



RCS: DD-A&T(Q&A)823-386



Ground/Air Task Oriented Radar (G/ATOR)

As of FY 2021 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

~~This document contains information that may be exempt from mandatory disclosure under the FOIA.~~

Table of Contents

Common Acronyms and Abbreviations for MDAP Programs	3
Program Information	5
Responsible Office	5
References	6
Mission and Description	7
Executive Summary	7
Threshold Breaches	10
Schedule	11
(U//FOUO) Performance	13
Track to Budget	17
Cost and Funding	17
Charts	24
Risks	26
Low Rate Initial Production	28
Foreign Military Sales	29
Nuclear Costs	30
Unit Cost	31
Cost Variance	34
Contracts	37
Deliveries and Expenditures	39
Operating and Support Cost	40

Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance
ACAT - Acquisition Category
ADM - Acquisition Decision Memorandum
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
\$B - Billions of Dollars
BA - Budget Authority/Budget Activity
Blk - Block
BY - Base Year
CAPE - Cost Assessment and Program Evaluation
CARD - Cost Analysis Requirements Description
CDD - Capability Development Document
CLIN - Contract Line Item Number
CPD - Capability Production Document
CY - Calendar Year
DAB - Defense Acquisition Board
DAE - Defense Acquisition Executive
DAMIR - Defense Acquisition Management Information Retrieval
DoD - Department of Defense
DSN - Defense Switched Network
EMD - Engineering and Manufacturing Development
EVM - Earned Value Management
FOC - Full Operational Capability
FMS - Foreign Military Sales
FRP - Full Rate Production
FY - Fiscal Year
FYDP - Future Years Defense Program
ICE - Independent Cost Estimate
IOC - Initial Operational Capability
Inc - Increment
JROC - Joint Requirements Oversight Council
\$K - Thousands of Dollars
KPP - Key Performance Parameter
LRIP - Low Rate Initial Production
\$M - Millions of Dollars
MDA - Milestone Decision Authority
MDAP - Major Defense Acquisition Program
MILCON - Military Construction
N/A - Not Applicable
O&M - Operations and Maintenance
ORD - Operational Requirements Document
OSD - Office of the Secretary of Defense
O&S - Operating and Support
PAUC - Program Acquisition Unit Cost

PB - President's Budget
PE - Program Element
PEO - Program Executive Officer
PM - Program Manager
POE - Program Office Estimate
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
SCP - Service Cost Position
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting
U.S. - United States
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)

Program Information

Program Name

Ground/Air Task Oriented Radar (G/ATOR)

DoD Component

Navy

Responsible Office

Mr. John Campoli
2200 Lester Ave
Quantico, VA 22134

john.campoli@usmc.mil

Phone: 703-432-3283

Fax: 703-432-3547

DSN Phone: 378-3283

DSN Fax: 278-3547

Date Assigned: April 18, 2019

References

SAR Baseline (Production Estimate)

Assistant Secretary of the Navy (Research, Development & Acquisition) (ASN(RDA)) Approved Acquisition Program Baseline (APB) dated April 14, 2014

Approved APB

Assistant Secretary of the Navy (Research, Development & Acquisition) (ASN(RDA)) Approved Acquisition Program Baseline (APB) dated June 4, 2019

Mission and Description

The Ground/Air Task Oriented Radar (G/ATOR) is a single material solution for the mobile Multi-Role Radar System and Ground Weapons Locating Radar (GWLR) requirements. It is a three-dimensional, short/medium range multi-role radar designed to detect unmanned aerial systems, cruise missiles, air breathing targets, rockets, artillery, and mortars. G/ATOR satisfies the warfighter's expeditionary needs across the Marine Air Ground Task Force spectrum replacing five legacy radar systems with a single solution. The Air Defense/ Surveillance Radar G/ATOR Block 1 provides capabilities in the Short Range Air Defense and Air Surveillance mission areas; GWLR G/ATOR Block 2 will address Counter-fire Targeting Missions; and Expeditionary Airport Surveillance Radar G/ATOR Block 4 will address Air Traffic Control missions. G/ATOR Block 4 is not included in the Acquisition Program Baseline. Resourcing may be included in future budget builds. G/ATOR provides real-time radar measurement data to the Common Aviation Command and Control System, Composite Tracking Network, and Advanced Field Artillery Tactical Data System.

Executive Summary

Program Highlights Since Last Report

Completed G/ATOR Block 2 Early Deployment Decision with early fielding of 4 LRIP units to 11th Marines in 2nd quarter FY 2019.

FRP Decision and FRP Contract awarded in June 2019.

Completed fielding 2 LRIP units to 10th Marines in September 2019.

Completed fielding 1 LRIP unit to Marine Air Control Squadron-4 Marines in October 2019.

Awarded FRP Lot 2 in December 2019 for 6 units.

There are no significant software-related issues with this program at this time.

