Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-373

MQ-4C Triton Unmanned Aircraft System (MQ-4C Triton)

As of FY 2020 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Sensitivity Originator

No originator information is available at this time.

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
MQ-4C Triton Unmanned Aircraft System (MQ-4C Triton)

DoD Component
Navy

Responsible Office

CAPT Daniel Mackin
47561 Ranch Road
Bldg 4023
Naval Air Station Patuxent River, MD 20670

daniel.mackin@navy.mil

Phone: 301-757-5821
Fax: 301-757-9459
DSN Phone: 301-757-5821
DSN Fax: 757-9459
Date Assigned: September 5, 2017

References

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated December 20, 2016

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated December 20, 2016

Mission and Description

The MQ-4C Triton Unmanned Aircraft System (MQ-4C Triton) is an integrated System of Systems and a force multiplier for the Joint Force and Fleet Commander, enhancing battlespace awareness and shortening the sensor-to-shooter kill chain. The system provides multiple-sensor, persistent maritime and littoral Intelligence, Surveillance and Reconnaissance data collection and dissemination as well as an airborne communications relay capability to Combatant Commanders, Expeditionary Strike Group Commanders, Carrier Strike Group Commanders, and other designated U.S. and Joint Commanders. The addition of a de-icing capability over the baseline Global Hawk provides operators with the capability to transition through icing conditions. The mission sensors installed on the MQ-4C Triton provide 360 degree radar and Electro-Optical/Infrared coverage. Additional functionality that optimizes the system for maritime search operations includes an Automatic Identification System and an Electronic Support Measures system. The MQ-4C Triton is a tactical, land-based, forward deployed platform that will operate from five operational sites (orbits) worldwide. It will provide surveillance when no other naval forces are present and will support operations in the littorals. Furthermore, the asset will respond to theater level operational or national strategic taskings.

Executive Summary

Program Highlights Since Last Report

The Triton program is on track to meet IOC in 3Q FY 2021. During this reporting period, the Triton program continued the operational test period (OT-C1) of Integrated Functional Capability (IFC) 3 in a phased (crawl, walk, run) approach. The crawl phase was initiated on February 16, 2018 at the Patuxent River, MD test facilities. A series of ground tests and seven test flights were conducted with the IFC 3 software build as part of the OT-C1 crawl and walk phases. In September 2018, led by the VUP-19 and VX-1 test squadrons, the OT-C1 run phase began in Pt. Mugu with two Triton aircraft to engage in operational test for early operational capability (EOC) preparations. The first operational test flight occurred on September 5, 2018 in Pt. Mugu. On September 12, 2018, during the fourth of nine routine test flights, one aircraft (B-6) was involved in a Class A mishap. The Aircraft Mishap Board (AMB) completed the mishap investigation report in December 2018 and identified a non-systemic material failure. Triton's Naval Air Training and Operating Procedures Standardization and training have been modified as a result of the AMB report findings. On December 18, 2018, Triton returned to flight test. IFC 4 developmental activities have not been impacted by the mishap. The IFC 3.2 software build will be provided to the fleet in 2019 and includes sensor enhancements, Link-16 capability, and interoperability functionality. The Patuxent River Main Operating Base (MOB) completed DD-250 in September 2018 and was loaded with 3.2 software in support of testing prior to fleet release in support of EOC.

Since the April 16, 2018 ADM, the Triton program has progressed with Multi-Intelligence IFC 4 development. The IFC 4 hardware and software build will bring a multi-mission sensor capability to replace the aging EP-3 platform as part of the Navy's Maritime Intelligence, Surveillance, Reconnaissance, and Targeting transition plan.

The LRIP 4 contract is currently in technical review and evaluation, with an anticipated award in 2Q FY 2019. The Triton program is on track for FRP decision.

The United States of America and Commonwealth of Australia entered into a Cooperative Partnership under a Memorandum of Understanding (MOU) for the Development, Production, and Sustainment of MQ-4C Triton UAS; this was signed on June 19, 2018. The first executive steering committee was completed in October 2018. Currently, the Royal Australian Air Force (RAAF) has Australian Department of Defense approval to procure one aircraft and all ground stations within the scope of the MOU; the Capability Acquisition Sustainment Group supporting the RAAF procurement of Triton plans to return to Government for approval to procure the next aircraft. When appropriate, the results of this approval will be shared with the PMA-262 team.

