The cost drivers influencing the negative variances are the Control Actuation System (CAS), software algorithms and processor. The CAS has negatively impacted schedule by delaying Separation Control Test Vehicle (SCTV) testing which has subsequently delayed the Engineering Development Model (EDM) flight test schedule by three months. The contractor has accrued additional cost to stabilize schedule and in mitigation efforts. Throughput difficulties combined with incorporation of anti-tamper technologies have impacted processor board design and testing.

The impact on schedule of the technical difficulties to date has been a three month delay in first EDM launch. Technical challenges remain in flight testing and integration activities. The government/contractor team is assessing the schedule and cost impact and developing alternatives to lessen overall schedule impact.

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

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-17)</u>	<u>Total</u>
RDT&E	391.3	81.1	34.9	39.9	547.2
Procurement	-	61.9	64.2	2419.8	2545.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	391.3	143.0	99.1	2459.7	3093.1

b. Annual Summary -- AIM9X

Appropriation: 0400 - RDT&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY97 Dollars Nonrec</u>	<u>Flyaway FY97 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1995				47.6	46.4
Subtotal				47.6	46.4

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY97 Dollars Nonrec</u>	<u>Flyaway FY97 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				28.3	28.1
1997				45.1	45.3
1998				54.4	55.1
1999				63.1	64.6
2000				38.6	40.1
2001				16.6	17.5
2002				5.3	5.7
2003				1.7	1.9
2004				0.7	0.8
2005				1.3	1.5
Subtotal	26			255.1	260.6

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY97 Dollars Nonrec</u>	<u>Flyaway FY97 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				18.9	18.8
1997				29.1	29.2

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				50.6	51.2
1999				51.4	52.6
2000				39.4	41.0
2001				16.5	17.4
2002				2.4	2.6
2003				4.5	4.9
2004				14.9	16.6
2005				5.2	5.9
Subtotal	23			232.9	240.2

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	75	4.0	21.5	28.4	30.1
2001	125	1.0	23.8	31.0	33.4
2002	300	2.8	48.5	53.4	58.5
2003	300	0.5	55.2	57.2	64.0
2004	300	1.4	54.4	57.5	65.6
2005	300	0.6	53.6	57.5	67.0
2006	300	1.2	54.6	57.4	68.3
2007	300	1.2	52.7	55.6	67.5
2008	300	1.2	52.3	55.2	68.5
2009	300	1.2	55.2	58.1	73.6
2010	300	1.2	59.5	62.4	80.7
2011	300	1.2	59.0	62.0	81.8
2012	300	1.2	58.8	61.7	83.2
2013	300	1.2	58.5	61.4	84.5
2014	300	1.2	58.0	60.9	85.6
2015	300	1.2	57.9	60.8	87.2
2016	300	1.2	57.7	60.6	88.7
2017	300	1.3	57.5	58.7	87.8
Subtotal	5000	24.8	938.7	999.8	1276.0

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	75	4.0	21.4	30.1	31.8
2001	125	1.0	23.4	28.6	30.8

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AIM-9X, December 31, 1998

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002	300	2.8	48.8	57.5	63.0
2003	300	0.5	56.2	60.0	67.1
2004	380	1.4	69.8	74.7	85.3
2005	300	0.6	54.4	56.7	66.1
2006	300	1.2	55.2	56.9	67.7
2007	300	1.2	54.6	56.1	68.1
2008	300	1.2	54.2	55.5	68.8
2009	300	1.2	53.8	55.0	69.7
2010	300	1.2	53.5	54.7	70.7
2011	300	1.2	55.0	56.2	74.2
2012	300	1.2	58.9	60.1	81.0
2013	300	1.2	58.6	59.8	82.3
2014	300	1.2	58.2	59.5	83.6
2015	300	1.2	58.0	59.2	85.0
2016	300	1.2	57.8	59.1	86.6
2017	300	1.3	57.6	58.9	88.1
Subtotal	5080	24.8	949.4	998.6	1269.9

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD				47.6	46.4
Navy	5026	24.8	938.7	1254.9	1536.6
USAF	5103	24.8	949.4	1231.5	1510.1
Grand Total	10129	49.6	1888.1	2534.0	3093.1

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 255

(U) Percent Total Program Expended: 8.2%

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AIM-9X, December 31, 1998

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The AIM-9X is a long-term evolution to the AIM-9 family, a fielded system. The estimate for the Operating and Support costs are as of December 1997. Mission pay and allowance costs are the direct costs for the primary mission personnel and the costs to operate this joint service air-to-air missile (excluding base operating support). The estimate assumes 12 carriers deployed per year at 300 missiles per carrier (beginning in the third year of operations). Unit level consumption primarily relates to the annual training firings and transportation receipt, segregation, storage and issue (RSSI). The system is procured with an all-up-round (AUR) warranty of 2000 hours or 120 months, whichever come first, on all contractor furnished equipment (CFE). Depot AUR maintenance is limited to component repair of failed Government furnished equipment (GFE) and 2nd destination transportation. The AOTD, rocket motor, and warhead are to be provided as GFE. The cost estimate considers a fifteen (15) year service life and spans a thirty-three (33) year time period. Contractor support is required to repair out of warranty and voided warranty AURs. This cost includes the required AUR repairs, software support, and technical publication revisions. The sustaining support consists of replenishment spares, support equipment replacement, systems engineering and program management, and missile demilitarization. Intermediate maintenance and indirect costs are as noted.

Note: This is based on the Total Ownership Cost (TOC) Plan dated Dec 98.

b. (U) Costs -- (FY 1997 Constant (Base-Year) Dollars in Millions)

Cost Element	AIM-9X NAVY	AIM-9X AIR FORCE
Mission Pay & Allowances	0.6	1.2
Unit Level Consumption	0.4	1.3
Intermediate Maintenance	N/A	N/A
Depot Maintenance	1.1	0.4
Contractor Support	0.3	0.0
Sustaining Support	5.6	9.6
Indirect Costs	N/A	N/A
Total	8.0	12.5

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N-4 CEC

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: CEC

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Cooperative Engagement Capability

2. (U) DoD Component: Navy

Joint Participants:

USAF-AWACS, USA-PATRIOT, JLENS PROGRAMS (STUDIES & DEMONSTRATIONS)

3. (U) Responsible Office and Telephone Number:

Program Executive Officer (Theater CAPT Daniel E. Busch
Air Defense/Surface Combatants) CEC Assigned: September 22, 1997
2531 Jefferson Davis Highway DSN 332-7413 x200
Arlington, VA 22242-5170 COMM (703) 602-7413 x200
 BuschDE@NAVSEA.NAVY.MIL

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

RDT&E:

(U) PE 0204152N (Shared) Project E0463 (Shared)
(U) PE 0603658N Project K2039, U2039, U2394
(U) PE 0603755N (Shared) Project U2039

PROCUREMENT:

(U) APPN 1611 ICN 2300000000 (Navy) (Shared)
(U) APPN 1810 ICN 2606000000 (Navy)
(U) APPN 1506 ICN 3300000000 (Navy) (Shared)

No Security Objection
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AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

99-C-0833

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CEC, December 31, 1998

5. (U) References:

SAR Baseline (Development Estimate):

(U) NAE Approved Acquisition Program Baseline dated July 10, 1995.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated March 18, 1999.

6. (U) Mission and Description:

(U) Cooperative Engagement Capability (CEC) significantly improves Battle Force air and missile defense capabilities by coordinating measurement data from all battle force air search sensors into a single, real-time, composite track picture. CEC distributes sensor data from each ship and aircraft, or cooperating unit (CU) to all other CUs in the battle force through a line of sight, high data rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking (relative spatial positioning) between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best Anti Aircraft Warfare (AAW) sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system. CEC will significantly improve our Battle Force defense in depth, including both local and area defense capabilities against current and future AAW threats. Moreover, CEC will provide critical connectivity and integration of over-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

The CEC equipment set for AN/USG-2 shipboard systems consists of the Data Distribution System (DDS), Combat Systems modifications, one (1) or two (2) active aperture antennas depending on ship class, a receiver synthesizer, red and black processors and a Cooperative Engagement Processor (CEP). The CEC equipment set for AN/USG-3 systems consists of an end-fire array antenna, a transceiver, a red and black processor, CEP, and a receiver synthesizer. The DDS encodes and distributes ownship sensor and engagement data, is a high capacity, jam resistant, directive system providing precision gridlocking and high throughput of data. The CEP is a high capacity distributed processor which is able to convert sensor data from each CU to output data which can be utilized for real-time target tracking by all cooperating units. The data is passed to the ship/aircraft combat system and each unit can then cue its onboard sensors for fire control and target prosecution, or use the fire control quality data from other units through CEC to engage targets without tracking by own sensors.

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CEC, December 31, 1998

7. (U) Executive Summary:

(U) COMOPTEVFOR report of Initial Operational Testing and Evaluation (IOT&E) of AN/USG-2 equipment indicated that CEC has the potential to be operationally effective and operationally suitable. The CEC hardware performed as designed during the test period. Interoperability between combat systems and tactical data links was noted as major concern.

As a result of the computer program-related interoperability problems, the CEC test program has been replanned. FY 1998 Operational Evaluation (OPEVAL) of AN/USG-2 equipment has been deferred to allow computer program developers adequate time to identify and resolve the interoperability issues. Extensive Developmental Testing/Operational Testing (DT/OT) will be conducted in FY 1999 and early 2000 to ensure thorough resolution of computer program and interoperability issues, and prepare for OPEVAL of the AN/USG-2 system in 2000.

The replanned test and evaluation schedule will delay the Full Rate Production (FRP) decision to FY 2001. The FY 2000 OPEVAL results will be the basis for the FRP decision.

ASN(RDA) conducted a review of the CEC program in February 1998. The IOT&E test results were addressed and ASN(RDA) directed establishment of a Program Management Assistance Group (PMAG) to review and recommend future program direction to ensure CEC program success. ASN(RDA) also approved Low Rate Initial Production (LRIP) of four (4) AN/USG-2 systems and long lead funding for up to nine (9) systems. The authority to procure the balance of the planned and funded FY 1998 procurement program was deferred to the 4th quarter of FY 1998. The PMAG was directed to establish exit criteria for the subsequent FY 1998 procurement.

ASN(RDA) conducted a follow-on program review in August 1998 and authorized the FY 1998 procurement of three (3) additional LRIP units. ASN(RDA) also approved the transfer of previously approved OP,N funded units to Land Based Test Sites; and approved the revised CEC program schedule. ASN(RDA) program review for approval to procure ten (10) FY 1999 LRIP units is planned for March 1999.

First flight of a CEC equipped E-2C aircraft took place in April 1998 and during the summer, engineering testing was conducted at the Atlantic Fleet Weapons Training Facility (AFWTF). During this test period while participating in a CEC based network, the E-2C contributed radar and IFF data to the network, participated in simulated engagements, and demonstrated 120% of required maximum range surface-to-air connectivity.

Airworthiness flight testing of the CEC equipped Naval Research Laboratory (NRL) P-3D aircraft was conducted at the Lockheed Martin facility in Greenville, SC and the aircraft has been delivered to the NRL Detachment at Patuxent River Naval Air Station. Completion of flight qualification testing is expected by the end of March 1999.

CEC baseline 2.0.10 with ACDS Block 1, Level 2.1.3 was installed on the USS John F. Kennedy (CV 67) following a Fleet Delivery Readiness Review (FDRR)

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CEC, December 31, 1998

7. (U) Executive Summary (Cont'd):

on 26 February 1999. CEC baseline 2.0.10 is Y2K compliant, and the validation phase for CEC baseline 2 software has successfully been completed. AN/USG-1, AN/USG-2 and AN/USG-3 equipment with baseline 2.0 software has been certified as Y2K compliant by PEO Theater/Surface Combatants.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
Milestone II	MAY 95	MAY 95	MAY 95	
Development Contract Modification	MAY 95	MAY 95	MAY 95	(Ch-1)
Preliminary Design Review Complete	FEB 96	FEB 96	JUL 96	(Ch-2)
Critical Design Review Complete	AUG 96	AUG 96	DEC 96	
Baseline System Initial Operational Capability	SEP 96	SEP 96	SEP 96	
IOT&E (DT-IIB/OT-IIA1)				
Start	MAY 97	MAY 97	MAY 97	
Complete	JUL 97	AUG 97	AUG 97	
LRIP Decision	DEC 97	DEC 97	FEB 98	
Low Rate Production Contract Award	JAN 98	APR 98	APR 98	
Service Final DT&E				
Start	MAR 98	JUL 00	JUL 00	
Complete	APR 98	NOV 00	NOV 00	
IOT&E - OPEVAL (OT-IIA2)				
Start	MAY 98	SEP 00	SEP 00	
Complete	MAY 98	NOV 00	NOV 00	
Milestone III	OCT 98	JUL 01	JUL 01	

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

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
Organic Support Date	JUL 00	OCT 01	OCT 01	(Ch-3)
Service Depot Support Date	JUL 00	OCT 00	OCT 00	
FOT&E-1 (DTIIIA/OT-IIIA)E-2C				
Start	N/A	APR 01	APR 01	
Complete	N/A	AUG 01	AUG 01	
FOT&E-2 (DTIIIB/OT-IIIB)E-2C				
Start	N/A	MAR 03	MAR 03	
Complete	N/A	JUL 03	JUL 03	
Full Rate Production Contract Award	NOV 98	JUL 01	JUL 01	
Full Operational Capability	JUL 00	DEC 03	DEC 03	
AIR IOC	N/A	DEC 03	DEC 03	

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
1. Track Base Size	(b)(1)			
2. Track Measurement				
Update Rate (1/sec)				
Local				
Remote				
3. Operational				
Availability				
4. Data Rate (without				
any Compression				
Technology				
Implemented) (Mbps)				
5. Anti-jam Resistance				
(kW/MHz)	(b)(1)			

(U) - Because of the difficulty in simultaneously developing and testing ACDS Block 1, CEC and AEGIS Baseline 6 software, and the uncertain availability of ships for Battle Group interoperability testing during the OPEVAL OT-IIA1 period, additional test periods are being considered to reduce risk. CEC will conduct a series of Land Based Test, DT/OT leading to OPEVAL OT-IIA1 in mid to late 2000. OPEVAL OT-IIA1 is planned to take place using CEC equipped surface ships, aircraft and land based test sites. The Milestone III decision will follow later.

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CEC, December 31, 1998

10b. (U) Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	1030.4	1544.4	1544.4
Procurement	1150.3	1644.6	1644.6
Rollaway	(677.3)		(1562.8)
Other Weapon Systems Cost	(473.0)		(81.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	41.2	47.3	0.0
Total FY 95 Base-Year \$	2221.9	3236.3	3189.0
Escalation	351.2	358.3	405.6
Development (RDT&E)	(57.8)	(80.2)	(80.2)
Procurement	(280.3)	(325.4)	(325.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(13.1)	(-47.3)	(0.0)
Total Then Year \$	2573.1	3594.6	3594.6

b. (U) Quantity --

Development (RDT&E)	9	11	11
Procurement	174	220	220
Total	183	231	231

(U) A total of seven (7) Limited Rate Initial Production (LRIP) units were approved for procurement in FY 1998.

The total procurement quantity for AN/USG-2 shipboard systems includes seven (7) RDT&E,N funded systems, one hundred and twenty two (122) OP,N funded systems, and twenty five (25) SC,N funded systems.

The total procurement quantity for AN/USG-3 airborne systems includes four (4) RDT&E,N funded systems, seventy (70) AP,N funded systems, and three (3) OP,N funded systems.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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CEC, December 31, 1998

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

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Organic Support Date	JUL 00	OCT 01	OCT 01 (Ch-3)
Service Depot Support Date	JUL 00	OCT 00	OCT 00
FOT&E-1 (DTIIIA/OT-IIIA)E-2C			
Start	N/A	APR 01	APR 01
Complete	N/A	AUG 01	AUG 01
FOT&E-2 (DTIIIB/OT-IIIB)E-2C			
Start	N/A	MAR 03	MAR 03
Complete	N/A	JUL 03	JUL 03
Full Rate Production Contract Award	NOV 98	JUL 01	JUL 01
Full Operational Capability	JUL 00	DEC 03	DEC 03
AIR IOC	N/A	DEC 03	DEC 03

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Track Base Size	(b)(1)			
Track Measurement				
Update Rate (1/sec)				
Local				
Remote				
Operational				
Availability				
Data Rate (without				
any Compression				
Technology				
Implemented) (Mbps)				
Anti-jam Resistance				
(kW/MHz)	(b)(1)			

(U) - Because of the difficulty in simultaneously developing and testing ACDS Block 1, CEC and AEGIS Baseline 6 software, and the uncertain availability of ships for Battle Group interoperability testing during the OPEVAL OT-IIA1 period, additional test periods are being considered to reduce risk. CEC will conduct a series of Land Based Test, DT/OT leading to OPEVAL OT-IIA1 in mid to late 2000. OPEVAL OT-IIA1 is planned to take place using CEC equipped surface ships, aircraft and land based test sites. The Milestone III decision will follow later.

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CEC, December 31, 1998

7. (U) Executive Summary (Cont'd):

on 26 February 1999. CEC baseline 2.0.10 is Y2K compliant, and the validation phase for CEC baseline 2 software has successfully been completed. AN/USG-1, AN/USG-2 and AN/USG-3 equipment with baseline 2.0 software has been certified as Y2K compliant by PEO Theater/Surface Combatants.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

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Milestone II	MAY 95	MAY 95	MAY 95	
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Preliminary Design Review Complete	FEB 96	FEB 96	JUL 96	(Ch-2)
Critical Design Review Complete	AUG 96	AUG 96	DEC 96	
Baseline System Initial Operational Capability	SEP 96	SEP 96	SEP 96	
IOT&E (DT-IIB/OT-IIA1)				
Start	MAY 97	MAY 97	MAY 97	
Complete	JUL 97	AUG 97	AUG 97	
LRIP Decision	DEC 97	DEC 97	FEB 98	
Low Rate Production Contract Award	JAN 98	APR 98	APR 98	
Service Final DT&E				
Start	MAR 98	JUL 00	JUL 00	
Complete	APR 98	NOV 00	NOV 00	
IOT&E - OPEVAL (OT-IIA2)				
Start	MAY 98	SEP 00	SEP 00	
Complete	MAY 98	NOV 00	NOV 00	
Milestone III	OCT 98	JUL 01	JUL 01	

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CEC, December 31, 1998

7. (U) Executive Summary:

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CEC, December 31, 1998

5. (U) References:

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(U) NAE Approved Acquisition Program Baseline (APB) dated March 18, 1999.

6. (U) Mission and Description:

(U) Cooperative Engagement Capability (CEC) significantly improves Battle Force air and missile defense capabilities by coordinating measurement data from all battle force air search sensors into a single, real-time, composite track picture. CEC distributes sensor data from each ship and aircraft, or cooperating unit (CU) to all other CUs in the battle force through a line of sight, high data rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking (relative spatial positioning) between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best Anti Aircraft Warfare (AAW) sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system. CEC will significantly improve our Battle Force defense in depth, including both local and area defense capabilities against current and future AAW threats. Moreover, CEC will provide critical connectivity and integration of over-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

The CEC equipment set for AN/USG-2 shipboard systems consists of the Data Distribution System (DDS), Combat Systems modifications, one (1) or two (2) active aperture antennas depending on ship class, a receiver synthesizer, red and black processors and a Cooperative Engagement Processor (CEP). The CEC equipment set for AN/USG-3 systems consists of an end-fire array antenna, a transceiver, a red and black processor, CEP, and a receiver synthesizer. The DDS encodes and distributes ownship sensor and engagement data, is a high capacity, jam resistant, directive system providing precision gridlocking and high throughput of data. The CEP is a high capacity distributed processor which is able to convert sensor data from each CU to output data which can be utilized for real-time target tracking by all cooperating units. The data is passed to the ship/aircraft combat system and each unit can then cue its onboard sensors for fire control and target prosecution, or use the fire control quality data from other units through CEC to engage targets without tracking by own sensors.

N-4 CEC

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: CEC

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Cooperative Engagement Capability

2. (U) DoD Component: Navy

Joint Participants:

USAF-AWACS, USA-PATRIOT, JLENS PROGRAMS (STUDIES & DEMONSTRATIONS)

3. (U) Responsible Office and Telephone Number:

Program Executive Officer (Theater Air Defense/Surface Combatants) CEC
2531 Jefferson Davis Highway
Arlington, VA 22242-5170
CAPT Daniel E. Busch
Assigned: September 22, 1997
DSN 332-7413 x200
COMM (703) 602-7413 x200
BuschDE@NAVSEA.NAVY.MIL

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

RDT&E:

(U) PE 0204152N (Shared) Project E0463 (Shared)
(U) PE 0603658N Project K2039, U2039, U2394
(U) PE 0603755N (Shared) Project U2039

PROCUREMENT:

(U) APPN 1611 ICN 2300000000 (Navy) (Shared)
(U) APPN 1810 ICN 2606000000 (Navy)
(U) APPN 1506 ICN 3300000000 (Navy) (Shared)

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DEPARTMENT OF DEFENSE

99-C-0833

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AIM-9X, December 31, 1998

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The AIM-9X is a long-term evolution to the AIM-9 family, a fielded system. The estimate for the Operating and Support costs are as of December 1997. Mission pay and allowance costs are the direct costs for the primary mission personnel and the costs to operate this joint service air-to-air missile (excluding base operating support). The estimate assumes 12 carriers deployed per year at 300 missiles per carrier (beginning in the third year of operations). Unit level consumption primarily relates to the annual training firings and transportation receipt, segregation, storage and issue (RSSI). The system is procured with an all-up-round (AUR) warranty of 2000 hours or 120 months, whichever come first, on all contractor furnished equipment (CFE). Depot AUR maintenance is limited to component repair of failed Government furnished equipment (GFE) and 2nd destination transportation. The AOTD, rocket motor, and warhead are to be provided as GFE. The cost estimate considers a fifteen (15) year service life and spans a thirty-three (33) year time period. Contractor support is required to repair out of warranty and voided warranty AURs. This cost includes the required AUR repairs, software support, and technical publication revisions. The sustaining support consists of replenishment spares, support equipment replacement, systems engineering and program management, and missile demilitarization. Intermediate maintenance and indirect costs are as noted.

Note: This is based on the Total Ownership Cost (TOC) Plan dated Dec 98.

b. (U) Costs -- (FY 1997 Constant (Base-Year) Dollars in Millions)

Cost Element	AIM-9X NAVY	AIM-9X AIR FORCE
Mission Pay & Allowances	0.6	1.2
Unit Level Consumption	0.4	1.3
Intermediate Maintenance	N/A	N/A
Depot Maintenance	1.1	0.4
Contractor Support	0.3	0.0
Sustaining Support	5.6	9.6
Indirect Costs	N/A	N/A
Total	8.0	12.5

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AIM-9X, December 31, 1998

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002	300	2.8	48.8	57.5	63.0
2003	300	0.5	56.2	60.0	67.1
2004	380	1.4	69.8	74.7	85.3
2005	300	0.6	54.4	56.7	66.1
2006	300	1.2	55.2	56.9	67.7
2007	300	1.2	54.6	56.1	68.1
2008	300	1.2	54.2	55.5	68.8
2009	300	1.2	53.8	55.0	69.7
2010	300	1.2	53.5	54.7	70.7
2011	300	1.2	55.0	56.2	74.2
2012	300	1.2	58.9	60.1	81.0
2013	300	1.2	58.6	59.8	82.3
2014	300	1.2	58.2	59.5	83.6
2015	300	1.2	58.0	59.2	85.0
2016	300	1.2	57.8	59.1	86.6
2017	300	1.3	57.6	58.9	88.1
Subtotal	5080	24.8	949.4	998.6	1269.9

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD				47.6	46.4
Navy	5026	24.8	938.7	1254.9	1536.6
USAF	5103	24.8	949.4	1231.5	1510.1
Grand Total	10129	49.6	1888.1	2534.0	3093.1

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date

	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 255

(U) Percent Total Program Expended: 8.2%

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AIM-9X, December 31, 1998

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				50.6	51.2
1999				51.4	52.6
2000				39.4	41.0
2001				16.5	17.4
2002				2.4	2.6
2003				4.5	4.9
2004				14.9	16.6
2005				5.2	5.9
Subtotal	23			232.9	240.2

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	75	4.0	21.5	28.4	30.1
2001	125	1.0	23.8	31.0	33.4
2002	300	2.8	48.5	53.4	58.5
2003	300	0.5	55.2	57.2	64.0
2004	300	1.4	54.4	57.5	65.6
2005	300	0.6	53.6	57.5	67.0
2006	300	1.2	54.6	57.4	68.3
2007	300	1.2	52.7	55.6	67.5
2008	300	1.2	52.3	55.2	68.5
2009	300	1.2	55.2	58.1	73.6
2010	300	1.2	59.5	62.4	80.7
2011	300	1.2	59.0	62.0	81.8
2012	300	1.2	58.8	61.7	83.2
2013	300	1.2	58.5	61.4	84.5
2014	300	1.2	58.0	60.9	85.6
2015	300	1.2	57.9	60.8	87.2
2016	300	1.2	57.7	60.6	88.7
2017	300	1.3	57.5	58.7	87.8
Subtotal	5000	24.8	938.7	999.8	1276.0

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY97 Dollars Nonrec	Flyaway FY97 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	75	4.0	21.4	30.1	31.8
2001	125	1.0	23.4	28.6	30.8

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AIM-9X, December 31, 1998

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

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-17)</u>	<u>Total</u>
RDT&E	391.3	81.1	34.9	39.9	547.2
Procurement	-	61.9	64.2	2419.8	2545.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	391.3	143.0	99.1	2459.7	3093.1

b. Annual Summary -- AIM9X

Appropriation: 0400 - RDT&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY97 Dollars Nonrec</u>	<u>Flyaway FY97 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1995				47.6	46.4
Subtotal				47.6	46.4

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY97 Dollars Nonrec</u>	<u>Flyaway FY97 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				28.3	28.1
1997				45.1	45.3
1998				54.4	55.1
1999				63.1	64.6
2000				38.6	40.1
2001				16.6	17.5
2002				5.3	5.7
2003				1.7	1.9
2004				0.7	0.8
2005				1.3	1.5
Subtotal	26			255.1	260.6

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY97 Dollars Nonrec</u>	<u>Flyaway FY97 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				18.9	18.8
1997				29.1	29.2

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AIM-9X, December 31, 1998

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

a. RDT&E --	Initial Contract Price		
(U) AIM-9X:	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Hughes Aircraft Co., Tuscon, AZ			
N00019-97-C-0027, CP1F/AF	\$169.2	\$0.0	49
Award: December 13, 1996			
Definitized: December 13, 1996			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$193.5	\$0.0	49	\$181.9	\$199.5

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-0.8	\$-2.8
Cumulative Variances To Date (11/16/98)	\$-5.4	\$-7.3
Net Change	\$-4.6	\$-4.5

Explanation of Change:

(U) The cost drivers influencing the negative variances are the Control Actuation System (CAS), software algorithms and processor. The CAS has negatively impacted schedule by delaying Separation Control Test Vehicle (SCTV) testing which has subsequently delayed the Engineering Development Model (EDM) flight test schedule by three months. The contractor has accrued additional cost to stabilize schedule and in mitigation efforts. Throughput difficulties combined with incorporation of anti-tamper technologies have impacted processor board design and testing.

The impact on schedule of the technical difficulties to date has been a three month delay in first EDM launch. Technical challenges remain in flight testing and integration activities. The government/contractor team is assessing the schedule and cost impact and developing alternatives to lessen overall schedule impact.

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AIM-9X, December 31, 1998

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	Cur Est
0.32	-0.02	--	--	+0.02	+0.02	--	-0.03	-0.01	0.31

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

Changes										PUC
PUC Dev Est										Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
0.27	-0.02	--	--	+0.01	+0.02	--	-0.03	-0.02	0.25	

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	DEC 94	DEC 94	N/A	DEC 94
Milestone II	OCT 96	OCT 96	N/A	DEC 96
Milestone III	SEP 02	MAR 02	N/A	MAY 02
FUE/IOC	(b)(1)	(b)(1)	N/A	(b)(1)
Total Cost	695	3232.9	N/A	3093.4
Total Quantity	0	10049	N/A	10129
Prog Acq Unit Cost	0	0.32	N/A	0.31

(U) Milestone III revised from March 2002 to May 2002 due to technical difficulties with the Control Actuation System (CAS). Late delivery of CAS has forced delays in the Separation Control Test Vehicles and Engineering Development Model launches. This has caused a delay in critical path activities.

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AIM-9X, December 31, 1998

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-4.1
Adjustment for Current and Prior Inflation. (Estimating)	+3.6	+3.9
Funds were added to the program for Pre-Planned Product Improvement (P3I). (Estimating)	+35.0	+37.9
Funds were reprogrammed to the F/A-18 and the LAU-7 APN account from the AIM-9X program. (Estimating)	-23.5	-26.2
RDT&E Subtotal	+15.1	+11.5
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-72.4
Economic adjustment for negative program change. (Economic)	N/A	+10.4
Engineering Change Orders were downscoped and the Estimate at Complete (EAC) was revised. (Estimating)	-96.0	-141.1
Revised estimate of initial spares and peculiar support. (Support)	+7.9	+13.0
Correction to previous SAR. Revised acquisition of test equipment and bit reprogrammer should have been support variance. (Support)	-84.1	-109.3
Correction to previous SAR. Revised acquisition of test equipment and bit reprogrammer should have been a support variance. (Estimating)	+84.1	+109.3
Quantity increase of 80 missiles from 5000 to 5080 (Air Force). (Quantity)	+11.3	+16.8
Allocation to engineering variance resulting from quantity change of 80 missiles. (Engineering)	+1.2	+1.5
Allocation to estimating variance resulting from quantity increase of 80 missiles. (Estimating)	+1.5	+2.5
Procurement Subtotal	-74.1	-169.3

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AIM-9X, December 31, 1998

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	553.5	2679.4	-	3232.9
Previous Changes:				
Economic	-12.7	-169.4	-	-182.1
Quantity	-	-	-	-
Schedule	+8.9	-	-	+8.9
Engineering	+19.1	+149.4	-	+168.5
Estimating	-33.1	+240.1	-	+207.0
Other	-	-	-	-
Support	-	-184.3	-	-184.3
Subtotal	-17.8	+35.8	-	+18.0
Current Changes:				
Economic	-4.1	-62.0	-	-66.1
Quantity	-	+16.8	-	+16.8
Schedule	-	-	-	-
Engineering	-	+1.5	-	+1.5
Estimating	+15.6	-29.3	-	-13.7
Other	-	-	-	-
Support	-	-96.3	-	-96.3
Subtotal	+11.5	-169.3	-	-157.8
Total Changes	-6.3	-133.5	-	-139.8
Current Estimate	547.2	2545.9	-	3093.1

(U) Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	531.4	1932.6	-	2464.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	+8.5	-	-	+8.5
Engineering	+18.4	+114.8	-	+133.2
Estimating	-37.8	+143.8	-	+106.0
Other	-	-	-	-
Support	-	-118.7	-	-118.7
Subtotal	-10.9	+139.9	-	+129.0
Current Changes:				
Quantity	-	+11.3	-	+11.3
Schedule	-	-	-	-
Engineering	-	+1.2	-	+1.2
Estimating	+15.1	-10.4	-	+4.7
Other	-	-	-	-
Support	-	-76.2	-	-76.2
Subtotal	+15.1	-74.1	-	-59.0
Total Changes	+4.2	+65.8	-	+70.0
Current Estimate	535.6	1998.4	-	2534.0

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CEC, December 31, 1998

12. (U) Unit Cost Summary:

	UCR Baseline (JUL 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	2739.9	3189.0	
(2) Quantity	227	231	
(3) Unit Cost	12.070	13.805	+14.37
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	1490.6	1644.6	
(2) Quantity	216	220	
(3) Unit Cost	6.901	7.475	+8.32

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	1088.2	1430.6	-	54.3	2573.1
Previous Changes:					
Economic	-19.6	-102.8	-	-5.2	-127.6
Quantity	+8.0	+198.0	-	-	+206.0
Schedule	-	+40.8	-	-	+40.8
Engineering	+69.0	-	-	-	+69.0
Estimating	+308.1	+252.0	-	+6.1	+566.2
Other	-	-	-	-	-
Support	-	+243.5	-	-	+243.5
Subtotal	+365.5	+631.5	-	+0.9	+997.9
Current Changes:					
Economic	-10.8	-	-	-	-10.8
Quantity	-	+29.5	-	-	+29.5
Schedule	+85.9	-	-	-	+85.9
Engineering	+3.8	-112.5	-	-	-108.7
Estimating	+92.0	+644.1	-	-55.2	+680.9
Other	-	-	-	-	-
Support	-	-653.2	-	-	-653.2
Subtotal	+170.9	-92.1	-	-55.2	+23.6
Total Changes	+536.4	+539.4	-	-54.3	+1021.5
Current Estimate	1624.6	1970.0	-	-	3594.6

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

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	1030.4	1150.3	-	41.2	2221.9
Previous Changes:					
Quantity	+7.7	+139.2	-	-	+146.9
Schedule	-	-	-	-	-
Engineering	+67.1	-	-	-	+67.1
Estimating	+276.7	+233.6	-	+6.1	+516.4
Other	-	-	-	-	-
Support	-	+176.2	-	-	+176.2
Subtotal	+351.5	+549.0	-	+6.1	+906.6
Current Changes:					
Quantity	-	+18.5	-	-	+18.5
Schedule	+78.9	-	-	-	+78.9
Engineering	+5.2	-86.3	-	-	-81.1
Estimating	+78.4	+580.5	-	-47.3	+611.6
Other	-	-	-	-	-
Support	-	-567.4	-	-	-567.4
Subtotal	+162.5	-54.7	-	-47.3	+60.5
Total Changes	+514.0	+494.3	-	-41.2	+967.1
Current Estimate	1544.4	1644.6	-	-	3189.0

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-10.8
Revised OPEVAL Schedule (Schedule)	+78.9	+85.9
Elimination of Satellite Integration funding from program cost (Engineering)	-12.9	-13.7
The increased FY 1999 Congressional Appropriation includes \$20M for resolution of IOT&E interoperability issues; \$15M for transition of design agent functions to Raytheon Systems Company; etc. (Engineering)	+60.7	+64.5
Transfer of Funds for LAMPS Data Link Conversion (Engineering)	-42.6	-47.0
Adjustment for Current and Prior Inflation (Estimating)	+5.6	+5.8
Addition of FYs 2004-05 to program (Estimating)	+81.5	+95.4
Funds reprogrammed to Small Business Innovative Research (SBIR) program (Estimating)	-5.1	-5.4
Miscellaneous budget adjustments (Estimating)	-3.6	-3.8
RDT&E Subtotal	+162.5	+170.9

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(2) <u>Procurement</u>		
Revision of several minor estimating methodologies, i.e., revision of hardware estimates; ship installations/manday rates; shipboard antenna requirements; Government support requirements (Estimating)	+28.1	+30.7
Estimated saving from change to Low Cost Planar Array (LCPA) antenna (Engineering)	-86.3	-112.5
Reflects addition of five (5) land-based test sites and three (3) AP,N funded units. Also includes reduction of four (4) units to reflect OPNAV decision not to install CEC equipment on DD 993 (Quantity)	+18.5	+29.5
Reflects reduction of Airborne ILS requirements for AN/USG-3 equipment which is budgeted separately by NAVAIRSYSCOM with other E-2C aircraft ILS requirements. (Support)	-15.0	-39.8
AN/UYQ-70 display and installation costs were previously considered as Other Weapon System costs. Re-categorization of these costs as flyaway is considered more appropriate. (Support)	-552.4	-613.4
AN/UYQ-70 display and installation costs were previously considered as Other Weapon System costs. Re-categorization of these costs as flyaway is considered more appropriate. (Estimating)	+552.4	+613.4
Procurement Subtotal	<u>-54.7</u>	<u>-92.1</u>
(3) <u>O&M</u>		
Elimination of O&M,N funds from Acquisition Program Baseline (APB). The previous estimate included O&M,N costs for maintenance and support of CEC systems installed aboard operational ships (Estimating)	-47.3	-55.2
O&M Subtotal	<u>-47.3</u>	<u>-55.2</u>

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
14.06	-0.60	-1.91	+0.55	-0.17	+5.40	--	-1.77	+1.50	15.56

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.22	-0.47	-0.69	+0.19	-0.51	+4.07	--	-1.86	+0.73	8.95

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	MAY 95	N/A	MAY 95
Milestone II	N/A	MAY 95	N/A	MAY 95
Milestone III	N/A	OCT 98	N/A	JUL 01
FUE/IOC	N/A	SEP 96	N/A	SEP 96
Total Cost	N/A	2573.1	N/A	3594.6
Total Quantity	N/A	183	N/A	231
Prog Acq Unit Cost	N/A	14.06	N/A	15.56

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

a. RDT&E --

(U) CEC Design/Dev:

Raytheon Systems Co., St. Petersburg FL

N00024-92-C-5230, CPAF/IF/FF/E&MD

Award: June 1, 1992

Definitized: May 30, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$115.0	\$121.9	9

Current Contract Price

Target	Ceiling	Qty
\$440.0	\$485.6	22

Estimated Price At Completion

Contractor	Program Manager
\$464.8	\$467.1

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-33.7	\$-2.9
Cumulative Variances To Date (11/11/98)	<u>\$-31.9</u>	<u>\$-2.2</u>
Net Change	\$1.8	\$0.7

Explanation of Change:

(U) Raytheon's unfavorable cost variance reflects increased material costs due to Transmit/Receive (T/R) module subcontract growth, Randtron subcontract growth, and higher material costs. The variance has no impact on the critical path of the program.