History of Significant Developments Since Program Initiation

History of Significant Developments Since Program Initiation	
Date	Significant Development Description
July 2005	July 26, 2005: G/ATOR Program Milestone B ADM. This memorandum designated G/ATOR as an ACAT II program and approved entry into the System Development and Demonstration (SDD) phase. The MDA at program initiation was Assistant Secretary of the Navy (Research, Development and Acquisition) (ASN (RDA)).
September 2005	Initial development contract awarded to Northrop Grumman and became a subject of protest.
February 2007	The FY 2008 Senate Armed Services Committee Report directed the Secretary of the Navy to conduct an independent assessment, and submit a report to the Congressional Defense Committees, with the FY 2009 budget request on the Marine Corps acquisition of the G/ATOR. The report was provided to the Congressional Defense Committees on February 4, 2008. The report concluded the G/ATOR system design provides optimal capability across a wide variety of operational mission profiles. The system is properly phased to provide the necessary air defense capabilities to Joint forces with performance that exceeds that of the legacy systems it replaces.
March 2007	Deputy Commandant, Combat Development and Integration letter, and the subsequent Director, Force Protection Integration Division letter, dated August 3, 2007, clarified G/ATOR's compliance with Joint Requirements Oversight Council Memorandum 120-05, "Policy for Updating Capabilities Documents to Incorporate Force Protection and Survivability KPPs" dated June 13, 2005, by requiring G/ATOR to procure M1152A1 up-armored High Mobility Multipurpose Wheeled Vehicles. This KPP forced significant system redesign.
March 2007	Awarded SDD Contract to Northrop Grumman.
April 2007	ASN (RDA) directed transition of the G/ATOR Program from Marine Corps Systems Command to the newly established Program Executive Office Land Systems (PEO LS).
February 2009	The G/ATOR Program was designated a Department of Defense Special Interest program by a USD (AT&L) Memorandum.
October 2011	USD (AT&L) ADM, designated G/ATOR an ACAT IC program with the Navy as the lead component. G/ATOR was no longer a special interest program.
March 2014	ASN (RDA) G/ATOR Milestone C ADM authorized the procurement of LRIP Lot 1 units contingent upon approval of all statutory acquisition documentation. The memorandum also required ASN (RDA) authorization for an Early Deployment Decision (EDD) based on Marine Corps Operational Test and Evaluation Activity (MCOTEA) certification of Operational Effectiveness/Operational Suitability (OE/OS).
March 2015	On March 30, 2015, G/ATOR Program received Director, Capabilities Development Directorate letter that clarified G/ATOR reliability requirements and the development of an operationally meaningful Key System Attribute with the timeline for achieving the threshold and objective values.
June 2015	ASN (RDA) memorandum, dated June 11, 2015 amended the Milestone C ADM to require Director, MCOTEA to provide an assessment of progress towards OE/OS to support an EDD for GaAs – based GB1 and GB2 assets, and defer final certification of OE/OS to Initial Operational Test & Evaluation.
August 2015	Contract awarded to develop and verify the GB2 capability. GB2 will address Counterfire Targeting missions.
August 2016	Awarded LRIP GaN Contract to Northrop Grumman.
June 2017	MS C ADM clarification. Delegation of Authority for EDD of GB1 and GB2 systems to PEO LS on June 13, 2017.

December 2017	Director, MCOTEA provided an assessment of progress towards OE/OS to support an EDD of the G/ATOR GB1 in December 2017.
February 2018	The GB1 EDD was approved on February 15, 2018 by PEO LS allowing for the fielding of G/ATOR LRIP System 1 to Marine Air Control Squadron 2 (MACS) and System 3 to MACS-1.
February 2019	The GB2 EDD was approved on February 14, 2019 by PEO LS allowing for the fielding of G/ATOR LRIP Systems 2, 4, 5, 6 to 11th Marines.
June 2019	FRP Contract awarded.
September 2019	Fielding of G/ATOR LRIP Units 8 and 10 to 10th Marines.
October 2019	Fielding of G/ATOR LRIP Unit 7 to MACS-4.
December 2019	Awarded FRP Lot 2 for 6 units.

Threshold Breaches

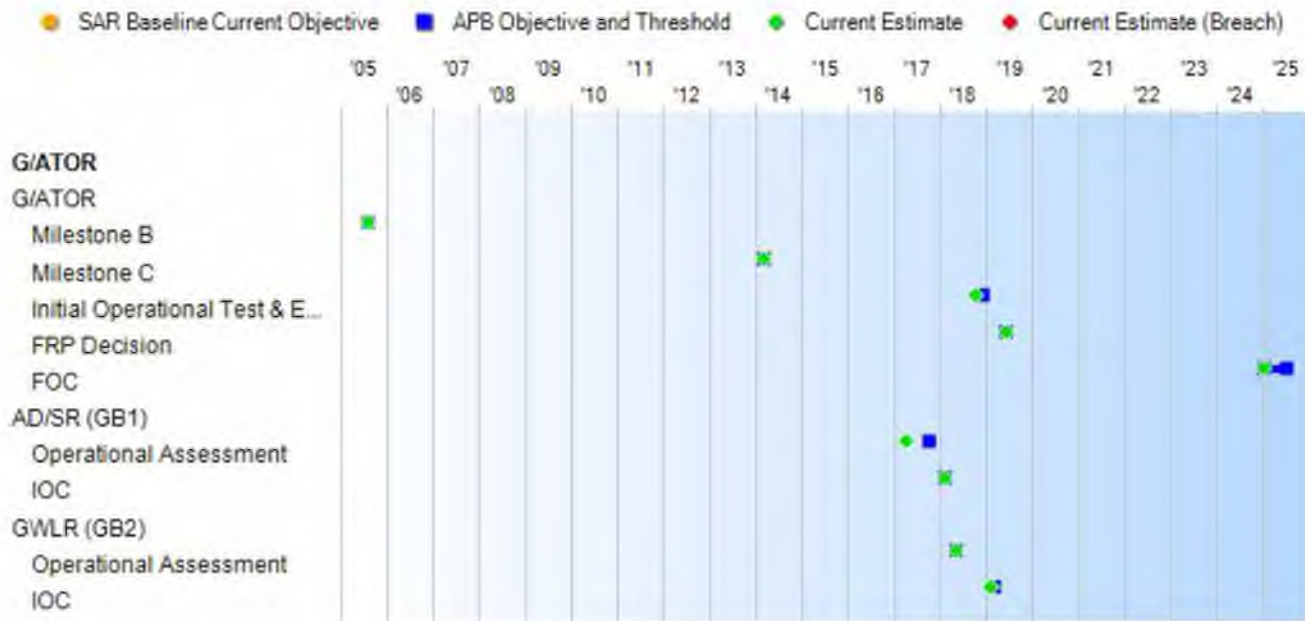
APB Breaches

Schedule		<input type="checkbox"/>
Performance		<input type="checkbox"/>
Cost	RDT&E	<input type="checkbox"/>
	Procurement	<input type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>
O&S Cost		<input type="checkbox"/>
Unit Cost	PAUC	<input type="checkbox"/>
	APUC	<input type="checkbox"/>