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

History of Significant Developments Since Program Initiation

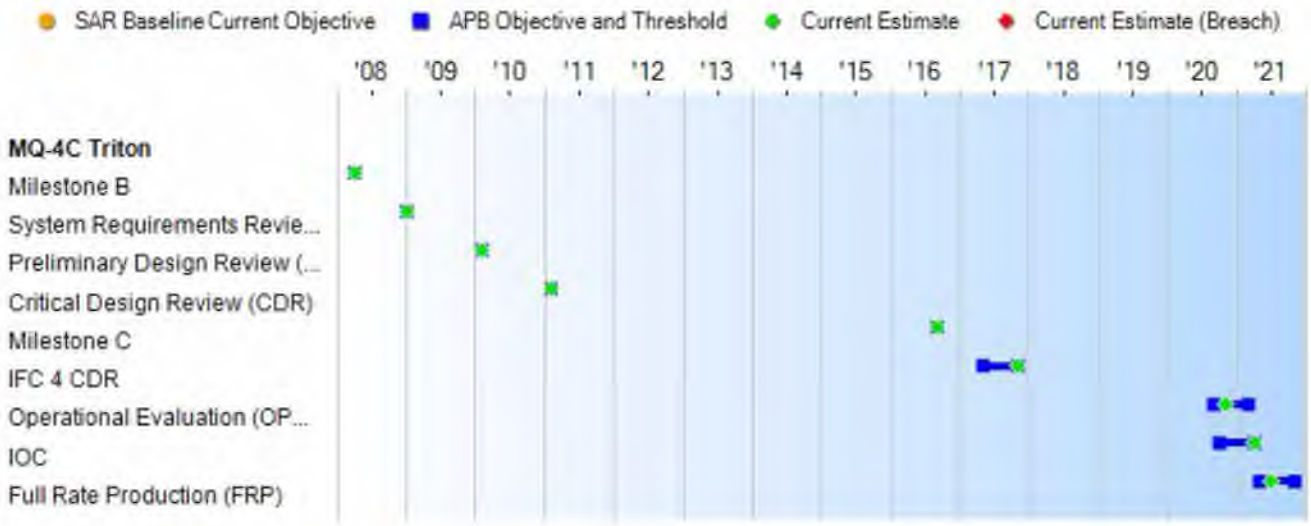
History of Significant Developments Since Program Initiation	
Date	**Significant Development Description**
April 2008	Milestone (MS) B
April 2008	System Development and Demonstration (SDD) Contract Award
January 2009	System Requirements Review
February 2010	Preliminary Design Review
February 2011	Critical Design Review (CDR)
November 2011	System Demonstration Test Article (SDTA) Contract Award
June 2012	Entered Integrated Testing with receipt of first SDD aircraft
May 2013	First Flight
March 2014	Completed Initial Envelope Expansion
4th Quarter FY 2014	Ferried three developmental test aircraft from Palmdale, California to Patuxent River Naval Air Station in Maryland (Fourth Quarter FY 2014 through First Quarter FY 2015)
December 2014	Began software installation in support of sensor testing
December 2014	Completed development of Integrated Functional Capability (IFC) 2 software
April 2015	FMS technical services case with the German Federal Ministry of Defense
June 2015	Executive Production Readiness Review
September 2016	MS C
September 2016	LRIP 1 Contract Award
December 2016	Conducted an Operational Assessment in support of MS C
December 2016	Completed flight test for IFC 2 software build demonstrating air vehicle performance, sensor and communication/network functionality
May 2017	LRIP 2 Contract Award
1st Quarter FY 2018	Delivered SDTA aircraft and supporting ground station assets
November 2017	IFC 4 CDR
November 2017	Redesignated from ACAT ID to ACAT IC
December 2017	LRIP 3 Contract Award
2nd Quarter FY 2018	Baseline entrance into OT-C1

Threshold Breaches

APB Breaches		
Schedule		☐
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

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	
Milestone B	Apr 2008	Apr 2008	Apr 2008	Apr 2008	
System Requirements Review (SRR)	Jan 2009	Jan 2009	Jan 2009	Jan 2009	
Preliminary Design Review (PDR)	Feb 2010	Feb 2010	Feb 2010	Feb 2010	
Critical Design Review (CDR)	Feb 2011	Feb 2011	Feb 2011	Feb 2011	
Milestone C	Sep 2016	Sep 2016	Sep 2016	Sep 2016	
IFC 4 CDR	May 2017	May 2017	Nov 2017	Nov 2017	
Operational Evaluation (OPEVAL) Start	Sep 2020	Sep 2020	Mar 2021	Nov 2020	
IOC	Oct 2020	Oct 2020	Apr 2021	Apr 2021	(Ch-1)
Full Rate Production (FRP)	May 2021	May 2021	Nov 2021	Jul 2021	(Ch-2)