(U) Contract Comments:

The contract price has increased due to the addition of quantities and increased contractor costs for materials. Raytheon's performance under the contract is judged to be satisfactory.

(U) <u>E-2C Integration:</u>	Initial Contract Price		
Northrop-Grumman Corp., Bethpage, L.I. NY	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00019-97-C-0069, CPAF	\$63.7	\$63.7	0
Award: March 31, 1997			
Definitized: March 31, 1998			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$63.7	\$63.7	0	\$57.1	\$91.8

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (12/31/98)	<u>\$0.3</u>	<u>\$0.0</u>
Net Change	\$0.3	\$0.0

Explanation of Change:

(U) First E-2C CPR reported in CEC Program SAR.

b. Procurement --

(U) <u>LRIP:</u>	Initial Contract Price		
Raytheon Systems Co., St. Petersburg FL	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00024-98-C-5409, CPAF/IF	\$37.8	\$37.8	4
Award: April 30, 1998			
Definitized: February 28, 1999			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$52.7	\$52.7	7	\$51.2	\$51.6

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

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	<u>\$0.5</u>	<u>\$0.0</u>
Net Change	\$0.5	\$0.0

Explanation of Change:

(U) First time reporting for this contract.

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

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

<u>Appropriation</u>	<u>Prior Years (FY94-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-17)</u>	<u>Total</u>
RDT&E	1215.9	114.9	98.2	195.6	1624.6
Procurement	216.6	93.4	138.7	1521.3	1970.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1432.5	208.3	236.9	1716.9	3594.6

b. Annual Summary -- CEC

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY95 Dollars Nonrec</u>	<u>Flyaway FY95 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994				203.4	202.2
1995				151.8	153.8
1996				248.4	255.9
1997				215.1	224.3
1998				187.2	196.8
1999				172.0	182.9
2000				106.4	114.9
2001				89.5	98.2
2002				45.5	50.7
2003				43.6	49.5
2004				41.1	47.6
2005				40.4	47.8
Subtotal	11			1544.4	1624.6

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	3		11.6	11.6	12.7
2001	5		21.7	21.7	24.2
2002	5		17.4	17.4	19.7
2003	2		6.9	6.9	8.0
2004	4		26.2	26.4	31.2
2005	3		19.2	19.2	23.2
2006	5		32.3	32.4	39.9
2007	4		25.6	25.6	32.2
2008	4		25.1	25.1	32.2
2009	4		24.6	24.5	32.2
2010	4		24.0	24.0	32.2
2011	4		23.5	23.5	32.2
2012	4		23.1	23.1	32.2
2013	4		22.6	22.6	32.2
2014	4		22.1	22.1	32.2
2015	4		21.7	21.7	32.2
2016	4		21.2	21.2	32.2
2017	3		15.6	15.6	24.2
Subtotal	70		384.4	384.6	505.1

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995			10.7	13.0	13.5
1996			9.5	10.4	11.0
1997					
1998	2		22.0	29.0	31.0
1999			7.8	9.9	10.7
2000	5		14.4	18.4	20.4
2001	2		34.3	43.7	49.4
2002	2		34.0	44.5	51.6
2003	4		33.2	43.9	51.4
2004	5		13.0	16.0	20.0
2005	5		7.1	9.9	12.0
Subtotal	25		186.0	238.7	271.0

(U) The quantities reported indicate the fiscal year the equipment will be procured. The recurring flyaway and total program funds (base-year and then-year) indicate the fiscal year funds are budgeted by ship program managers for procurement of equipment.

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

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	5		57.5	67.0	70.9
1999	10		72.3	74.1	79.5
2000	3		53.6	55.3	60.3
2001	9		57.0	58.8	65.1
2002	15		117.0	118.7	133.8
2003	20		131.0	132.7	152.4
2004	8		89.0	90.7	106.4
2005	9		91.4	93.2	111.6
2006	19		123.9	125.7	153.6
2007	13		84.9	86.8	108.2
2008	11		74.8	76.5	97.6
2009	3		35.9	37.7	49.0
2010			4.1	4.1	5.5
Subtotal	125		992.4	1021.3	1193.9

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	231		1562.8	3189.0	3594.6

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	11	11
Procurement	220	0

(U) Percent Total Program Quantities Delivered: 4.8%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 959.3

(U) Percent Total Program Expended: 26.7%

(U) Deliveries to Date have been revised to reflect correct quantities.

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18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
The CEC O&S costs include applicable costs in accordance with CAIG Operating & Support Cost Estimating Guide of May 1992.

1. MISSION PERSONNEL: The costs of maintenance personnel defined in the CEC Navy Training Plan of December 1993 are included. The costs of operations personnel and other mission personnel are excluded since CEC requires no system specific operators or support personnel.

2. O, I, & D MAINTENANCE: Costs for labor, overhead, material, and repair parts projected to be performed at O, I and D-level maintenance activities have been included.

3. CONTRACTOR SUPPORT: Costs for interim contractor Integrated Logistics Support (ILS) pending establishment of organic Navy capabilities are included.

4. SUSTAINING SUPPORT: The costs of continuing engineering support and software maintenance projected for Navy in-house facilities have been included. Also included are costs to provide, operate and maintain CEC training equipment at projected training sites. Costs for support equipment, and modification kit procurement/installation have not been included since there are no unique support equipment requirements and there are no currently planned modifications to CEC equipment.

5. PERSONNEL SUPPORT: Costs for initial training, permanent change of station (PCS) and medical support have been included. Training course costs for maintenance personnel are also included. There are no specific training course requirements for CEC operator personnel.

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per CEC Systems	Avg Annual Cost Per Antecedent System
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	0.4	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.3	0.0
Contractor Support	0.1	0.0
Sustaining Support	0.2	0.0
Indirect Costs	N/A	N/A
Total	1.0	0.0

A-8 BRADLEY UPGRADE

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

PROGRAM: BFVS A3 Upgrade

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Bradley Fighting Vehicle Systems (BFVS) A3 Upgrade
2. DoD Component: Army
3. Responsible Office and Telephone Number:
PEO, Ground Combat Support Systems COL Paul S. Izzo
PM, Bradley Fighting Vehicle Systems Assigned: July 24, 1997
ATTN: SFAE-GCSS-W-BV. DSN 786-5630; COMM (810) 574-5630
Warren, MI 48397-5000 IZZOP@CC.TACOM.ARMY.MIL
4. Program Elements/Procurement Line Items:
RDT&E:
PE 23735 Project 2TT, 332, 371 (Shared)
PROCUREMENT:
APPN 2033 ICN G20900 (Army) (Shared)
APPN 2033 ICN G80717 (Army)
APPN 2033 ICN GE0163 (Army) (Shared)

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5. References:

SAR Baseline (Development Estimate):

AAE Approved Acquisition Program Baseline dated March 8, 1994.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated August 4, 1997.

6. Mission and Description:

The upgraded Bradley Fighting Vehicle (BFV), M2A3 Infantry Fighting Vehicle (IFV) and M3A3 Cavalry Fighting Vehicle (CFV) will facilitate enhanced command and control, provide greater lethality, provide mobile protected transport of an infantry squad to critical points on the battlefield and perform cavalry scout and other claimant (Bradley equipped Fire Support Teams) missions in the 21st century. Upgrades in this program include advanced technology in the areas of command and control, lethality, survivability, mobility, and sustainability required to defeat current and future threat forces while remaining operationally compatible with the main battle tank. The M2A3/M3A3 will provide overwatching fires to support the dismounted infantry, and suppress/defeat enemy tanks, reconnaissance vehicles, IFV, armored personnel carriers, bunkers, dismounted infantry, and attack helicopters. The infantry version (M2A3) of the A3BFV is used most often to close with the enemy by means of fire and maneuver. The primary tasks performed by the cavalry version (M3A3) as part of a troop and/or squadron are reconnaissance, security, and flank guard missions. The Bradley Fire Support Team vehicle (BFIST) variant acquires targets and coordinates all indirect fire support assets.

7. Executive Summary:

The Bradley A3 effort is part of the overall Modernization program aimed at upgrading the existing fleet by correcting deficiencies identified in the Battlefield Development Plan, while accomplishing the intent of the Base Sustainment Program approved by the Secretary of Defense as part of the FY94 Amended Budget Submission. The BFVS is on the Department of the Army's Industrial Preparedness Planning List, making it essential to the Army combat needs to domestically remanufacture these vehicles. Acquisition Decision Memorandum (ADM) approval from Milestone II was received on Mar 29, 1994. The first prototype delivery was October 1, 1996.

The Acquisition Decision Memorandum for the M2/M3A3 Bradley Army System Acquisition Review Council (ASARC) was signed on July 18, 1997 giving approval for entry into Low Rate Initial Production (LRIP), updated BFVS A3 Exit Criteria for Milestone III, and designation of PEO-GCSS as Milestone Decision Authority for the follow-on LRIP decision. The contract for the first year of A3 LRIP was signed with United Defense (LP) in July 1997, and for the second year in November 1997.

Contractor activity during 1998 continued to be intense, with three software releases in May, August, and October. The first Low Rate Initial Production (LRIP) vehicle was delivered on schedule in October 1998. The third year LRIP contract was signed in December 1998.

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7. Executive Summary (Cont'd):

During the Army's FY00-05 POM process, the quantity of A3 vehicles was reduced from 1602 to 1109. This quantity reduction of 31% and the associated unit cost increase were included in a revised Acquisition Program Baseline (APB) and are now shown as the UCR baseline in section 12.

In December 1998, the PEO approved moving Milestone III to allow the system to mature for full objective capability to be in place for Initial Operational Test and Evaluation (IOT&E). The Milestone III is now scheduled for May 2000. Live Fire Testing began in August 1998 with the control damage portion completed in November 1998. The first shot was successfully conducted in December 1998. An Operational Experiment was successfully completed in October 1998. The contractor portion of Production Verification Test (formerly titled Production Qualification Test--PQT) began in December 1998.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (\$AR)	Approved Program (APB)	Current Estimate
Milestone IV	JAN 94	JAN 94	JAN 94
Development Contract Award	APR 94	MAY 94	MAY 94
Preliminary Design Review	JUN 94	MAR 95	JUL 95
Critical Design Review	OCT 94	SEP 95	JAN 96
1st Low Rate Initial Production (LRIP Award)	FEB 96	JUL 97	JUL 97
Pre-Production Qualification Test (PPQT)			
Start	AUG 95	OCT 96	OCT 96
Complete (Government)	MAY 96	JUL 97	JUL 97
2nd LRIP Award	OCT 96	MAY 98	NOV 97

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BFVS A3 Upgrade, December 31, 1998

9a. Schedule (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
PQT			
Start	NOV 97	OCT 98	DEC 98 (Ch-1)
Complete	JUN 98	JUL 99	NOV 99 (Ch-1)
1st LRIP Vehicle Deliveries	AUG 97	OCT 98	OCT 98
3rd LRIP Award	OCT 97	DEC 98	DEC 98
2nd LRIP Vehicle Deliveries	MAY 98	AUG 99	MAY 99
Initial Operation Test & Evaluation (IOT&E)			
Start	FEB 98	MAR 99	SEP 99 (Ch-2)
Complete	JUN 98	JUL 99	DEC 99 (Ch-2)
First Unit Equipped (FUE)	SEP 98	APR 00	AUG 00
Milestone III	NOV 98	NOV 99	MAY 00 (Ch-3)
3rd LRIP Vehicle Deliveries	MAY 00	APR 00	APR 00

b. Current Change Explanations --

(Ch-1) Production Verification Test (formerly PQT) start changed from Oct 98 to Dec 98 to reflect actual start date. Estimated completion date changed from Aug 99 to Nov 99.

(Ch 2) IOT&E start changed from Mar 99 to Sep 99 and complete changed from Jul 99 to Dec 99 to reflect current test plan and allow system to mature for performance capability to be in place for IOT&E.

(Ch-3) Milestone III moved from Nov 99 to May 00 to accommodate the adjustment in IOT&E.

10. Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Command and Control:				
The command & control system must comply with the Army Standard Protocol	MIL-STD- 188-220	MIL-STD-/ MIL-STD- 188-220 / 188-220	MIL-STD- 188-220	MIL-STD- 188-220
The command & control system must communicate fully with the command and control system employed by the armored forces	Combined Arms Command and Control	Combined/ Army Arms / Brigade Command/ and and / below Control/	TBD	Future Battle Command Brigade and Below
Lethality:				

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BFVS A3 Upgrade, December 31, 1998

10a. Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold		Demon- strated Perf	Current Estimate
Improve the target acquisition and fire control system	Dual track and auto track with IBAS and CIV	Dual track and auto track with IBAS and CIV	/ Dual track and auto track with IBAS /	Dual track and auto track with IBAS	Dual track and Auto track with IBAS
Survivability:					
NBC protection for dismount element while in vehicle	Ventila- ted face pieces	Ventila- ted / face / pieces /	Ventila- ted / face / pieces	Ventila- ted face pieces	Ventila- ted Face Pieces
Mobility:					
Ability of the BFVS to navigate in all weather conditions with GPS (accuracy plus or minus in meters)	16	16	/ 16	16	16
The driver display will present navigational information	GPS informa- tion and map	GPS Informa- tion and map	/ GPS Informa- tion / /	GPS Informat ion	GPS Informat ion
Maintain cross-country mobility with main battle tank	M1A2 Tank	M1A2 Tank	/ M1A2 Tank	M1A2 Tank	M1A2 Tank
RAM (Mean Miles Between Failure)	N/A	500	/ 400	409	409 (Ch-1)
Integrated Logistics Support:					
Systems fault isolation capability to provide unambiguous fault isolation to:	95	95	/ 95	TBD	95
Mission critical Line Replaceable Units (LRU) (% of the time)					
Non-Mission critical LRUS (% of the time)	90	90	/ 90	TBD	90

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10a. Performance Characteristics (Cont'd):

Command and Control: Command and control functionality will be demonstrated during Initial Operating Test and Evaluation (IOTE) in 1st quarter FY00, dependent upon Embedded Battle Command (EBC) software releases

Integrated Logistics Support: System fault isolation capability will be demonstrated in the A3 IOTE 1st quarter FY00.

b. Current Change Explanations --

(Ch-1) Changed from 279 to 409 because 409 was demonstrated during preproduction qualification (PPQT) test in July 1997 and its extension completed in July 1998.

11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	394.1	458.5	466.9
Procurement	2703.2	3709.3	3058.4
Non-recurring	(27.9)		(15.9)
Recurring	(2476.8)		(2668.5)
Total Rollaway	(2504.7)		(2684.4)
Training Devices	(53.1)		(74.6)
Other	(58.2)		(152.6)
Total Other Wpn Sys	(111.3)		(227.2)
Peculiar Support	(40.1)		(53.5)
Initial Spares	(47.1)		(93.3)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	3.0
Total FY 94 Base-Year \$	3097.3	4167.8	3525.3
Escalation	941.5	1038.4	540.0
Development (RDT&E)	(31.4)	(31.7)	(26.1)
Procurement	(910.1)	(1006.7)	(513.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	4038.8	5206.2	4065.3

b. Quantity --

Development (RDT&E)	2	0	0
Procurement	1600	1602	1109
Total	1602	1602	1109

Note: Excludes 8 RDT&E prototypes from the SAR Baseline and 8 from the Current Estimate that are not considered fully configured.

The current funded LRIP quantity is 126, which exceeds 10% of the total procurement quantity due to the Army reduction of A3s from 1602 to 1109.

Two fully configured vehicles originally planned to be funded by RDT&E have now

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11b. Total Program Cost and Quantity (Cont'd):

been funded by the Procurement Appropriation.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (Mar 99 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 94 BY\$)	3525.1	3525.3	
(2) Quantity	1109	1109	
(3) Unit Cost	3.179	3.179	0.00
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 94 BY\$)	3058.4	3058.4	
(2) Quantity	1109	1109	
(3) Unit Cost	2.758	2.758	0.00

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BFVS A3 Upgrade, December 31, 1998

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	425.5	3613.3	-	-	4038.8
Previous Changes:					
Economic	-15.9	-485.4	-	-	-501.3
Quantity	-3.1	+4.8	-	-	+1.7
Schedule	-	+278.2	-	-	+278.2
Engineering	-	+305.5	-	-	+305.5
Estimating	+84.0	+605.5	-	0.0	+689.5
Other	-	-	-	-	-
Support	-	+368.9	-	-	+368.9
Subtotal	+65.0	+1077.5	-	0.0	+1142.5
Current Changes:					
Economic	-2.6	-119.7	-	-	+117.1
Quantity	-	-1144.4	-	-	-1144.4
Schedule	-	-11.9	-	-	-11.9
Engineering	+1.0	-119.1	-	-	-118.1
Estimating	+4.1	+172.6	-	-	+176.7
Other	-	-	-	-	-
Support	-	-135.4	-	-	-135.4
Subtotal	+2.5	-1118.5	-	-	-1116.0
Total Changes	+67.5	-41.0	-	0.0	+26.5
Current Estimate	493.0	3572.3	-	0.0	4065.3

Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	394.1	2703.2	-	3097.3
Previous Changes:				
Quantity	-3.0	+3.0	-	-
Schedule	-	+131.7	-	+131.7
Engineering	-	-241.0	-	+241.0
Estimating	+71.3	+535.1	-	+606.4
Other	-	-	-	-
Support	-	+270.0	-	+270.0
Subtotal	+68.3	+1180.8	-	-1249.1
Current Changes:				
Quantity	-	-766.7	-	-766.7
Schedule	-	-14.3	-	-14.3
Engineering	+0.9	-89.9	-	-89.0
Estimating	+3.6	+139.8	-	+143.4
Other	-	-	-	-
Support	-	-94.5	-	-94.5
Subtotal	+4.5	-825.6	-	-821.1
Total Changes	+72.8	+355.2	-	+428.0
Current Estimate	466.9	3058.4	-	3525.3

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BFVS A3 Upgrade, December 31, 1996

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-2.6
Increase to incorporate Combat ID (Engineering)	+0.9	+1.0
Adjustment for Current and Prior Inflation. (Estimating)	+2.1	+2.5
Increase cost to actual contract (Estimating)	+2.0	+2.1
Decrease in testing cost (Estimating)	-0.5	-0.5
RDT&E Subtotal	+4.5	+2.5
(2) <u>Procurement</u>		
Revised escalation indices (Economic)	N/A	-87.5
Economic adjustment for negative program change. (Economic)	N/A	+207.2
Total Quantity Variance associated with decrease of 493 units from 1602 to 1109.	-865.0	-1268.0
Quantity decrease of 493 units. (Quantity)	-766.7	-1144.4
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	-14.3	-28.9
Allocation to Engineering variance resulting from Quantity Change. (Engineering)	-26.1	-31.8
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	-57.9	-62.9
Change in annual procurement buy profile. (Schedule)	0.0	+17.0
Elimination of Survivability Suite of Enhancement Systems (SSES) (Engineering)	-105.0	-126.0
Addition of Embedded Battle Command (EBC) Circuit Card Assembly (CCA) (Engineering)	+14.0	+16.6
Addition of Engine Exhaust Modification (Engineering)	+27.2	+32.5
Allocation to engineering resulting from economic adjustment for negative program change (Engineering)	0.0	-10.4
Adjustment for Current and Prior Inflation. (Estimating)	+6.9	+7.4
Increased cost due to loss of Business Base (Estimating)	+62.0	+73.3
Quantities decreased by 30% while program length was decreased only by one year, resulting in less efficient procurement profile. (Estimating)	+142.7	+168.5
Adjustment to actual costs (Estimating)	-2.1	-2.3
Revised estimates of contractor's costs (Estimating)	-11.8	-11.4
Adjustment for Current and Prior Inflation. (Support)	-0.5	+0.6

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BFVS A3 Upgrade, December 31, 1993

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Change estimated cost of Initial Spares (Support)	-16.1	-19.8
Change estimated cost of Peculiar Support (Support)	-24.9	-29.8
Change estimated cost of Training Devices (Support)	-8.6	-10.6
Change in estimated cost of Data, Classroom Spares, New equipment Training (NET), and Contractor Logistics Support (CLS) (Support)	-45.4	-57.6
Allocation to support resulting from economic adjustment for negative program change (Support)	0.0	-18.2
Procurement Subtotal	-825.6	-1118.5

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.52	-0.35	+0.10	+0.24	+0.17	+0.78	--	+0.21	+1.15	3.67

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.26	-0.33	-0.03	+0.24	+0.17	+0.70	--	+0.21	+0.96	3.22

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14c. Unit Cost and Other History (Cont'd):

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	JAN 94	N/A	JAN 94
Milestone III	N/A	NOV 98	N/A	MAY 00
FUE/IOC	N/A	SEP 98	N/A	AUG 00
Total Cost	N/A	4038.8	N/A	4065.3
Total Quantity	N/A	1602	N/A	1109
Prog Acq Unit Cost	N/A	2.52	N/A	3.67

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

Contracts DAAE07-94-C-0456 to UDLP and DAAH01-93-C-0206 to Texas Instruments are over 90% complete and are no longer reported.

Target price and quantity changed to reflect third LRIP award in December 1998.

a. Procurement --

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
1 United Defense L.P., York,, PA DAAE0796CX036, FFP Award: July 25, 1997 Definitized: July 25, 1997	\$66.2	N/A	35

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$217.0	N/A	126	\$217.0	\$217.0

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years (FY94-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-08)</u>	<u>Total</u>
RDT&E	489.8	3.2	-	-	493.0
Procurement	578.7	365.8	430.3	2197.5	3572.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1068.5	369.0	430.3	2197.5	4065.3

b. Annual Summary -- BFVS A3 Upgrade

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY94 Dollars Nonrec</u>	<u>Flyaway FY94 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994				60.3	61.2
1995				74.3	76.9
1996				111.3	117.2
1997				82.0	87.4
1998				71.4	76.7
1999				64.7	70.4
2000				2.9	3.2
Subtotal				466.9	493.0

Appropriation: 2033 - Proc of Weapons & Tracked Combat Veh

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY94 Dollars Nonrec</u>	<u>Flyaway FY94 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1997	35	5.9	156.6	163.9	176.4
1998	18		100.0	103.7	113.0
1999	73	8.1	237.1	263.6	289.3
2000	104		264.2	328.0	365.8
2001	149		334.5	379.5	430.3
2002	160	0.6	354.7	373.4	431.7
2003	134		301.8	321.9	379.1
2004	145		308.1	344.9	414.7
2005	153	0.6	322.4	340.8	418.4
2006	138		289.8	323.1	405.0
2007				68.4	87.5
2008				47.2	61.7
2009					
Subtotal	1109	15.2	2669.2	3058.4	3572.3

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

Appropriation: 2020 - Operation & Maintenance, Army

Fiscal Year	Qty	Flyaway FY94 Dollars Nonrec	Flyaway FY94 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998					
Subtotal					

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1109	15.2	2669.2	3525.3	4065.3

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	10	7

Percent Total Program Quantities Delivered: 0.6%

b. Total Expenditures To Date (In Millions of Dollars): \$ 610

Percent Total Program Expended: 15.0%

Eight prototype EMD vehicles have been delivered.

Only seven out of ten vehicles have been delivered to date due to problems with delivery of the Improved Bradley Acquisition System (IBAS). We are intensely managing deliveries, and are preparing a revised schedule that will make up for the current shortfall.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --
Operation and support costs reflect world wide regular Army activity and are presented as an estimate of the average annual cost per fielded M2A3 and M3A3. These costs assume the average operating tempo of 874 miles per year (for the M2A3). The source for this cost estimate is the A3 Army Cost Position (ACP), dated July 1997.
There is no antecedent.

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

b. Costs -- (FY 1994 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost/Veh Reg Army M2A3/M3A3	Avg Annual Cost/Veh (Antecedent)
Mission Pay & Allowances	194.9	N/A
Unit Level Consumption	44.7	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	1.9	0.0
Contractor Support	5.4	0.0
Sustaining Support	8.9	0.0
Indirect Costs	6.8	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Total	262.6	0.0

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A-20 MCS

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: MCS

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): MANEUVER CONTROL SYSTEM (MCS)

2. DoD Component: Army

3. Responsible Office and Telephone Number:

PM-ATCCS, SFAE-C3S-AT	COL STANLEY C LEJA
FORT MONMOUTH, NJ 07703-5405	Assigned: August 24, 1995
	DSN 992-4041; COMM 732-532-4041
	leja@doim6.monmouth.army.mil

4. Program Elements/Procurement Line Items:

RD&E:

PE 23740 (Shared) Project D2HT, D484

PROCUREMENT:

APPN 2035 ICN BA9320 (Army)
APPN 2035 ICN BA9710 (Army)
APPN 2035 ICN BS9710 (Army)

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DEPARTMENT OF DEFENSE

99-C-0877

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5. References:

MCS BLOCKS I, II & IIIa

SAR Baseline (Development Estimate):

AAE Approved Acquisition Program Baseline dated October 16, 1989.

Approved Program:

Approved Acquisition Program Baseline (APB) dated January 6, 1999.

MCS BLOCKS IIIb & IV

SAR Baseline (Development Estimate):

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated January 6, 1999.

6. Mission and Description:

The Maneuver Control System (MCS) is one of the five Battlefield Functional Areas (BFA) of the Army Tactical Command and Control Systems (ATCCS). MCS is a network of computer equipment which serves the Commander and Staff Corps, Division, Brigade, and Maneuver Battalion. The system provides automated assistance in the coordination of plans, dissemination of orders and guidance, and the monitoring and supervision of operations. MCS is the force level commander's information system and integrates the maneuver functions with the automated or manual Command and Control (C2) systems of the other four functional areas. The other four functional areas are: Fire Support, Air Defense, Intelligence/Electronic Warfare, and Combat Service Support). MCS versions of software will extend automated command and control capabilities down to battalion/squadron, company/troop, squad/weapon system and platoon level through the subordinate systems to MCS.

The Maneuver Control System (MCS) is a collection of computer equipment which supports operation planning and control at one of the five nodal points (Maneuver Control) of the Army Tactical Command and Control System (ATCCS). MCS currently consists of the Non-Development Items (NDI) such as the Tactical Computer Processor (TCP) nomenclatured AN/UYQ-43(V)1. It is a microprocessor based portable system which provides automated assistance to the maneuver commanders. The Analyst Console (AC) nomenclatured AN/UYQ-43(V)2, is a microprocessor based intelligent terminal, connected to the TCP via Local Area Network, which provides multiple workstations within a nodal configuration.

The TCP/AC were transitioned with currently fielded software Version 10.03.1G1, from OPM OPTADS to the Communications-Electronics Command (CECOM) on Oct 4, 1992. The NDI equipment (TCP/AC) will be replaced by Common Hardware (CH). CH is composed of CHS-2 computers which will exceed the capability and the processing of the TCP/AC. These devices are to be fielded to all US Army Tactical Units. They are smaller and lighter and provide ease of transportability to all ATCCS users.

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7. Executive Summary:

In 1980, the first elements of the MCS were fielded to VII Corps in Europe, which consisted of Engineering models of the AN/UYQ-30 Tactical Computer Terminal (TCT) with a limited Command, Control and Communications (C3) capability. In 1981 the system was enhanced with additional TCTs and increased software C3 capabilities. In 1982, the MCS program was continued by awarding a MCS System Engineering/Integration and Software Development contract which was awarded to Ford Aerospace and Communication Corporation (FACC). This five year effort continued the MCS evolutionary development. By 1986 the software had evolved to Version 9, was written in Ada, fielded with production TCTs in Europe, and ported to the Tactical Computer Processor (TCP) prototype. In 1986 the production contract for the AN/UYQ-43 (V)1/(V)2 TCP/AC Non- Developmental Item (NDI) was awarded. In 1987 the second five year evolutionary development effort was awarded to FACC (which became Loral Command and Control Systems) for the software effort and a separate contract was awarded to TRW for the system engineering/integration effort. Under these efforts, Version 10 software was completed, and fielded in 1989.

MCS Version 11 software development effort was continued under Loral. However, Loral experienced significant delays in their development effort. As a result, there was little confidence in Loral's ability to deliver Version 11 without further schedule slips and cost growth. The decision was made by the Army to discontinue funding the contract. The Army decided the MCS requirements could best be satisfied by an alternative other than continuing the Loral contract effort. The decision to discontinue the development contract beyond the current target contract price, was approved by the Army Acquisition Executive via a memorandum dated February 24, 1993.

A restructured MCS program strategy was presented to and approved in concept by the OSD C3I Committee on March 11, 1993. OSD formal approval was received via an Acquisition Decision Memorandum (ADM) dated April 6, 1993. The revised approach to complete Block III development is described as MCS Version 12.0. Version 12.0 is a rapid prototype effort which relies on Common Hardware, and a foundation of Common Operating Environment (COE) to support stand alone applications which provide an initial maneuver control capability, supports horizontal interoperability testing with other BFA control systems, and exploits reusable software from MCS Version 11.0.

In August 1994 MCS V12.0 successfully completed an Integrated Interoperability Demonstration (as an MCS Operational Assessment) which was included as a part of the ATCCS level testing at Fort Hood, Texas. The MCS Operational Requirements Document (ORD) (October 26, 1992) remains valid for Block III, Version 12.0. The PEO C3S directed the PM OPTADS to replan the program on December 22, 1994, due to the continued delays in the CHS-2 hardware contract award. This direction required substituting a Limited User Test (LUT) for the IOT&E. Also, the program was to proceed toward a Low Rate Initial Production (LRIP) decision to procure CHS-2 hardware to be used for the MCS IOT&E. This program strategy was subsequently solidified when the MCS program came under the Integrated Product Team process in May 1995. The MCS ORD for Block IV was approved November 15, 1995.

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7. Executive Summary (Cont'd):

The MCS Block IV contract was awarded to Lockheed Martin Corporation Management and Data Systems Division on September 26, 1996. The Block IV effort is basically a combat developer approved sequencing of pre-planned product improvements to the Block III baseline functionality, providing application and functionality enhancements which reside on the Defense Information Infrastructure Common Operating Environment (DII COE) software infrastructure in line with the migration plan for compliance with the Army Technical Architecture (ATA). Block III application software will be considered as candidate reuse software by the Block IV contractor to satisfy a portion of the overall Block IV functional requirements. Block IV encompasses development of MCS software versions 12.1, 12.2 and 12.3 and fielding of this upgraded functionality to the Army, upon being successfully tested via an Operational Assessment/Operational Test (OA/OT). Software enhancements in Version 12.1 through 12.3 include developing and analyzing basic course of action, tools, war gaming, and embedded training at the operator and staff section level.