Nunn-McCurdy Breaches

Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
G/ATOR				
Milestone B	Aug 2005	Aug 2005	Aug 2005	Aug 2005
Milestone C	Mar 2014	Mar 2014	Mar 2014	Mar 2014
Initial Operational Test & Evaluation	Oct 2018	Dec 2018	Dec 2018	Oct 2018
FRP Decision	Mar 2019	Jun 2019	Jun 2019	Jun 2019
FOC	N/A	Jan 2025	Jul 2025	Jan 2025
AD/SR (GB1)				
Operational Assessment	Aug 2016	Oct 2017	Oct 2017	Apr 2017
IOC	Feb 2017	Feb 2018	Feb 2018	Feb 2018
GWLR (GB2)				
Operational Assessment	Oct 2017	May 2018	May 2018	May 2018
IOC	Feb 2018	Mar 2019	Mar 2019	Feb 2019

Change Explanations

(Ch-1) The current estimate for FRP Decision changed from May 2019 to June 2019 to reflect the actual date.

(Ch-2) FOC is a new Milestone in this SAR.

Acronyms and Abbreviations

AD/SR - Air Defense/Surveillance Radar

GB1/2 - Ground/Air Task Oriented Radar Block 1/2

GWLR - Ground Weapons Locating Radar

Track to Budget

RDT&E

Appn	BA	PE	
Navy	1319 07	0204460M	
	Project	Name	
	9C89	Marine Ground-Air Radar	
Navy	1319 04	0206313M	
	Project	Name	
	3099D	Radar Systems	(Shared) (Sunk)
	Notes: .		
Navy	1319 07	0206313M	
	Project	Name	
	9C89	G/ATOR	(Shared) (Sunk)

Procurement

Appn	BA	PE	
Navy	1109 04	0204460M	
	Line Item	Name	
	4650	Radar Systems	(Shared) (Sunk)
Navy	1109 04	0206313M	
	Line Item	Name	
	4650	Radar Systems	(Shared) (Sunk)
Navy	1109 04	0506313M	
	Line Item	Name	
	4655	Ground/Air Task Oriented Radar	
	Notes: G/ATOR Reserves		
Navy	1109 04	0204460M	
	Line Item	Name	
	4655	Ground/Air Task Oriented Radar	
Navy	1109 07	0204460M	
	Line Item	Name	
	7000	Spares and Repairs Parts	(Shared)

Cost and Funding

Cost Summary

Total Acquisition Cost						
Appropriation	BY 2012 \$M			BY 2012 \$M	TY \$M	
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective
RDT&E	986.5	1042.0	1146.2	1074.7	1019.2	1077.0
Procurement	1625.3	1711.5	1882.7	1720.3	1894.8	1997.1
Flyaway	--	--	--	1485.0	--	--
Recurring	--	--	--	1316.7	--	--
Non Recurring	--	--	--	168.3	--	--
Support	--	--	--	235.3	--	--
Other Support	--	--	--	125.0	--	--
Initial Spares	--	--	--	110.3	--	--
MILCON	3.5	0.0	0.0	0.0	3.9	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0
Total	2615.3	2753.5	N/A	2795.0	2917.9	3074.1

Current APB Cost Estimate Reference

Source documents: Full Rate Production Decision Program Office Estimate for Ground/Air Task Oriented Radar; Naval Center for Cost Analysis Independent Cost Estimated for AN/TPS-80 of 29 Apr 2019. The Acquisition Cost, APUC and PAUC are reflective of the Full Funding Certification Memo dated May 20, 2019

Cost Notes

An Independent Cost Estimate (ICE) in support of the Full Rate Production Decision for Ground/Air Task Oriented Radar was delegated to and performed by the Naval Center for Cost Analysis. The ICE in support of FRPD was completed in April 2019. The CAPE concurred with the NCCA's assessment that there were no major cost risks to the program.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	0	0	0
Procurement	45	45	45
Total	45	45	45

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2021 President's Budget / December 2019 SAR (TY\$ M)									
Appropriation	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
RDT&E	1005.0	28.9	22.2	13.7	13.6	12.5	12.8	2.2	1110.9
Procurement	911.3	286.3	297.8	311.5	35.4	33.7	34.5	97.4	2007.9
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2021 Total	1916.3	315.2	320.0	325.2	49.0	46.2	47.3	99.6	3118.8
PB 2020 Total	1903.8	310.1	308.6	324.0	45.7	46.7	59.4	123.4	3121.7
Delta	12.5	5.1	11.4	1.2	3.3	-0.5	-12.1	-23.8	-2.9

Quantity Summary										
FY 2021 President's Budget / December 2019 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	21	8	8	8	0	0	0	0	45
PB 2021 Total	0	21	8	8	8	0	0	0	0	45
PB 2020 Total	0	21	8	8	8	0	0	0	0	45
Delta	0	0	0	0	0	0	0	0	0	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding							
1319 RDT&E Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2004	--	--	--	--	--	--	6.7
2005	--	--	--	--	--	--	8.9
2006	--	--	--	--	--	--	13.5
2007	--	--	--	--	--	--	37.2
2008	--	--	--	--	--	--	88.8
2009	--	--	--	--	--	--	127.4
2010	--	--	--	--	--	--	67.2
2011	--	--	--	--	--	--	63.3
2012	--	--	--	--	--	--	110.1
2013	--	--	--	--	--	--	76.7
2014	--	--	--	--	--	--	72.9
2015	--	--	--	--	--	--	90.6
2016	--	--	--	--	--	--	63.2
2017	--	--	--	--	--	--	78.9
2018	--	--	--	--	--	--	56.4
2019	--	--	--	--	--	--	43.2
2020	--	--	--	--	--	--	28.9
2021	--	--	--	--	--	--	22.2
2022	--	--	--	--	--	--	13.7
2023	--	--	--	--	--	--	13.6
2024	--	--	--	--	--	--	12.5
2025	--	--	--	--	--	--	12.8
2026	--	--	--	--	--	--	2.2
Subtotal	--	--	--	--	--	--	1110.9