Change Explanations

(Ch-1) The current estimate for IOC has changed from February 2021 to April 2021 to account for the slide in delivery of aircraft as a result of the FY 2018 APN-5 budget mark.
(Ch-2) The current estimate for FRP has changed from May 2021 to July 2021 due to a budget cuts in FY 2018 and FY 2019 APN-4 and APN-5 funding which resulted in Multi-INT capacity being delayed due to aircraft retrofits impacting both EOC and IOC. FRP slid based on the IOC dependency.

Acronyms and Abbreviations

APN - Aircraft Procurement Navy
EOC - Early Operational Capability
IFC - Integrated Functional Capability
INT - Intelligence

Performance

Performance Characteristics				
SAR Baseline Production Estimate	**Current APB Production Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**
Persistent multi-sensor maritime ISR at mission radius				
On station 24 hrs a day / 7 days a week for 30 consecutive days with an ETOS of >=95%	On station 24 hrs a day / 7 days a week for 30 consecutive days with an ETOS of >=95%	On station 24 hrs a day for 7 consecutive days with ETOS of >=80%	ETOS of ~.89 (Estimated)	On station 24 hrs a day / 7 days a week for 7 consecutive days with an ETOS of >=88% at a mission radius of 2,000 nm
Level of Interoperability 1-5				
BLOS and LOS from MOB/ FOB (Land Based) MCS	BLOS and LOS from MOB/ FOB (Land Based) MCS	BLOS and LOS from the MOB (Land Based) MCS	BLOS and LOS from MOB (Land Based) MCS (LOI 1-5)	BLOS and LOS from MOB (Land Based) MCS
UA Mission Radius				
>=3,000 nm	>=3,000 nm	>=2,000 nm	2,400 nm	>=2,000 nm
Level Of Interoperability 2 Capability				
LOS/BLOS multi-ISR payload reception to Maritime Forces	LOS/BLOS multi-ISR payload reception to Maritime Forces	LOS, ISR payload sensor data reception to Maritime Forces afloat (CVN, LHA/LHD)	LOS/BLOS multi-ISR payload reception to Maritime Forces	LOS, ISR payload sensor data reception to Maritime Forces afloat (CVN, LHA/LHD)
Net Ready				
IAW CJCSI 6212.01D	IAW CJCSI 6212.01D	IAW CJCSI 6212.01D	IAW CJCSI 5123-01G, CJCSI 3170.01I and the JCIDS Manual (Estimated)	IAW CJCSI 5123-01G, CJCSI 3170.01I and the JCIDS Manual
Operational Availability				
>=0.9	>=0.9	>=0.7 at IOT&E >=0.8 at IOC plus two years	0.89 (Estimated)	>=0.86

Classified Performance information is provided in the classified annex to this submission.

Requirements Reference

CDD in lieu of CPD dated August 2, 2016

Change Explanations

None

Acronyms and Abbreviations

BLOS - Beyond Line of Sight
CJCSI - Chairman of the Joint Chiefs of Staff Instruction
CVN - Aircraft Carrier Nuclear
ETOS - Effective Time On Station
FOB - Forward Operating Base
hrs - hours
IAW - In Accordance With
IOT&E - Initial Operational Test & Evaluation
ISR - Intelligence, Surveillance, and Reconnaissance
JCIDS - Joint Capabilities Integration Development System
LHA - Amphibious Assault Ship (General Purpose)
LHD - Amphibious Assault Ship (Multi Purpose)
LOI - Level of Interoperability
LOS - Line of Sight
MCS - Mission Control System
MOB - Main Operating Base
nm - nautical miles
UA - Unmanned Aircraft

Track to Budget

RDT&E

Appn	BA	PE		
Navy	1319	07	0305205N	
Project		Name		
4020		MQ-4C Triton	(Shared)	(Sunk)
Navy	1319	07	0305220N	
Project		Name		
4020		MQ-4C Triton		
Navy	1319	07	0305421N	
Project		Name		
2939		RQ-4 Modernization		