On November 22, 1996, a C3I Systems Overarching Integrated Product Team (OIPT) met to review the Army's request to procure hardware, prior to Milestone III for the training base. The Army proposed equipping the training base with MCS in two phases. An Acquisition Decision Memorandum was signed on January 24, 1997 authorizing the Army to acquire initial LRIP quantities of 81 CHS-2 systems for operational assessment in the training base. A DOT&E directed operational assessment on the training base was conducted in May 1997 using these 81 systems with the available MCS Block III software; the assessment concluded that MCS Block III is suitable for use in the TRADOC training base. The MCS IOT&E will be completed prior to a Milestone III decision to field MCS to operational units. The IOT&E can make use of the results of the Limited User Test and the training base operational assessment.

In March 1997, the MCS Block III software was successfully used in Task Force XXI Army Warfighting Experiment (AWE). The lessons that were learned during Task Force XXI AWE, were successfully implemented in software modifications which were used in the Division AWE. MCS Block III, was part of the Army Battle Command System software baseline, which was used during Division AWE in November 1997. This demonstrated the tremendous operational potential of digital technology in achieving Information Dominance. A System Stress Test, of MCS Block III, was held at the Consolidated Technical Support Facility, Ft. Hood, TX in December 1997. This test demonstrated developmental test exit and operational test entrance criteria. The results supported proceeding to the Initial Operational Test and Evaluation in June 1998. The latest MCS Acquisition Decision Memorandum (ADM) was signed on July 16, 1997, authorizing the Army to extract the training base content from the MCS program. In FY 1997 and FY 1998, \$6.0M and \$15.7M, respectively, were extracted from the MCS Acquisition Program Baseline (APB) along with 207 High Capacity Unit (HCU) Vls, reducing the quantity from 3156 to 2949.

For this period, MCS Block III IOT&E was successfully conducted at Fort Hood, Texas in June 1998. The IOT&E results were positive with OPTEC

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7. Executive Summary (Cont'd):

recommending Block III be fielded to First Digital Corps (FDC). MCS Block III Y2K certification package was completed 23 December 1998, approved by PEO C3S and forwarded to Y2K authorities. Block IV is synchronized with ABCS spiral development efforts for FDD and FDC.

This may be the final SAR for this program since the Blocks I, II, IIIa are 90% complete, and the Blocks IIIb and IV are below major defense acquisition program thresholds.

8. Threshold Breaches:

MCS BLOCKS I, II & IIIa

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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8. Threshold Breaches (Cont'd):

MCS BLOCKS IIIb & IV

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

There are RDT&E and Procurement breaches to the currently approved APB. The Procurement breach is due to an additional requirements to field not only the active Army but also the National Guard. The RDT&E breach is caused by an increase in Block IV development requirements to support the ongoing MCS development and future P3I programs.

9. Schedule:

MCS BLOCKS I, II & IIIa

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
BLOCK I			
AN/UYQ-30/30A			
Milestone III ASARC	MAY 83	MAY 83	MAY 83
Initial Prod Contract Award	JUN 83	N/A	N/A
First Prod Del Initial Contr	FEB 85	N/A	N/A
Follow-on Prod Contr Award	AUG 86	N/A	N/A
FUE/IOC	SEP 86	SEP 86	SEP 86
Version 9 Software Release	SEP 86	SEP 86	SEP 86
User Follow-on Test & Eval I	APR 87	APR 87	APR 87
First Prod Deliv Follow Contr	NOV 87	N/A	N/A
BLOCK II			
AN/UYQ-43 (V)1&(V)2			

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9a. Schedule (Cont'd):

MCS BLOCKS I, II & IIIa

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
IPR Approval	JUN 86	JUN 86	JUN 86
Initial Production Contract Award	JUN 87	N/A	N/A
First Article Test			
Start	MAY 88	MAY 88	MAY 88
Complete	SEP 88	SEP 88	SEP 88
Production Contract Option Award	SEP 88	N/A	N/A
Version 10 Software Release	OCT 88	OCT 88	OCT 88
First Prod Deliv Initial Contr	FEB 89	N/A	N/A
FUE\IOC	APR 89	APR 89	APR 89
First Prod Deliv Prod Option	JUN 89	N/A	N/A
Field Validation	AUG 89	AUG 89	AUG 89
BLOCK III			
AN/TYQ-45 (CHS)			
CHS Software Verification Test	MAY 91	N/A	N/A
FUE/IOC	NOV 91	N/A	N/A
Follow-on Test & Evaluation	JAN 92	N/A	N/A
Milestone III ASARC	MAY 92	N/A	N/A
First MCS Prod Buy of CHS	JUN 92	N/A	N/A
First Production Deliveries	OCT 92	N/A	N/A
Software Releases			
Version 9	SEP 86	N/A	N/A
Version 10	OCT 88	N/A	N/A
Version 11 (30/30A & 43 (V) 1&2)	NOV 90	N/A	N/A
Version 11 (CHS)	SEP 91	N/A	N/A
First CHS Prototype Delivery (Build I)	DEC 88	DEC 88	DEC 88
MCS Version 12.0			
MCS Integration and Validation	N/A	SEP 93	SEP 93
Compliance Test			
MCS V12.0 Operational Assessment	N/A	AUG 94	AUG 94

b. Current Change Explanations -- None

MCS BLOCKS IIIb & IV

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
BLOCK III			
MCS VERSION 12.01			
Limited User Test (LUT)	N/A	NOV 96	NOV 96
System Segment Acceptance Test -1	N/A	FEB 96	FEB 96
Low Rate Initial Production (LRIP)	N/A	FEB 97	FEB 97
IOT&E			
Start	N/A	JUN 98	JUN 98
Completed	N/A	JUL 98	JUL 98
MILESTONE III DAB	N/A	FEB 99	APR 99 (Ch-1)

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9a. Schedule (Cont'd):

MCS BLOCKS IIIb & IV

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
Issue V12.01 to the Field	N/A	MAR 99	MAY 99	(Ch-1)
IOC	N/A	FEB 00	APR 00	(Ch-1)
BLOCK IV				
AN/TYQ-45 (CHS)				
Award MCS Contract	N/A	SEP 96	SEP 96	
FDD	N/A	SEP 00	SEP 00	(Ch-2)
FDC	N/A	APR 04	APR 04	(Ch-2)

b. Current Change Explanations --

(Ch-1) A delay in OPTEC evaluation of the MCS IOT&E results, necessitated the slip in the milestones for the DAB, V12.01 issued to the field and IOC.

	From	To
Block III		
Milestone III DAB	Dec 98	Apr 99
Issue 12.01 to the Field	Jan 99	May 99
IOC	Feb 00	Apr 00

(Ch-2) These milestones were added to the APB approved in January 1999 and did not appear in the previous SAR.

(Ch-3) These milestones are no longer applicable due to the re-baselined requirements for the APB.

	From	To
Block IV		
MCS Version 12.1		
OA/OT	Feb 99	N/A
Issue V12.1 to the Field	Jul 99	N/A
MCS Version 12.2		
OA/OT	Feb 00	N/A
Issue V12.2 to the Field	Aug 00	N/A
MCS Version 12.3		
OA/OT	Feb 01	N/A
Issue V12.3 to the Field	Aug 01	N/A
Convert to Post Deployment		
Software Support (PDSS)	Dec 02	N/A

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10. Performance Characteristics:

MCS BLOCKS I, II & IIIa

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
BLOCK I				
AN/UYQ-30/30A				
100% Memory	5	5 / 5	10	5
Retention during power fluc/loss (at least xx mins)				
Purge Memory (within xx mins)	3	3 / 3	1.57	3
Mean Time to Repair (hrs)				
Organizational	.5	.5 / .5	.5	.5
Direct Support	2.0	2.0 / 2.0	2.0	2.0
Reliability (hrs)				
AN/UYQ-30/30A TCT	433	433 / 433	433	433
AN/UYQ-30/30A TCT'	310	310 / 310	310	310
Operational				
Availability (Ao)				
AN/UYQ-30 TCT	.88	.88 / .88	.88	.88
AN/UYQ-30 TCT'	.84	.84 / .84	.84	.84
BLOCK II				
AN/UYQ-43 (V)1 & (V)2				
100% Memory	5	5 / 5	10	5
Retention during power fluc/loss (at least xx mins)				
Emergency Purge Memory (within xx mins)	3	3 / 3	1.32	3
Mean Time to Repair Organizational (Hr)	.5	.5 / .5	.5	.5
Operational				
Availability (Ao)	.76	.76 / .76	.76	.76

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10b. Performance Characteristics (Cont'd):

MCS BLOCKS I, II & IIIa

b. Current Change Explanations --
None

MCS BLOCKS IIIb & IV

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demon- strated Perf</u>	<u>Current Estimate</u>
BLOCK III					
AN/TYQ-45 (CHS)					
100% Memory Retention During Power Fluc/loss (at least xx mins)	5	N/A	/ N/A	TBD	N/A
Purge Memory (within xx mins)	3	N/A	/ N/A	TBD	N/A
Mean Time to Repair Organizational (hr)	.5	N/A	/ N/A	TBD	N/A
Situation Awareness					
Integrity of Common Picture (%)	N/A	95	/ 85	TBD	95
Between Div and Corps Main (sec)	N/A	7200	/ 7200	TBD	7200
Between Adjacent Echelons or Among TAC/Main/Rear w/i an Echelon (sec)	N/A	3600	/ 3600	TBD	3600
Interoperability					
Direct Data Exchange Integrity IAW Applicable UIRs (%)	N/A	95	/ 85	TBD	95
Continuity of Operations Commander's Situation Report Availability					
After:					
Planned Outage (min)	N/A	90	/ 90	TBD	90
Unplanned Outage (min)	N/A	180	/ 180	TBD	180

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10a. Performance Characteristics (Cont'd):

MCS BLOCKS IIIb & IV

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Operational Availability (Ao)	.88	.88 / .76	TBD	.88
BLOCK IV				
AN/TYQ-45/53 (CHS)				
100% Memory Retention during Power fluc/loss (at least xx mins)	5	N/A / N/A	TBD	N/A
Purge Memory (within xx mins)	3	N/A / N/A	TBD	N/A
Mean Time to Repair Organizational (hr)	.5	N/A / N/A	TBD	N/A
Situation Awareness Integrity of:				
"Common Picture" (assumes COE compliant input from external sources) (%)	N/A	100 / 95	TBD	100
Between Army and Joint Echelons(sec)	N/A	8 / 1800	TBD	8
Adjacent Army and Joint Echelons (sec)	N/A	8 / 900	TBD	8
Within Army and Joint Echelons (sec)	N/A	8 / 900	TBD	8
Interoperability Direct data exchange integrity IAW DoD COE Standards (%)	N/A	100 / 95	TBD	100
Continuity of Operations (hr)				
Commander's Situation Report Availability After:				

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10a. Performance Characteristics (Cont'd):

MCS BLOCKS IIIB & IV

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Planned Outage (min)	N/A	15 / 30	TBD	15
Unplanned Outage (min)	N/A	45 / 60	TBD	45
Operational Availability (Ao)	.88	.88 / .76	TBD	.88

b. Current Change Explanations -- None

11. Total Program Cost and Quantity (Dollars in Millions):

MCS BLOCKS I, II & IIIa

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. Cost --			
Development (RDT&E)	152.1	194.1	194.1
Procurement	266.4	266.2	266.4
Flyaway	(235.7)		(226.4)
Other Wpn System Costs			(9.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(30.7)		(30.7)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 80 Base-Year \$	418.5	460.3	460.5
Escalation	187.7	291.0	222.5
Development (RDT&E)	(56.1)	(119.4)	(90.9)
Procurement	(131.6)	(171.6)	(131.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	606.2	751.3	683.0
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	1798	1798	1798
Total	1798	1798	1798
c. Foreign Military Sales --	None.		
d. Nuclear Costs --	None.		

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11a. Total Program Cost and Quantity (Cont'd):

MCS BLOCKS IIIb & IV

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. Cost --			
Development (RDT&E)	63.1	65.1	123.5
Procurement	279.1	70.0	321.6
Flyaway	(215.6)		(187.3)
Other Wpn System Costs			(114.4)
Peculiar Support	(0.0)		
Initial Spares	(63.5)		(19.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 80 Base-Year \$	342.2	135.1	445.1
Escalation	323.7	152.8	520.0
Development (RDT&E)	(67.0)	(69.3)	(117.3)
Procurement	(256.7)	(83.5)	(402.7)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	665.9	287.9	965.1

LRIP quantities in FY97 are 81 HCU V1s.

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>4567</u>	<u>1151</u>	<u>6290</u>
Total	4567	1151	6290

A unit of measure equates to one MCS Tactical High Capacity Computer Suite including installation kits, peripherals and common off-the-shelf software and one MCS Lightweight Computer Unit (LCU). The Low Rate Initial Production (LRIP) quantities for MCS are 81 HCU V1 systems procured in February 1997.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

MCS BLOCKS I, II & IIIa

	UCR Baseline (DEC 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 80 BY\$)	460.3	460.5	
(2) Quantity	1798	1798	
(3) Unit Cost	0.256	0.256	0.00
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 80 BY\$)	266.2	266.4	
(2) Quantity	1798	1798	
(3) Unit Cost	0.148	0.148	0.00

MCS BLOCKS IIIb & IV

	UCR Baseline (DEC 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 80 BY\$)	135.1	445.1	
(2) Quantity	1151	6290	
(3) Unit Cost	0.117	0.071	-39.32
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 80 BY\$)	70.0	321.6	
(2) Quantity	1151	6290	
(3) Unit Cost	0.061	0.051	-16.39

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13. Cost Variance Analysis:

MCS BLOCKS I, II & IIIa

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

	RD&E	PROC	MILCON	TOTAL
Development Estimate	208.2	398.0	-	606.2
Previous Changes:				
Economic	-6.2	-	-	-6.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+83.0	-	-	+83.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+76.8	-	-	+76.8
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	+76.8	-	-	+76.8
Current Estimate	285.0	398.0	-	683.0

Summary (FY 1980 Constant (Base-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	152.1	266.4	-	418.5
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+42.0	-	-	+42.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+42.0	-	-	+42.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	+42.0	-	-	+42.0
Current Estimate	194.1	266.4	-	460.5

This end item Block 1, II and IIIa, is considered 100% fielded and there will

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

MCS BLOCKS I, II & IIIa

be no future reporting.

b. Current Change Explanations -- None

MCS BLOCKS IIIb & IV

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	130.1	535.8	-	665.9
Previous Changes:				
Economic	-9.0	-17.2	-	-26.2
Quantity	-	-247.9	-	-247.9
Schedule	-	+38.3	-	+38.3
Engineering	-	-3.8	-	-3.8
Estimating	+33.0	-92.7	-	-59.7
Other	-	-	-	-
Support	-	-30.6	-	-30.6
Subtotal	+24.0	-353.9	-	-329.9
Current Changes:				
Economic	-1.5	+54.4	-	+52.9
Quantity	-	+1226.1	-	+1226.1
Schedule	-	+444.0	-	+444.0
Engineering	-	+293.6	-	+293.6
Estimating	+88.2	-1705.5	-	-1617.3
Other	-	-	-	-
Support	-	+229.8	-	+229.8
Subtotal	+86.7	+542.4	-	+629.1
Total Changes	+110.7	+188.5	-	+299.2
Current Estimate	240.8	724.3	-	965.1

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13a. Cost Variance Analysis (Cont'd):
MCS BLOCKS IIIb & IV

Summary (FY 1980 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	63.1	279.1	-	342.2
Previous Changes:				
Quantity	-	-121.5	-	-121.5
Schedule	-	-3.2	-	-3.2
Engineering	-	-0.3	-	-0.3
Estimating	+17.1	-48.1	-	-31.0
Other	-	-	-	-
Support	-	-15.6	-	-15.6
Subtotal	+17.1	-188.7	-	-171.6
Current Changes:				
Quantity	-	+523.5	-	+523.5
Schedule	-	-21.3	-	-21.3
Engineering	-	+150.5	-	+150.5
Estimating	+43.3	-517.3	-	-474.0
Other	-	-	-	-
Support	-	+95.8	-	+95.8
Subtotal	+43.3	+231.2	-	+274.5
Total Changes	+60.4	+42.5	-	+102.9
Current Estimate	123.5	321.6	-	445.1

b. Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-1.5
Adjustment for Current and Prior Inflation. (Estimating)	+0.6	+0.9
Revised estimate increases in RDT&E for Block IV development and the continuation of the Program Office infrastructure to support the ongoing MCS development and future P3I programs. (Estimating)	+42.7	+87.3
RDT&E Subtotal	+43.3	+86.7
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-3.4
Economic adjustment for negative program change. (Economic)	N/A	+57.8
Total Quantity Variance associated with increase of 5139 units from 1151 to 6290	+180.3	+417.0
Increase in requirements for a Quantity increase of 5139 units. (Quantity)	+523.5	+1226.1
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	-21.3	+446.2

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13b. Cost Variance Analysis (Cont'd):
MCS BLOCKS IIIb & IV

b. Current Change Explanations --

	(Dollars in Millions)	
	Base-Year	Then-Year
Allocation to Engineering variance resulting from Quantity Change. (Engineering)	-2.0	-49.4
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	-319.9	-1205.8
Acceleration/Stretchout of annual procurement buy profile. (Schedule)	0.0	-2.2
New requirements for a HCU configuration from Sun Sparc 20's to Ultra 10's. Also the new requirement for an LCU. (Engineering)	+152.5	+343.0
Adjustment for Current and Prior Inflation. (Estimating)	+0.2	+0.2
A revised estimate resulting from a change in MCS requirements and methodology for ICS, TPF, NETT. (Estimating)	-197.6	-499.9
Adjustment for Current and Prior Inflation. (Support)	+0.2	+0.2
Increase in requirements for Initial Spares. (Support)	+14.8	+35.1
Increase in Other Weapons System Costs (support) due to an increase in MCS requirements. (Support)	+80.8	+194.5
Procurement Subtotal	+231.2	+542.4

14. Unit Cost and Other History (Then-Year Dollars in Millions):
MCS BLOCKS I, II & IIIa

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.34	--	-0.01	--	--	+0.05	--	--	+0.04	0.38

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14b. Unit Cost and Other History (Cont'd):

MCS BLOCKS I, II & IIIa

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.22	--	--	--	--	--	--	--	--	0.22

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	MAY 83	N/A	N/A
FUE/IOC	N/A	SEP 86	N/A	SEP 86
Total Cost	N/A	606.2	N/A	683
Total Quantity	N/A	1798	N/A	1798
Prog Acq Unit Cost	N/A	0.34	N/A	0.38

"May 1983 represents Block 1, Milestone III.

MCS BLOCKS IIIb & IV

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.15	--	+0.11	+0.08	+0.05	-0.27	--	+0.03	--	0.15

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.12	+0.01	+0.12	+0.08	+0.05	-0.29	--	+0.03	--	0.12

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14c. Unit Cost and Other History (Cont'd):

MCS BLOCKS IIIb & IV

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	APR 99
FUE/IOC	N/A	N/A	N/A	APR 00
Total Cost	N/A	665.9	N/A	965.1
Total Quantity	N/A	4567	N/A	6290
Prog Acq Unit Cost	N/A	0.15	N/A	0.15

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

a. RDT&E --

Maneuver Control System:

LOCKHEED MARTIN CORP, TINTON FALLS NJ

DAAB07-96-C-E008, CPAF

Award: September 26, 1996

Definitized: N/A

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$63.1	\$95.1	1

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$63.1	\$95.1	1

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$63.1	\$63.1

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$	\$
Cumulative Variances To Date	\$	\$
Net Change	\$	\$

Explanation of Change:

Contractor executed a Single Point Adjustment in December 1998, based on contractual redirection, in support of the requirements of the First Digitized Division.

This contract is currently being renegotiated and is expected to be modified (March 1999).

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY80-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-15)</u>	<u>Total</u>
RDT&E	399.3	45.1	25.7	55.7	525.8
Procurement	443.6	52.0	55.7	571.0	1122.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	842.9	97.1	81.4	626.7	1648.1

MCS BLOCKS I, II & IIIa

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

<u>Appropriation</u>	<u>Prior Years (FY80-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	285.0	-	-	-	285.0
Procurement	398.0	-	-	-	398.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	683.0	-	-	-	683.0

MCS BLOCKS IIIb & IV

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

<u>Appropriation</u>	<u>Prior Years (FY96-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-15)</u>	<u>Total</u>
RDT&E	114.3	45.1	25.7	55.7	240.8
Procurement	45.6	52.0	55.7	571.0	724.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	159.9	97.1	81.4	626.7	965.1

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

b. Annual Summary -- MCS BLOCKS I, II & IIIa

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY80 Dollars Nonrec	Flyaway FY80 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1980				8.5	9.0
1981				13.2	15.2
1982				13.6	16.6
1983				15.7	19.9
1984				12.6	16.5
1985				23.5	31.8
1986				8.5	11.9
1987				8.8	12.6
1988				9.4	14.0
1989				7.7	11.9
1990				7.0	11.3
1991				10.6	17.8
1992				21.5	36.8
1993				15.3	26.8
1994				8.9	15.9
1995				9.3	17.0
Subtotal				194.1	285.0

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY80 Dollars Nonrec	Flyaway FY80 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1983	34	2.0	18.0	21.0	27.7
1984	31	0.2	20.7	21.8	29.5
1985	38	0.2	19.9	21.7	30.4
1986	103	0.4	38.3	45.9	66.0
1987	705	0.1	39.7	47.5	70.6
1988	887	1.1	53.5	73.7	114.3
1989			5.9	5.9	9.6
1990			11.4	11.4	19.1
1991			3.5	3.5	6.0
1992			2.2	4.6	8.0
1993			9.3	9.4	16.8
1994					
1995					
Subtotal	1798	4.0	222.4	266.4	398.0

The recurring costs from FY89 through FY93 were for hardware component upgrades and through FY90 for software development. No end items were purchased during these years.

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

MCS BLOCKS I, II & IIIa

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1798	4.0	222.4	460.5	683.0

b. Annual Summary -- MCS BLOCKS IIIb & IV

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY80 Dollars Nonrec	Flyaway FY80 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				18.8	34.8
1997				14.5	27.2
1998				12.5	23.7
1999				15.0	28.6
2000				23.2	45.1
2001				13.0	25.7
2002				4.3	8.6
2003				1.9	3.8
2004				7.6	15.9
2005				6.1	13.0
2006				6.6	14.4
Subtotal				123.5	240.8

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY80 Dollars Nonrec	Flyaway FY80 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996	123		7.5	10.0	18.7
1997	81		3.4	7.4	13.9
1998					
1999	46		3.3	6.7	13.0
2000	653		18.8	26.6	52.0
2001	663		17.5	28.0	55.7
2002			0.3	0.3	0.6
2003	159		6.3	10.0	20.6
2004	426		13.5	20.4	42.9
2005	699		19.8	26.0	55.9
2006	45		3.8	14.9	32.7
2007	149		4.5	9.4	21.0
2008	441		13.6	23.3	53.4
2009	481		14.7	23.0	53.8
2010	462		11.9	23.1	55.2

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

MCS BLOCKS IIIb & IV

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY80 Dollars Nonrec	Flyaway FY80 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2011	394		11.2	22.1	53.9
2012	510		12.6	21.1	52.6
2013	446		11.4	20.9	53.1
2014	482		11.1	20.2	53.5
2015	30		2.1	8.2	21.8
Subtotal	6290		187.3	321.6	724.3

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	6290		187.3	445.1	965.1

17. Delivery/Expenditure Information:

MCS BLOCKS I, II & IIIa

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	1798	1798

Percent Total Program Quantities Delivered: 100.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 683

Percent Total Program Expended: 100.0%

MCS BLOCKS IIIb & IV

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	6290	209

Percent Total Program Quantities Delivered: 3.3%

b. Total Expenditures To Date (In Millions of Dollars): \$ 94.6

Percent Total Program Expended: 9.8%

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18. Operating and Support Costs:

MCS BLOCKS I, II & IIIa

a. Assumptions and Ground Rules --

The MCS Mil Spec and NDI equipment (total quantity 1798) are obsolete and have been taken out of the Army's inventory. There will be no Operating and Support Costs.

b. Costs -- (FY 1980 Constant (Base-Year) Dollars in Thousands)

Cost Element	MCS Avg Annual Cost Per Equipment	Avg Annual Cost Per Equipment (Antecedent)
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	0.0
Intermediate Maintenance	N/A	0.0
Depot Maintenance	N/A	0.0
Contractor Support	N/A	0.0
Sustaining Support	N/A	0.0
Indirect Costs	N/A	0.0
Software Modifications	N/A	0.0
System Project Management	N/A	0.0
Consumables	N/A	0.0
System Test & Evaluation	N/A	0.0
Other	N/A	0.0
Total	N/A	0.0

MCS BLOCKS IIIb & IV

a. Assumptions and Ground Rules --

MCS operating costs are estimated based upon peacetime usage rates. Costs are based on an operating life of 20 years. CHS-2 equipment will only require Depot Level Repairables (spares), and Replenishment Consumables (Repair Parts) for the HCU's, LCU's and peripherals (RAID, LSP, LSD, Printers, TCIM) once fielded.

b. Costs -- (FY 1980 Constant (Base-Year) Dollars in Thousands)

Cost Element	MANEUVER CONTROL SYS Avg Annual Cost Per equipment	Antecedent None
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A

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

MCS BLOCKS IIIb & IV

b. Costs -- (FY 1980 Constant (Base-Year) Dollars in Thousands)

Cost Element	MANEUVER CONTROL SYS	Antecedent
	Avg Annual Cost Per equipment	None
Depot Level Repairables	188.8	N/A
Consumable Material/Repa	4.7	N/A
Total	193.5	N/A

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A-22 SADARM

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: SADARM

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AS OF DATE: December 31, 1998

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SADARM



1. (U) Designation and Nomenclature (Popular Name): Sense and Destroy Armor (SADARM)
2. (U) DoD Component: Army
3. (U) Responsible Office and Telephone Number:
OFFICE OF THE PROJECT MANAGER FOR COL BERNARD E. ELLIS
ARTILLERY MUNITIONS SYSTEMS (ARMS) Assigned: October 3, 1997
PICATINNY ARSEN, NJ 07806-5000 DSN 880-2573; COMM 973-724-2573
BELLIS@PICA.ARMY.MIL
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 64802 Project D369
(U) PE 64814 Project D2ST, D644
PROCUREMENT:
(U) APPN 2034 ICN E66300 (Army)

AS AMENDED

102 17 50

Classified by: SADARM-88C DTD 9 May 1997
Downgrade instructions: Regard
Declassify on: OADR

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5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline, dated 24 July 1989.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated August 4, 1997.

6. (U) Mission and Description:

(U) The SADARM smart munitions will provide an enhanced counterfire capability for the 155mm Howitzer delivery system capable of attacking targets well beyond the Forward Line of Troops (FLOT) in a fire and forget mode. This indirect fire mission can be accomplished under inclement weather, degraded battlefield conditions and Nuclear, Biological, Chemical (NBC) environments, both day and night. The SADARM munition is designed for use against self-propelled howitzers, lightly armored personnel carriers and other stationary armored threat vehicles encountered in counterfire, close support, Suppression of Enemy Air Defense (SEAD) and interdiction. The SADARM Munition Need and Planned Operational Environment description is contained in the SADARM Required Operational Capability (ROC) document dated 11 March 1986 and as revised 18 June 1987, and in an Operational Requirements Document (ORD) dated 3 August 1994. The system is comprised of the following major components: multi-mode sensor with infra-red, and active and passive millimeter wave; lethal mechanism with explosively-formed penetrator; parachutes which control deceleration, spin and descent velocity; fuzing, safe and arm device; and appropriate carrier hardware.

7. (U) Executive Summary:

(U) The original SADARM design was for an 8 inch projectile. The Army decided to retire the 8 inch howitzer fleet near the end of the Advanced Technology Demonstration in 1989. The program was changed to a mix of 63,386 155mm Projectiles (2 SADARM submunitions each) and 59,110 MLRS Rockets (6 SADARM submunitions each). In 1991, due to a reevaluation of the European threat, the quantities were cut to 39,018 projectiles and 23,712 rockets. In 1993, due to low reliability during technical testing, the program was suspended to determine if it was still viable. The program was reinstated in 1994 after the reliability problems were identified and fixes planned. The MLRS SADARM Rocket portion of the program was terminated, to be potentially resumed sometime in the future. To make up for the lost MLRS Rocket quantities, the 155mm SADARM Projectile quantity was increased to 73,612.

SADARM successfully completed Engineering and Manufacturing Development (EMD) during testing at Yuma Proving Ground, AZ, on April 30, 1996.

The Government began accepting SADARM production projectiles in November 1996. System level production testing continued through 1998.

A SADARM Product Improvement (PI) program was initiated in FY 1997. A sole source development contract was awarded to Aerojet, Azusa, CA, in February 1997. Because the PI SADARM will be more effective than the basic SADARM, the total procurement quantity was reduced from 73,612 projectiles to 50,000 projectiles, resulting in a savings of \$493M.

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7. (U) Executive Summary (Cont'd):

The FY 1998 Appropriations Act reduced the funding for the PI program until scheduled testing on the baseline system was completed in 1998. This delayed the cut-in of the new design by a minimum of one year to FY 2002. The resulting RDT&E funding was insufficient to complete the PI effort. The FY 1999 Appropriations Act increased the RDT&E funding by \$11M for the PI, reinstating the cut-in of the new design into the FY 2001 production. The FY 1999 Appropriations Act also decremented the production funding by \$25M, reducing that quantity to approximately 100 and potentially causing a production break.

The SADARM Operational Test (OT) was completed in August 1998. A total of five missions were physically fired in an operational scenario by soldiers from the 1/377th Field Artillery Regiment over actual threat targets at Ft. Greely, Alaska. Only three of the five missions delivered the SADARM projectiles over the target threat array. The average of these three missions attained the Operational Requirements Document (ORD) requirements for unique target kills. Two of the five fire missions failed to deliver the projectiles over the target array. As a result, the Operational Test & Evaluation Command (OPTEC) System Evaluation Report (SER) indicates that the SADARM was not effective or suitable as tested. The primary contributing factors were lower than expected submunition reliability, submunition performance, and delivery inaccuracy due to wind and to a lesser extent, delivery inaccuracy. As a result of OT, PM ARMS has restructured the basic SADARM program to include a robust reliability growth program to provide the Warfighter with a needed capability.

The program restructure has caused schedule and cost breaches to the approved Acquisition Program Baseline (APB). The Full Rate Production (FRP) decision will be postponed from Dec 98 until May 03, after completion of OT on the PI version of SADARM. Until then, the basic SADARM will remain in Low Rate Production to keep the line warm for the PI program and provide a minimum quantity of SADARM projectiles to the field. This also effects the milestones for the FRP award, First Unit Equipped (FUE), and Organic Support Capabilities. New acquisition assumptions, reduced production rates, and a two year production schedule stretch also contribute to the cost breaches. Total procurement cost and average procurement unit costs have increased 14.8% since the August 1997 APB.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

As a result of an unfavorable OPTEC SER, the SADARM program was restructured to improve reliability and begin production of the PI SADARM in the most efficient and economical manner. The restructure caused several schedule milestone breaches to the APB, the most notable of which was postponing the FRP decision from Dec 1998 until May 2003, after completion of OT on the PI SADARM.

The program also has Total Procurement Cost and APUC APB breaches of 14.8% in constant FY89 dollars. The primary causes of these breaches were revised acquisition assumptions, reduced production rates with a related two year production program extension, and the restructure.

A Program Deviation Report (PDR) is being staffed. A revised APB is being prepared.

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Generic SADARM Submunition Development Approved by Army Materiel Cmd	NOV 84	NOV 84	NOV 84
Congressional Direction for FSD/Prod	DEC 85	DEC 85	DEC 85
DA Approval SADARM (155mm & MLRS) ROC	MAR 86	MAR 86	MAR 86
DA In-Process Review for Submunition FSD	SEP 86	SEP 86	SEP 86
Competitive Submunition FSD Contract Award	SEP 86	SEP 86	SEP 86
Milestone II (ASARC)	NOV 87	NOV 87	NOV 87
Milestone II (DAB)	MAR 88	MAR 88	MAR 88
Congressional Demonstration Start	JAN 89	JAN 89	JAN 89

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

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Complete	APR 89	APR 89	JUL 89
Army Decision: keep 2 submun sizes	N/A	NOV 90	NOV 90
155mm SADARM Tech Tests			
Start	MAY 90	AUG 91	JUL 91
Complete	JUL 91	FEB 96	APR 96
155mm SADARM IOT&E			
Start	JUL 91	JUN 98	JUN 98
Complete	DEC 91	JUL 98	JUL 98
Submunition Design Select	JAN 92	N/A	N/A
Type Classification	JAN 92	N/A	N/A
Milestone III (ASARC)	JAN 92	N/A	N/A
LRP Decision	N/A	MAR 95	MAR 95
LRP Contract Award	N/A	APR 95	APR 95
LRP First Delivery	N/A	OCT 96	NOV 96
Milestone III DAB	N/A	DEC 98	MAY 03 (Ch-1)
155mm SADARM Full Scale Production	MAY 92	JAN 99	JUN 03 (Ch-1)
Award			
IOC/First Unit Equipped-155mm SADARM	JUL 93	JUL 99	JAN 01 (Ch-1)
Organic Support Capability	N/A	JUL 99	JAN 01 (Ch-1)
Award Product Improvement (PI) Contract	N/A	FEB 97	FEB 97
Complete PI Contract	N/A	MAY 01	SEP 01 (Ch-2)
First PI Production Delivery	N/A	JAN 02	JUN 02 (Ch-2)

(U) ACRONYMS:

DA	Department of the Army
FSD	Full Scale Development
ASARC	Army Systems Acquisition Review Council
DAB	Defense Acquisition Board
IOTE	Initial Operational Test & Evaluation
LRP	Low Rate Production
IOC	Initial Operational Capability

b. Current Change Explanations --

(U) (Ch-1) As a result of not meeting effectiveness requirements at maximum firing range during Operational Testing, the Milestone III DAB was changed from DEC 98 to May 03, after Operational Testing is complete on the PI SADARM; and the 155mm SADARM Full Scale Production Award was changed from JAN 99 to JUN 03; and IOC/First Unit Equipped - 155mm SADARM and Organic Support Capability both changed from JUL 99 to JAN 01.