Annual Funding 1319 RDT&E Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2012 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2004	--	--	--	--	--	--	7.8
2005	--	--	--	--	--	--	10.1
2006	--	--	--	--	--	--	14.8
2007	--	--	--	--	--	--	39.8
2008	--	--	--	--	--	--	93.3
2009	--	--	--	--	--	--	132.2
2010	--	--	--	--	--	--	68.7
2011	--	--	--	--	--	--	63.2
2012	--	--	--	--	--	--	108.2
2013	--	--	--	--	--	--	74.6
2014	--	--	--	--	--	--	69.9
2015	--	--	--	--	--	--	85.8
2016	--	--	--	--	--	--	58.8
2017	--	--	--	--	--	--	72.1
2018	--	--	--	--	--	--	50.3
2019	--	--	--	--	--	--	37.8
2020	--	--	--	--	--	--	24.8
2021	--	--	--	--	--	--	18.7
2022	--	--	--	--	--	--	11.3
2023	--	--	--	--	--	--	11.0
2024	--	--	--	--	--	--	9.9
2025	--	--	--	--	--	--	9.9
2026	--	--	--	--	--	--	1.7
Subtotal	--	--	--	--	--	--	1074.7

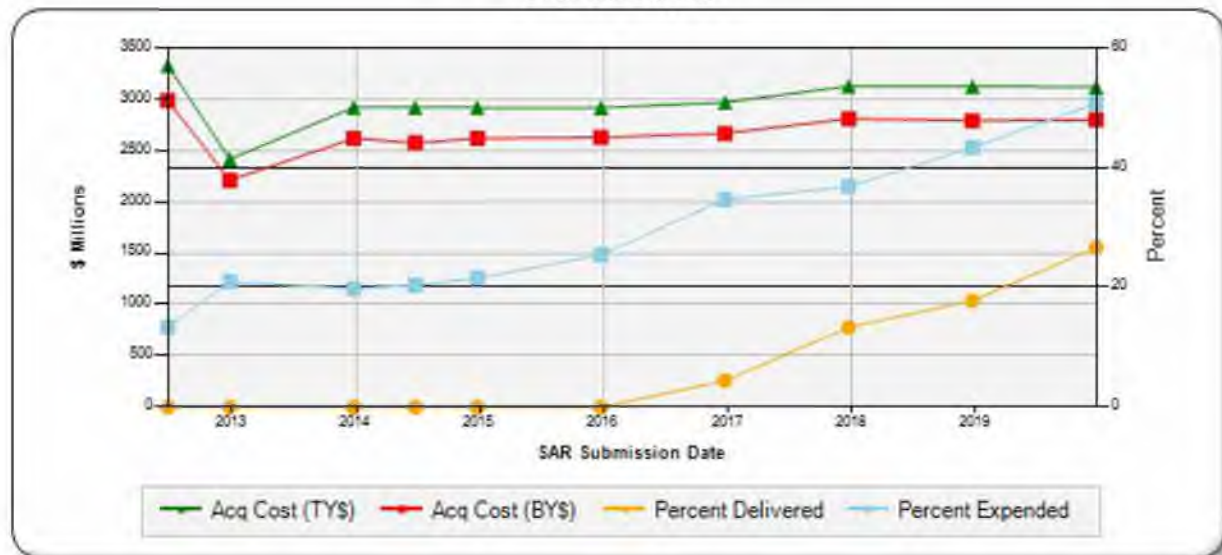
Annual Funding							
1109 Procurement Procurement, Marine Corps							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2013	2	77.1	--	9.3	86.4	3.0	89.4
2014	2	77.4	--	5.3	82.7	9.2	91.9
2015	2	72.6	--	6.4	79.0	11.9	90.9
2016	3	108.9	--	1.0	109.9	17.2	127.1
2017	3	108.4	--	10.8	119.2	14.5	133.7
2018	3	110.8	--	3.3	114.1	32.1	146.2
2019	6	196.7	--	11.5	208.2	23.9	232.1
2020	8	250.8	--	10.3	261.1	25.2	286.3
2021	8	244.5	--	25.2	269.7	28.1	297.8
2022	8	264.9	--	10.3	275.2	36.3	311.5
2023	--	--	--	2.0	2.0	33.4	35.4
2024	--	--	--	6.4	6.4	27.3	33.7
2025	--	--	--	19.8	19.8	14.7	34.5
2026	--	--	--	14.5	14.5	--	14.5
2027	--	--	--	13.5	13.5	--	13.5
2028	--	--	--	7.0	7.0	--	7.0
2029	--	--	--	6.1	6.1	--	6.1
2030	--	--	--	6.9	6.9	--	6.9
2031	--	--	--	8.4	8.4	--	8.4
2032	--	--	--	--	--	--	--
2033	--	--	--	--	--	--	--
2034	--	--	--	9.0	9.0	--	9.0
2035	--	--	--	--	--	--	--
2036	--	--	--	--	--	--	--
2037	--	--	--	9.4	9.4	--	9.4
2038	--	--	--	--	--	--	--
2039	--	--	--	--	--	--	--
2040	--	--	--	9.0	9.0	--	9.0
2041	--	--	--	--	--	--	--
2042	--	--	--	--	--	--	--
2043	--	--	--	7.9	7.9	--	7.9
2044	--	--	--	--	--	--	--
2045	--	--	--	5.7	5.7	--	5.7
Subtotal	45	1512.1	--	219.0	1731.1	276.8	2007.9