Procurement

Appn	BA	PE		
Navy	1506	04	0305220N	
Line Item		Name		
0442		MQ-4 Triton		
Navy	1506	05	0305220N	
Line Item		Name		
0596		MQ-4 Series		
Navy	1506	06	0305220N	
Line Item		Name		
0605		Spares and Repair Parts	(Shared)	

MILCON

Appn	BA	PE		
Navy	1205	01	0203176N	
Project		Name		
00207655		BAMS Mission Control Complex		(Sunk)
Navy	1205	01	0212176N	
Project		Name		
00207662		BAMS Mission Control System		(Sunk)
Navy	1205	02	0212176N	
Project		Name		
00620240		Triton Mission Control Facility		(Sunk)
Navy	1205	01	0212176N	
Project		Name		
69232577		Triton Forward Operating Base 3rd Fleet		
69232593		BAMS Consolidated Maintenance Hangar		(Sunk)

	C1002960	BAMS Operational Facilities	(Sunk)
Navy	1205 01	0712876N	
	Project	**Name**	
	62995407	BAMS Triton Hangar and Operations Facility	(Sunk)
Navy	1205 01	0805976N	
	Project	**Name**	
	69232607	Triton Avionics and Fuel Systems Trainer	(Sunk)
Navy	1205 01	0815976N	
	Project	**Name**	
	00207153	BAMS UAS Operator Training Facility	(Sunk)
	41557625	BAMS Forward Operational and Maintenance Hangar	(Sunk)
	63042900	BAMS Maintenance Training Facility	(Sunk)
	C1002154	Triton Forward Operating Base Hangar	(Sunk)
Navy	1205 01	0816376N	
	Project	**Name**	
	0428A263	BAMS Test and Evaluation Facility	(Sunk)

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2016 $M			BY 2016 $M	TY $M		
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective	Current Estimate
RDT&E	5383.5	5383.5	5921.9	5575.1	5341.0	5341.0	5561.9
Procurement	9357.5	9357.5	10293.3	9498.4	11348.6	11348.6	11560.4
Flyaway	--	--	--	7196.2	--	--	8880.7
Recurring	--	--	--	6538.1	--	--	8124.0
Non Recurring	--	--	--	658.1	--	--	756.7
Support	--	--	--	2302.2	--	--	2679.7
Other Support	--	--	--	1791.6	--	--	2126.5
Initial Spares	--	--	--	510.6	--	--	553.2
MILCON	323.3	323.3	355.6	321.4	337.5	337.5	337.6
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	15064.3	15064.3	N/A	15394.9	17027.1	17027.1	17459.9

Current APB Cost Estimate Reference

ICE dated September 21, 2016

Cost Notes

No cost estimate for the program has been completed in the previous year.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	4	4	5
Procurement	66	66	65
Total	70	70	70

Quantity Notes

Leading up to the program's Milestone C decision, the Navy and Northrop Grumman Corporation (NGC) entered into an agreement to share cost growth on the System Development and Demonstration contract by utilizing NGC capital contributions to offset future Navy budget requirements. As part of these contributions, NGC provided an Unmanned Aircraft to the Navy at no cost that they had previously built with private capital. This aircraft will be modified to the Multiple Intelligence configuration and used in development before being delivered to the fleet and offsetting one of the planned Aircraft Procurement, Navy funded aircraft procurements. Total aircraft quantity remains at 70.

Cost and Funding

Funding Summary

Appropriation Summary FY 2020 President's Budget / December 2018 SAR (TY$ M)									
Appropriation	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
RDT&E	4595.8	233.8	214.1	83.3	129.6	118.3	112.0	75.0	5561.9
Procurement	1934.0	694.8	693.2	541.7	672.0	686.1	730.4	5608.2	11560.4
MILCON	281.8	0.0	0.0	55.8	0.0	0.0	0.0	0.0	337.6
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2020 Total	6811.6	928.6	907.3	680.8	801.6	804.4	842.4	5683.2	17459.9
PB 2019 Total	6814.9	953.7	764.4	778.2	699.0	845.5	715.1	5355.2	16926.0
Delta	-3.3	-25.1	142.9	-97.4	102.6	-41.1	127.3	328.0	533.9