(Ch-2) Congressional increase to FY99 RDT&E funding and FY00 President's Budget provided sufficient funding to complete Product Improvement (PI) effort, changing milestones from TBD to SEP 01 to Complete PI Contract, and from TBD to JUN 02 for First PI Production Delivery.

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10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
155 mm EK (SPH) (4 projectiles)	N/A	(b)(1)		
155mm Effectiveness	(b)(1)	N/A /	N/A	N/A
Submunition Pk (secondary tgts)		N/A / N/A	(b)(1)	
Submunition Perforation (mm RHA)		N/A / N/A		
155mm Max Range (km) (M109A2/A3 w/M185)	17.9	N/A / N/A	N/A	N/A
155mm Max Range (km) (M109A1/A2/A3/A4 series howitzers)	N/A	17.9 / 17.9	17.9	17.9
155mm Max Range (km) (M198 series)	22.5	N/A / N/A	N/A	N/A
155mm Max Range (km) (M109 A3/E2 HIP) (M109A6)	22.5	N/A / N/A	N/A	N/A
155mm Max Range (km) (M198 and M109A5/A6 series howitzers)	N/A	22.5 / 22.5	22.5	22.5
Storage Life (all SADARM munitions) (yrs)	10	N/A / N/A	10	10
155mm Carrier Reliability	0.90	N/A / N/A	0.98	0.98
Submunition Reliability (155mm)	0.80	N/A / N/A	0.61	0.80
Submunition Self Destruct at less than 10 meters	N/A	N/A / N/A	TBD	0.95

(U) ACRONYMS:

EK Expected number of Kills
 SPH Self Propelled Howitzer
 Pk Probability of kill
 RHA Rolled Homogeneous Armor
 HIP Howitzer Improvement Program

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10b. (U) Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	237.7	365.1	377.5
Procurement	496.0	1263.4	1450.6
	(248.0)		(0.0)
Recurring Flyaway	(248.0)		(1373.2)
Nonrecurring Flyaway	(0.0)		(62.4)
Total Flyaway	(496.0)		(1435.6)
Pallets	(0.0)		(0.0)
Data			(14.1)
Total Other Wpn Sys	(0.0)		(14.1)
Peculiar Support	(0.0)		(0.9)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 89 Base-Year \$	733.7	1628.5	1828.1
Escalation	-198.6	680.2	742.0
Development (RDT&E)	(8.2)	(50.0)	(51.8)
Procurement	(-206.8)	(630.2)	(690.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	535.1	2308.7	2570.1

(U) In addition to the above, \$589.8M (then year) was spent on MLRS SADARM Rocket RDT&E prior to termination.

b. (U) Quantity --

Development (RDT&E)	132	189	189
Procurement	10156	50000	50000
Total	10288	50189	50189

Note: Excludes 772 RDT&E prototypes from the SAR Baseline and 772 from the Current Estimate that are not considered fully configured.

(U) The Low Rate Initial Production (LRIP) quantity planned at the time of the 30 March 1995 DAB was 1287.

The LRIP quantity was increased to 1390 due to delaying the FRP decision until after completion of the PI OT.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

	UCR Baseline (AUG 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 89 BY\$)	1628.5	1828.1	
(2) Quantity	50189	50189	
(3) Unit Cost	0.032	0.036	+12.50
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 89 BY\$)	1263.4	1450.6	
(2) Quantity	50000	50000	
(3) Unit Cost	0.025	0.029	+16.00

(U) The actual APUC increase is 14.82%, which is not an APUC breach. The 16% shown is the result of rounding the unit costs before calculating the increase.

13. (U) Cost Variance Analysis:

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	245.9	289.2	-	535.1
Previous Changes:				
Economic	-1.8	-187.4	-	-189.2
Quantity	-	+569.7	-	+569.7
Schedule	+7.9	+619.7	-	+627.6
Engineering	+62.8	+212.2	-	+275.0
Estimating	+87.9	+454.1	-	+542.0
Other	-	-	-	-
Support	-	+20.8	-	+20.8
Subtotal	+156.8	+1689.1	-	+1845.9
Current Changes:				
Economic	-0.7	-37.3	-	-38.0
Quantity	-	+0.4	-	+0.4
Schedule	+11.0	+68.0	-	+79.0
Engineering	-	-	-	-
Estimating	+16.3	+128.4	-	+144.7
Other	-	-	-	-
Support	-	+3.0	-	+3.0
Subtotal	+26.6	+162.5	-	+189.1
Total Changes	+183.4	+1851.6	-	+2035.0
Current Estimate	429.3	2140.8	-	2570.1

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13a. (U) Cost Variance Analysis (Cont'd):

(U) Summary (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	237.7	248.0	-	485.7
Previous Changes:				
Quantity	-	+461.7	-	+461.7
Schedule	+6.4	+204.2	-	+210.6
Engineering	+47.8	+144.8	-	+192.6
Estimating	+64.3	+278.7	-	+343.0
Other	-	-	-	-
Support	-	+13.3	-	+13.3
Subtotal	+118.5	+1102.7	-	+1221.2
Current Changes:				
Quantity	-	+0.3	-	+0.3
Schedule	+8.7	-	-	+8.7
Engineering	-	-	-	-
Estimating	+12.6	+97.9	-	+110.5
Other	-	-	-	-
Support	-	+1.7	-	+1.7
Subtotal	+21.3	+99.9	-	+121.2
Total Changes	+139.8	+1202.6	-	+1342.4
Current Estimate	377.5	1450.6	-	1828.1

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Congressional increase to accelerate design cut in from FY2002 to FY2001 (Schedule)	+8.7	+11.0
Adjustment for Current and Prior Inflation. (Estimating)	+0.4	+0.5
Program restructure resulting from FY98 Congressional decrement. (Estimating)	+12.2	+15.8
Revised escalation indices. (Economic)	N/A	-0.7
RDT&E Subtotal	+21.3	+26.6
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-37.3
Two year stretchout of annual procurement buy profile. (Schedule)	0.0	+68.0
Adjustment for Current and Prior Inflation. (Estimating)	+2.3	+2.8
Cost growth on FY95/FY96 contract paid out of FY96 & later year funding (Estimating)	+21.1	+26.6
Change in acquisition strategy from multi-year procurement to annual procurement (Estimating)	+28.5	+39.4
Additional quantity of non-fully configured test rounds. (Quantity)	+0.3	+0.4

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13b. (U) Cost Variance Analysis (Cont'd):

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	Base-Year	Then-Year
Eliminate assumption of Foreign Military Sales in FY01 - FY03 (Estimating)	+48.4	+65.5
Additional non-recurring costs for Value Engineering Change Proposals (Estimating)	+5.9	+10.6
Miscellaneous estimating changes (Estimating)	-8.3	-16.5
Revised Peculiar Support requirements (Support)	+0.2	+0.4
Revised Data requirements (Support)	+1.5	+2.6
Procurement Subtotal	+99.9	+162.5

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.05	--	-0.03	+0.01	+0.01	+0.01	--	--	--	0.05

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.03	--	-0.01	+0.01	--	+0.01	--	--	+0.01	0.04

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	MAR 88	N/A	MAR 88
Milestone III	N/A	APR 92	N/A	MAY 03
FUE/IOC	N/A	JUL 93	N/A	JAN 01
Total Cost	N/A	535.1	N/A	2570.1
Total Quantity	N/A	10288	N/A	50189
Prog Acq Unit Cost	N/A	0.05	N/A	0.05

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15. (U) Contract Information (Then-Year Dollars in Millions):

a. RDT&E --			Initial Contract Price		
(U) <u>SADARM Product Imprvmnt:</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
Aerojet, Azusa, CA					
DAAE30-97-C-1017, CPAF	\$46.7	N/A			
Award: February 24, 1997					
Definitized: February 24, 1997					

Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$44.6	N/A		\$44.0	\$43.6	

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.6	\$-0.2
Cumulative Variances To Date (12/31/98)	\$0.8	\$-0.5
Net Change	\$0.2	\$-0.3

Explanation of Change:

(U) Variances are insignificant.

b. Procurement --			Initial Contract Price		
(U) <u>SADARM LRP2 BASIC:</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
Aerojet, Azusa, CA					
DAAE30-97-C-1005, FFP	\$81.6	N/A	600		
Award: February 6, 1997					
Definitized: February 6, 1997					

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	600	\$81.6	\$81.6	

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:
Contract DAAE30-95-C-0080, FFP LRP1 Option for FY 96 production of 123 projectiles is complete and is no longer reporting.

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16. (U) Program Funding Summary (Current Estimate in Millions of Dollars):

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years (FY86-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-13)</u>	<u>Total</u>
RDT&E	398.3	19.4	9.8	1.8	429.3
Procurement	265.1	54.5	63.6	1757.6	2140.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	663.4	73.9	73.4	1759.4	2570.1

b. Annual Summary -- 155mm SADARM Projectile

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986				2.7	2.5
1987				14.9	14.2
1988				24.2	24.0
1989				37.8	39.0
1990				48.3	51.7
1991				28.6	31.8
1992				55.3	62.9
1993				19.3	22.5
1994				35.1	41.6
1995				33.5	40.5
1996				12.8	15.8
1997				7.8	9.7
1998				8.4	10.5
1999				24.9	31.6
2000				15.0	19.4
2001				7.5	9.8
2002				1.4	1.8
Subtotal	189			377.5	429.3

(U) Due to commonality, the RDT&E costs for submunitions for the 155mm Projectile and MLRS Rocket have been allocated to each system based on the total quantity of submunitions to be procured for each end item. All MLRS SADARM Rocket efforts have been terminated. The following table shows the sunk RDT&E costs allocated to the MLRS SADARM Rocket:

FY	BY89 \$M	TY \$M
1986	34.3	31.7
1987	60.1	57.3
1988	76.7	76.1
1989	101.9	105.2
1990	77.6	83.1
1991	68.0	75.6

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SADARM, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):

1992	74.9	85.2
1993	64.6	75.2
1994	0.3	0.4

TOTAL	558.4	589.8
-------	-------	-------

Appropriation: 2034 - Procurement of Ammunition, Army

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995	110	6.3	18.7	24.5	29.8
1996	123	6.7	32.9	36.4	44.9
1997	600	2.2	68.2	74.8	93.6
1998	300	3.9	44.8	51.5	65.3
1999	100	4.9	18.9	24.6	31.5
2000	227	5.8	35.3	41.9	54.5
2001	460	1.6	45.7	48.0	63.6
2002	730	7.2	48.9	56.8	76.5
2003	1300	4.8	62.1	67.6	92.8
2004	3125	3.4	106.2	110.3	154.6
2005	1455	0.7	56.4	57.8	82.8
2006	3112	3.8	80.9	85.5	125.0
2007	4005	3.8	95.9	100.5	150.0
2008	5388	3.7	112.9	117.4	178.9
2009	5412	3.6	109.6	114.0	177.4
2010	5730		110.4	111.2	176.7
2011	5790		108.2	109.0	176.8
2012	6032		106.0	106.8	176.8
2013	6001		111.2	112.0	189.3
Subtotal	50000	62.4	1373.2	1450.6	2140.8

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	50189	62.4	1373.2	1828.1	2570.1

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	189	132
Procurement	860	315

(U) Percent Total Program Quantities Delivered: 0.9%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 505.7

(U) Percent Total Program Expended: 19.7%

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17. (U) Delivery/Expenditure Information (Cont'd):

(U) RDT&E quantity excludes units that are not fully configured.

Expenditures to date exclude \$589.8M spent on MLRS SADARM Rocket.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
The 155mm SADARM munitions are considered "wooden rounds" and have no operational costs. The only O&S costs are for depot storage and stockpile testing. O&S costs are less than \$15 (BY89) per round per year. There is no antecedent.

b. (U) Costs -- (FY 1989 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per 155mm SADARM/year	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	0.0	0.0

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A-14 FMTV

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)

PROGRAM: FMTV

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): Family of Medium Tactical Vehicles (FMTV)
2. DoD Component: Army
3. Responsible Office and Telephone Number:
Program Executive Office, Ground Mr. Dennis E. Mazurek
Combat and Support Systems Assigned: January 25, 1999
ATTN: SFAE-GCSS-W-MTV DSN 786-8665; COMM (810) 574-8665
Warren, MI 48397-5000 mazurekd@tacon.army.mil
4. Program Elements/Procurement Line Items:
RDT&E:
 PE 64604 (Shared)
PROCUREMENT:
 APPN 2036 ICN D15500 (Army)
 APPN 2035 ICN DA035A (Army)
 APPN 2035 ICN DS1010 (Army)
 APPN 2035 ICN DV0310 (Army)
 APPN 2035 ICN DV0320 (Army)

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99-C-0713

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5. References:

SAR Baseline (Production Estimate):

AAE Approved Acquisition Program Baseline dated September 11, 1995.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated September 11, 1995.

6. Mission and Description:

The Family of Medium Tactical Vehicles (FMTV) is a complete series of trucks based on a common chassis, varied by payload and mission. The Light Medium Tactical Vehicle (LMTV) has a 2-1/2 ton capacity consisting of cargo and van models. The Medium Tactical Vehicle (MTV) has a 5 ton capacity and consists of cargo, tractor, van, wrecker, tanker and dump truck models. Subvariants provide Air Drop capability for contingency and rapid deployment operations. Trailer airdrop capability and a new truck variant, a water tanker, were approved by TRADOC in May 1997 for introduction later in the program. Over 80% commonality of parts between variants significantly reduces operational and support costs. FMTV, intended to replace obsolete and maintenance-intensive trucks currently in the fleet, performs local and line haul, unit mobility, unit resupply, and other missions in combat, combat support, and combat service support units. The system is designed to be rapidly deployable worldwide and operate on primary and secondary roads, trails, and cross-country terrain, in all climatic conditions.

7. Executive Summary:

The FMTV Operational and Organizational Plan was approved in September 1984. The Joint Services Operational Requirement (JSOR) was established on May 1, 1986, and subsequently, the Army Cost and Operational Effectiveness Analysis (COEA) justified the program initiation on June 4, 1987. The FMTV Army Systems Acquisition Review Council (ASARC) approval was obtained on August 5, 1987, with further program approval from the Defense Acquisition Board (DAB) on May 23, 1988, which led to the prototype contracts being awarded on October 21, 1988.

The December 1988 SAR represented a procurement program of 15 years. As a result of competing Army priorities, the December 1989 SAR reflected the current 30 year procurement program. The FMTV ASARC IIIA milestone review was completed in September 1991, and granted approval to proceed to Low Rate Initial Production. The FMTV production contract was awarded to Stewart & Stevenson Services Inc. of Houston, TX on October 11, 1991. This was a five-year multiyear fixed price contract with an escalation clause which procures 10,843 trucks and includes option provisions. The new production facility is located in Sealy, TX.

A sole-source R&D contract was awarded to Stewart & Stevenson on September 30, 1992 to build and test hardware, as well as develop the Technical Drawing Package (TDP) for the deferred fuel tanker, expansible van and trailers.

The ASARC IIIB for Full Rate Production and Type Classification Standard was approved in August 1995, and the production APB was approved on September 11, 1995. First Unit Equipped (FUE) occurred in January 1996 at Ft. Bragg, NC. The contract modification was signed in April 1996 for the contractor to develop the Level III Technical Data Package for the expansible van and fuel tanker variants.

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7. Executive Summary (Cont'd):

In October 1996 the contractor negotiated a three year contract to stretch the 5th base year production to December 1998, caused by a transfer of FMTV funds to a higher priority system.

On September 11, 1997, the Army Acquisition Executive approved a two-phase acquisition strategy for FMTV which would result in a second-source production qualification phase awarded competitively to two contractors in FY98, followed by the down-selection to one second source for a three-year, multiyear procurement in FY00. The FY99 Authorization Act levied cost, production and technical restrictions on the dual-source program. Phase I of the second source acquisition was implemented with contract awards to AM General and Oshkosh Truck Corporation on October 30, 1998.

In March 1998, a safety of use message was issued to units with FMTVs in their fleets concerning the vehicle driveline. Operators were instructed to restrict operating speed to 30 mph until further notice. The problem was traced to the driveline. Vehicles deadlined due to cracked flywheel housings have been, and continue to be repaired on an interim basis allowing vehicles to operate within the 30 mph restriction. A combined government, contractor, scientific and academic group evaluated the problem and developed a joint, final solution. Retrofit planning is in process, with some vehicles to be retrofitted in the field, and some at the plant before shipment. Vehicles produced under the rebuy contract awarded in October 1998 will have the improved driveline components.

The sole source negotiated, four-year, multiyear rebuy contract with Stewart & Stevenson was awarded on October 14, 1998. A stop work letter was issued to the contractor on October 21, 1998 as a result of direction received from the Army Acquisition Executive. Additional information regarding the driveline fix was submitted to Congress by OSD on November 4, 1998, and subsequently, the stop work was lifted on November 17, 1998, and the contract continues in force.

Production of vehicles under the original multiyear contract was completed in November 1998. FMTV Total Package Fielding continued throughout 1998. As of December 31, 1998, a total of 7,992 vehicles have been shipped and 6,968 received at the fielding sites.

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8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	Yes
Average Procurement Unit Cost	Yes

c. Explanation of Breach:

FMTV has experienced breaches to the Acquisition Program Baseline dated September 11, 1995 in Total Procurement Cost, Program Acquisition Unit Cost (PAUC) and Average Procurement Unit Cost (APUC). There are also Nunn-McCurdy unit cost baseline breaches of the PAUC and the APUC. All breaches result from the same set of programmatic and fact-of-life events. A revised APB has been forwarded to the Army for approval, and Nunn-McCurdy unit cost breach information is being provided in SAR sections 12.c through 12.m.

9. Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I/II (ASARC)	MAY 87	MAY 87	MAY 87
DAB Program Review	MAY 88	MAY 88	MAY 88
Prototype Contract Awards	OCT 88	OCT 88	OCT 88
First Prototype Delivery	JAN 90	JAN 90	JAN 90
FSD Development Testing			
Start	JAN 90	JAN 90	JAN 90
Complete	DEC 90	DEC 90	DEC 90
Early User Test and Evaluation			
Start	MAY 90	MAY 90	MAY 90
Complete	OCT 90	OCT 90	OCT 90
ASARC TIIA	SEP 91	SEP 91	SEP 91
Production Award (MYP)	OCT 91	OCT 91	OCT 91
Call up 2nd Year of MYP	AUG 92	AUG 92	AUG 92
Production Qualification Test (PQT)			
Start	MAY 92	MAY 92	MAY 92
Complete	NOV 92	NOV 92	NOV 92
First Production Delivery	MAY 93	MAY 93	MAY 93
Initial Production Test (IPT)			

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9a. Schedule (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Start	MAY 93	MAY 93	MAY 93
Complete	JUL 95	JUL 95	JUL 95
IOT&E			
Start	APR 95	APR 95	APR 95
Complete	JUL 95	JUL 95	JUL 95
Call Up 3rd Year of MYP Increment 1	SEP 93	SEP 93	SEP 93
ASARC IIIB	AUG 95	AUG 95	AUG 95
Call Up 3rd Year of MYP Increment 2	JUL 95	JUL 95	JUL 95
Organic Support Capability	DEC 95	DEC 95	DEC 95
First Unit Equipped (FUE)/Initial Operational Capability (IOC)-FMTV	DEC 95	DEC 95	JAN 96
Call up 4th Year of MYP Increment 1	JUL 95	JUL 95	JUL 95
Call up 4th Year of MYP Increment 2	SEP 95	SEP 95	SEP 95
Call Up 5th Year of MYP	JUL 96	JUL 96	AUG 96
Production Decision Review Van, Tanker, & Trailer	JUN 96	JUN 96	NOV 96
PQT, Van & Tanker			
Start	NOV 99	NOV 99	NOV 99
Complete	DEC 99	DEC 99	DEC 99
IPT, Van & Tanker			
Start	FEB 00	FEB 00	FEB 00
Complete	OCT 00	OCT 00	OCT 00
IOT&E, Van & Tanker			
Start	APR 00	APR 00	APR 00
Complete	AUG 00	AUG 00	AUG 00
PQT, Trailer			
Start	NOV 99	NOV 99	NOV 99
Complete	DEC 99	DEC 99	DEC 99
IPT Trailer			
Start	FEB 00	FEB 00	FEB 00
Complete	OCT 00	OCT 00	OCT 00
IOT&E, Trailer			
Start	APR 00	APR 00	APR 00
Complete	AUG 00	AUG 00	AUG 00
JSOR Amendment	N/A	N/A	MAY 97 (Ch-1)
Rebuy Contract Award	N/A	N/A	OCT 98 (Ch-2)
2nd Source Ph. I Awd	N/A	N/A	OCT 98 (Ch-3)
Van/Tanker Award	N/A	N/A	MAY 99 (Ch-4)
2nd Source Ph. II Awd	N/A	N/A	JUN 00 (Ch-3)
FUE Rebuy Contract	N/A	N/A	FEB 00 (Ch-2)
FUE 2nd Source	N/A	N/A	JAN 03 (Ch-3)
FUE Van/Tanker	N/A	N/A	NOV 01 (Ch-4)
Follow-On Contracts	N/A	N/A	NOV 02 (Ch-5)

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9b. Schedule (Cont'd):

b. Current Change Explanations --

(Ch-1) The addition of the JSOR Amendment recognizes the additional capability of the trailers to be air-dropped, and the addition of a new model of truck - a potable water tanker - to the program.

(Ch-2) Addition of the actual event of the rebuy contract award on October 14, 1998, and the projected FUE date for the FMTV A1 model.

(Ch-3) Addition of the actual event of the Phase I second source contract awards to AM General and Oshkosh Truck Corporation on October 30, 1998, and the projected Phase II (down-selection to a single second-source contractor) and FUE of the second source vehicles.

(Ch-4) Streamlining Van and Fuel Tanker milestones and updating them to reflect their relationship to the main FMTV program.

(Ch-5) Reflects the next phase of the FMTV dual source acquisition strategy, assumed in the current estimate to be head-to-head competition between the current producer and the competitively-selected second source.

10. Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Highway Speed on 2% Grade at GVW (mph)	55	55 / 55	54.8	55
Highway Speed on 3% Grade at GVW (mph)	45	45 / 45	48.7	45
Highway Speed on 2% Grade at GCW (mph)	40	40 / 40	45.5	40
Highway Speed on 3% Grade at GCW (mph)	30	30 / 30	35.8	35
LMTV Payload (tons)	2.5	2.5 / 2.5	2.5	2.5
MTV Payload (tons)	5	5 / 5	5	5
LMTV Towed Load (lbs)	7500	7500 / 7500	7500	12000
MTV Towed Load (lbs)	21000	21000 / 21000	21000	21000
Longitudinal Grade Operation (%)	60	60 / 60	60	60
Slide Slope Operation (%)	30	30 / 30	30	30
Fording Without Kit (inches)	30	30 / 30	30	30
Fording With Kit (inches)	60	60 / 60	60	60
Operating Range on Integral Fuel at GCW (miles)	300	300 / 300	300	300
Reliability: MMBHMf (miles)		/ N/A	TRD	

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10a. Performance Characteristics (Cont'd):

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>	
Truck, Cargo (LMTV)	3000	3000 / 2450	12000	5500	
Truck, Cargo (MTV)	2700	2700 / 1950	12000	5500	
Tractor	3300	3300 / 2600	4800	3800	
Wrecker	2300	2300 / 2000	4800	2800	
Trailer (LMTV)	2800	2800 / 1985	5000	2800	
Trailer (MTV)	2600	2600 / 1600	5000	2600	(Ch- 1)
MMBOMF (miles)					
Truck, Cargo (LMTV)	2228	2228 / 1832	>8279	2228	(Ch-2)
Truck, Cargo (MTV)	2035	2035 / 1446	6386	2035	(Ch-2)
Tractor	2480	2480 / 1960	3606	2480	(Ch-2)
Wrecker	1875	1875 / 1500	4720	1875	(Ch-2)
Trailer (LMTV)	2056	2056 / 1489	5000	2056	(Ch-2)
Trailer (MTV)	1913	1913 / 1200	5000	1913	(Ch-2)
MMHPOM					
Truck, Cargo (LMTV)	.01	.01 / .011	.0037	.0044	(Ch-3)
Truck, Cargo (MTV)	.011	.011 / .012	.0048	.0055	(Ch-3)
Tractor	.012	.012 / .015	.0062	.0065	(Ch-3)
Wrecker	.015	.015 / .018	.0069	.0064	(Ch-3)
Trailer (LMTV)	.003	.003 / .005	.0003	.0017	(Ch-3)
Trailer (MTV)	.003	.003 / .005	.0006	.0017	(Ch-3)
Transportability:					
Surface	H, S&R	H, S&R / H, S&R	H, S&R	H, S&R	
Transportation (Highway, Ship & Rail)					
Air Transportation	C-141 N/A	C-141 / C-141 N/A	C-141 TBD	C-141 C-130	(Ch-4)
Mobility: (vehicle cone index)					
Truck Cargo	25	25 / 25	25	25	
Truck & Trailer Combination	35	35 / 35	30	35	

GVW - Gross Vehicle Weight
 GCW - Gross Combined Weight
 MMBOMF - Mean Miles Between Hardware Mission Failure
 MMBOMF - Mean Miles Between Operational Mission Failure
 MMHPOM - Maintenance Man hours/Operating Mile (Unit Level)

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10b. Performance Characteristics (Cont'd):

b. Current Change Explanations --

(Ch-1) Change from 2800 miles to 2600 miles to correct typographical error in December 1997 SAR.

(Ch-2) Lowers the operational mission failure objectives to equal the requirement, as reflected in the Joint Service Operational Requirement (JSOR) values. Actual performance in the original production testing exceeded these values.

<u>Characteristic</u>	<u>From</u>	<u>To</u>
MMBOMF (miles)		
Truck, Cargo (LMTV)	>8279	2228
Truck, Cargo (MTV)	6386	2035
Tractor	3606	2480
Wrecker	4720	1875
Trailer (LMTV)	5000	2056
Trailer (MTV)	5000	1913

(Ch-3) Values reflect Unit level maintenance contained in the FMTV System Specification, ATPD 2131A, dated May 7, 1998.

<u>Characteristic</u>	<u>From</u>	<u>To</u>
MMHPOM		
Truck, Cargo (LMTV)	.0057	.0044
Truck, Cargo (MTV)	.0070	.0055
Tractor	.0091	.0065
Wrecker	.0097	.0064
Trailer (LMTV)	.0020	.0017
Trailer (MTV)	.0020	.0017

(Ch-4) Addition of C-130 recognizes this former and current FMTV transportability requirement.

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11. Total Program Cost and Quantity (Dollars in Millions):

	Production Estimate (SAR)	Approved Program (APR)	Current Estimate
a. Cost --			
Development (RDT&E)	121.8	121.8	120.5
Procurement	11472.4	11472.4	14156.4
Rollaway	(10677.1)		(13711.9)
Other Wpn Systems Cost	(777.3)		(427.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(18.0)		(17.4)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 96 Base-Year \$	11594.2	11594.2	14276.9
Escalation	7327.1	7327.1	4106.7
Development (RDT&E)	(-6.2)	(-6.2)	(-7.7)
Procurement	(7333.3)	(7333.3)	(4114.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	18921.3	18921.3	18383.6
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	85488	85488	86916
Total	85488	85488	86916

Note: Excludes 51 RDT&E prototypes from the SAR Baseline and 51 from the Current Estimate that are not considered fully configured.

Total LRIP quantities produced prior to Milestone III, Full Rate Production Decision were 1,804 LMTV trucks and 779 MTV trucks.

c. Foreign Military Sales --
FMTV Foreign Military Sales through December 31, 1998:

Country	Quantity	Estimated Cost
Saudi Arabia	99	\$13.5M
Taiwan	3	.4M
Thailand	117	22.8M
Greece	4	.6M

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

	UCR Baseline (SEP 95 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	11594.2	14276.9	
(2) Quantity	85488	86916	
(3) Unit Cost	0.136	0.164	+20.59
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	11472.4	14156.4	
(2) Quantity	85488	86916	
(3) Unit Cost	0.134	0.163	+21.64
	UCR Baseline (SEP 95 APB)	Current Estimate (Dec 98 SAR)	Percent Change
c. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (TY\$)	18921.3	18383.6	
(2) Unit Cost	0.221	0.212	-4.07
d. Avg. Proc. Unit Cost (APUC)			
(1) Cost (TY\$)	18805.7	18270.8	
(2) Unit Cost	0.220	0.210	-4.55
e. Changes from Previous SAR (DEC 97)	Dollars/Qty	Percent	
(1) PAUC (BY\$)	0.025	+17.95	
(2) APUC (BY\$)	0.023	+12.13	
(3) PAUC Quantity	1428	+1.67	
(4) PAUC (TY\$)	0.029	+15.89	
(5) APUC (TY\$)	0.028	+15.37	
f. Initial SAR Information			
Initial SAR Date (DEC 88):			
(1) Program Acquisition Cost (BY\$)	6625.3		
(2) Program Acquisition Cost (TY\$)	8568.6		

Initial Dec 88 SAR information is shown in the Base Year at that time, which was FY89 Constant Dollars. The current Base Year is FY96 Constant Dollars.

g. Unit Cost PAUC Changes --

Less than 1% of the FMTV Program Acquisition Cost is RDT&E and the change experienced in RDT&E was a reduction and does not contribute to the breach. The following narrative applies to both PAUC and APUC changes.

The reasons for the breach are both Programmatic, that is, due to changes directed by higher headquarters or due to events outside the Project Manager's span of control, and Fact-of-Life, due primarily to the incorporation of the latest contract award prices into our cost estimates, which reflects increases in material cost, overhead, General & Administrative, and profit.

Programmatic Changes:

*** UNCLASSIFIED ***

FMTV, December 31, 1998

12g. Unit Cost Summary (Cont'd):

Out of the \$.025M (FY96 Constant \$) increase in PAUC and APUC, \$.010M, or 40%, is attributed to directed changes to the program. Specifically:

1. Addition of the Water Tanker Model. The FMTV Joint Services Operational Requirements document (JSOR) was amended in 1997 to add the water tanker model. This model was not formally incorporated into our cost reporting until this cycle. The quantity of vehicles is 1,500, at a total cost of \$339.9M, which contributes \$.004M (\$3,911), or 16%, to the unit cost increase.

2. Anti-lock Brakes. Statute dictated that all trucks have anti-lock brakes, and this change took effect with the FMTV A1 configuration contract award in October 1998, and is incorporated into the estimate for the total program. This adds \$98.5M to the program over its life, which contributes \$.001M (\$1,133) to the unit cost increase.

3. Updated EPA-compliant Engine. FMTV complies with Environmental Protection Agency (EPA) requirements for emissions. This also ensures that FMTV is in step with current industry technology. This change took effect with the FMTV A1 configuration contract award in October 1998, and is incorporated into the estimate for the total program. This adds \$306.2M to the program over its life, which contributes \$.004M (\$3,523), or 16%, to the unit cost increase.

4. Break-in-production and Delivery Order Termination. In the FY99 President's Budget, the submission did not forecast a break-in-production, but rather several months of production at a very low rate. The eventual contract schedule instead reflects a break-in-production between the previous and current contracts, and was reflected in the FY00/01 President's Budget submission. In addition, the Project Manager was directed to cancel two delivery orders from the Requirements contract. The PM has executed a contract modification against the cost of the termination; the final settlement will be negotiated with the contractor. These actions add \$11.1M to the program, although they contribute less than \$.001M (\$128) to the unit cost increase.

5. Tarps, Bows & Tie-downs. In previous program cost estimates, the cost of tarps, bows and tie-downs was not considered an acquisition cost, as the field units were responsible for these purchases. A change from this policy was directed by higher headquarters, and the Project Manager now procures tarps, bows and tie-downs, as needed by the field, and they are part of the acquisition program. This adds \$75.3M to the program, which contributes \$.001M (\$866) to the unit cost increase.

In summary, the portion of the PAUC and APUC unit cost increase attributable to Programmatic changes is significant.

Fact-of-Life Changes: The balance of the PAUC and APUC unit cost increases are due to non-programmatic changes. Most significant are,

1. Corrosion Prevention enhancements include over 30 component design and material upgrades, including a full galvanized cab, stainless steel exhaust system, brass radiator, changes in fasteners, the use of Carwell rust inhibitor solution for vehicles destined for over-ocean transport to high humidity areas,

FMTV, December 31, 1998

12g. Unit Cost Summary (Cont'd):

and additional process and quality monitoring.

2. Comprehensive updating of the PM's estimates for the expansible van and fuel tanker, two of the more expensive truck models, as the scope-of-work evolved during 1998.

3. Inclusion of known negotiated contract information into the revised current estimate. This refers to the inclusion of the October 1998 contract award for the rebuy production contract, as well as using the information from this contract to form the basis for our revised current estimate for the entire program. Primary areas of increase were in direct material, overhead, G&A and other burden accounts.

4. Although significant effort by OSD, non-defense, and Congressional agencies and offices has been expended on behalf of the Army to obtain relief from Federal Retail Excise Tax (FRET) of 12% for vehicles used in the United States exceeding certain weights, this on-going effort has not yet been successful. Therefore, each increase in vehicle hardware cost carries with it a like increase for FRET.

5. Engineering Changes, which are a percentage of hardware, increase when the percentage is applied to a higher base. In addition, near-term ECP rates have been raised to 5% from 4%, based on actual experience, and have been reduced over the succession of multiyear contracts to a rate of 2% in the final (winner-take-all) procurement. The Transportation Center, Ft. Eustis, VA, has provided broad priorities for future changes to the FMTV: (1) improving soldier safety, (2) reducing logistics support, and (3) improving capabilities consistent with Force XXI goals.