Annual Funding							
1109 Procurement Procurement, Marine Corps							
Fiscal Year	Quantity	BY 2012 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2013	2	74.3	--	8.9	83.2	2.9	86.1
2014	2	73.6	--	5.0	78.6	8.8	87.4
2015	2	68.0	--	6.0	74.0	11.2	85.2
2016	3	100.2	--	0.9	101.1	15.9	117.0
2017	3	97.8	--	9.7	107.5	13.1	120.6
2018	3	98.1	--	2.9	101.0	28.4	129.4
2019	6	170.7	--	10.0	180.7	20.7	201.4
2020	8	213.4	--	8.8	222.2	21.4	243.6
2021	8	204.0	--	20.9	224.9	23.5	248.4
2022	8	216.6	--	8.4	225.0	29.8	254.8
2023	--	--	--	1.6	1.6	26.8	28.4
2024	--	--	--	5.0	5.0	21.5	26.5
2025	--	--	--	15.3	15.3	11.3	26.6
2026	--	--	--	11.0	11.0	--	11.0
2027	--	--	--	10.0	10.0	--	10.0
2028	--	--	--	5.1	5.1	--	5.1
2029	--	--	--	4.3	4.3	--	4.3
2030	--	--	--	4.8	4.8	--	4.8
2031	--	--	--	5.7	5.7	--	5.7
2032	--	--	--	--	--	--	--
2033	--	--	--	--	--	--	--
2034	--	--	--	5.8	5.8	--	5.8
2035	--	--	--	--	--	--	--
2036	--	--	--	--	--	--	--
2037	--	--	--	5.7	5.7	--	5.7
2038	--	--	--	--	--	--	--
2039	--	--	--	--	--	--	--
2040	--	--	--	5.2	5.2	--	5.2
2041	--	--	--	--	--	--	--
2042	--	--	--	--	--	--	--
2043	--	--	--	4.3	4.3	--	4.3
2044	--	--	--	--	--	--	--
2045	--	--	--	3.0	3.0	--	3.0
Subtotal	45	1316.7	--	168.3	1485.0	235.3	1720.3

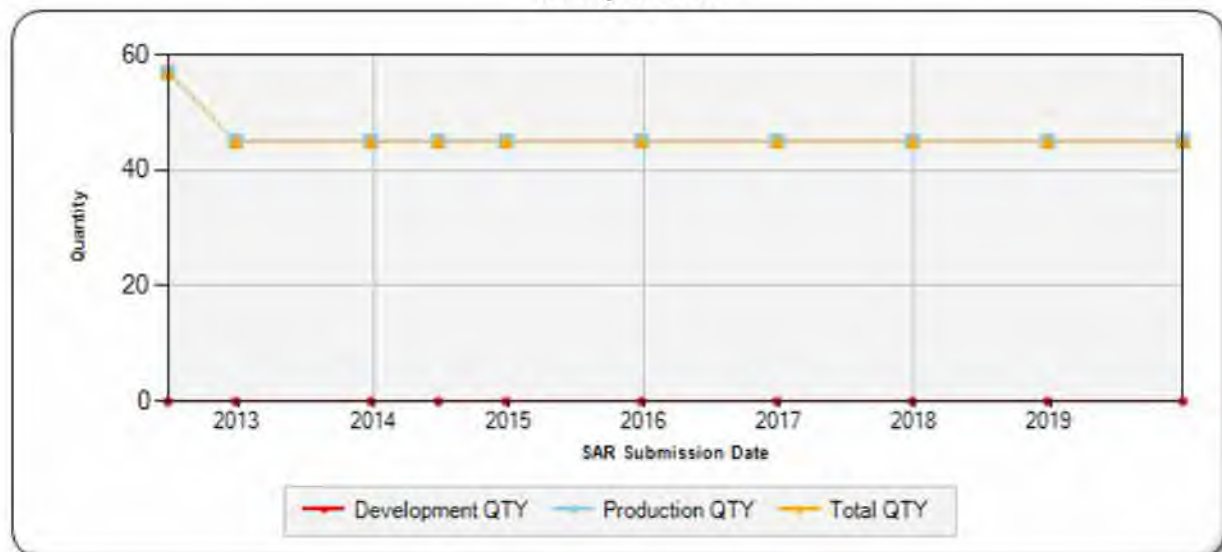
Charts

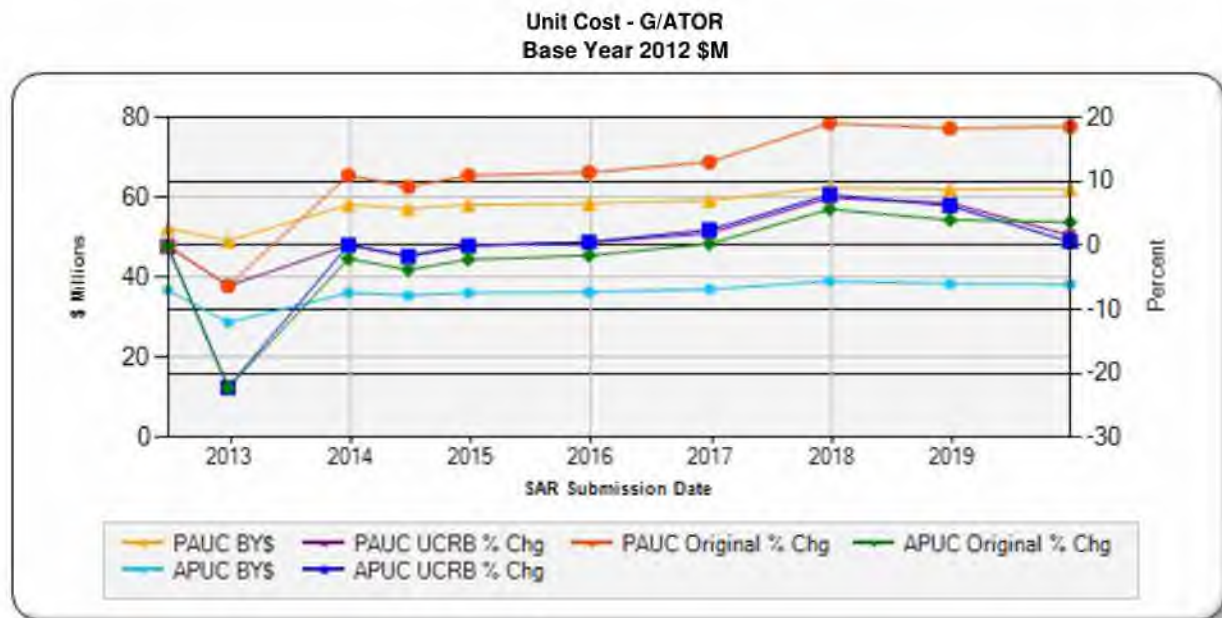
G/ATOR first began SAR reporting in June 2012