Quantity Summary FY 2020 President's Budget / December 2018 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Development	5	0	0	0	0	0	0	0	0	5
Production	0	9	3	2	2	3	5	5	36	65
PB 2020 Total	5	9	3	2	2	3	5	5	36	70
PB 2019 Total	5	9	3	3	3	3	5	4	35	70
Delta	0	0	0	-1	-1	0	0	1	1	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	--	--	--	--	--	--	17.9
2005	--	--	--	--	--	--	39.3
2006	--	--	--	--	--	--	--
2007	--	--	--	--	--	--	26.2
2008	--	--	--	--	--	--	83.1
2009	--	--	--	--	--	--	420.4
2010	--	--	--	--	--	--	438.1
2011	--	--	--	--	--	--	525.6
2012	--	--	--	--	--	--	550.1
2013	--	--	--	--	--	--	612.7
2014	--	--	--	--	--	--	375.2
2015	--	--	--	--	--	--	449.2
2016	--	--	--	--	--	--	473.6
2017	--	--	--	--	--	--	266.0
2018	--	--	--	--	--	--	318.4
2019	--	--	--	--	--	--	233.8
2020	--	--	--	--	--	--	214.1
2021	--	--	--	--	--	--	83.3
2022	--	--	--	--	--	--	129.6
2023	--	--	--	--	--	--	118.3
2024	--	--	--	--	--	--	112.0
2025	--	--	--	--	--	--	75.0
Subtotal	5	--	--	--	--	--	5561.9

Annual Funding 1319 | RDT&E | Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2016 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2004	--	--	--	--	--	--	21.9
2005	--	--	--	--	--	--	46.8
2006	--	--	--	--	--	--	--
2007	--	--	--	--	--	--	29.6
2008	--	--	--	--	--	--	92.1
2009	--	--	--	--	--	--	459.9
2010	--	--	--	--	--	--	472.2
2011	--	--	--	--	--	--	553.3
2012	--	--	--	--	--	--	569.6
2013	--	--	--	--	--	--	627.9
2014	--	--	--	--	--	--	379.1
2015	--	--	--	--	--	--	448.3
2016	--	--	--	--	--	--	464.3
2017	--	--	--	--	--	--	256.1
2018	--	--	--	--	--	--	300.3
2019	--	--	--	--	--	--	216.2
2020	--	--	--	--	--	--	194.1
2021	--	--	--	--	--	--	74.0
2022	--	--	--	--	--	--	112.9
2023	--	--	--	--	--	--	101.1
2024	--	--	--	--	--	--	93.8
2025	--	--	--	--	--	--	61.6
Subtotal	5	--	--	--	--	--	5575.1

Annual Funding 1506 | Procurement | Aircraft Procurement, Navy							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2015	--	72.0	--	--	72.0	--	72.0
2016	4	402.2	--	43.3	445.5	161.5	607.0
2017	2	251.5	--	125.5	377.0	197.2	574.2
2018	3	351.5	--	51.3	402.8	278.0	680.8
2019	3	340.5	--	109.8	450.3	244.5	694.8
2020	2	204.8	--	77.0	281.8	411.4	693.2
2021	2	290.9	--	33.0	323.9	217.8	541.7
2022	3	414.7	--	81.2	495.9	176.1	672.0
2023	5	527.8	--	79.3	607.1	79.0	686.1
2024	5	563.4	--	28.9	592.3	138.1	730.4
2025	4	486.3	--	9.4	495.7	216.0	711.7
2026	4	495.8	--	9.6	505.4	81.5	586.9
2027	4	505.7	--	9.8	515.5	73.0	588.5
2028	4	516.0	--	10.0	526.0	74.5	600.5
2029	4	526.6	--	10.2	536.8	76.0	612.8
2030	4	537.5	--	10.4	547.9	77.5	625.4
2031	4	543.1	--	10.5	553.6	79.1	632.7
2032	4	551.5	--	10.7	562.2	80.7	642.9
2033	4	542.2	--	46.8	589.0	17.8	606.8
Subtotal	65	8124.0	--	756.7	8880.7	2679.7	11560.4