Unit Cost APUC Changes --

Less than 1% of the FMTV Program Acquisition Cost is RDT&E and the change experienced in RDT&E was a reduction and does not contribute to the breach. The PAUC narrative applies to APUC changes.

h. Impact of Perf or Sched Changes --

Performance changes addressed in Sec. 10 reflect improvements in reliability and maintainability parameters.

i. Program Management & Control --

The Project Manager is continually in contact with the contractor and the field in order to maintain control of the FMTV program. Significant improvements in quality procedures at the contractor production facility and in the government inspection process have been made, and a larger field service representative staff at posts, camps, and stations address soldiers' concerns in a timely fashion.

The PM has been a pioneer in attacking the problem of corrosion on tactical vehicles, particularly those fielded in high humidity areas or shipped

FMTV, December 31, 1998

12i. Unit Cost Summary (Cont'd):

by sea. Working with Aberdeen Test Center, MD, a corrosion test facility has been created so that FMTV's current corrosion prevention package can be evaluated, as well as additional improvements identified. The PM's introduction of Carwell rust inhibitor, applied prior to shipment to Hawaii and Korea, as well during the field's semiannual maintenance, will further curtail corrosion.

The PM strongly recommended that DA call in the Army's Cost and Economic Analysis Center (CEAC) to perform the Cost-Benefit Analysis of the FMTV Second Source. This study was completed in October 1998. The revised current estimate complies with the FY99 Defense Authorization Act, Sec. 112 mandate that the total cost of the dual source program will be the same or lower than the sole source program.

Since approval was given and the Phase I (production qualification) contracts were awarded in October 1998, the PM has worked to treat each contractor fairly, without compromising proprietary aspects of the current contractor's operations. A Partnering Agreement with the two second source contractors is under development.

j. Cost Control Actions --

The PM has a list of Top Ten Cost Drivers, which address both the acquisition and operating and support phases of the program. These initiatives range from seeking additional procurement funds to increase FMTV production to more economic levels, through working to develop new uses and applications for FMTV. Initiatives implemented to date, either totally or in part, include:

(1) raising the objectives for many reliability and maintainability performance parameters (as shown in Sec. 10), based on previous testing values and current reports. This will reduce the number of spares which need to be stocked, and maintain or improve operational readiness.

(2) revising the service intervals for lubrication and filter replacement to a mileage basis instead of a time interval, in keeping with the lower operating tempos of peacetime.

(3) developing Integrated Electronic Technical Manuals (IETMs), which will introduce faster diagnostics, reduce vehicle down time, and maintain or improve operational readiness.

(4) Corrosion prevention changes implemented in the first production contract have also been applied in the rebuy contract and the second source contracts. Over 30 component design upgrades occurred, including full galvanized cab, cab bottom protection, stainless steel exhaust system, coated oil pan and transmission oil cooler, and brass radiator tanks. These changes will result in fewer spares, reduced time to service and maintain vehicles, and improve operational readiness.

Qualification of additional production sources for components in addition to those currently spelled out in the Technical Data Package is an ongoing

FMTV, December 31, 1998

12j. Unit Cost Summary (Cont'd):

process. Significant savings in both acquisition and operating and support costs will be realized based on the qualification of an alternate tire source in the rebuy contract.

The PM has made extensive use of modeling and simulation. This has served to preserve hardware from more destructive testing, and to save time in the testing process. Overall, due to acquisition streamlining of testing in general, the PAUC and APUC reflect a decrease in the cost of testing over the life of the program. However, testing associated with the identification and verification of the driveline fix was a new cost to the program. It would have been higher if modeling and simulation on the part of the government, the contractor, his vendors, and the scientific and academic communities had not been used effectively.

k. Contract Information (In Millions of Then-Year Dollars) -- None.

l. Contracts exceeding Contract Cost Baseline Thresholds -- None.

m. General Comments -- None.

13. Cost Variance Analysis:

a. Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	115.6	18805.7	-	18921.3
Previous Changes:				
Economic	-1.6	-2844.3	-	-2845.9
Quantity	-	+215.6	-	+215.6
Schedule	+1.5	-592.3	-	-590.8
Engineering	-	+6.0	-	+6.0
Estimating	-0.4	+156.1	-	+155.7
Other	-	-	-	-
Support	-	-119.7	-	-119.7
Subtotal	-0.5	-3178.6	-	-3179.1
Current Changes:				
Economic	-0.7	-445.5	-	-446.2
Quantity	-	+352.7	-	+352.7
Schedule	-	-78.8	-	-78.8
Engineering	-	+655.8	-	+655.8
Estimating	-1.6	+2586.4	-	+2584.8
Other	-	-	-	-
Support	-	-426.9	-	-426.9
Subtotal	-2.3	+2643.7	-	+2641.4
Total Changes	-2.8	-534.9	-	-537.7
Current Estimate	112.8	18270.8	-	18383.6

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13a. Cost Variance Analysis (Cont'd):

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	121.8	11472.4	-	11594.2
Previous Changes:				
Quantity	-	-221.4	-	+221.4
Schedule	+0.2	+42.6	-	+42.8
Engineering	-	+5.7	-	+5.7
Estimating	-0.4	+95.9	-	+95.5
Other	-	-	-	-
Support	-	-47.4	-	-47.4
Subtotal	-0.2	+318.2	-	+318.0
Current Changes:				
Quantity	-	-210.8	-	+210.8
Schedule	-	-	-	-
Engineering	-	+481.1	-	+481.1
Estimating	-1.1	+1977.3	-	+1976.2
Other	-	-	-	-
Support	-	-303.4	-	-303.4
Subtotal	-1.1	+2365.8	-	+2364.7
Total Changes	-1.3	+2684.0	-	+2682.7
Current Estimate	120.5	14156.4	-	14276.9

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices (Economic)	N/A	-0.7
Change in acquisition strategy (Estimating)	-1.1	-1.6
RDT&E Subtotal	-1.1	-2.3
(2) <u>Procurement</u>		
Revised escalation indices (Economic)	N/A	-445.5
Add 1,500 water tankers and delete 72 chassis (from 85488 to 86916) (Quantity)	+210.8	+352.7
Increase in water tanker estimate. (Estimating)	+107.4	+147.9
Change in annual procurement buy profile. (Schedule)	0.0	-78.8
Corrosion Prevention enhancements (Engineering)	+105.9	+144.5
Updated EPA-compliant engine (Engineering)	+283.9	+386.6
Anti-lock brakes (Engineering)	+91.3	+124.7
Other increases in vehicle material, overheads and burden. (Estimating)	+783.5	+1021.0
Federal Retail Excise Tax (FRET) computed on higher base. (Estimating)	+34.3	+47.7
Engineering Changes computed on a higher base. (Estimating)	+128.6	+154.3

13b. Cost Variance Analysis (Cont'd):

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Change in expansible van and fuel tanker estimates. (Estimating)	+53.4	+57.4
Change in trailer estimates based on contract award. (Estimating)	+142.7	+182.6
(Estimating)	+479.4	+663.4
(Support)	-479.4	-663.4
Testing, and government and contractor program support. (Estimating)	+225.7	+288.8
Adjustment for Current and Prior Inflation. (Estimating)	+11.2	+11.7
Change in Initial Spares due to change in requirement for spares. (Support)	-6.6	-10.9
Other Weapon Systems cost changes associated with field support. (Support)	+182.2	+247.0
Adjustment for Current and Prior Inflation. (Support)	+0.4	+0.4
Break in Production and Delivery Order Termination. (Estimating)	+11.1	+11.6
Procurement Subtotal	+2365.8	+2643.7

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

Changes									PAUC
PAUC									Prod Est
Init Est	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.07	--	+0.04	+0.04	--	+0.07	--	+0.01	+0.15	0.22

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

Changes									PAUC
PAUC									Cur Est
Prod Est	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.22	-0.04	+0.01	-0.01	+0.01	+0.03	--	-0.01	-0.01	0.21

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14b. Unit Cost and Other History (Cont'd):

b. Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.07	--	+0.04	+0.04	--	+0.07	--	+0.01	+0.15	0.22

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.22	-0.04	+0.01	-0.01	+0.01	+0.03	--	-0.01	-0.01	0.21

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	AUG 87	MAY 87	MAY 87
Milestone II	N/A	AUG 87	MAY 87	MAY 87
Milestone III	N/A	MAR 93	AUG 95	AUG 95
FUE/IOC	N/A	APR 93	DEC 95	JAN 96
Total Cost	0	8568.6	18921.3	18383.6
Total Quantity	0	119542	85488	86916
Prog Acq Unit Cost	0	0.07	0.22	0.21

In the Development Estimate, the unit of measure for the PAUC and PUC included truck and trailer quantities. The unit of measure was changed to truck-only quantities in the December 1993 SAR. This unit of measure continues to be used in the Production Estimate and Current Estimate cost columns.

15. Contract Information (Then-Year Dollars in Millions):

a. Procurement --

FMTV:

Stewart & Stevenson Serv., Houston TX

DAAE07-92-C-R001, FFP-EPA

Award: October 11, 1991

Definitized: October 11, 1991

Initial Contract Price

Target	Ceiling	Qty
\$1196.2	N/A	10843

Current Contract Price

Target	Ceiling	Qty
\$1398.0	N/A	10843

Estimated Price At Completion

Contractor	Program Manager
\$1398.0	\$1398.0

Explanation of Change:

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15. Contract Information (Cont'd):

None.

Cost and Schedule variance reporting is not required on this FFP-EPA contract.

<u>FMTV:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Stewart & Stevenson Serv, Houston TX			
DAAE07-98-C-M005, FFP	\$1016.8	N/A	5390
Award: October 14, 1998			
Definitized: October 14, 1998			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1016.8	N/A	5390	\$1016.8	\$1016.8

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

Contract DAAE07-98-C-M005 consists of 5,390 trucks and 1,040 trailers. To maintain consistency with the official unit of measure for FMTV - trucks only - the truck quantity is shown in this section.

16. Program Funding Summary (Current Estimate in Millions of Dollars):

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years (FY88-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-23)</u>	<u>Total</u>
RDT&E	90.7	2.0	2.0	18.1	112.8
Procurement	1848.5	425.9	510.2	15486.2	18270.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1939.2	427.9	512.2	15504.3	18383.6

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16b. Program Funding Summary (Cont'd):

b. Annual Summary -- FMTV

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				12.0	9.8
1989				31.8	27.0
1990				22.1	19.5
1991				10.7	9.8
1992				11.6	10.9
1993				0.7	0.7
1994				7.4	7.2
1995				4.3	4.3
1996				1.5	1.5
1997					
1998					
1999					
2000				1.9	2.0
2001				1.9	2.0
2002				1.8	2.0
2003				1.8	2.0
2004				1.8	2.0
2005				1.7	2.0
2006					
2007					
2008					
2009					
2010					
2011				2.0	2.6
2012				3.6	4.9
2013				1.9	2.6
Subtotal				120.5	112.8

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991	394	20.0	55.4	81.1	76.2
1992	1301	9.9	153.7	187.5	180.0
1993	2008	12.1	237.0	260.6	255.2
1994	183	2.6	24.8	33.5	33.3
1995	3351	11.9	343.5	364.4	369.0
1996	825	46.8	100.4	160.0	163.5
1997	1821	5.7	208.7	226.4	234.2
1998	1179	40.2	141.3	192.9	201.6
1999	1439	21.6	281.0	317.3	335.5
2000	2179	30.5	359.0	397.9	425.9

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16b. Program Funding Summary (Cont'd):

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001	2577	35.3	421.6	468.9	510.2
2002	3486	26.7	541.5	584.3	647.1
2003	3286	21.2	584.6	621.7	702.2
2004	3832	22.6	617.8	655.6	756.0
2005	3675	20.8	580.9	619.6	729.5
2006	3500	20.2	543.4	579.9	697.1
2007	3500	20.2	526.9	562.9	690.9
2008	3561	19.9	570.4	606.1	759.6
2009	3561	19.1	563.8	598.3	765.5
2010	3561	19.1	542.0	576.3	752.9
2011	3561	19.1	527.7	562.1	749.7
2012	3560	19.2	532.3	566.7	771.8
2013	3561	18.7	578.2	612.0	850.9
2014	3563	18.0	568.1	600.6	852.6
2015	3563	18.0	556.7	589.1	853.9
2016	3563	18.0	545.8	578.2	855.7
2017	3504	17.6	527.4	559.3	845.1
2018	2690	11.3	388.2	413.9	638.6
2019	2690	10.9	380.7	402.7	634.3
2020	2689	10.9	372.7	394.8	634.9
2021	2684	10.9	364.4	386.4	634.5
2022	2069	10.6	358.0	375.9	630.1
2023		4.4		19.5	33.3
Subtotal	86916	614.0	13097.9	14156.4	18270.8

FMTV quantities in FY99 through FY05 in Section 16 reflect the printed FYDP and match a premature lock of the database before funding reductions could be addressed. The correct quantities, which the funding estimates support, are as follows:

FY99 1441
FY00 2104
FY01 2488
FY02 3364
FY03 3184
FY04 3702
FY05 3596

FY22 was then adjusted in Section 16 so that the total program quantity would match the overall requirement of 86,916. The correct quantity for the dollars in FY22 is 2664.

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16b. Program Funding Summary (Cont'd):

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	86916	614.0	13097.9	14276.9	18383.6

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	10925	10925

Percent Total Program Quantities Delivered: 12.6%

b. Total Expenditures To Date (In Millions of Dollars): \$ 1480.5

Percent Total Program Expended: 8.1%

Delivery refers to the number of Army trucks accepted or conditionally accepted to date.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The average miles/vehicle/year for the LMTV truck is 2,796 miles and for the MTV truck, 2,635 miles. These revised operating tempos are associated with the FY99 Program Objective Memorandum (POM) profile. The average years of operation (useful life) is 20 years. The dedicated crew/vehicle/year for LMTV trucks is .1 annual manyears per vehicle; for MTV trucks is .25 annual manyears per vehicle. Trailers do not have dedicated crew.

The current Baseline Cost Estimate, June 1995, was used to develop the costs in Section 18b, with the exception of Unit Level Consumption, which was updated based on the most recent FMTV System Specification and its impact on replenishment consumables (repair parts). Petroleum, Oil and Lubricants (POL) costs, also part of Unit Level Consumption, have been revised to incorporate the reduced operating tempo identified above compared to the higher optempos in the December 1996 SAR. The standard unit of measure for this program - the quantity of trucks only - has been used in developing O&S costs reported below.

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per LMTV	Ave Annual Cost Per MTV
Mission Pay & Allowances	5.3	8.3
Unit Level Consumption	0.6	1.3
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.0	0.0
Contractor Support	0.0	0.0

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18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per LMTV	Ave Annual Cost Per MTV
Sustaining Support	0.3	0.3
Indirect Costs	2.4	3.5
Total	8.6	13.4

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-11 JSOW

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: JSOW

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Joint Standoff Weapons
Program (JSOW)

2. (U) DoD Component: Navy

Joint Participants:
Air Force

3. (U) Responsible Office and Telephone Number:

Conventional Strike Weapons, PMA 201 CAPT C.H. Johnston
Bldg 2272 Assigned: August 6, 1996
47123 Buse Road Unit #IPT DSN 757-7477; COM (301) 757-7477
Patuxent River, MD 20670-1547 johnstonb@navair.navy.mil

4. (U) Program Elements/Procurement Line Items:

RDT&E:

(U) PE 0604727F
(U) PE 0604727N

PROCUREMENT:

(U) APPN 1507 ICN 223000 (Navy)
(U) APPN 3020 ICN JSOW00 (Air Force)

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5. (U) References:

Baseline

SAR Baseline (Development Estimate):

(U) Acquisition Decision Memorandum (ADM) dated June 23, 1992, subject: Authorization for Milestone II.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated December 10, 1997.

Unitary

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline dated April 26, 1995.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated April 26, 1995.

6. (U) Mission and Description:

(U) The JSOW is an air-to-ground weapon designed to attack a variety of targets during day, night, and adverse weather conditions. JSOW enhances aircraft survivability by providing the capability for launch aircraft to standoff outside the range of most target area surface-to-air threat systems. The JSOW launch-and-leave capability allows several target kills per aircraft sortie.

The JSOW program developed a Baseline weapon for use against fixed area targets. The JSOW Baseline variant includes a kinematically efficient airframe and integrated Global Positioning System (GPS)/Inertial Navigation System (INS) navigation capability, and a BLU-97/B submunition payload. This weapon is designed to allow for pre-planned product improvements. The JSOW/BLU-108 variant incorporates the Sensor Fuzed Weapon submunition (BLU-108) into the baseline vehicle. The JSOW/BLU-108 variant provides a standoff delivery capability against massed armor and land combat vehicles. The Unitary warhead variant originally added a terminal seeker, a man-in-the-loop data link, and a unitary warhead to enable the attack of blast/frag sensitive and moving point targets. To become more affordable, the JSOW Unitary program implemented cost as an independent variable (CAIV) principles resulting in the deletion of the man-in-the-loop weapon data terminal while adding a low cost seeker with autonomous Targeting Acquisition embedded software. The JSOW Unitary weapon provides increased accuracy and lethality, and the capability for aimpoint selection and target discrimination. No key performance parameters have been changed.

Through adherence to international standards for weapons interfaces and minimized weight and dimension considerations, JSOW is compatible with Air Force and NATO aircraft. JSOW is a joint Navy/Air Force program.

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7. (U) Executive Summary:

(U) The original JSOW Acquisition Plan (AP), AP-88-21, was approved on July 1, 1988. The JSOW program was reviewed by the Defense Acquisition Board (DAB) on June 5, 1989 and was granted Milestone I approval to enter an 18 month Demonstration/Validation (DEM/VAL) phase for the JSOW Baseline program. The program name was changed from Advanced Interdiction Weapon System (AIWS) to Joint Standoff Weapon (JSOW).

JSOW (AGM-154A) OPEVAL report was completed during October 1997. COMOPTEVFOR found JSOW operationally effective, operationally suitable, and ready for fleet introduction.

JSOW Baseline (AGM-154A) has been deployed aboard the USS NIMITZ, USS EISENHOWER, and USS ENTERPRISE. The weapon is functioning as designed with no problems identified to date.

An Acquisition Program Baseline (APB) was signed on December 10, 1997 incorporating BLU-108 test schedule changes.

JSOW (AGM-154A) Low Rate Initial Production deliveries were completed in December 1998. Lot II production contract was awarded to Raytheon TI Systems on December 30, 1997. The contract procures 180 AGM-154A's for the Navy and Air Force. The contractor began delivering LRIP II AGM-154A weapons in December 1998, three months ahead of schedule.

On 30 October 1998, the Navy approved Full Rate Production of the JSOW Baseline (AGM-154A) variant and Low Rate Initial Production of the JSOW BLU-108 (AGM-154B). The FY 99 contract was awarded on 30 December 1998 for 403 AGM 154A weapons and 24 AGM-154B weapons (including testing articles). The contract includes three firm fixed price options.

A program rebaseline has been requested to reflect the JSOW Unitary (AGM-154C) variant program restructure.

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8. (U) Threshold Breaches:

Baseline

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

Unitary

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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9. (U) Schedule:

Baseline

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Milestone I	JUN 89	JUN 89	JUN 89
DEMVAL Contract Award	JUN 89	JUN 89	JUN 89
Early Operational Assessment (OT-I)			
Start	MAR 91	MAR 91	MAR 91
Complete (Report)	OCT 91	OCT 91	OCT 91
Milestone II	APR 92	APR 92	JUN 92
E&MD Contract Award	MAY 92	MAY 92	JUN 92
Preliminary Design Review	NOV 92	NOV 92	JAN 93
Critical Design Review	DEC 94	DEC 94	APR 95
IOT&E (OT-IIA)			
Start	DEC 95	DEC 95	FEB 96
Complete (Report)	JUL 96	JUL 96	DEC 96
TECHEVAL (DT-IIC)			
Start	NOV 95	NOV 95	FEB 96
Complete (Report)	JUL 96	JUL 96	DEC 96
Functional Configuration Audit	OCT 95	OCT 95	DEC 95
Production Verification Review	APR 96	APR 96	JAN 96
Production Readiness Review	JUN 96	JUN 96	OCT 96
LRIP Contract Option Exercised	OCT 96	OCT 96	FEB 97
LRIP First Delivery	MAY 98	MAY 98	MAY 98
OPEVAL (OT-IIB)			
Start	AUG 96	AUG 96	FEB 97
Complete (Report)	JUL 97	JUL 97	SEP 97
Organizational Level Support	APR 00	APR 00	JUN 00
Intermediate Level Support	JUL 00	JUL 00	SEP 00
Milestone III	JUL 98	JUL 98	OCT 98
(S) IOC	(b)(1)		
BLU-108 SYSTEM			
Pre-EMD Contract Award	N/A	MAY 93	MAY 93
Preliminary Fit Checks	N/A	JUN 93	JUN 93
Eng Dev Test Vehicle Delivery	N/A	FEB 94	FEB 94
F-16 Flight Tests	N/A	MAR 94	MAR 94
F-15E Flight Tests	N/A	MAY 94	MAY 94
Systems Design Review	N/A	JUN 94	JUN 94
Milestone II	N/A	APR 95	APR 95
E&MD Contract Mod	N/A	JUN 95	JUN 95
Preliminary Design Review	N/A	OCT 95	OCT 95
Critical Design Review	N/A	OCT 96	APR 97
DT&E			
Start	N/A	DEC 95	FEB 96
Complete (Report)	N/A	JUN 98	SEP 98
Operational Assessment			
Start	N/A	DEC 95	APR 96
Complete (Report)	N/A	SEP 96	FEB 97

(Ch-1)

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9a. (U) Schedule (Cont'd):

Baseline

	Development Estimate (\$AR)	Approved Program (APB)	Current Estimate
LRIP Contract Option Exercised	N/A	JAN 00	DEC 98
LRIP First Delivery	N/A	JUL 01	JAN 00 (Ch-2)
Milestone III	N/A	OCT 01	NOV 00 (Ch-3)
(S) Initial Operational Capability	(b)(1)		
Organizational Level Support	N/A	TBD	TBD
Intermediate Level Support	N/A	TBD	TBD
Depot Level Support	N/A	TBD	TBD
IOT&E			
Start	N/A	JUL 00	APR 00 (Ch-4)
Complete (report)	N/A	MAR 01	SEP 00

b. Current Change Explanations --

- (U) (Ch-1) Change from Dec 98 to Jan 99 to reflect actual achievement of IOC.
- (Ch-2) Change from Jul 00 to Jan 00 to reflect actual BLU-108 negotiated contract schedule.
- (Ch-3) Change from Oct 00 to Nov 00 to reflect the revised LRIP negotiated contract delivery schedule for LRIP quantities.
- (Ch-4) Change from Mar 00 to Apr 00 to reflect a more realistic test planning schedule.

Unitary

a. Milestones --

	Development Estimate (\$AR)	Approved Program (APB)	Current Estimate
Milestone II	APR 95	APR 95	APR 95
E&MD Contract Award	JUL 95	JUL 95	AUG 95
Critical Process Review #1	FEB 96	FEB 96	JUN 96
Critical Process Review #2	DEC 98	DEC 98	MAR 99
Critical Process Review #3	AUG 00	AUG 00	AUG 00
System Flight Test			
Start	JAN 01	JAN 01	JAN 99
Complete (Report)	SEP 01	SEP 01	AUG 00
LRIP Contract Option Exercised	OCT 00	OCT 00	OCT 00
LRIP First Delivery	APR 02	APR 02	JAN 02
OPEVAL (OT-IIB)			
Start	NOV 01	NOV 01	NOV 00
Complete (Report)	MAY 02	MAY 02	MAY 01
Milestone III	SEP 02	SEP 02	JUL 00
(S) Initial Operational Capability	(b)(1)		
Organization Level Support	TBD	TBD	TBD
Intermediate Level Support	TBD	TBD	TBD
Depot Level Support	TBD	TBD	TBD

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9b. (U) Schedule (Cont'd):

Unitary

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

Baseline

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(S) Carriage Envelope	(b)(1)			
(S) Airspeed				
(S) Altitude (k-ft) MSL				
(S) Operational				
(S) Suitability				
(S) Weapon Availability				
(S) (Ao)				
(S) Tactics and Targeting				
(S) Launch Envelope				
(S) Airspeed (IMN)				
(S) Airspeed (IMN/KCAS)				
(S) Altitude (ft)				
(S) Pitch Angle				
(S) Off Axis Launch				
(S) Angle				
(S) Roll Angle (deg)				
(S) Survivability				
(S) Accuracy (CEP)				
(S) Weapon (ft)				

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10a. (U) Performance Characteristics (Cont'd):

Baseline

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(S) Weapon (Air Vehicle) (ft)	(b)(1)			
(S) Weapon System, F/A-18				
(S) Reliability				
(S) Mean Ftl Hrs Between Failure (MFHBF)				
(S) System Mission				
(S) System in Service Time (mo)				
Built-In-Test (BIT)				
Failure Detection Rate				
Fault Isolation Rate				
False Alarm Rate				
Maintainability				
(S) Combat Load Time (min for two wpns)				
Aircraft Compatibility				
Size (in.)				
Weight (lbs)				
Range				
(S) Low				
(S) High				
Range (nm from launch at specified conditions)				
Low Altitude (NM)	N/A	>or=15 / (200 ft / MSL, .8/	>or=12 / (500 ft MSL, .8	>or=12 / (500 ft MSL, .8
(S) High MSL,	(b)(1)	(b)(1)		

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10a. (U) Performance Characteristics (Cont'd):
Baseline

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Weapon System	(b)(1)			
Effectiveness				
Targets				
(C) MIG-21 Aircraft on				
the ground				
(PTO-4)				
(C) SA-8 Missile				
System (F-Kill)				
(C) ZIL-157 Truck				
(CAT. A, M-Kill)				
BLU-108 System				
(C) Weapon Effective-				
ness (Kill per				
Weapon) Non-				
Countermeasures				
Environment				
Reliability				
(C) System Mission				

(Ch-1)

b. Current Change Explanations --

(U) (Ch-1) Change from TBD to .875 to reflect achievement of demonstrated performance characteristic.

Unitary

a. Performance --

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Launch Envelope	(b)(1)			
(C) Airspeed (IMN/KCAS)				
(C) Off Axis Launch Angle				
(deg)				
Survivability				
Accuracy (CEP)				
Weapon (ft)				
Weapon (Air Vehicle)				
(ft)				
Range (nm from				
launch at specified				
conditions)				

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10a. (U) Performance Characteristics (Cont'd):

Unitary

	Development Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
Low Altitude (NM)	(b)(1)			
High MSL, Reliability System Mission	(b)(1)			

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

Baseline

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	328.3	506.1	565.3
Procurement	1535.7	2963.3	2956.1
Recurring	(1320.2)		(2651.0)
Nonrecurring	(79.6)		(270.0)
Total Flyaway	(1399.8)		(2921.0)
Fleet Support	(92.4)		(34.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(43.5)		(0.9)
Construction (MILCON)	21.8	21.8	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 90 Base-Year \$	1885.8	3491.2	3521.4
Escalation	1083.4	2056.1	1292.9
Development (RDT&E)	(44.5)	(83.1)	(79.7)
Procurement	(1032.1)	(1966.2)	(1213.2)
Construction (MILCON)	(6.8)	(6.8)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2969.2	5547.3	4814.3
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	8800	16000	16124
Total	8800	16000	16124

Note: Excludes 69 RDT&E prototypes from the SAR Baseline and 69 from the Current Estimate that are not considered fully configured.

(U) Note: 16,124 procurement units includes 8800 Navy Baselines (\$1893.5M), 1200 Navy BLU-108's (\$450.4M), 3,000 Air Force Baselines (\$619.2M), and 3,124 Air

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11b. (U) Total Program Cost and Quantity (Cont'd):

Baseline

Force BLU-108's (\$1206.2M).

Note: The Program Manager plans to procure less than 250 BLU-108s during LRIP. This does not represent 10% or more of the planned buy quantities.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

Unitary

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	257.2	257.2	211.4
Procurement	3103.7	3103.7	1394.4
Recurring Flyaway	(2825.2)		(1277.9)
Nonrecurring Flyaway	(102.1)		(99.7)
Total Flyaway	(2927.3)		(1377.6)
Fleet Support	(35.5)		(2.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(140.9)		(14.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 90 Base-Year \$	3360.9	3360.9	1605.8
Escalation	2946.3	2946.3	865.2
Development (RDT&E)	(79.1)	(79.1)	(43.1)
Procurement	(2867.2)	(2867.2)	(822.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	6307.2	6307.2	2471.0
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>7800</u>	<u>7800</u>	<u>7800</u>
Total	7800	7800	7800

Note: Excludes 50 RDT&E prototypes from the SAR Baseline and 50 from the Current Estimate that are not considered fully configured.

(U) Note: Unitary procurement quantities are being updated in new program baseline.

Note: LRIP quantities approved at Milestone II are 140 for Unitary. This does not represent 10% or more of the planned buy quantities.

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11c. (U) Total Program Cost and Quantity (Cont'd):
Unitary

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

Baseline

	UCR Baseline (JAN 97 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 90 BY\$)	3491.2	3521.4	
(2) Quantity	16000	16124	
(3) Unit Cost	0.218	0.218	0.00
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 90 BY\$)	2963.3	2956.1	
(2) Quantity	16000	16124	
(3) Unit Cost	0.185	0.183	-1.08

Unitary

	UCR Baseline (APR 95 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 90 BY\$)	3360.9	1605.8	
(2) Quantity	7800	7800	
(3) Unit Cost	0.431	0.206	-52.20
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 90 BY\$)	3103.7	1394.4	
(2) Quantity	7800	7800	
(3) Unit Cost	0.398	0.179	-55.03

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13. (U) Cost Variance Analysis:

Baseline

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	372.8	2567.8	28.6	2969.2
Previous Changes:				
Economic	-6.3	-483.7	-	-490.0
Quantity	-	+1565.2	-	+1565.2
Schedule	-	-97.5	+0.4	-97.1
Engineering	-	-	-	-
Estimating	+277.4	+826.2	-29.0	+1074.6
Other	-	-	-	-
Support	-	-179.2	-	-179.2
Subtotal	+271.1	+1631.0	-28.6	+1873.5
Current Changes:				
Economic	+18.2	-50.8	-	-32.6
Quantity	-	+22.7	-	+22.7
Schedule	-	+72.9	-	+72.9
Engineering	-	-	-	-
Estimating	-17.1	-85.0	-	-102.1
Other	-	-	-	-
Support	-	+10.7	-	+10.7
Subtotal	+1.1	-29.5	-	-28.4
Total Changes	+272.2	+1601.5	-28.6	+1845.1
Current Estimate	645.0	4169.3	-	4814.3

(U) Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	328.3	1535.7	21.8	1885.8
Previous Changes:				
Quantity	-	+964.1	-	+964.1
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+235.2	+589.3	-21.8	+802.7
Other	-	-	-	-
Support	-	-105.3	-	-105.3
Subtotal	+235.2	+1448.1	-21.8	+1661.5
Current Changes:				
Quantity	-	+13.2	-	+13.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-9.5	-45.4	-	-54.9
Other	-	-	-	-
Support	-	+4.5	-	+4.5
Subtotal	-9.5	-27.7	-	-37.2
Total Changes	+225.7	+1420.4	-21.8	+1624.3
Current Estimate	554.0	2956.1	-	3510.1

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13b. (U) Cost Variance Analysis (Cont'd):
Baseline

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	+20.1
Economic adjustment for negative program change. (Economic)	N/A	-1.9
Adjustment for Current and Prior Inflation. (Estimating)	-10.1	-20.4
Refinement of estimate to incorporate contract actuals. (Estimating)	+0.6	+3.3
RDT&E Subtotal	-9.5	+1.1
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-70.9
Economic adjustment for negative program change. (Economic)	N/A	+20.1
Air Force Quantity increase of 124 units from 3000 to 3124. (Quantity)	+13.2	+22.7
Allocation to Schedule variance resulting from Air Force Quantity Change. (Schedule)	0.0	-0.9
Allocation to Estimating variance resulting from Air Force Quantity Change. (Estimating)	+3.9	+7.6
Stretchout of annual procurement buy profile. (Schedule)	0.0	+73.8
Adjustment for Current and Prior Inflation. (Estimating)	+3.8	+4.7
Refinement of estimate for contract actuals. (Estimating)	-53.1	-97.3
Reduction in Initial Spares requirement due to incorporation of warranty package into contract. (Support)	-0.9	-1.3
Change in Fleet Support requirement to include Common Munitions Bit Reprogrammable Equipment (CMBRE) / Dummy Air Training Missiles (DATMs). (Support)	+5.4	+12.0
Procurement Subtotal	-27.7	-29.5

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13. (U) Cost Variance Analysis (Cont'd):

Unitary

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	336.3	5970.9	-	6307.2
Previous Changes:				
Economic	-21.2	-714.0	-	-735.2
Quantity	-	-	-	-
Schedule	-	-374.2	-	-374.2
Engineering	-	-	-	-
Estimating	+25.2	-759.1	-	-733.9
Other	-	-	-	-
Support	-	-150.5	-	-150.5
Subtotal	+4.0	-1997.8	-	-1993.8
Current Changes:				
Economic	+2.7	+358.0	-	+360.7
Quantity	-	-	-	-
Schedule	-	+275.1	-	+275.1
Engineering	-	-	-	-
Estimating	-88.5	-2251.5	-	-2340.0
Other	-	-	-	-
Support	-	-138.2	-	-138.2
Subtotal	-85.8	-1756.6	-	-1842.4
Total Changes	-81.8	-3754.4	-	-3836.2
Current Estimate	254.5	2216.5	-	2471.0

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13a. (U) Cost Variance Analysis (Cont'd):

Unitary

(U) Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	257.2	3103.7	-	3360.9
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+20.3	-409.8	-	-389.5
Other	-	-	-	-
Support	-	-73.8	-	-73.8
Subtotal	+20.3	-483.6	-	-463.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-66.1	-1139.9	-	-1206.0
Other	-	-	-	-
Support	-	-85.8	-	-85.8
Subtotal	-66.1	-1225.7	-	-1291.8
Total Changes	-45.8	-1709.3	-	-1755.1
Current Estimate	211.4	1394.4	-	1605.8

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) RDT&E

Revised escalation indices. (Economic)	N/A	-4.1
Economic adjustment for negative program change. (Economic)	N/A	+6.8
Adjustment for Current and Prior Inflation. (Estimating)	+1.7	+2.0
Refinement of estimate to reflect contract actuals. (Estimating)	-67.8	-90.5
RDT&E Subtotal	-66.1	-85.8

(2) Procurement

Revised escalation indices. (Economic)	N/A	-100.6
Economic adjustment for negative program change. (Economic)	N/A	+458.6
Stretchout of annual procurement buy profile. (Schedule)	0.0	+275.1
Refinement of estimate to incorporate CAIV affordability initiatives (AR) (Estimating)	-1139.9	-2251.5
Reduction in fleet support requirement due to commonality with Baseline variant. (Support)	-23.6	-34.1

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13b. (U) Cost Variance Analysis (Cont'd):
Unitary

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year
-62.2 -104.1

Reduction in initial spares requirement due
to the incorporation of a warranty package
into the contract. (Support)

Procurement Subtotal -1225.7 -1756.6

AR Acquisition Reform related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):
Baseline

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.34	-0.03	-0.06	--	--	+0.06	--	-0.01	-0.04	0.30

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.29	-0.03	-0.04	--	--	+0.05	--	-0.01	-0.03	0.26

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	JUN 89	JUN 89	N/A	JUN 89
Milestone II	MAR 91	APR 92	N/A	JUN 92
Milestone III	JUN 94	JUL 98	N/A	OCT 98
FUE/IOC	(b)(1)	(b)(1)	N/A	(b)(1)
Total Cost	260	2969.2	0	4814.3
Total Quantity	0	8800	0	16124
Prog Acq Unit Cost	0	0.34	0	0.3

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JSOW, December 31, 1998

14a. (U) Unit Cost and Other History (Cont'd):

Unitary

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.81	-0.05	--	-0.01	--	-0.39	--	-0.04	-0.49	0.32

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.77	-0.05	--	-0.01	--	-0.39	--	-0.04	-0.49	0.28

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	APR 95	N/A	APR 95
Milestone III	N/A	SEP 02	N/A	SEP 02
FUE/IOC	N/A	(b)(1)	N/A	(b)(1)
Total Cost	0	6307.2	0	2471
Total Quantity	0	7800	0	7800
Prog Acq Unit Cost	0	0.81	0	0.32

15. (U) Contract Information (Then-Year Dollars in Millions):

a. RDT&E --

(U) JSOW Baseline/BLU108 EMD:

Raytheon TI Systems, Dallas, TX

N00019-91-C-0196, CPIF

Award: June 26, 1992

Definitized: June 26, 1992

Initial Contract Price

Target	Ceiling	Qty
\$202.5	N/A	0

Current Contract Price

Target	Ceiling	Qty
\$322.7	N/A	0

Estimated Price At Completion

Contractor	Program Manager
\$340.6	\$342.0

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JSOW, December 31, 1998

15a. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-20.0	\$-0.9
Cumulative Variances To Date (12/23/98)	<u>\$-19.4</u>	<u>\$-0.3</u>
Net Change	\$0.6	\$0.6

Explanation of Change:

(U) Cost Variance: The favorable cost variance change is primarily due to resolution of scope increase and crediting performance for work previously charged.