Program Acquisition Cost - G/ATOR
Base Year 2012 \$M



Quantity - G/ATOR





Risks

Significant Schedule and Technical Risks

Significant Schedule and Technical Risks	
APB AMD (May 2012)	
1.	Schedule Risk: If the software requirements definition, code & unit test, and software integration is not completed per the defined schedule, then the system integration and test schedule will not meet the Engineering Development Model (EDM) delivery schedule for Developmental Test (DT). Mitigation: Completion of the Radar Control Signal Processor (RCSP) development and Software Qualification Test (SQT). Conduct safety testing.
Milestone B (April 2005)	
1.	Schedule Risk: Funding profile imposed by Program Objective Memorandum (POM)-06 is not conducive to a sound systems engineering approach, and may cause schedule delays. Mitigation: Evaluation of offerors' proposals on approach to mitigate uneven funding. Funding profile released to industry as part of draft Request for Proposal (RFP) documents in order to ensure that offerors are aware of the situation.
2.	Technical Risk: Inadequate cooling design of array and electronic equipment bays may decrease reliability and increase weight and power requirements. Mitigation: Investigation and fabrication of composite prototype structures. Establishment of a cooling margin (reserve) as a proposal evaluation factor. Investigation of high power transmit/receive (T/R) devices.
Milestone C (January 2014)	
1.	Technical Risk: If system reliability does not improve system will not meet Mean Time Between Failure (MTBF) KSAs. Mitigation: Received clarification from Combat, Development and Integration (CD&I) regarding timeframe for compliance, i.e. at conclusion of GB2 Follow-on Test and Evaluation (FOT&E). Execute Software hardening efforts to improve software stability. Incorporate Design for Reliability (DFR) into LRIP.
2.	Technical Risk: The 2014 SCP identified the primary areas of risk and uncertainty for this program was associated with GaN technology insertion. The SCP accounted for uncertainty in the area of GaN T/R Module development and GaN antenna array depopulation. Mitigation: Costs for additional test events associated with GaN technology insertion were included in the ICE based on discussions with DOT&E staff.
Current Estimate (December 2019)	
1.	None. There are no known significant Schedule or Technical risks with this program at this time. The system is currently undergoing Full Rate Production.

Risks

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Baseline Estimate (June 2019)	
1.	The current baseline estimate reflects the Service Cost Position (SCP) that the Naval Center for Cost Analysis (NCCA) developed in support of the Full Rate Production (FRP). The SCP was also used as the basis for the June 2019 Acquisition Program Baseline (APB). The estimate is based on a production quantity of 45 and supports an FOC of FY 2025.
Original Baseline Estimate (May 2012)	
1.	The original baseline estimate was developed after G/ATOR was officially designated as an ACAT IC program by ASN (RDA). The estimate was based on a production quantity of 57 (of which only 45 were funded) and supported an FY 2024 FOC.
Revised Original Estimate (N/A)	
None	
Current Procurement Cost (December 2019)	
1.	The Current Procurement Cost reflects the 2019 SCP with fact of life changes in PB 2021. No significant cost risk.

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	3/10/2014	8/8/2016
Approved Quantity	14	15
Reference	MS C ADM	Justification and Authorization (J&A) No. 15,077 Amendment (1)
Start Year	2014	2014
End Year	2018	2018

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the MDA authorization of additional LRIP units to mitigate risk associated with conversion to Gallium Arsenide (GaN) technology and associated testing (no change to total Approved Acquisition Objective (AAO) quantity).