Annual Funding 1506 | Procurement | Aircraft Procurement, Navy							
Fiscal Year	Quantity	BY 2016 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2015	--	70.9	--	--	70.9	--	70.9
2016	4	388.2	--	41.8	430.0	155.9	585.9
2017	2	238.0	--	118.7	356.7	186.6	543.3
2018	3	326.0	--	47.6	373.6	257.7	631.3
2019	3	309.6	--	99.8	409.4	222.3	631.7
2020	2	182.5	--	68.6	251.1	366.8	617.9
2021	2	254.2	--	28.8	283.0	190.4	473.4
2022	3	355.3	--	69.6	424.9	150.8	575.7
2023	5	443.3	--	66.6	509.9	66.4	576.3
2024	5	463.9	--	23.8	487.7	113.8	601.5
2025	4	392.6	--	7.6	400.2	174.4	574.6
2026	4	392.4	--	7.6	400.0	64.5	464.5
2027	4	392.4	--	7.6	400.0	56.7	456.7
2028	4	392.5	--	7.6	400.1	56.7	456.8
2029	4	392.8	--	7.6	400.4	56.7	457.1
2030	4	393.0	--	7.6	400.6	56.7	457.3
2031	4	389.3	--	7.5	396.8	56.8	453.6
2032	4	387.6	--	7.5	395.1	56.7	451.8
2033	4	373.6	--	32.2	405.8	12.3	418.1
Subtotal	65	6538.1	--	658.1	7196.2	2302.2	9498.4

Cost Quantity Information 1506 | Procurement | Aircraft Procurement, Navy		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2016 $M**
2015	--	--
2016	4	405.0
2017	2	236.9
2018	3	324.5
2019	3	308.4
2020	2	216.8
2021	2	218.6
2022	3	318.4
2023	5	459.7
2024	5	462.5
2025	4	391.2
2026	4	391.1
2027	4	391.0
2028	4	391.1
2029	4	391.3
2030	4	391.6
2031	4	388.0
2032	4	388.4
2033	4	463.6
Subtotal	65	6538.1

Annual Funding 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	TY $M Total Program
2011	33.0
2012	4.5
2013	65.0
2014	55.5
2015	--
2016	51.9
2017	71.9
2018	--
2019	--
2020	--
2021	55.8
Subtotal	337.6

Annual Funding 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	BY 2016 $M
	Total Program
2011	34.0
2012	4.6
2013	65.1
2014	54.8
2015	--
2016	48.9
2017	66.4
2018	--
2019	--
2020	--
2021	47.6
Subtotal	321.4

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	4/18/2008	9/22/2016
Approved Quantity	10	18
Reference	Milestone B ADM	Gate 6/Configuration Steering Board (CSB) ADM
Start Year	2013	2013
End Year	2015	2020

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the establishment of an initial production base for the system and an orderly and efficient increase in the production rate. The increase to 18 LRIP aircraft was authorized due to a change of FRP to 4th Quarter FY 2021.

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost $M	Description
Germany	4/2/2015		4.0	Agreement number GY-P-GPT is an active technical services case which provides technical data on the MQ-4C Triton.
Australia	8/1/2013		5.0	Agreement number AT-P-GTJ is an active technical services case which provides technical data on the MQ-4C Triton.

Notes

The program office is currently executing two FMS technical services cases for information on the MQ-4C Triton with both Australia and Germany to help them determine how the MQ-4C Triton will meet their needs for a High Altitude Long Endurance Unmanned Aircraft System (UAS). Other interested foreign governments include Canada, Japan, New Zealand, Norway and the United Kingdom.

A Memorandum of Understanding with Australia for the procurement of six MQ-4C Triton aircraft via cooperative program was signed in June 2018. On March 6, 2017, Germany announced their intent to procure three Triton UAS as a replacement for the Euro Hawk. A Letter of Offer and Acceptance was offered in August 2018 and signature is expected in CY 2020.