Schedule Variance: The unfavorable schedule variance has improved due to the October 1995 implementation of the Over Target Baseline that zeroed cumulative to date schedule variances and replanned future activities.

There is no impact to the contract or JSOW program for these variances.

(U) <u>JSOW UNITARY E&MD:</u> Raytheon TI Systems, Dallas, TX N00019-95-C-0120, CPIF/AF Award: August 30, 1995 Definitized: August 30, 1995	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$211.5	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$223.3	N/A	0	\$212.8	\$223.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.6	\$-2.4
Cumulative Variances To Date (12/31/98)	<u>\$2.0</u>	<u>\$-0.7</u>
Net Change	\$1.4	\$1.7

Explanation of Change:

(U) Cost Variance: The cost variance continues to be positive and is driven by favorable engineering overhead, subcontractor material overhead and G&A rates.

Schedule Variance: This unfavorable schedule variance is due to engineering labor delays related to availability of less labor resources than projected.

There is no impact to the contract or JSOW program for these variances.

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JSOW, December 31, 1998

15b. (U) Contract Information (Cont'd):

b. Procurement --
(U) JSOW LRIP II:
Raytheon TI Systems, Dallas, TX
N00019-98-C-0008, FPIF
Award: December 31, 1997
Definitized: December 31, 1997

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$86.0	\$86.0	180

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$86.0	\$86.0	180

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$78.0	\$77.0

Previous Cumulative Variances
Cumulative Variances To Date (12/30/98)
Net Change

<u>Cost Variance</u>	<u>Schedule Variance</u>
\$0.0	\$0.0
\$1.5	\$-0.1
\$1.5	\$-0.1

Explanation of Change:

None.

(U) JSOW FRP:
Raytheon Systems Company, Lewisville TX
N00019-99-C-1014, FFP
Award: December 30, 1998
Definitized: December 30, 1998

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$133.9	N/A	427

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$133.9	N/A	427

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$133.9	\$133.9

Explanation of Change:

(U) Contract is for Baseline and BLU-108 Full Rate Production quantities.
Navy Baseline quantity:328, Navy BLU-108 quantity:3
Air Force Baseline quantity:75, Air Force BLU-108 quantity:21.

Cost and Schedule variance reporting is not required on this FFP contract.

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16. (U) Program Funding Summary (Current Estimate in Millions of Dollars):

Total Program

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years (FY87-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-19)</u>	<u>Total</u>
RDT&E	830.3	40.9	22.6	5.7	899.5
Procurement	341.9	224.7	250.6	5568.6	6385.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1172.2	265.6	273.2	5574.3	7285.3

Baseline

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years (FY87-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-13)</u>	<u>Total</u>
RDT&E	627.7	11.1	3.5	2.7	645.0
Procurement	341.9	224.7	248.5	3354.2	4169.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	969.6	235.8	252.0	3356.9	4814.3

(U) Funding does not include Seck Eagle or BRU-57 funds which are include in the P-1 documentation.

Unitary

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years (FY92-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-19)</u>	<u>Total</u>
RDT&E	202.6	29.8	19.1	3.0	254.5
Procurement	-	-	2.1	2214.4	2216.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	202.6	29.8	21.2	2217.4	2471.0

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JSOW, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):

b. Annual Summary -- Baseline

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				1.1	1.0
1988				20.3	19.2
1989				13.2	13.0
1990				8.3	8.5
1991				15.6	16.5
1992				42.0	45.8
1993				52.6	58.7
1994				71.1	80.9
1995				90.0	104.3
1996				39.8	46.9
1997				29.5	35.2
1998				6.8	8.2
1999				6.4	7.8
2000				0.6	0.8
2001				1.6	2.0
2002				2.1	2.7
Subtotal				401.0	451.5

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				4.8	5.4
1994				20.3	23.1
1995				45.8	53.1
1996				35.4	41.8
1997				18.4	22.0
1998				17.9	21.5
1999				12.2	14.8
2000				8.3	10.3
2001				1.2	1.5
Subtotal				164.3	193.5

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16b. (U) Program Funding Summary (Cont'd):

Baseline

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996		20.3		21.1	25.2
1997	100	11.0	40.8	54.2	65.4
1998	135	12.0	46.0	63.0	76.9
1999	328	26.1	65.1	94.1	116.5
2000	615	12.4	108.1	123.2	154.9
2001	636	10.2	125.9	139.0	177.8
2002	733	11.7	137.8	152.8	199.0
2003	745	11.2	133.5	145.1	192.8
2004	725	7.9	110.8	119.1	161.6
2005	514	5.7	70.1	76.1	105.4
2006	716	9.9	99.3	109.5	154.9
2007	766	10.1	96.1	106.6	153.8
2008	675	7.5	72.1	79.8	117.6
2009	675	7.7	71.4	78.8	119.4
2010	675	7.4	76.1	80.4	126.6
2011	675	7.7	76.7	82.7	133.2
2012	675	7.2	76.4	79.4	135.0
2013	552	6.8	69.1	73.9	126.6
Subtotal	10000	192.8	1475.3	1678.8	2342.6

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	45	2.4	13.8	16.6	20.2
1999	96	4.3	23.3	30.5	37.7
2000	193	6.6	44.4	55.5	69.8
2001	180	5.5	41.1	55.3	70.7
2002	170	4.2	36.8	50.6	65.9
2003	222	7.5	47.9	56.1	74.6
2004	473	5.8	87.8	94.7	128.5
2005	561	7.4	116.9	125.8	174.3
2006	663	6.2	121.8	127.9	180.9
2007	642	5.5	116.7	122.1	176.3
2008	921	7.1	183.2	190.3	280.5
2009	964	6.6	190.5	195.2	296.7
2010	382	3.1	74.5	76.6	119.2
2011	306	2.3	38.6	41.5	65.0
2012	306	2.7	38.4	38.6	66.4
Subtotal	6124	77.2	1175.7	1277.3	1826.7

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16b. (U) Program Funding Summary (Cont'd):

Baseline

(U) Funding does not include Seek Eagle or BRU-57 funds which are include in the P-1 documentation.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	10000	192.8	1475.3	2079.8	2794.1
USAF	6124	77.2	1175.7	1441.6	2020.2
Grand Total	16124	270.0	2651.0	3521.4	4814.3

b. Annual Summary -- Unitary

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				1.7	1.9
1993				4.1	4.6
1994				2.1	2.4
1995				8.9	10.3
1996				26.2	30.9
1997				39.4	47.0
1998				54.8	65.9
1999				32.5	39.6
2000				24.1	29.8
2001				15.2	19.1
2002				2.4	3.0
Subtotal				211.4	254.5

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001		1.6		1.6	2.1
2002	15	7.4	7.5	15.3	19.9
2003	30	0.7	12.6	13.4	17.8
2004	60	0.7	17.2	18.1	24.6
2005	70	0.5	18.8	19.6	27.1
2006	400	9.9	82.8	93.9	132.8
2007	600	9.4	111.4	122.3	176.6
2008	600	6.1	104.6	112.0	165.1
2009	600	6.4	100.2	107.9	162.4
2010	600	6.1	97.1	104.5	160.6

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16b. (U) Program Funding Summary (Cont'd):

Unitary

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2011	600	6.0	94.7	102.0	160.0
2012	600	5.9	92.8	99.9	160.1
2013	600	6.0	91.1	98.3	160.8
2014	600	6.3	90.7	98.1	163.9
2015	600	6.3	89.4	96.8	165.1
2016	600	6.2	88.3	95.6	166.5
2017	600	6.2	87.3	94.6	168.1
2018	600	6.1	86.4	93.6	169.9
2019	25	1.9	5.0	6.9	13.1
Subtotal	7800	99.7	1277.9	1394.4	2216.5

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	7800	99.7	1277.9	1605.8	2471.0

17. (U) Delivery/Expenditure Information:

Baseline

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	100	104

(U) Percent Total Program Quantities Delivered: 0.6%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 620.9

(U) Percent Total Program Expended: 12.9%

Unitary

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 148.3

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17b. (U) Delivery/Expenditure Information (Cont'd):

Unitary

(U) Percent Total Program Expended: 6.0%

18. (U) Operating and Support Costs:

Baseline

a. (U) Assumptions and Ground Rules --

SOURCE: Operations and Support requirements analysis dated December 1996.

ASSUMPTIONS:

There is no antecedent system.

No additional operational/maintenance personnel at O-Level.

No I-Level Maintenance.

60 JSOW expenditures per year.

Deployed aboard 10 CVBG each year - 100 JSOW per CV.

20 year missile life.

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per JSOW Unit	Avg Annual Cost Per ANTECEDENT
Mission Pay & Allowances	0.0	0.0
Unit Level Consumption	0.3	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.0	0.0
Contractor Support	0.0	0.0
Sustaining Support	0.2	0.0
Indirect Costs	0.0	0.0
Total	0.5	0.0

Unitary

a. (U) Assumptions and Ground Rules --

SOURCE: Operations and Support requirements analysis dated April 1995.

ASSUMPTIONS:

There is no antecedent system.

Unitary will be integrated with the established Baseline program.

10 Unitary expenditures per year.

Deployed aboard 10 CVBG each year, 50 JSOW Unitary per CV.

Twenty year missile operating life.

No additional operational/maintenance personnel at O-Level.

No I-Level Maintenance

Contractor Depot Component Repair Program.

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18b. (U) Operating and Support Costs (Cont'd):
Unitary

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per JSOW Unitary	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.0	0.0
Unit Level Consumption	0.3	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.1	0.0
Contractor Support	0.0	0.0
Sustaining Support	0.5	0.0
Indirect Costs	0.0	0.0
Total	0.9	0.0

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N-14 MHC 51

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)

PROGRAM: MHC 51

AS OF DATE: December 31, 1998

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1. Designation and Nomenclature (Popular Name): MHC 51 (OSPREY Class) Coastal Minehunter Ship
2. DoD Component: Navy
3. Responsible Office and Telephone Number:
MINE WARFARE SHIP PROG OFF (PMS303) JOHN P. GALLOWAY
PROGRAM EXEC OFFICE MINE WARFARE Assigned: February 12, 1996
2531 JEFFERSON DAVIS HWY DSN 332-6481, 6482; COMM 703-602-6481, 6482
ARLINGTON, VA 22242-5167

4. Program Elements/Procurement Line Items:
RDT&E:
PE 0604567N (Shared)
PROCUREMENT:
APPN 1611 ICN 32401500 (Navy)

5. References:

SAR Baseline (Production Estimate):

NAE approved Acquisition Program Baseline dated March 11, 1992.

Approved Program:

NAE Approved Acquisition Program Baseline (APB) dated October 20, 1995.

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FOR OPEN PUBLICATION

MAR 10 1999 9

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

No Security Objection
to Open Publication
(SAR Baseline)
99-C-0728
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Office of the Chief of
Naval Operations
Dept. of the Navy

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99-C-0720

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MHC 51, December 31, 1998

6. Mission and Description:

The MHC 51 Coastal Minehunter Ship class provides the U.S. Navy with state of the art surface minehunting and mine neutralization mission capability which will be employed well into the 21st century. The 57.2 meter (188 foot) long Glass Reinforced Plastic (GRP) ship integrates exceptionally low noise design and utilizes very low magnetic signature equipment, diesel engines, and cycloidal propulsion. Major payload equipments include the AN/SYQ-13 Navigation, Command, and Control System, AN/SQQ-32 Advanced Minehunting Sonar, and a AN/SIQ-48 Mine Neutralization System. The MHC class serves as the "low-mix" complement to the larger and deeper water capable Mine Countermeasures (MCM 1) AVENGER Class ships. MHC ships will enable battle group and amphibious operations in harbors, coastal waters, and littoral areas worldwide by clearing acoustic, magnetic, pressure and contact mines from the bottom and surrounding water volume. The MHC can operate in coordinated mission scenarios with Airborne Mine Countermeasures (AMCM) helicopters and MCM ships.

7. Executive Summary:

NOTE: This is the final SAR report submit for the MHC shipbuilding program. As of 01/11/99, all programmed ships have been delivered.

Significant Historical Developments: During May 1982, an Operational Requirement (OR) was issued for a "low mix" (smaller mission/shallower water) littoral minehunting ship to complement the larger ocean going MCM ship. This requirement led to the Minesweeper Hunter (MSH-1) class design which employed Swedish based "foam core" ship construction technology. Structural design concerns surfaced early, however, when preliminary shock and strength testing on sectional test panels indicated major weight and shock problems would materialize and that costly redesign would be necessitated. Consequently, contract effort was terminated in 1986. The Coastal Minehunter (MHC) ship program was begun shortly thereafter to replace the MSH. The MHC is based on the Italian built LERICI Class minesweepers designed and constructed by Intermarine S.p.A. (IMSpA). IMSpA was contracted to modify the LERICI design to meet U.S. Navy mission requirements. Milestone I (Authorization for Contract Design) was approved in June 1986. An MHC Program Endorsement Memo (PEM) for Milestone II (lead production authorization) was issued by the Ass't Secretary of the Navy, Shipbuilding and Logistics (ASN/S&L) 12/11/86. The PEM authorized sole source award of the class leadship contract, MHC 51, to Savannah, GA based Intermarine USA (IMUSA) - corporate subsidiary of IMSpA. The PEM further directed that a second source shipbuilder be competitively selected. The MHC 51 contract was awarded to IMUSA 05/22/87 and construction began in May 1988. Milestone IIIA (authorization for limited production) was approved by ASN(S&L) during February 1989. The "second source" builder, Avondale Industries, Inc. of New Orleans, LA, was awarded a contract for construction of their first vessel, MHC 53, on 10/03/89. Milestone IIIB (full rate production) approval was authorized in January 1990. The MHC program force level authorization is 12 ships.

Significant Developments Since Last SAR Report:

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MHC 51, December 31, 1998

7. Executive Summary (Cont'd):

Program Deliveries: MHC 61, the 11th of the program's 12 MHC ships, was delivered 04/14/98. The program's last ship, MHC 62, was delivered 01/11/99.

Technical Issues/Status: The previous (December 1997) SAR described shock qualification issues and relative impact on the MHC Class ships' capability to meet mission requirements. Concern centered on two of the ship's propulsion train components, namely, the Sound Attenuating Couplings (SAC) and Misalignment Couplings (MAC). Shock qualified SAC and MAC redesigns were analytically developed and approved last year. Procurement was initiated shortly thereafter. Parallel effort was also underway during this time to redesign a shock hardened upgrade of certain internal bearings within an adjacent propulsion train component called the Integrated Fluid Variator and Gearbox (IFVG). This effort recognized that the heavier redesigned SAC would impose increased loads on these IFVG bearings. A shock qualified redesign was approved and by early 1998 production was begun. By September 1998, all upgraded shock qualified propulsion train components for the entire MHC class had been received. On 09/03/98, USS PELICAN (MHC 53) was the first ship to complete a series of at sea tests which successfully demonstrated the performance of all redesigned components integrally installed on one ship. At the time this SAR report is being forwarded, installation of shock qualified components for remaining ships of the class is progressing satisfactorily.

General Program Status: With the last MHC ship delivered during January 1999, lead builder, Intermarine USA, is now primarily engaged in commercial work, most of which involves large Glass Reinforced Plastic (GRP) yacht construction and ship repair. During February 1999, the Navy was in final negotiations with IMUSA to award a "Restricted Availability" contract for performance of general maintenance and upgrade work on MHC 59. With respect to final corporate profitability, the Navy program manager estimates that IMUSA will earn a net profit of about \$45M (6%) against the total contract value of all 8 MHC ships under contract--this despite major losses on the first two MHC ship contracts. Profitability was significantly enhanced by the company earning the full \$15M early delivery incentive allocation provided for the last 5 ships under contract (\$3M max incentive per ship). IMUSA continues to compete for commercial and government work and is a recognized and quality east coast ship repair facility. During January 1999, an agreement in principle to sell Intermarine USA was reached between IMUSA's Italian corporate parent, IMSpA, and the Ebbes Group-World MCI. The other MHC shipbuilder, Avondale Industries of New Orleans, completed its 4 ship MHC program delivering their final MHC in January 97. Avondale was recently acquired by Virginia based Newport News Shipbuilding.

MHCs delivered to the fleet have demonstrated their mission capability and have successfully participated in several NATO and other joint force exercises during the past 2 years.

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8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I	JUN 86	JUN 86	JUN 86
Milestone II	DEC 86	DEC 86	DEC 86
MHC 51 (Leadship) Award	MAY 87	MAY 87	MAY 87
Milestone IIIA	FEB 89	FEB 89	FEB 89
MHC53, 1st ship to 2nd yard	OCT 89	OCT 89	OCT 89
Milestone IIIB	JAN 90	JAN 90	JAN 90
Launch MHC 51 Leadship	MAR 91	MAR 91	MAR 91
MHC 51 Acceptance Trial	NOV 92	JUL 93	JUL 93
MHC 51 Delivery	DEC 92	AUG 93	AUG 93
MHC 53 Delivery	MAR 94	MAR 95	AUG 95

Milestone I: ASN(S&L) contract design authorization.

Milestone II: ASN(S&L) Program Endorsement Memo authorizing lead ship production.

Milestone IIIA: ASN(S&L) authorization for award of FY 89 ships.

Milestone IIIB: ASN(S&L) authorization for award of FY 90 ships and out.

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9b. Schedule (Cont'd):

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Operating Crew (Auth)	51	51 / 57	51	51
Beam (meters)	11.0	11.0 / 11.0	11.0	11.0
Draft (Nav) (meters)	2.8	3.68 / 3.86	3.69	3.69
Length (meters)	57.2	57.2 / 57.2	57.2	57.2
Full Load Disp (metric tons)	918	918 / 964	959	959
Speed (knots)	10.0	10.0 / 10.0	10.0	10.0
Endurance (NM @ 10 kts) (@ 80% power)	1500.0	1500.0 / 1500.0	1500	1500
Propulsion				
Diesels (cyl)	2/8	2/8 / 2/8	2/8	2/8
Shafts	2	2 / 2	2	2
Horsepower @ (RPM)	1600 @ 1800	1600 @ / 1600 @ 1800	1600 @ 1800	1600 @ 1800

"Draft (Nav)" represents Full Load Navigational Departure Draft.

b. Current Change Explanations -- None

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11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	17.2	17.2	18.5
Procurement	1440.2	1626.9	1650.0
Basic	(966.4)		(1131.2)
Government Furnished Eq	(346.9)		(364.3)
Other	(31.9)		(56.2)
Outfitting/Post Deliver	(80.1)		(83.7)
Total Sailaway	(1425.3)		(1635.4)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(14.9)		(14.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 92 Base-Year \$	1457.4	1644.1	1668.5
Escalation	90.9	85.6	82.7
Development (RDT&E)	(-2.2)	(-2.2)	(-2.3)
Procurement	(93.1)	(87.8)	(85.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	1548.3	1729.7	1751.2

Current Estimate is the FY 1999 President's Budget.

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	12	12	12
Total	12	12	12

c. Foreign Military Sales --
None

d. Nuclear Costs --
N/A

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12. Unit Cost Summary:

	UCR Baseline (OCT 95 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 92 BY\$)	1644.1	1668.5	
(2) Quantity	12	12	
(3) Unit Cost	137.008	139.042	+1.48
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 92 BY\$)	1626.9	1650.0	
(2) Quantity	12	12	
(3) Unit Cost	135.575	137.500	+1.42

Current Estimate (TY) is the FY 2000 President's Budget. All categories include ships' outfitting and post delivery cost estimates.

13. Cost Variance Analysis:

a. Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	15.0	1533.3	-	1548.3
Previous Changes:				
Economic	-	-4.8	-	-4.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.2	+211.2	-	+212.4
Other	-	-	-	-
Support	-	-0.3	-	-0.3
Subtotal	+1.2	+206.1	-	+207.3
Current Changes:				
Economic	-	-1.2	-	-1.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-3.2	-	-3.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-4.4	-	-4.4
Total Changes	+1.2	+201.7	-	+202.9
Current Estimate	16.2	1735.0	-	1751.2

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13a. Cost Variance Analysis (Cont'd):

Summary (FY 1992 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	17.2	1440.2	-	1457.4
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.3	+213.0	-	+214.3
Other	-	-	-	-
Support	-	-0.3	-	-0.3
Subtotal	+1.3	+212.7	-	+214.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-2.9	-	-2.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-2.9	-	-2.9
Total Changes	+1.3	+209.8	-	+211.1
Current Estimate	18.5	1650.0	-	1668.5

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>Procurement</u>		
Revised OSD inflation indices. (Economic)	N/A	-1.2
Small reduction mainly in basic contract budgets (Estimating)	-2.0	-2.6
Decrease in Gov't Furnished Equipment (GFE) estimate mainly due to lower return costs for select EXCOMM equipment (Estimating)	-3.7	-4.3
Small increase for contractor support and planning yard support services (Estimating)	+2.8	+3.2
Refinement in ships' outfitting and post delivery cost estimate (Estimating)	0.0	-0.7
Adjustment for current and prior year inflation. (Estimating)	0.0	+1.2
Procurement Subtotal	-2.9	-4.4

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14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate										PAUC Cur Est
PAUC Prod Est	Changes									
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
129.02	-0.50	--	--	--	+17.43	--	-0.02	+16.91	145.93	

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate									PUC Cur Est
PUC Prod Est	Changes								
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
127.78	-0.50	-0.01	--	--	+17.33	--	-0.02	+16.80	144.58

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	JUN 86	JUN 86
Milestone II	N/A	N/A	DEC 86	DEC 86
Milestone III	N/A	N/A	FEB 89	FEB 89
FUE/IOC	N/A	N/A	N/A	SEP 96
Total Cost	N/A	N/A	1548.3	1751.2
Total Quantity	N/A	N/A	12	12
Prog Acq Unit Cost	N/A	N/A	129.02	145.93

15. Contract Information (Then-Year Dollars in Millions):

a. Procurement --
MHC 61/62 (OPTION):
INTERMARINE USA, SAVANNAH, GA
N00024-92-C-2203, FPI/FFP
Award: March 31, 1993
Definitized: March 31, 1993

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$162.8	N/A	2	\$162.8	\$162.8

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15a. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-13.4	\$-5.2
Cumulative Variances To Date (11/30/98)	<u>\$-11.9</u>	<u>\$-1.8</u>
Net Change	\$1.5	\$3.4

Explanation of Change:

(Values noted below are \$M/Then Year)

GENERAL: MHCs 61 & 62 are IMUSA's final 2 MHC ships under contract and the last 2 ships of the 12 ship MHC program. The MHC 61/62 contract option was structured by the same December 1995 "Global Settlement" modification provisions applicable to IMUSA's MHC 58-60 contract. Among several of the settlement's major provisions, those most pertinent from a contract cost and schedule performance measurement perspective entail converting the existing contract from Fixed Price Incentive (FPI) to Firm Fixed Price (FFP), revising delivery schedules, and establishing early delivery incentives.

COST PERFORMANCE: The "Estimated Price At Completion" reflects the current MHC 61/62 FFP contract value. For performance reporting purposes, IMUSA has assigned a \$135.8M Budget At Completion (BAC) cost baseline for this \$162.8M FFP contract. The prior SAR reported unfavorable cost variance of \$-13.4M moderately improved to \$-11.9M (\$124.4M of assessed value earned at an incurred cost of \$136.3M (data per contractor's November 98 Cost Performance Report)). Practically all of this variance derives from the contractor's overly ambitious (arguably, unrealistically low) contract work breakdown structure budgets established after the contract's FFP conversion 3 years ago. Given the contract's FFP status and with the program approaching completion, IMUSA had no incentive to change internal performance budgets to more realistically reflect the very favorable performance which has otherwise been achieved. The contractor's most recent Estimate At Completion (EAC) cost of \$142.9M is about \$6M higher than their estimate of a year ago. The PM's \$142.9M cost EAC is \$2.9M higher than the \$140.0M estimate reported in last year's SAR (\$1.9M of the respective contractor's and PM's EAC increases result from negotiated contract changes which have occurred during the past year). The profit projection for this final MHC contract is \$23M (14.1%).

SCHEDULE PERFORMANCE: MHC 61, the 11th ship of the 12 programmed MHC 51 class, was delivered 04/14/98. The final ship of the class, MHC 62, was delivered 01/11/99. Both ships were delivered to the contract's maximum early delivery incentive allocation of \$3M per ship.

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16. Program Funding Summary (Current Estimate in Millions of Dollars):

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years (FY86-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	16.2	-	-	-	16.2
Procurement	1733.4	1.6	-	-	1735.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1749.6	1.6	-	-	1751.2

b. Annual Summary -- COASTAL MINEHUNTER SHIP

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY92 Dollars Nonrec</u>	<u>Flyaway FY92 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1986		1.8		1.8	1.5
1987		7.9		7.9	6.7
1988		4.3		4.3	3.8
1989		3.7		3.7	3.4
1990		0.8		0.8	0.8
Subtotal		18.5		18.5	16.2

Appropriation: 1611 - Shipbuilding and Conversion, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY92 Dollars Nonrec</u>	<u>Flyaway FY92 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1986	1		289.9	277.1	259.3
1987				0.6	0.6
1988					
1989	2		285.7	269.5	273.5
1990	2		244.9	248.0	258.9
1991	2		211.5	201.7	216.4
1992	3		348.2	333.9	367.5
1993	2		255.2	258.5	287.8
1994				15.0	17.1
1995				4.9	5.7
1996				21.7	25.3
1997				13.3	15.8
1998				2.5	3.0
1999				2.0	2.5
2000				1.3	1.6
Subtotal	12		1635.4	1650.0	1735.0

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16b. Program Funding Summary (Cont'd):

FY 1990 "Flyaway" column excludes \$14.6M FY 92 base year of SQQ 32 Sonar and SLQ 48 MNS battle spares which are classed as "initial spares."

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	12	18.5	1635.4	1668.5	1751.2

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RD&E	0	0
Procurement	12	11

Percent Total Program Quantities Delivered: 91.7%

b. Total Expenditures To Date (In Millions of Dollars): \$ 1639.2

Percent Total Program Expended: 93.6%

The 12th and final ship of the class, MHC 62, was scheduled to deliver 12/18/98. Scheduling problems involving availability of Navy Board of Inspection and Survey (INSURV) to conduct MHC 62 Acceptance Trials preparatory to delivery were encountered. As a result, delivery of the ship was delayed about 3 weeks. MHC 62 was delivered in Savannah, GA (builder's yard) on 01/11/99 (subsequent to this SAR report's 12/31/98 cutoff date).

18. Operating and Support Costs:

a. Assumptions and Ground Rules --
O & S costs associated with the Coastal Minehunter (MHC) are based on a 35 year service life. Factors and associated O & S cost estimates are based on a new design ship class with first unit delivering in the May/June 1993 timeframe. Estimates are based on an "operating tempo" approach and include direct costs to support the primary personnel to operate the ships (currently authorized force level of 12 ships), Operations (including fuel, repair parts, supplies, training, and purchased services), Intermediate and Depot level maintenance, and Indirect Costs including training, publications, engineering and technical services. There is no antecedent system. Operating and Support cost data is current through 1996.

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18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1992 Constant (Base-Year) Dollars in Millions)

Cost Element	Cost Element	
	Avg Annual Cost Per	
	Ship	
Mission Pay & Allowances	1.8	N/A
Unit Level Consumption	0.8	0.0
Intermediate Maintenance	0.1	0.0
Depot Maintenance	0.9	0.0
Contractor Support	0.1	0.0
Sustaining Support	0.3	0.0
Indirect Costs	0.1	N/A
Total	4.1	0.0

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AF-16 MILSTAR

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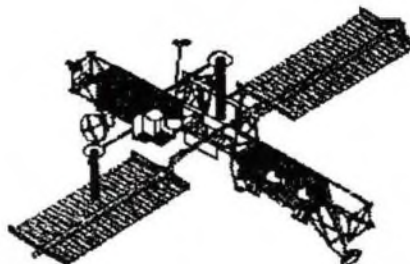
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: MILSTAR

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): Milstar Satellite Communications Systems
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:
SMC/MC BGen Craig R. Cooning
2420 Vela Way Assigned: November 30, 1998
Suite 1467-A8 DSN 833-4877; COMM 310-336-4877
Los Angeles AFB, CA 90245-4659 Craig.Cooning@losangeles.af.mil
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0303603F
(U) PE 0604479F
PROCUREMENT:
(U) APPN 3080 ICN 836780 (Air Force)

SAF/PAS

99--0266

CONGRESSIONAL

Classified by: Milstar Security Classification Guide, 10 Sep 93
Downgrade instructions: Not Subject to Automatic Downgrade
Declassify on: Originating Agency Determination Required (OADR)

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DEPARTMENT OF DEFENSE

99-C-068

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5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE approved Acquisition Program Baseline dated October 28, 1992.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated February 6, 1995.

6. (U) Mission and Description:

(U) The Milstar Satellite Communications System, which in part takes over the mission of DSCS and AFSATCOM, is a joint service program to develop and acquire the Milstar satellite, its mission control segment, and Army, Navy and Air Force communications terminals. The Milstar system will provide survivable, jam-resistant, worldwide secure communications for the National Command Authorities and Commanders-in-Chief to command and control their tactical and strategic forces at all levels of conflict.

7. (U) Executive Summary:

(U) In 1983, the Milstar Satellite Communications System program was designated with the highest national priority. After a short feasibility study, the Space and Mission Control program proceeded directly into the Full Scale Development (FSD) phase. The FSD contract was awarded in June of 1983.

In the National Defense Authorization Act for FY91, Congress directed the Department of Defense to restructure the Milstar system to reduce cost, increase the utility of the system for tactical users, and eliminate enduring nuclear warfighting capabilities. As a result, the number of satellites, mission control stations and terminals was reduced. Furthermore, features associated with nuclear hardness and survivability were reduced and capabilities to support tactical requirements were added. A contract for the Milstar II satellite development was awarded in October 1992 following a successful October 1992 Defense Acquisition Board (DAB) Program Review. The Milstar II satellite will incorporate the Low Data Rate payload of the original Milstar satellite and add a new Medium Data Rate payload.

Flight 1, (formerly Sat 1) launched on February 7, 1994 successfully completed Air Force Operational Test and Evaluation Center's (AFOTEC) Dedicated Asset Test (DAT) and Navy's Follow-On Operational Test and Evaluation (FOT&E) on September 9, 1994. The program office turned over Satellite Control Authority (SCA) to Air Force Space Command (AFSPC) on November 1, 1994.

In a January 17, 1995 memo, the Defense Acquisition Executive (DAE) directed the program office to decouple the Advanced EHF and Milstar programs, and to appropriately revise the Milstar Acquisition Program Baseline to only include the 2 Milstar block I and 4 Milstar block II satellites. In addition, the revised baseline incorporated the current approved test plan and established new milestones in accordance with the approved Milstar Streamlined Acquisition Strategy Report. The revised Milstar APB was approved by the DAE on February 6, 1995.

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7. (U) Executive Summary (Cont'd):

On May 11, 1995 the Office of the Joint Chiefs of Staff (JCS) certified the Milstar Low Data Rate (LDR) system for Emergency Action Message (EAM) dissemination and force feedback.