G/ATOR

December 2019 SAR

Foreign Military Sales

None

G/ATOR

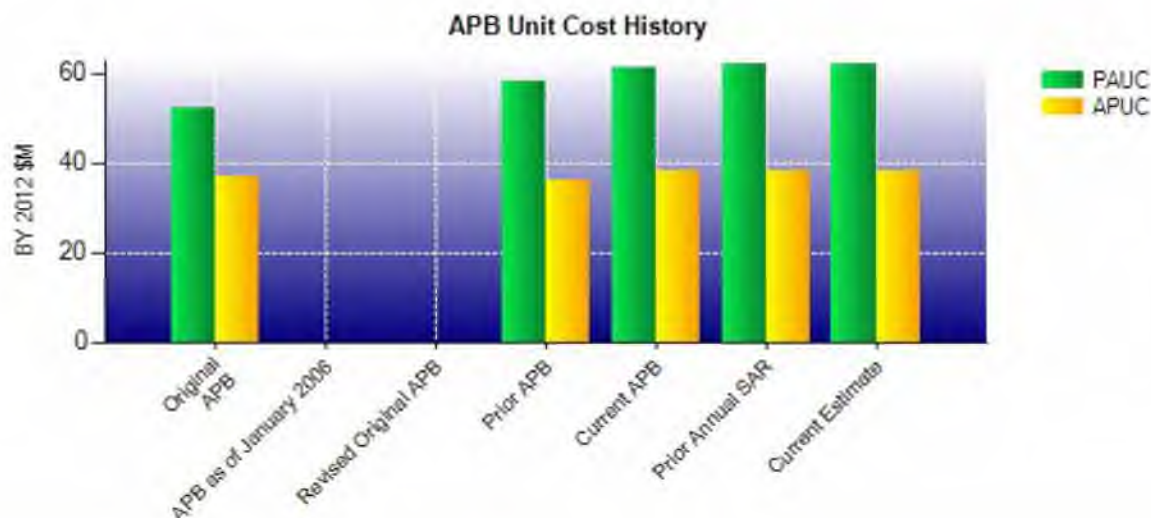
December 2019 SAR

Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2012 \$M	BY 2012 \$M	% Change
	Current UCR Baseline (Jun 2019 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	2753.5	2795.0	
Quantity	45	45	
Unit Cost	61.189	62.111	+1.51
Average Procurement Unit Cost			
Cost	1711.5	1720.3	
Quantity	45	45	
Unit Cost	38.033	38.229	+0.52
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2012 \$M	BY 2012 \$M	% Change
	Original UCR Baseline (May 2012 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	2987.3	2795.0	
Quantity	57	45	
Unit Cost	52.409	62.111	+18.51
Average Procurement Unit Cost			
Cost	2103.1	1720.3	
Quantity	57	45	
Unit Cost	36.896	38.229	+3.61



APB Unit Cost History					
Item	Date	BY 2012 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	May 2012	52.409	36.896	58.349	42.665
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	Apr 2014	58.118	36.118	64.842	42.107
Current APB	Jun 2019	61.189	38.033	68.313	44.380
Prior Annual SAR	Dec 2018	61.964	38.347	69.371	44.776
Current Estimate	Dec 2019	62.111	38.229	69.307	44.620

SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial PAUC Development Estimate	Changes								PAUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
58.349	0.367	5.249	0.813	0.000	1.451	0.000	-1.387	6.493	64.842

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
64.842	-0.691	0.000	-0.076	2.793	-1.244	0.000	3.683	4.465	69.307

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial APUC Development Estimate	Changes								APUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
42.665	0.276	1.067	0.813	0.000	-1.327	0.000	-1.387	-0.558	42.107

Current SAR Baseline to Current Estimate (TY \$M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
42.107	-0.556	0.000	-0.076	1.647	-2.064	0.000	3.562	2.513	44.620

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	Aug 2005	Aug 2005	Aug 2005
Milestone C	N/A	Jul 2013	Mar 2014	Mar 2014
IOC	N/A	Aug 2016	Feb 2017	Feb 2018
Total Cost (TY \$M)	N/A	3325.9	2917.9	3118.8
Total Quantity	N/A	57	45	45
PAUC	N/A	58.349	64.842	69.307

Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	1019.2	1894.8	3.9	2917.9
Previous Changes				
Economic	-6.8	-23.0	-0.1	-29.9
Quantity	--	--	--	--
Schedule	--	-3.4	--	-3.4
Engineering	+51.6	+64.3	--	+115.9
Estimating	+37.4	-39.2	-3.8	-5.6
Other	--	--	--	--
Support	+5.4	+121.4	--	+126.8
Subtotal	+87.6	+120.1	-3.9	+203.8
Current Changes				
Economic	+0.8	-2.0	--	-1.2
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	+9.8	--	+9.8
Estimating	+3.3	-53.7	--	-50.4
Other	--	--	--	--
Support	--	+38.9	--	+38.9
Subtotal	+4.1	-7.0	--	-2.9
Total Changes	+91.7	+113.1	-3.9	+200.9
Current Estimate	1110.9	2007.9	--	3118.8

Summary BY 2012 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	986.5	1625.3	3.5	2615.3
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	-0.1	-0.1
Engineering	+44.7	+53.8	--	+98.5
Estimating	+31.6	-57.3	-3.4	-29.1
Other	--	--	--	--
Support	--	+103.8	--	+103.8
Subtotal	+76.3	+100.3	-3.5	+173.1
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	+8.3	--	+8.3
Estimating	+11.9	-43.8	--	-31.9
Other	--	--	--	--
Support	--	+30.2	--	+30.2
Subtotal	+11.9	-5.3	--	+6.6
Total Changes	+88.2	+95.0	-3.5	+179.7
Current Estimate	1074.7	1720.3	--	2795.0

Previous Estimate: December 2018

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+0.8
Revised estimate to incorporate prior year actuals with reconciliation of PBIS report. (Estimating)	+15.6	+16.0
Revised estimate to remove out year software Engineering Change Orders/Proposals (ECO/ECPs). (Estimating)	-29.4	-44.3
Revised estimate to incorporate software burn down as negotiated via the Service Cost Position (SCP). (Estimating)	+10.8	+12.7
Revised estimate to reflect budget adjustments enacted. (Estimating)	+9.8	+12.7
Revised estimate due to incorporate Congressional Additions for Initiatives. (Estimating)	+5.5	+6.6
Adjustment for current and prior escalation. (Estimating)	-0.4	-0.4
RDT&E Subtotal	+11.9	+4.1