On November 6, 1995 Flight 2 was successfully launched from Cape Canaveral on a Titan IV/Centaur booster. The satellite arrived at its initial testing location at 90 degrees West longitude and completed early on-orbit operations. On December 15, 1995 Milstar demonstrated unprecedented communication capability with a message sent from the JCS to the CINCs without the use of vulnerable ground relays. The message was sent from the National Military Command Center's terminal at Ft. Belvoir, VA to the Flight 1, then crosslinked to Flight 2, and downlinked to the CINCs. Satellite Control Authority (SCA) was transferred to Air Force Space Command (AFSPC) on March 22, 1996.

The fourth Space Operations Squadron deployment of the mobile Constellation Control Station to Europe (with our support) started in May 1997 and operations completed in June 1997. The mission was highly successful and proved the capability to perform command and control of the entire constellation worldwide.

In the Spring of 1997, the MILSATCOM Joint Program Office (MJPO) and AFSPC successfully completed a demonstration of Milstar's ability to operate autonomously for a sustained period without ground commands. Milstar's performance exceeded requirements and specifications. Autonomy is one of Milstar's key survivability features and one of several critical operational parameters was formally tested during the Phase II IOT&E program.

The Defense Information Services Agency sponsored Milstar Advanced Narrowband Voice Terminal/Defense Red Switch Network (ANDVT/DRSN) demo was held in September 1997 and was a success. Local conferencing was demonstrated. MJPO will provide technical support per Joint Staff direction in CONOPs and baseband implementation.

In the Spring of 1998, work on the Milstar I contract was completed. Contract closeout activities have begun.

Milstar Flight 3 completed final assembly in April 1997 and the Functional Integrated Satellite Test in November 1998. Flight 3 is scheduled to launch in May 1999, contingent on the results of the A-20/Titan investigation and the DSP-19 launch which is currently scheduled for April 1999. Flight 4 completed final assembly and is in Baseline Integrated Satellite Testing. Flight 4 remains scheduled for a March 2000 launch date. Flight 5 Low Data Rate (LDR) and Medium Data Rate (MDR) payloads will be completed in early 1999 and delivered for satellite final assembly in May 1999.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milstar I Dev Contract Award	JUN 83	JUN 83	JUN 83
LDR Payload/Bus CDR	JUL 87	JUL 87	JUL 87
Mission Control Segment CDR	AUG 88	AUG 88	AUG 88
DAB Program Review	SEP 92	OCT 92	OCT 92
Milstar II Contract Award	OCT 92	OCT 92	OCT 92
Satellite 1 Delivery	DEC 92	DEC 92	DEC 92
Satellite 1 On-Orbit DT&E			
Start	JUL 93	FEB 94	FEB 94
Complete	JAN 94	JUN 94	JUN 94
Milstar I Phase 1 IOT&E			
Start	FEB 94	AUG 94	AUG 94
Dedicated Asset Test			
Start	N/A	AUG 94	AUG 94
Complete	N/A	SEP 94	SEP 94
Complete	AUG 94	SEP 95	AUG 95
Milstar I Phase 2 IOT&E			
Start	MAY 95	MAR 96	JUN 96
Complete	NOV 95	SEP 96	MAR 97
IOC I	MAR 96	JAN 97	JUL 97
Mission Control Organic Support Capability	SEP 96	SEP 96	SEP 96
Milstar II IOT&E			
Start	APR 99	AUG 99	AUG 99
Complete	SEP 99	FEB 00	JUL 00 (Ch-1)
Milstar II MS III	SEP 99	N/A	N/A

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9a. (U) Schedule (Cont'd):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
IOC II	OCT 00	OCT 00	OCT 00
Constellation Control Organic Support	DEC 00	DEC 00	DEC 00
FOC	DEC 04	DEC 04	DEC 04

(U) Acronyms & Abbreviations:

CDR - Critical Design Review Capability
DAB - Defense Acquisition Board
Dev - Development
DT&E - Developmental Test and Evaluation
FOC - Full Operational Capability
IOC - Initial Operational Capability
IOT&E - Initial Operational Test and Evaluation
LDR - Low Data Rate
MS - Milestone

b. Current Change Explanations --

(U) (Ch-1)

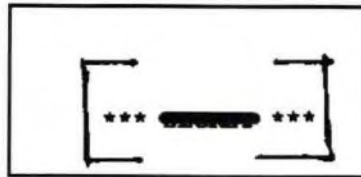
The current estimate for the completion of Milstar II IOT&E changed from Feb 00 to Jul 00 due to the 6 month launch slip of Flight 3 resulting from the A-20/Titan failure.

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate	
Polar					
Coverage	65N-90N	65N-90N / 65N-90N	65N-90N	65N-90N	
Hrs/day	24	24 / 16	16	16	
Capacity Payload					
Uplink	TBD	TBD / TBD	TBD	TBD	
Downlink	TBD	TBD / TBD	TBD	TBD	
Crosslink	TBD	TBD / TBD	TBD	TBD	
UHF	TBD	TBD / TBD	TBD	TBD	
Anti-jam Capability	TBD	TBD / TBD	TBD	TBD	
Scintillation	TBD	TBD / TBD	TBD	TBD	
Protection					
Mid Latitude					
Coverage	65S-65N	65S-65N / 65S-65N	65N-65N	65S-65N	
LDR					
Hrs/day	24	24 / 24	24	24	
Capacity/Payload (Kbps)					
Uplink	315	315 / 225	237.3	237.3	(Ch-1)

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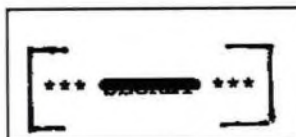
MILSTAR, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>	
Downlink	485	485 / 340	604.8	604.8	(Ch-1)
Crosslink	170	170 / 115	133.5	133.5	(Ch-1)
MDR					
Hrs/day	24	24 / 24	24	24	
Capacity/Payload	1 WSA & +1 ECA & +3 MSA & +4 LSA	1 WSA & / 1 WSA & +1 ECA / +3 MSA & +3 / MSA & / +4 LSA /	1 WSA & +3 MSA	1 WSA & +3 MSA	
Uplink (Mbps)	57	57 / 43	71.6	71.6	(Ch-1)
WSA	40	40 / 30	35.8	35.8	(Ch-1)
MSA	12	12 / 6	8.9	8.9	(Ch-1)
Downlink (Mbps)	76	76 / 38	45	45	(Ch-1)
Crosslink (Mbps)	6.3	6.3 / 3.2	5	5	

(b)(1)





MILSTAR, December 31, 1998

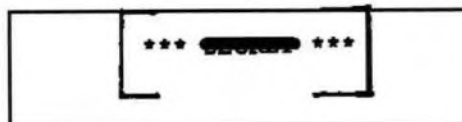
10a. (U) Performance Characteristics (Cont'd):

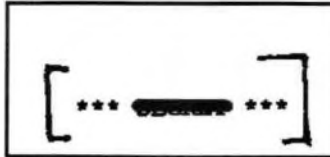
	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(b)(1)				
LDR UHF Compati- bility	AFSATCOM FLTBD CST	AFSATCOM/ FLTBD CST/	AFSATCOM FLTBD CST	AFSATCOM FLTBD CST
Capacity (links @ bps)	4 @ 75 & 1 @ 1200	4 @ 75 &/ 1 @ 1200/ / 1200	4 @ 75 & 1 @ 1200	4 @ 75 & 1 @ 1200
LDR Interopera- bility	MIL-STD 1582C MJCS1-87	MIL-STD / 1582C / MJCS1-87/	MIL-STD 1582C MJCS1-87	MIL-STD 1582C MJCS1-87
MMD (months)				
LDR	84	84 / 84	84	84
MDR	84	84 / 84	84	84
Constellation Control Stations R&M (MCE + Fixed CP) (hrs)				
MTBCF (hrs)	221	221 / 221	297	297
MTTRF (hrs)	1.0	1.0 / 1.0	1.0	1.0
Satellite Design Weight (lbs)	10000	N/A / N/A	N/A	N/A
Milstar I Weight (lbs)	N/A	TitanIV// Centaur / compati/ - / ble / ble	TitanIV/ Centaur compati- ble	TitanIV/ Centaur compati- ble
Milstar II Weight (lbs)	N/A	TitanIV// Centaur / compati/ - / ble /	TitanIV/ Centaur compati- ble	TitanIV/ Centaur compati- ble

(U) Acronyms & Abbreviations

dBW - decibel Watts

EAM - Emergency Action Message





MILSTAR, December 31, 1998

10a. (U) Performance Characteristics (Cont'd):

ECA - Earth Coverage Area
EIRP - Effective Isotropic Radiated Power
Kbps - Kilo bits per second
LDR - Low Data Rate
LSA - Local Service Area
Mbps - Mega bits per second
MCE - Mission Control Element
MDR - Medium Data Rate
MIL-STD 1582C - Military Standard (Milstar Waveform)
MJCS - Joint Chiefs of Staff Memo
MMD - Mean Mission Duration
MSA - Medium Service Area
MTBCF - Mean Time Between Critical Failure
MTTRF - Mean Time To Restore Function
NCGS - Nuclear Criteria Group Secretariat
R&M - Reliability and Maintainability
SCT - Single Channel Transponder
UHF - Ultra High Frequency
WSA - Wide Service Area

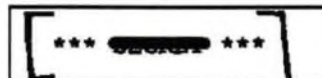
b. Current Change Explanations --

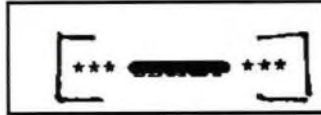
~~(S)~~ (Ch-1)

The following Demonstrated Performances and Current Estimates changed due to revised testing results and estimates:

LDR Capacity/Payload Uplink changed from 240 to 237.3
LDR Capacity/Payload Downlink changed from 500 to 604.8
LDR Capacity/Payload Crosslink changed from 130 to 133.5
MDR Capacity/Payload Uplink changed from 57.399 to 71.6
MDR Capacity/Payload Uplink WSA changed from 30 to 35.8
MDR Capacity/Payload Uplink MSA changed from 6 to 8.9
MDR Capacity/Payload Downlink changed from 39.68 to 45

(b)(1)





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(b)(1)



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(b)(1)



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MILSTAR, December 31, 1998

15. (U) Contract Information (Then-Year Dollars in Millions):

a. RDT&E --
 (U) Milstar II Satellites:
 Lockheed MSL & Space Co, Sunnyvale CA
 F04701-92-C-0049, CPAF
 Award: October 30, 1992
 Definitized: October 30, 1992

Current Contract Price			Initial Contract Price	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>
\$3819.6	N/A	4	\$1659.5	N/A

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$3748.3	\$3748.3

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$71.1	\$-7.7
Cumulative Variances To Date (11/29/98)	\$68.9	\$-9.9
Net Change	\$-2.2	\$-2.2

Explanation of Change:

(U) The decrease in Cost Variance is due to a decrease in the cost performance of the Spacecraft Structure and Electronics portion of the contract.

The decrease in Schedule Variance is due to problems with the Spacecraft Structure and Electronics portion of the contract.

There is no major impact to the contract or the program.

(b)(1)

[*** ~~SECRET~~ ***]

MILSTAR, December 31, 1998

(b)(1)



[*** ~~SECRET~~ ***]

MILSTAR, December 31, 1998

(b)(1)

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --
The Operating & Support (O & S) period covers phase-in to Full Operation Capability (FOC) FY92-99 plus 12 steady state years. This estimate covers the cost of 12 Satellite Mission Control Subsystems in a steady-state condition. The maintenance concept consists of two levels for hardware and software. A constellation consists of four satellites. Support costs are derived from the August 25, 1992 Program Life Cycle Cost Estimate (PLCCE).
There is no antecedent for this system.

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Constellation	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	17.9	0.0
Unit Level Consumption	2.9	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.1	0.0
Contractor Support	9.5	0.0
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	30.4	0.0

[*** ~~SECRET~~ ***]

4-18 LONGBOW APACHE

*** ~~SECRET~~ ***

SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)
PROGRAM: LONGBOW APACHE

AS OF DATE: December 31, 1998

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Delivery/Expenditure Information	26
Operating and Support Costs	26



1. (U) Designation and Nomenclature (Popular Name): LONGBOW APACHE

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:
APACHE ATTACK HELICOPTER
ATTN: SFAE-AV-AAH
BLDG 5681
Redstone Arsenal, AL 35898-5000
COL HOWARD T. BRAMBLETT
Assigned: July 15, 1998
DSN 897-4200; COMM 205-313-4200
brambleth@peoavn.redstone.army.mil

4. (U) Program Elements/Procurement Line Items:

RDT&E:
(U) PE 23744 Project D423
(U) PE 63776 Project D472
(U) PE 64816 Project D2DT, DC27, DC31, DC87
PROCUREMENT:
(U) APPN 2031 ICN AA0978 (Army)
(U) APPN 2031 ICN AA6605 (Army)
(U) APPN 2031 ICN AA6607 (Army)
(U) APPN 2031 ICN AA6608 (Army)

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

Classified by:
Downgrade instructions: Apache
Declassify on: X3

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- 1 -

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Longbow Apache, December 31, 1998

5. (U) References:

Airframe Modifications

SAR Baseline (Production Estimate):

(U) DAE Approved Acquisition Program Baseline dated November 27, 1995.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated March 23, 1998.

FCR MISSION KIT

SAR Baseline (Production Estimate):

(U) DAE Approved Acquisition Program Baseline dated November 27, 1995.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated November 27, 1995.

6. (U) Mission and Description:

(U) The Longbow consists of a mast-mounted Fire Control Radar (FCR) that will be integrated into the AH-64 airframe and a Radio Frequency (RF) autonomous seeker in an upgraded Hellfire missile (Longbow Hellfire). Longbow will provide the AH-64 with a true fire-and-forget capability, greatly increasing weapon system effectiveness and aircraft survivability. The weapon system will be employable day or night, in adverse weather and in obscurants. Hellfire must effectively engage and destroy advanced threat armor on the Air-Land Battlefield of the late 1990's and into the next century. To be effective and survive on this future battlefield, the attack helicopter team must rapidly engage multiple targets with minimum exposure time and deploy a system that is inherently resistant to threat countermeasures. A total of 320 aircraft will be modified with all of the Longbow improvements including the FCR and the 701-C engine integrated onto an AH-64 airframe. An additional 210 aircraft will be modified to incorporate all of the Longbow improvements except the FCR and the 701-C engines.

7. (U) Executive Summary:

(U) On August 16, 1996, the Apache Project Manager signed a multi-year contract with McDonnell Douglas Helicopter Systems, now the Boeing Company. The \$1.6B contract provides for the production of 232 aircraft over five years. Through December 1998, 55 production AH-64D aircraft have been delivered by Boeing Company.

Multiyear contracts for Lots 3-7, for both the FCR and the Radar Frequency Interferometer (RFI) were awarded November 26, 1997.

As of 31 December 1998, Lots 1 and 2 contract deliveries for 20 FCRs and 20 RFIs were completed. Lot 3 contract deliveries for 4 RFIs were completed.

The First Article Test of the FCR was completed in April 1998. The report has been formally approved.

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7. (U) Executive Summary (Cont'd):

The Longbow Apache with the FCR completed a 6 month comprehensive electromagnetic test program at the Naval Air Warfare Center, Patuxent River, Maryland, in June 1998.

Flight testing with the FCR and RFI were completed ahead of schedule.

The 24th AH-64D Longbow Apache was delivered to 1-227 Attack Helicopter Battalion on 15 July 98. This met the requirement for First Unit Equipped on time.

The first Longbow Apache battalion, 1-227th, was certified as C-1 Combat ready in November 1998 by the successful completion of the Unit Fielding and Training Program (UFTP) at Ft. Hood, Tx. This Initial Operational Capability (IOC) makes the 1-227th by far the most lethal attack battalion in the world. The unit successfully completed several challenging collective training events during a demanding External Evaluation and exceeded the Army maintenance standard for the AH-64 during the exercise.

On 24 November 1998, the 4ID successfully conducted a Y2K end-to-end (sensor to shooter) demonstration with support from PEO TM, PEO ANV, AMCOM DSA, and PEO C3S at White Sands Missile Range (WSMR). With all system clocks set to 31 December 1999 (2345 hrs), Apache AH-64A and Apache Longbow AH-64D each fired one LASER HELLFIRE Missile. All system clocks continued to run, rolling over to Year 2000. Each platform fired again and then acquired targets for fire support, transmitting them to Advanced Field Artillery Tactical Data System (AFATDS) Command, Control, Communication and Intelligence (C3I) using either voice (AH-64A) or a digital (AH-64D) call for fire (CFF) over SINCGARS radios in Frequency Hopping Secure Mode. AFATDS C3I received and transmitted targets through Multiple Launch Rocket System (MLRS) Fire Direction System (FDS) to the MLRS launcher for engagement using CFF. All missiles and rockets were successfully launched, and all targets engaged. This demonstration culminates a week of dry runs successfully verifying roll over of five critical Y2K dates.

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8. (U) Threshold Breaches:

Airframe Modifications

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	Yes
Average Procurement Unit Cost	Yes

c. (U) Explanation of Breach:

The airframe program has deviated from its current approved Acquisition Program Baseline (APB) for both the PAUC and APUC. This unit cost deviation has resulted in a Nunn McCurdy breach. Reasons for the breach are the following:

1. The inclusion of Second Generation Forward Looking Infrared Radar (SGF) into the unit cost of the airframe added Research and Development funds, as well as procurement funds without increasing the number of airframe units delivered.
- 2) Budget pressures required that quantities of aircraft purchased in FY01, FY02, and FY05 be adjusted away from the most economic order quantity. This increased the expected unit cost for those years.
3. Change in the program quantity (from 758 to 530) greatly reduced the number of units that would be used in the unit cost calculations. While the appropriate dollars were removed from the program based on production reductions, the number of support devices (such as trainers) remained constant. These costs, while constant, are now spread over a lesser number of units, causing an overall increase in unit cost.

A program deviation report (PDR) and a revised (APB) were submitted.

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Longbow Apache, December 31, 1998

8c. (U) Threshold Breaches (Cont'd):

FCR MISSION KIT

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	Yes

c. (U) Explanation of Breach:

The Fire Control Radar program has deviated from its current Approved Program Baseline for the average procurement unit cost (APUC). This deviation has resulted in a Nunn-McCurdy breach. Reasons for the deviation are the following:

1) Continuation of the multiyear pricing for FCRs beyond the termination of the current multiyear contract in FY02 cannot be assumed. The vendor has notified us that a follow on multiyear contract is not probable due to unavailability of parts (diminishing sources) and parts obsolescence.

2) The production quantities in FY03, and FY06-FY09, are below minimum plant production requirements, with Foreign Military Sales (FMS) sales not expected to provide the manufacturer with enough volume to make up the difference. This increased the expected unit production cost.

3) A two year production gap in FY04 and FY05 requires additional fixed cost for closing down production lines, an extended caretaker status, and then restarting the factory production line.

A PDR and revised APB were submitted.

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Longbow Apache, December 31, 1998

9. (U) Schedule:

Airframe Modifications

a. Milestones --

	Production Estimate (\$AR)	Approved Program (APB)	Current Estimate
Milestone I In Process Review	AUG 85	AUG 85	AUG 85
Prelimin Design Contract Award	NOV 85	NOV 85	NOV 85
Contract Award (Proof of Principle)	AUG 86	AUG 86	AUG 86
LBA Phase I Contract Award	AUG 88	AUG 88	AUG 88
Milestone IB (DAB)	JUL 89	JUL 89	JUL 89
LBA Phase 2 Contract Award	AUG 89	AUG 89	AUG 89
IDP Contract Award	SEP 89	SEP 89	SEP 89
Dev Test/Early User Test and Eval			
Start	FEB 90	FEB 90	FEB 90
Complete	APR 90	APR 90	APR 90
Milestone II/IV (DAB)	DEC 90	DEC 90	DEC 90
Full Scale Development Contract Award	DEC 90	DEC 90	DEC 90
Verification of Apache Action Tm Fixes			
Start	APR 91	APR 91	APR 91
Complete	JUL 91	JUL 91	JUL 91
First Flight of Prototype w/o Longbow	APR 92	APR 92	APR 92
Prelim Airworthiness Eval			
Start	MAR 93	MAR 93	MAR 93
Complete	AUG 93	AUG 93	JUN 93
LBA Initial Prod Readiness Rev	JUL 92	JUL 92	JUL 92
First Flight w/ Longbow	AUG 93	AUG 93	AUG 93
Component Qualification	JUN 94	JUN 94	DEC 93
LBA Long Lead IPR	OCT 94	OCT 94	OCT 94
First Flight (AH-64D w/o FCR)	JAN 94	JAN 94	JAN 94
Long Lead Time Items Contract Award	DEC 94	DEC 94	DEC 94
Development Test			
Start	JUL 94	JUL 94	JUL 94
Complete	SEP 94	SEP 94	SEP 94
Force Dev Test and Experimentation			
Start	OCT 94	OCT 94	OCT 94
Complete	NOV 94	NOV 94	NOV 94
Production Readiness Review	JUN 95	JUN 95	JUN 95
IOT&E			
Start	JAN 95	JAN 95	JAN 95
Complete	MAR 95	MAR 95	MAR 95
Milestone III (DAB)	OCT 95	OCT 95	OCT 95
Lot 1 Contract Award	NOV 95	NOV 95	DEC 95
First Production Delivery (LBA & FCR)	MAR 97	MAR 97	MAR 97
First Unit Equipped	OCT 97	JUL 98	JUL 98
IOC	SEP 98	SEP 98	NOV 98 (Ch-1)

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Longbow Apache, December 31, 1998

9b. (U) Schedule (Cont'd):

Airframe Modifications

b. Current Change Explanations --

(U) (Ch-1) The Initial Operational Capability (IOC) changed from October 98 to November 98. The reason for the date slip was lack of aircraft availability for training for the following three primary reasons:

- 1) Higher than expected failure rates of AH-64D Unique Spare Parts
- 2) Poor condition of AH-64A/D common parts.
- 3) Increased number of spares

FCR MISSION KIT

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone I In Process Review	AUG 85	AUG 85	AUG 85
Preliminary Design Contract Award	NOV 85	NOV 85	NOV 85
Contract Award (Proof of Principle)	AUG 86	AUG 86	AUG 86
Milestone IB DAB	JUL 89	JUL 89	JUL 89
IDP Contract Award	SEP 89	SEP 89	SEP 89
Development Test/Early User Test & Experimentation			
Start	FEB 90	FEB 90	FEB 90
Complete	APR 90	APR 90	APR 90
Milestone II/IV	DEC 90	DEC 90	DEC 90
Full Scale Development Award	DEC 90	DEC 90	DEC 90
Long Lead Time Items Contract Award	NOV 94	NOV 94	DEC 94
Lot 1 Contract Award	NOV 95	NOV 95	MAR 96
First Production Delivery	FEB 97	FEB 97	MAR 97

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

Airframe Modifications

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Vertical Rate of Climb for AH-64D with FCR Mission Kit (ft/min)	450	450 / 450	705	450
Ordnance Load (primary mission config)				
Hellfire (no.)	16	16 / 12	8	12
Target Handover	No	No / 15%	13%	No
	degrada- tion	degrada- tion / degrada- tion	Degrada- tion	degrada- tion

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10a. (U) Performance Characteristics (Cont'd):
Airframe Modifications

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(S) Engagement time RF Hellfire) in seconds	(b)(1)			
Ao, Operational Availability (%) of AH-64D w/FCR Kit	79	79 / 75	91.4	79

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(U) The objective for Ordnance Load (primary mission configuration) refers to AH-64A goal. The Longbow primary mission configuration is 8 Longbow Hellfire missiles, and 320 30mm rounds.

b. Current Change Explanations -- None

FCR MISSION KIT

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(S) Probability of Detection				
(S) Ground Targets, Benign Conditions	(b)(1)			
(S) Stationary @6KM				
(S) /2				
(S) Moving @6KM /2/3				

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b. Current Change Explanations -- None

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Longbow Apache, December 31, 1998

11. (U) Total Program Cost and Quantity (Dollars in Millions):
Airframe Modifications

	Production <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	638.4	635.1	740.4
Procurement	5052.2	6272.0	5222.1
Flyaway	(4161.5)		(3790.9)
Non recurring Flyaway			(240.2)
Total Flyaway	(4161.5)		(4031.1)
Other Weapon System	(737.4)		(1107.7)
Peculiar Support	(42.6)		(29.4)
Initial Spares	(110.7)		(53.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 96 Base-Year \$	5690.6	6907.1	5962.5
Escalation	1337.2	852.9	476.9
Development (RDT&E)	(-46.1)	(-38.0)	(-28.0)
Procurement	(1383.3)	(890.9)	(504.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	7027.8	7760.0	6439.4
b. (U) Quantity --			
Development (RDT&E)	N/A	0	0
Procurement	<u>758</u>	<u>758</u>	<u>530</u>
Total	758	758	530

Note: Excludes 6 RDT&E prototypes from the SAR Baseline and 6 from the Current Estimate that are not considered fully configured.

c. (U) Foreign Military Sales --
Foreign Military Sale with Netherlands.
Effective Date February 11, 1994
Quantity - 30 Net estimated cost - \$649M

d. Nuclear Costs -- None.

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Longbow Apache, December 31, 1998

11a. (U) Total Program Cost and Quantity (Cont'd):

FCR MISSION KIT

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E)	885.2	885.2	863.6
Procurement	813.9	813.9	1342.4
Flyaway	(741.3)		(1015.0)
Non recurring Flyaway			(49.4)
			(0.0)
Total Flyaway	(741.3)		(1064.4)
Other Weapon System	(22.2)		(176.9)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(50.4)		(101.1)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 96 Base-Year \$	1699.1	1699.1	2206.0
Escalation	2.3	2.3	51.2
Development (RDT&E)	(-117.5)	(-117.5)	(-101.7)
Procurement	(119.8)	(119.8)	(152.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	1701.4	1701.4	2257.2
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>227</u>	<u>227</u>	<u>320</u>
Total	227	227	320

Note: Excludes 10 RDT&E prototypes from the SAR Baseline and 10 from the Current Estimate that are not considered fully configured.

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
None.

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Longbow Apache, December 31, 1998

12. (U) Unit Cost Summary:

Airframe Modifications

	UCR Baseline (MAR 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	6907.1	5962.5	
(2) Quantity	758	530	
(3) Unit Cost	9.112	11.250	+23.46
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	6272.0	5222.1	
(2) Quantity	758	530	
(3) Unit Cost	8.274	9.853	+19.08
	UCR Baseline (MAR 98 APB)	Current Estimate (Dec 98 SAR)	Percent Change
c. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (TY\$)	7760.0	6439.3	
(2) Unit Cost	10.237	12.150	+18.69
d. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (TY\$)	7162.9	5726.9	
(2) Unit Cost	9.450	10.805	+14.34
e. (U) Changes from Previous SAR (Dec 97)	Dollars/Qty	Percent	
(1) PAUC (BY\$)	2.138	+23.46	
(2) APUC (BY\$)	1.575	+19.03	
(3) PAUC Quantity	-228	-30.08	
(4) PAUC (TY\$)	1.913	+18.69	
(5) APUC (TY\$)	1.360	+14.40	
f. (U) Initial SAR Information			
Initial SAR Date (Sep 96):			
(1) Program Acquisition Cost (BY\$)	5690.6		
(2) Program Acquisition Cost (TYS)	7027.8		
g. (U) Unit Cost PAUC Changes --			
The PAUC breach was the result of the following:			
1) Inclusion of Second Generation FLIR added capability to the program.			
2) Budget pressures required that aircraft purchased in FY01, FY02, and FY05 adjusted away from the most economic order quantity.			
3) Reduction in program quantity from 758 to 530.			

(U) Unit Cost APUC Changes --

The APUC breach is the result of the following:

- 1) Reduction in program quantity
- 2) Added Second Generation FLIR capability
- 3) Quantities of aircraft purchased in FY01, FY02, and FY05 were adjusted away from the most economic order quantity.

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Longbow Apache, December 31, 1998

12. (U) Unit Cost Summary (Cont'd):

Airframe Modifications

h. (U) Impact of Perf or Sched Changes --
None

i. (U) Program Management & Control --
The Longbow Project Manager is COL Howard T. Bramblett. The Deputy Project Manager is Mr. Gary Nenninger. Chief of the Business Management Division is Mr. William Redmond.

j. (U) Cost Control Actions --
The main cost control mechanism is the firm fixed price (FFP) contract, which includes constant communication between government and contractor.

k. (U) Contract Information (In Millions of Then-Year Dollars) -- None.

l. (U) Contracts exceeding Contract Cost Baseline Thresholds -- None.

m. General Comments -- None.

FCR MISSION KIT

	UCR Baseline (NOV 95 APB)	Current Estimate (Dec 98 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 96 BY\$)	1699.1	2206.0	
(2) Quantity	227	320	
(3) Unit Cost	7.485	6.894	-7.90
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 96 BY\$)	813.9	1342.4	
(2) Quantity	227	320	
(3) Unit Cost	3.585	4.195	+17.02
	UCR Baseline (NOV 95 APB)	Current Estimate (Dec 98 SAR)	Percent Change
c. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (TY\$)	1701.4	2257.2	
(2) Unit Cost	7.495	7.054	-5.88
d. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (TY\$)	933.7	1495.3	
(2) Unit Cost	4.113	4.673	+13.62

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12e. (U) Unit Cost Summary (Cont'd):

FCR MISSION KIT

e. (U) Changes from Previous SAR (DEC 97)	Dollars/Qty	Percent
(1) PAUC (BY\$)	-0.387	-5.32
(2) APUC (BY\$)	0.718	+20.65
(3) PAUC Quantity	93	+40.97
(4) PAUC (TY\$)	-0.034	-0.48
(5) APUC (TY\$)	0.943	+25.28

f. (U) Initial SAR Information

Initial SAR Date (Sep 96):

(1) Program Acquisition Cost (BY\$)	1699.1
(2) Program Acquisition Cost (TY\$)	1701.4

g. Unit Cost PAUC Changes -- None.

(U) Unit Cost APUC Changes --

The primary reasons for the Average Procurement Unit Cost increase are:

- 1) Production quantities in FY03, and FY06-FY09, are below minimum plant production requirements.
- 2) A two year production gap in FY04 and FY05 requires additional fixed cost for closing down production lines.
- 3) Cannot assume continuation of multiyear pricing for FCRs beyond the termination of the current Multiyear contract.

h. Impact of Perf or Sched Changes -- None.

i. (U) Program Management & Control --

The Longbow Project Manager is COL Howard T. Bramblett. The Deputy Project Manager is Mr. Gary Nenninger. The Chief of the Business Management Division is Mr. William Redmond.

j. (U) Cost Control Actions --

Main cost control mechanism is the firm fixed price contract, which includes constant communication between government and contractor.

k. (U) Contract Information (In Millions of Then-Year Dollars) -- None.

l. (U) Contracts exceeding Contract Cost Baseline Thresholds -- None.

m. General Comments -- None.

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Longbow Apache, December 31, 1998

13. (U) Cost Variance Analysis:

Airframe Modifications

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	592.3	6435.5	-	7027.8
Previous Changes:				
Economic	-	-263.6	-	-263.6
Quantity	-	-	-	-
Schedule	-	+1.1	-	+1.1
Engineering	-	+221.7	-	+221.7
Estimating	+4.8	+369.3	-	+374.1
Other	-	-	-	-
Support	-	+398.9	-	+398.9
Subtotal	+4.8	+727.4	-	+732.2
Current Changes:				
Economic	-0.1	-67.8	-	-67.9
Quantity	-	-1822.0	-	-1822.0
Schedule	-	+9.6	-	+9.6
Engineering	+115.3	+400.1	-	+515.4
Estimating	+0.1	+137.4	-	+137.5
Other	-	-	-	-
Support	-	-93.2	-	-93.2
Subtotal	+115.3	-1435.9	-	-1320.6
Total Changes	+120.1	-708.5	-	-588.4
Current Estimate	712.4	5727.0	-	6439.4

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	638.4	5052.2	-	5690.6
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+178.8	-	+178.8
Estimating	-3.3	+691.3	-	+688.0
Other	-	-	-	-
Support	-	+349.8	-	+349.8
Subtotal	-3.3	+1219.9	-	+1216.6
Current Changes:				
Quantity	-	-1464.6	-	-1464.6
Schedule	-	-	-	-
Engineering	+105.2	+340.3	-	+445.5
Estimating	+0.1	+123.7	-	+123.8
Other	-	-	-	-
Support	-	-49.5	-	-49.5
Subtotal	+105.3	-1050.1	-	-944.8
Total Changes	+102.0	+169.8	-	+271.8
Current Estimate	740.4	5222.0	-	5962.4

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Longbow Apache, December 31, 1998

13b. (U) Cost Variance Analysis (Cont'd):

Airframe Modifications

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-0.1
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
Second Generation FLIR is a new program requirement. (Engineering)	+105.2	+115.3
RDT&E Subtotal	+105.3	+115.3
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-132.3
Economic adjustment for negative program change. (Economic)	N/A	+64.5
Total Quantity Variance associated with decrease of 228 units, from 758 to 530. (Quantity)	-1464.6	-1822.0
Decrease in annual procurement buy profile. (Schedule)	0.0	+9.6
Adjustment for Current and Prior Inflation. (Estimating)	+13.9	+14.5
Costs for HALON, a new environmental requirement, and Hell Fire Sys Test Sets, a new requirement, were not include in the previous SAR (Engineering)	+22.1	+24.3
National Guard is no longer able to perform the crash rescue mission for pilot training. (Support)	+3.2	+3.5
Air to Air missile launchers estimate was increased to allow universal missile capability and facilitate a fly-off competition. (Engineering)	+4.2	+4.9
ORT Relay Tube (ORT) Conversion and Improved Data Modem (IDM) Version 5 were unfunded. (Engineering)	+106.5	+124.2
Additional requirements because of dual fleet increased simulator costs. (Support)	+121.6	+132.6
Less than economic order quantity (EOQ) production increased estimate by \$.25M per airframe for Multiyear II buys. (Estimating)	+66.3	+74.5
In-house and Contractor systems engineering program management (SEPM) and Safety Sustainment estimates have been modified. (Estimating)	+29.4	+29.9
Added Second Gen FLIR as a new program requirement. (Engineering)	+207.5	+246.7

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13b. (U) Cost Variance Analysis (Cont'd):

Airframe Modifications

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Change in Battalion Fielding (independent of aircraft fielding) drove requirements down. (Support)	-42.6	-48.1
Revised program estimate. (Estimating)	+14.1	+18.5
Adjustment for Current and Prior Inflation. (Support)	+3.4	+3.8
Initial estimate for spares was inadequate. Revised estimate based on actual field data. (Support)	+18.5	+21.8
Peculiar Support requirements estimates have changed due to changes in the Battalion fielding. (Support)	+2.1	+2.4
Reduced other weapon system costs due to quantity decrease. (Support)	-155.7	-209.2
Procurement Subtotal	-1050.1	-1435.9

FCR MISSION KIT

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	767.7	933.7	-	1701.4
Previous Changes:				
Economic	-	-27.9	-	-27.9
Quantity	-	-	-	-
Schedule	-	+4.0	-	+4.0
Engineering	-	-	-	-
Estimating	-5.8	-55.2	-	-61.0
Other	-	-	-	-
Support	-	-7.5	-	-7.5
Subtotal	-5.8	-86.6	-	-92.4
Current Changes:				
Economic	-	-11.7	-	-11.7
Quantity	-	+395.4	-	+395.4
Schedule	-	+22.2	-	+22.2
Engineering	-	+39.0	-	+39.0
Estimating	-	-48.0	-	-48.0
Other	-	-	-	-
Support	-	+251.3	-	+251.3
Subtotal	-	+648.2	-	+648.2
Total Changes	-5.8	+561.6	-	+555.8
Current Estimate	761.9	1495.3	-	2257.2

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Longbow Apache, December 31, 1998

13a. (U) Cost Variance Analysis (Cont'd):

FCR MISSION KIT

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	885.2	813.9	-	1699.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-21.6	-19.1	-	-40.7
Other	-	-	-	-
Support	-	-5.6	-	-5.6
Subtotal	-21.6	-24.7	-	-46.3
Current Changes:				
Quantity	-	+328.9	-	+328.9
Schedule	-	-	-	-
Engineering	-	+34.5	-	+34.5
Estimating	-	-21.2	-	-21.2
Other	-	-	-	-
Support	-	+211.0	-	+211.0
Subtotal	-	+553.2	-	+553.2
Total Changes	-21.6	+528.5	-	+506.9
Current Estimate	863.6	1342.4	-	2206.0

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) Procurement

Revised escalation indices. (Economic)	N/A	-11.7
Total Quantity Variance associated with increase of 93 units from 227 to 320.	+149.0	+179.6
Increase of 93 units from 227 to 320. (Quantity)	+214.2	+258.4
Allocation to Schedule variance resulting from Quantity Change. (Schedule)	0.0	+22.2
Allocation to Estimating variance resulting from Quantity Change. (Estimating)	-65.1	-101.0
Adjustment for Current and Prior Inflation. (Estimating)	+4.2	+4.4
Additional engine purchases are necessary to accommodate the increased FCR quantities. Engines are purchased with a long lead of one year in advance of FCR purchase. (Quantity)	+114.7	+137.0
Costs for FCR beyond Multi-year increased due to less than minimal quantities of production. (Estimating)	+42.0	+51.4
Higher fixed costs due to shutdown and restart of FCR production line for two years. (Support)	+30.4	+36.6

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13b. (U) Cost Variance Analysis (Cont'd):
FCR MISSION KIT

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Program increased for MY contract escalation. (Estimating)	+2.7	+3.3
Replaced obsolete data chips. (Engineering)	+15.6	+17.0
Increase for Engineering change orders for previously procured FCRs to maintain single configuration. (Engineering)	+18.9	+22.0
Other program estimating revisions (Estimating)	-5.0	-6.1
Adjustment for Current and Prior Inflation. (Support)	+0.6	+0.6
Change in Initial Spares, which increased due to additional FCR fielded. (Support)	+63.7	+76.4
Change in support costs due to increase in FCR quantity. (Support)	+116.3	+137.7
Procurement Subtotal	+553.2	+648.2

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):
Airframe Modifications

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
7.34	-1.22	--	-0.41	--	+3.28	--	+0.28	+1.93	9.27

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
9.27	-0.63	+0.55	+0.02	+1.39	+0.97	--	+0.58	+2.88	12.15

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14b. (U) Unit Cost and Other History (Cont'd):
Airframe Modifications

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.77	-1.13	--	-0.41	--	+2.98	--	+0.28	+1.72	8.49

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.49	-0.63	+0.22	+0.02	+1.17	+0.96	--	+0.58	+2.32	10.81

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	JUL 89	JUL 89	JUL 89
Milestone II	N/A	DEC 90	DEC 90	DEC 90
Milestone III	N/A	NOV 95	OCT 95	OCT 95
FUE/IOC	N/A	APR 97	SEP 98	NOV 98
Total Cost	N/A	5564.4	7027.8	6439.3
Total Quantity	N/A	758	758	530
Prog Acq Unit Cost	N/A	7.34	9.27	12.15

FCR MISSION KIT

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.36	-1.03	--	+0.08	--	+2.51	--	-0.42	+1.13	7.50

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14a. (U) Unit Cost and Other History (Cont'd):
FCR MISSION KIT

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
7.50	-0.12	-0.95	+0.08	+0.12	-0.34	--	+0.76	-0.45	7.05

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.96	-0.63	--	+0.08	--	+2.12	--	-0.42	+1.15	4.11

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.11	-0.12	+0.04	+0.08	+0.12	-0.32	--	+0.76	+0.56	4.67

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	JUL 89	JUL 89	JUL 89
Milestone II	N/A	DEC 90	DEC 90	DEC 90
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	N/A	N/A
Total Cost	N/A	1442.6	1701.4	2257.2
Total Quantity	N/A	227	227	320
Prog Acq Unit Cost	N/A	6.36	7.5	7.05

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Longbow Apache, December 31, 1998

15. (U) Contract Information (Then-Year Dollars in Millions):

a. RDT&E -- (U) <u>AH-64D FCR Multiyr Prod:</u> Longbow LLC, Orlando, FL DAAH23-98-C-0008, FFP Award: November 11, 1997 Definitized: November 11, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$565.3	N/A	207

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$565.5	N/A	207	\$565.5	\$565.5

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

b. Procurement -- (U) <u>FIRE CONTROL RADAR LOT 1:</u> Longbow LTD Liability Co., Orlando FL DAAJ09-95-C-A002, FFP Award: March 4, 1996 Definitized: June 28, 1996	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$133.9	N/A	10

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$134.3	N/A	10	\$134.3	\$134.3

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>AH64D Multiyr Production:</u> Boeing Company, Mesa, AZ DAAJ09-95-C-A001, FFP Award: December 12, 1994 Definitized: August 16, 1996	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$1690.3	N/A	232

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$2002.5	N/A	232	\$2002.5	\$2002.5

Explanation of Change:

None.

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15. (U) Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>FCR Lot 2 Production:</u> Longbow Limited Liability, Orlando FL DAAJ09-96-C-0114, FFP Award: July 15, 1996 Definitized: January 31, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$82.5	N/A	11

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$83.1	N/A	11	\$83.1	\$83.1

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>AH-64D RFI Multiyr Prod:</u> Lockheed Martin Federal, Owego, NY DAAJ09-97-C-0124, FFP Award: November 26, 1997 Definitized: November 26, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$92.3	N/A	207

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$94.5	N/A	207	\$94.5	\$94.5

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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16. (U) Program Funding Summary (Current Estimate in Millions of Dollars):

Total Program

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY85-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	1359.0	17.6	17.5	80.2	1474.3
Procurement	2109.3	773.4	749.5	3590.1	7222.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3468.3	791.0	767.0	3670.3	8696.6

Airframe Modifications

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY88-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	597.1	17.6	17.5	80.2	712.4
Procurement	1639.8	643.9	621.6	2821.7	5727.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	2236.9	661.5	639.1	2901.9	6439.4

FCR MISSION KIT

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY85-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-08)	<u>Total</u>
RDT&E	761.9	-	-	-	761.9
Procurement	469.5	129.5	127.9	768.4	1495.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1231.4	129.5	127.9	768.4	2257.2

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16b. (U) Program Funding Summary (Cont'd):

b. Annual Summary -- Airframe Modifications

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				22.9	18.7
1989				55.3	47.0
1990				78.1	68.9
1991				62.0	56.8
1992				78.1	73.2
1993				105.2	100.9
1994				89.0	86.9
1995				112.5	112.0
1996				21.7	22.0
1997				10.4	10.7
1998					
1999					
2000				16.6	17.6
2001				16.2	17.5
2002				35.3	38.7
2003				37.1	41.5
Subtotal				740.4	712.4

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995		39.5		74.9	75.6
1996	24	118.0	172.8	331.3	338.9
1997	24	67.3	174.9	304.3	314.8
1998	44	11.4	262.1	382.5	399.8
1999	66	3.5	399.4	485.2	510.7
2000	74	0.5	456.2	602.7	643.9
2001	60		439.3	572.6	621.6
2002	66		479.1	638.9	705.9
2003	72		509.5	618.2	696.5
2004	72		525.3	631.6	726.6
2005	28		295.1	354.9	416.8
2006			20.8	78.8	94.5
2007			16.4	63.9	78.2
2008			40.0	71.3	89.1
2009				11.0	14.1
Subtotal	530	240.2	3790.9	5222.1	5727.0

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Longbow Apache, December 31, 1998

16b. (U) Program Funding Summary (Cont'd):
Airframe Modifications

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	530	240.2	3790.9	5962.5	6439.4

b. Annual Summary -- FCR MISSION KIT

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985				19.9	14.7
1986				39.7	30.2
1987				98.8	77.6
1988				101.6	83.0
1989				100.7	85.6
1990				106.0	93.5
1991				86.3	79.0
1992				82.2	77.0
1993				124.0	118.9
1994				82.2	80.3
1995				22.2	22.1
Subtotal				863.6	761.9

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY96 Dollars Nonrec	Flyaway FY96 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995		14.0		40.9	41.3
1996	10	5.3	88.9	94.2	96.4
1997	10	14.5	62.7	92.5	95.7
1998	21		100.5	108.2	113.1
1999	40		100.8	116.9	123.0
2000	45	1.9	118.9	121.2	129.5
2001	44	5.3	112.4	117.8	127.9
2002	57	8.4	102.5	113.5	125.4
2003	14		50.9	90.4	101.9
2004				16.9	19.4
2005				49.0	57.5
2006	34		119.7	184.1	220.8
2007	20		80.7	99.4	121.7
2008	25		77.0	97.4	121.7
Subtotal	320	49.4	1015.0	1342.4	1495.3

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16b. (U) Program Funding Summary (Cont'd):

FCR MISSION KIT

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	320	49.4	1015.0	2206.0	2257.2

17. (U) Delivery/Expenditure Information:

Airframe Modifications

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	55	55

(U) Percent Total Program Quantities Delivered: 10.4%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1179

(U) Percent Total Program Expended: 18.3%

FCR MISSION KIT

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	20	20

(U) Percent Total Program Quantities Delivered: 6.3%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 671.8

(U) Percent Total Program Expended: 29.8%

18. (U) Operating and Support Costs:

Airframe Modifications

a. (U) Assumptions and Ground Rules --
Assumes 510 fielded operational aircraft each flying 14.5 hours per month. Maintenance concept is 2 level maintenance, contractor depot support. The airframe Mean Time Between Failure (MTBF) goal is 19.5 hours at Maturity (50,000 flight hours). Source: Army Cost Position Update (Sep 95). The Longbow aircraft system has no antecedent.

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18b. (U) Operating and Support Costs (Cont'd):

Airframe Modifications

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per Longbow aircraft	Avg Annual Cost Per antecedent system
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	3.0	0.0
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Replenishment	398.8	0.0
Military Personnel	683.2	0.0
Other	147.7	0.0
Total	1232.7	0.0

FCR MISSION KIT

a. (U) Assumptions and Ground Rules --

Assumes 320 fielded operational Fire Control Radars each flying 14.5 hours per month. Maintenance concept is 2 level maintenance, contractor depot support. At maturity (50,000 flight hours), the Fire Control Radar Mean Time Between Failure (MTBF) goal is 150 hours. Source: Army Cost Position Update (Sep 95). The Longbow Fire Control Radar system has no antecedent.

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per Fire Control Radar	Avg Annual Cost Per antecedent system
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	0.0	0.0
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Replenishment	63.7	0.0
Other	21.1	0.0
Mission Pay & Allowances	N/A	N/A
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Contractor Support	N/A	N/A
Intermediate Maintenance	N/A	N/A
Indirect Costs	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A

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18b. (U) Operating and Support Costs (Cont'd):
FCR MISSION KIT

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per Fire Control Radar	Avg Annual Cost Per antecedent system
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	84.8	0.0

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: NMD

AS OF DATE: December 31, 1998

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1. (U) Designation and Nomenclature (Popular Name): National Missile Defense (NMD)
2. (U) DoD Component: BMDO
3. (U) Responsible Office and Telephone Number:
Ballistic Missile Defense Org. BG Willie B. Nance, Jr.
NMD Joint Program Office Assigned: July 30, 1998
1725 Jefferson Davis Dr., Suite 809 DSN 664-3225; COMM (703) 604-3225
Arlington, VA 22202-4102 willie.nance@bmdo.osd.mil
4. (U) Program Elements/Procurement Line Items:
RDT&E:
(U) PE 0603871C

AS AMENDED

~~Classified by NSA BMD Classification Guide
Downgrade instructions:
Declassify on: Source Marked OADR~~

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5. (U) References:

SAR Baseline (Planning Estimate):

(U) Acquisition Decision Memorandum (ADM) dated August 11, 1997, Subject: National Missile Defense (NMD) Acquisition Decision Memorandum.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated August 11, 1997.

6. (U) Mission and Description:

(U) The National Missile Defense (NMD) acquisition program objective is to develop, demonstrate, and deploy, if directed, an initial system capable of protecting the United States against small scale attacks by ballistic missiles from rogue nations. A deployment decision may be made in 2000 to field the system in FY2005 or, if the threat and demonstrated technical maturity warrant, potentially sooner.

The FY2005 fielding date requires the NMD site to be selected at the FY2000 Deployment Readiness Review. The program will start site construction, building the site radar, Battle Management Command, Control and Communications (BMC3), and upgrading the existing Early Warning Radars in FY2001. Full weapon production will begin in FY2003.

7. (U) Executive Summary:

(U) A critical element of the broad United States strategy to counter nuclear proliferation is a capability to deal with the emergence of this longer range ballistic missile threat. To achieve this capability the Secretary of Defense established the National Missile Defense (NMD) Program. The NMD Program contributes to each of the three components of the nation's broad strategy to deal with proliferation: preventing and reducing the threat, deterring the threat, and defending against the threat. The Joint Requirements Oversight Council (JROC) validated the Capstone Requirements Document (CRD) during the fourth quarter of FY1996 and the Operational Requirements Document (ORD) during the second quarter of FY1997. The Development Phase will be compliant with the 1972 Anti-Ballistic Missile (ABM) Treaty and modifications will be sought for deployment, if necessary.

Boeing North American was awarded a Lead System Integrator (LSI) contract on April 30, 1998. The LSI will be responsible for the development, integration, and deployment of the NMD system. The program continues transfer of execution responsibility to the LSI. The Battle Management Command, Control, and Communication (BMC3) contract transitioned to the LSI in August 1998. The transition of several remaining legacy contracts in the Spring of 1999 will assure that the LSI will have accountability for, and control of, most of the Integrated Flight Test (IFT) test assets.

Personnel from the NMD Joint Program Office (JPO) visited sites on the north slope of Alaska to obtain information on existing infrastructure at Department of Defense radar sites should a deployment decision be made that requires

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7. (U) Executive Summary (Cont'd):

basing NMD elements in Alaska. The Notice of Intent was signed by Lt Gen Lyles on November 10, 1998 and published in the Federal Register on November 17, 1998. Public scoping meetings were conducted at possible deployment sites in Alaska, North Dakota, and Washington, D.C. during December 1998.

The commercial booster option has been selected for the NMD system. Also, two successful sensor flight tests have been conducted in 1997 and 1998. Raytheon Missile Systems Company has been selected to be the provider of the NMD Exoatmospheric Kill Vehicle (EKV). The LSI is scheduled to use Raytheon's EKV to conduct both IFT-3, the program's first intercept attempt, and IFT-4 in 1999, and the Integrated System Test in January 2000.

The NMD JPO and the U.S. Army Corps of Engineers (USACE) have agreed to serve as full partners in all aspects relating to NMD. This ensures that quality facilities are delivered within program schedule and budget constraints in order to provide the nation with an effective National Missile Defense.

A Defense Acquisition Executive (DAE) decision results in a restructuring of the NMD Program. For the first time, Procurement and MILCON funds are programmed in the FY2000 President's Budget for the deployment of the NMD system. The restructure modifies the NMD system deployment schedule from three years following a decision to deploy a system to a threshold date of FY2005. The restructuring also affirms the intent to comply with the 1972 ABM Treaty; however, the Administration will work in good faith to secure modification allowing for the deployment of a National Missile Defense system. Changes resulting from this restructure will be captured in a revised Acquisition Program Baseline (APB) and supporting documentation scheduled for approval at an April 1999 Department Review.

Limited reporting (i.e., RDT&E-only) is permitted for pre-Milestone II programs in accordance with Title 10, United States Code.

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8. (U) **Threshold Breaches:**

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The FY00-01 President's Budget results in the total program cost to exceed the current APB cost threshold. The increase in cost is due to a restructure of the NMD program. A Program Deviation Report has been initiated, and a revised APB reflecting this restructure will be forwarded to the Defense Acquisition Executive for approval at an April, 1999 Department Review.

9. (U) **Schedule:**

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
NMD Integrated System Test	SEP 99	SEP 99	JAN 00 (Ch-1)
Deployment Review	MAR 00	MAR 00	JUN 00 (Ch-1)
IOC	TBD	TBD	TBD

b. Current Change Explanations --

(U) (Ch-1) - The NMD Integrated System Test changed from SEP 99 to JAN 00 and the Deployment Review from MAR 00 to JUN 00 to reflect the Lead System Integrator (LSI) schedule. The LSI contract was awarded to Boeing in April 1998 for the development, integration, and deployment of an NMD system.

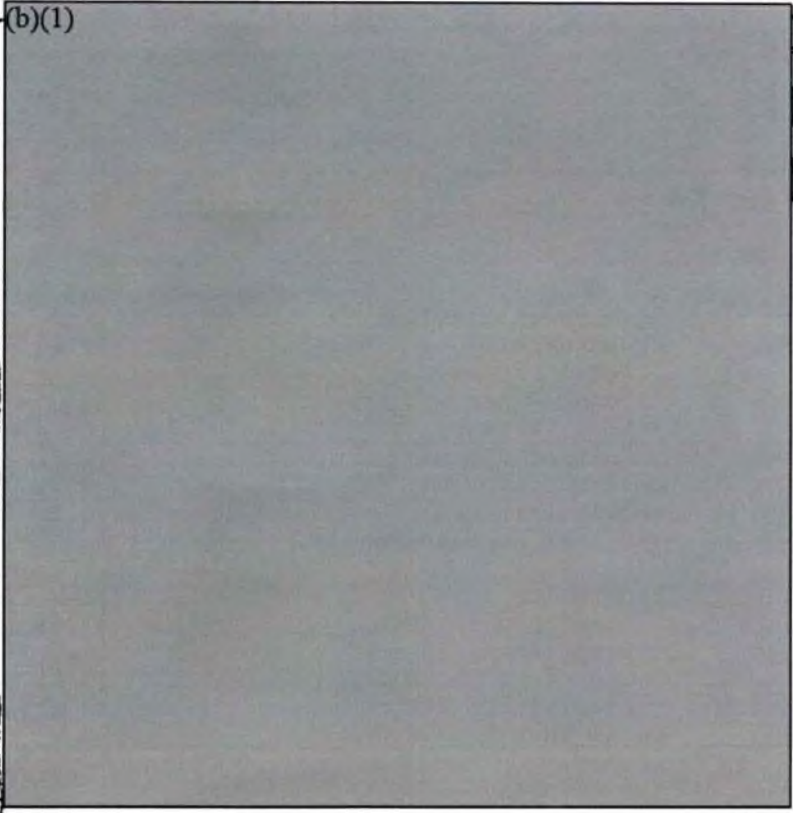
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10. (U) Performance Characteristics:

a. Performance --

	Planning <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
1 KPP 1: Operational Effectiveness for the Strategic Defense of the US	<div>(b)(1)</div> 			
1 Provide protection to all				
1 Against limited ballistic missile attacks of (RVs)				
1 With threat characterization				
1 To a negation probability of				
1 At a performance probability of				
1 Mission duration (hrs)				
1 Key functions (TBD) restored within (mins)				
1 System survivability				
1 KPP 2: HIC Parameter (sec)				
1 Selected employment options				
1 Kill assessment data (seconds)				
1 Safeguards to prevent inadvertent launches				
1 KPP 3: ABMDS Parameter (sec)				
1 System Life Cycle (yrs)				

(Ch-1)

(Ch-1)

(b)(1)

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10a. ~~(S)~~ Performance Characteristics (Cont'd):

(b)(1)

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	4892.0	4892.0	6582.5
Procurement	0.0	N/A	
Total Flyaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 88 Base-Year \$	4892.0	4892.0	6582.5
Escalation	1737.0	1737.0	2225.9
Development (RDT&E)	(1737.0)	(1737.0)	(2225.9)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	6629.0	6629.0	8808.4
b. (U) Quantity --			
Development (RDT&E)	N/A	N/A	0
Procurement	N/A	N/A	0
Total	N/A	N/A	0
c. Foreign Military Sales --	None.		
d. Nuclear Costs --	None.		

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12. (U) Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	6629.0	-	-	6629.0
Previous Changes:				
Economic	-109.4	-	-	-109.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-287.1	-	-	-287.1
Estimating	-41.1	-	-	-41.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-437.6	-	-	-437.6
Current Changes:				
Economic	-70.9	-	-	-70.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+2687.9	-	-	+2687.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+2617.0	-	-	+2617.0
Total Changes	+2179.4	-	-	+2179.4
Current Estimate	8808.4	-	-	8808.4

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13a. (U) Cost Variance Analysis (Cont'd):

(U) Summary (FY 1988 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	4892.0	-	-	4892.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-203.0	-	-	-203.0
Estimating	-26.2	-	-	-26.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-229.2	-	-	-229.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1919.7	-	-	+1919.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1919.7	-	-	+1919.7
Total Changes	+1690.5	-	-	+1690.5
Current Estimate	6582.5	-	-	6582.5

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

(1) <u>RDT&E</u>		
Revised escalation indices. (Economic)	N/A	-70.9
Adjustment for Current and Prior Inflation. (Estimating)	+24.4	+32.0
Reduction for Small Business Innovation Research. (Estimating)	-7.1	-9.3
NMD Program restructure, which modifies the NMD deployment schedule from three years following a decision to deploy a system to a threshold date of FY2005. (Estimating)	+1542.9	+2198.0
Budget reduced for Contracted Advisory and Assistance Services, inflation, and other reductions. (Estimating)	-48.2	-66.9
BMDO Reprogrammings for Lethality, Advanced Research Center, Space Based Laser, and other adjustments. (Estimating)	-46.3	-65.9
FY99 Supplemental to support additional testing hardware and software requirements. Of the \$600M Supplemental, \$150M will be allocated in FY99, and \$450M in FY00. (Estimating)	+454.0	+600.0
RDT&E Subtotal	+1919.7	+2617.0

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13b. (U) Cost Variance Analysis (Cont'd):

b. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	TBD	TBD	TBD	TBD
Total Cost	6629	0	0	8808.4
Total Quantity	0	0	0	0
Prog Acq Unit Cost	0	0	0	0

15. (U) Contract Information (Then-Year Dollars in Millions):

a. RDT&E --

(U) NMD GBR-P:

Raytheon Company, Bedford, MA
DASG60-92-C-0184, CPFF
Award: November 9, 1994
Definitized: April 18, 1997

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$142.2	N/A	0

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$166.9	N/A	0

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$174.2	\$173.7

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15a. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-5.3	\$-6.9
Cumulative Variances To Date (12/31/98)	<u>\$-4.9</u>	<u>\$-1.8</u>
Net Change	\$0.4	\$5.1

Explanation of Change:

(U) This contract was originally awarded in November 1994 and the GBR-P portion was definitized in April 1997. The Initial Contract Target Price reflects the April 1997 definitization.

The cumulative cost variance of -\$4.9M (-3.9%) reflects a favorable change of \$.4M since the last report. The improvement was mainly in the Data Processing Equipment (DPE) Work Breakdown Structure (WBS) element and is largely due to the definitization of a \$7.3M software impact equitable adjustment.

The cumulative schedule improved \$5.1M since the last report. The improvement was due to manufacturing catching up on the Transmit/Receive Element Assemblies (TREA) schedule and the finalization of many system engineering milestones, specifically in the areas of object classification, target object mapping and kill assessment.

The Program Manager's Estimated Price at Completion of \$173.7M reflects an increase of \$20M since the last report and is attributed to new work, specifically High Frequency (HF-4) Pilot Array and the software equitable adjustment added to the contract discussed above.

(U) NMD PLV-EKV: Lockheed Martin, Sunnyvale, CA DASG60-86-C-0014, CPFF Award: January 31, 1990 Definitized: January 31, 1990	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$232.2	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$262.1	N/A	0	\$313.1	\$314.1

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-21.6	\$-0.8
Cumulative Variances To Date (12/31/98)	<u>\$-42.7</u>	<u>\$-0.4</u>
Net Change	\$-21.1	\$0.4

Explanation of Change:

(U) The \$21.1M unfavorable change in the cumulative cost variance was spread throughout the program among numerous cost accounts. Several of the major contributors to the variance were In-Plant Integration Assembly and Test,

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15. (U) Contract Information (Cont'd):

Air Vehicle Miscellaneous Hardware, Project Management, Ground Support Equipment, Subsystem Requirements, Launch Ground Support Equipment Software and Avionics Equipment. Key causes of the variances include unplanned efforts required to recover from hardware/software anomalies, unplanned software modifications, revised overhead rates, underestimation of effort required to perform software upgrades, schedule adjustments (slips and accommodating late delivery), and additional scope on hardware upgrades.

The cumulative schedule variance of $-\$0.4\text{M}$ represents an improvement of $\$0.4\text{M}$ since the last report. The improvement occurred in Ground Support Equipment, and Launch Ground Support equipment.

The Program Manager's Estimate at Completion increased $\$33.6\text{M}$ since the last report based primarily on new work for Integrated System Test Capability, Spares, Access Stand, and Special Studies.

(U) <u>NMD EKV:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Boeing North American, Downey, CA DASG60-90-C-0165, CPFF Award: October 2, 1990 Definitized: October 2, 1990	\$310.1	N/A	0

	Current Contract Price		<u>Qty</u>	Estimated Price At Completion	
	<u>Target</u>	<u>Ceiling</u>		<u>Contractor</u>	<u>Program Manager</u>
	\$366.9	N/A	0	\$434.2	\$442.1

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-22.4	\$-11.4
Cumulative Variances To Date (12/31/98)	<u>\$-4.2</u>	<u>\$-3.2</u>
Net Change	\$18.2	\$8.2

Explanation of Change:

(U) The $\$18.2\text{M}$ favorable change in the cumulative cost variance was the result of Boeing North American (BNA) rebaselining their program to a January 1999 flight date, with the subsequent implementation of an Over Target Baseline (OTB), and single point adjustment (SPA) in September 1998. The Cost Variance (CV) on September 30, 1998 was $-\$60.2\text{M}$, and was driven mainly by the Seeker, Avionics, and Kill Vehicle Sub-System Integration, Assembly, and Test (KV S/S IA&T). Contributing to the variance were the increased support for vehicle Integration and Exoatmospheric Flight Test software development, increased costs resulting from algorithm changes, and increased subcontract efforts associated with antenna and modem activities. The CV of $-\$4.2$ since the SPA is driven mainly by the Seeker, Avionics, and KV S/S Eng IA&T.

The $\$8.2\text{M}$ improvement in the cumulative schedule variance (SV) was also due to the rebaselining described above. The SV on September 30, 1998 was

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15. (U) Contract Information (Cont'd):

-\$9.5M, and was driven mainly by activities in the Seeker, S/S Eng IA&T. The SV of -\$3.2M since the SPA is due mainly to the activities in the KV S/S IA&T, Avionics, and Flight Tests.

The Program Manager's Estimated Price at Completion increased \$38.7M since the last report, reflecting projected cost growth due to delays in deliveries of subsystem hardware, and complexities in development and integration of qualified software.

(U) <u>NMD EKV:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Raytheon Missile Systems, Tucson AZ			
DASG60-90-C-0166, CPFF	\$329.8	N/A	0
Award: October 2, 1990			
Definitized: October 2, 1990			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$384.7	N/A	0	\$417.5	\$424.7

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-19.6	\$-6.3
Cumulative Variances To Date (12/31/98)	<u>\$-22.1</u>	<u>\$-12.0</u>
Net Change	\$-2.5	\$-5.7

Explanation of Change:

(U) The \$2.5M unfavorable change in Raytheon's cumulative cost variance was due primarily to cost growth in the guidance unit, avionics and software efforts. The guidance unit effort experienced problems caused by kill vehicle integration complexities, which necessitated implementation of a second shift to preserve the flight schedule. The avionics increase was due largely to extensive rework on the electronics unit and technical problems and delays experienced by the battery vendor. The software cost variance was driven by delays in completion of various software builds caused largely by hardware-software integration problems and a high employee turnover rate.

The \$5.7M unfavorable change in the cumulative schedule variance occurred primarily in the sensor and avionics areas. The increase in the sensor schedule variance was driven by delays caused by the unavailability of flight qualified hardware (which delayed the assembly and testing of sub-assemblies) and rework and late material receipts on the sensor electronics. The increase in the avionics schedule variance occurred mostly in the electronics unit, inertial measurement unit, and battery efforts.

The increase to the Program Manager's Estimated Contract Price at Completion of \$18.1M reflects an increase to the contract budget of \$4.8M for definitization of two change orders, and additional projected cost

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15. (U) Contract Information (Cont'd):

growth for several elements, notably avionics, guidance unit, flight test and sensor. Also included is an anticipated increase in labor rates of about \$5.7M, caused by the Raytheon-Hughes consolidation (this rate increase is not yet reflected in the contractor's estimated price).

(U) <u>Multi-Serv. Launch Syst.:</u>			Initial Contract Price	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
Lockheed Martin Corp., Denver, CO				
F4704-92-C-0013, CPAF	\$30.8	N/A	1	
Award: May 18, 1992				
Definitized: May 13, 1992				

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$107.7	N/A	8	\$115.1	\$115.1

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-33.3	\$0.2
Cumulative Variances To Date (12/31/98)	<u>\$-30.4</u>	<u>\$-0.6</u>
Net Change	\$2.9	\$-0.8

Explanation of Change:

(U) This contract is managed by the Air Force and there are currently four launch missions remaining under this contract.

The historical cost variance is due primarily to the demo flight delay and a quantity reduction from forty to eight. This variance predates NMD involvement and is not expected to grow in the future. The last three missions were re-baselined on December 30, 1996. The total re-negotiated price for each of these missions is \$7M.

The \$2.9M favorable change in the cost variance is due to several contract modifications which added contract value for activities already included in the actual expenses (e.g. consolidation proposal, stretch-outs 3 and 4). The schedule variance unfavorable change of \$.8M is related to stretch-out 5, which is awaiting contract definitization.

The contractor recently reduced the estimate at completion by \$1.6M after determining the close-out costs and other risk evaluations.

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15. (U) Contract Information (Cont'd):

(U) LSI: Boeing North American, Downey, CA HQ0006-98-C-0003, CPAF Award: April 30, 1998 Definitized: April 30, 1998	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$1649.5	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1645.6	N/A	0	\$1645.6	\$1645.6

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (12/31/98)	<u>\$8.1</u>	<u>\$-10.4</u>
Net Change	\$8.1	\$-10.4

Explanation of Change:

(U) This contract was awarded on April 30, 1998. The Lead System Integrator (LSI) will be responsible for the development, integration, and deployment of the NMD system.

The Performance Measurement Baseline (PMB) was established as of the month-end September 1998 Cost Performance Report, representing the first Earned Value reporting for this contract. LSI actuals are substantially less than the plan, as reflected in the cost and schedule variances to date. However, the variances are within acceptable thresholds and the contractor does not expect any impacts to significant milestones.

Undistributed Budget contains \$434.4M and is comprised largely of three major subcontractors (TRW, Raytheon, Xontech). The BMC3 Element TRW subcontract was definitized in February 1999. The X-Band Radar Element Raytheon subcontract is scheduled for definitization in March 1999, and Upgraded Early Warning Radar Element Xontech subcontract in March 1999.

The TRW BMC3 System Engineering & Integration contract is no longer reflected in this SAR as it was transitioned to the LSI in August 1998.

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16. (U) Program Funding Summary (Current Estimate in Millions of Dollars):

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years (FY91-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	4573.1	836.6	866.7	2532.0	8808.4
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	4573.1	836.6	866.7	2532.0	8808.4

b. Annual Summary -- NMD

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY88 Dollars Nonrec	Flyaway FY88 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991				74.9	86.3
1992				159.9	189.3
1993				117.0	141.7
1994				81.1	100.1
1995				155.8	196.1
1996				453.0	579.6
1997				626.2	810.8
1998				716.5	935.7
1999				1160.3	1533.5
2000				623.3	836.6
2001				635.4	866.7
2002				544.0	754.2
2003				461.0	651.2
2004				441.5	636.8
2005				332.6	489.8
Subtotal				6582.5	8808.4

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total				6582.5	8808.4

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17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date - None.

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 2033.8

(U) Percent Total Program Expended: 23.1%

18. (U) Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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