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-2.0
New Engineering Change to incorporated Engineering Change Order/Proposals (ECO/ECPs) for Full Rate Production Baseline. (Engineering)	+8.3	+9.8
Revised estimate to incorporate prior year actuals with reconciliation of PBIS report from Service Cost Position (SCP). (Estimating)	-3.8	-3.8
Revised estimate for outyear methodology and phasing for post FRP engineering change rate. (Estimating)	+2.8	+4.9
Revised estimating methodology for retrofit approach. (Estimating)	-25.1	-31.5
Revised estimating methodology associated with efforts to closeout FRP in support of FOC. (Estimating)	-18.6	-24.2
Revised estimate due to incorporate Congressional Additions for Initiatives. (Estimating)	+0.3	+0.6
Revised estimate reconcile POE to OSD out-year inflation (Estimating)	-0.1	-0.3
Adjustment for current and prior escalation. (Estimating)	+0.7	+0.6
Adjustment for current and prior escalation. (Support)	0.0	+0.2
Increase in Other Support and phasing for facilitization. (Support)	+17.6	+22.6
Increase in Initial Spares from revised spares requirements based Service Cost Position revised estimate. (Support)	+12.6	+16.1
Procurement Subtotal	-5.3	-7.0

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: Full Rate Production (FRP)
Contractor: Northrop Grumman Corporation
Contractor Location: 1580 West Nursery Road
 Linthicum Heights, MD 21090
Contract Number: M67854-19-C-0043/10
Contract Type: Firm Fixed Price (FFP)
Award Date: June 07, 2019
Definitization Date: November 20, 2019

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
194.8	N/A	6	396.8	N/A	12	396.8	396.8

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to Initial Contract Price Target was based on the base year option, the Current Contract Price Target include the exercise of Option 2 for quantity of six units with an additional option to be exercised for two additional units.

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FFP) contract.

Contract Identification

Appropriation: Procurement
Contract Name: LRIP GaN
Contractor: Northrop Grumman Corporation
Contractor Location: 1580 West Nursery Road
 Linthicum Heights, MD 21090
Contract Number: M67854-16-C-0211/9
Contract Type: Fixed Price Incentive(Firm Target) (FPIF), Cost Plus Fixed Fee (CPFF), Firm Fixed Price (FFP)
Award Date: August 31, 2016
Definitization Date: August 31, 2016

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
126.2	132.1	3	494.6	511.3	9	411.5	417.1

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to exercising 2 additional lots of 6 units, bringing total LRIP unit quantity to 9, the incorporation of Interim Contractor Logistics Support efforts, and incorporations of Field Service Representative Support for fielded assets.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (11/22/2019)	+3.3	-13.6
Previous Cumulative Variances	+4.0	-7.7
Net Change	-0.7	-5.9

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to Delay in delivery of material resulting in late material receipts.

The unfavorable net change in the schedule variance is due to Delay in delivery of material receipts to support some lower level LRU and manifold builds.

Notes

All options for Gallium Arsenide (GaN) LRIP Prime Mission Product (PMP) have been exercised to date.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	45	12	45	26.67%
Total Program Quantity Delivered	45	12	45	26.67%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	3118.8	Years Appropriated	17
Expended to Date	1581.5	Percent Years Appropriated	40.48%
Percent Expended	50.71%	Appropriated to Date	2231.5
Total Funding Years	42	Percent Appropriated	71.55%

The above data is current as of February 10, 2020.

Operating and Support Cost

Cost Estimate Details

Date of Estimate: January 24, 2020
Source of Estimate: POE
Quantity to Sustain: 45
Unit of Measure: System
Service Life per Unit: 20.00 Years
Fiscal Years in Service: FY 2018 - FY 2044

A system consists of the Radar Equipment Group, the Communications Equipment Group, and the Power Equipment Group.

Sustainment Strategy

The sustainment strategy includes organic support with contract support for the depot level. Current Product Support Strategy employs Contractor Logistics Support (CLS) during the EMD phase to provide support for the two Engineering Development Models and up to 18 LRIP systems through Interim CLS on the Gallium Nitride (GaN) and FRP contracts. During production some components may remain under CLS, others may transition to Performance Based Logistics and others may transition to traditional organic support.

Antecedent Information

The AN/TPS-63B Radar is the antecedent system. There is no data in the Naval Visibility and Management of Operating and Support Costs database for the antecedent system.

Cost Element	Annual O&S Costs BY2012 \$M	
	G/ATOR Average Annual Cost Per System	AN/TPS-63B Radar (Antecedent) Average Annual Cost Per System
Unit-Level Manpower	0.000	0.000
Unit Operations	0.013	0.000
Maintenance	1.623	0.000
Sustaining Support	0.412	0.000
Continuing System Improvements	0.364	0.000
Indirect Support	0.076	0.000
Other	0.000	--
Total	2.488	--

Unitized costs are inclusive of all Internal (Program Level) and External (Enterprise Level) Costs .

Item	Total O&S Cost \$M			
	G/ATOR			AN/TPS-63B Radar (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	2124.8	2337.3	2239.2	N/A
Then Year	3066.5	N/A	3059.0	N/A

The Total O&S Costs upon which the APB was developed did not fully account for all Internal (Program Management Office Level) and External (Enterprise Level Cost). This omission has an impact on the calculation for breach purposes. The full cost per unit and corresponding annual cost as listed above is inclusive of all Internal and External Costs.

Equation to Translate Annual Cost to Total Cost

Total O&S cost = Average Annual Cost Per System * # of systems * Service Life = \$2.488M * 45 * 20 = \$2239M

* To provide a true comparison to the APB for breach purposes the Total O&S cost equation does not include the externally funded Military Personnel (MILPERS).

O&S Cost Variance		
Category	BY 2012 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2018 SAR	2477.9	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	-19.7	Revised estimated associated with product support strategy.
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	-219.0	Estimating of the Externally Funded Cost for MILPERS was not included in Production APB. This error can only be remedied through a revision to the APB to fully account for Total Ownership Cost as denoted in prior SAR submissions.
Total Changes	-238.7	
Current Estimate	2239.2	

Disposal Estimate Details

Date of Estimate: January 24, 2019
Source of Estimate: POE
Disposal/Demilitarization Total Cost (BY 2012 \$M): 3.2

TY Total disposal cost are \$5.6M.

G/ATOR

December 2019 SAR

PLCCE December 2019 aligned to PB21.