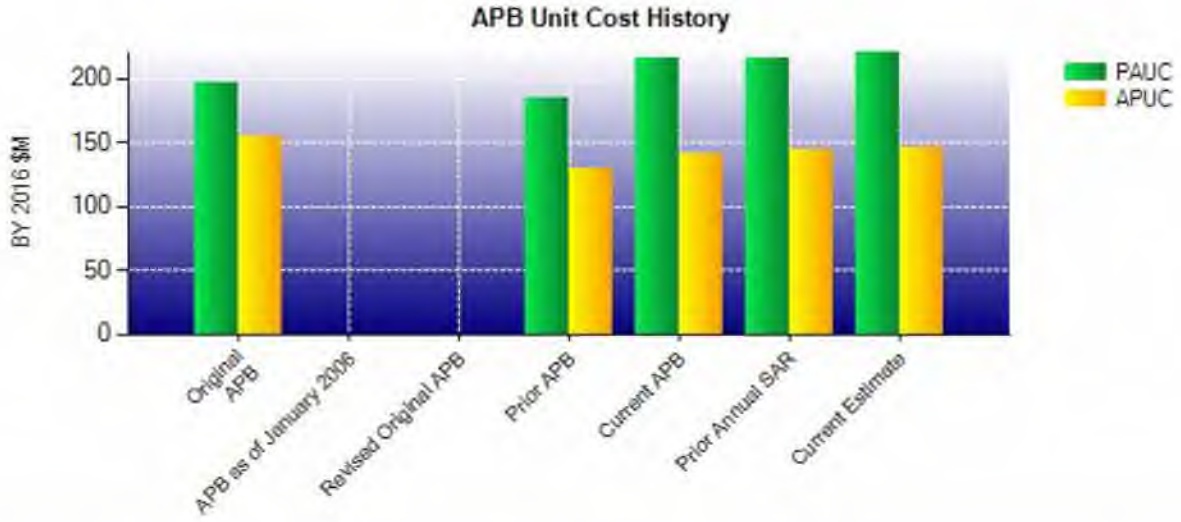
Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2016 $M Current UCR Baseline (Dec 2016 APB)	BY 2016 $M Current Estimate (Dec 2018 SAR)	% Change
Program Acquisition Unit Cost			
Cost	15064.3	15394.9	
Quantity	70	70	
Unit Cost	215.204	219.927	+2.19
Average Procurement Unit Cost			
Cost	9357.5	9498.4	
Quantity	66	65	
Unit Cost	141.780	146.129	+3.07

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2016 $M Original UCR Baseline (Feb 2009 APB)	BY 2016 $M Current Estimate (Dec 2018 SAR)	% Change
Program Acquisition Unit Cost			
Cost	13783.4	15394.9	
Quantity	70	70	
Unit Cost	196.906	219.927	+11.69
Average Procurement Unit Cost			
Cost	10002.5	9498.4	
Quantity	65	65	
Unit Cost	153.885	146.129	-5.04



APB Unit Cost History					
Item	Date	BY 2016 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	Feb 2009	196.906	153.885	216.747	177.317
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	Jul 2014	184.743	129.664	207.763	156.288
Current APB	Dec 2016	215.204	141.780	243.244	171.948
Prior Annual SAR	Dec 2017	215.129	143.729	241.800	173.042
Current Estimate	Dec 2018	219.927	146.129	249.427	177.852

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	
216.747	-5.878	1.731	22.407	24.911	7.156	0.000	-23.830	26.497	243.244

Current SAR Baseline to Current Estimate (TY $M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
243.244	0.937	-1.416	-0.924	0.000	6.210	0.000	1.376	6.183	249.427

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	
177.317	-5.578	-0.850	23.765	8.085	-5.007	0.000	-25.784	-5.369	171.948

Current SAR Baseline to Current Estimate (TY $M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
171.948	0.922	1.120	-0.583	0.000	2.963	0.000	1.482	5.904	177.852

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	Apr 2008	Apr 2008	Apr 2008
Milestone C	N/A	May 2013	Sep 2016	Sep 2016
IOC	N/A	Dec 2015	Oct 2020	Apr 2021
Total Cost (TY $M)	N/A	15172.3	17027.1	17459.9
Total Quantity	N/A	70	70	70
PAUC	N/A	216.747	243.244	249.427

Cost Variance

Summary TY $M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	5341.0	11348.6	337.5	17027.1
Previous Changes				
Economic	-6.0	-44.0	+0.6	-49.4
Quantity	--	-99.1	--	-99.1
Schedule	--	-34.9	--	-34.9
Engineering	--	--	--	--
Estimating	+5.7	+100.1	-0.5	+105.3
Other	--	--	--	--
Support	--	-23.0	--	-23.0
Subtotal	-0.3	-100.9	+0.1	-101.1
Current Changes				
Economic	+9.5	+103.9	+1.6	+115.0
Quantity	--	--	--	--
Schedule	-26.8	-3.0	--	-29.8
Engineering	--	--	--	--
Estimating	+238.5	+92.5	-1.6	+329.4
Other	--	--	--	--
Support	--	+119.3	--	+119.3
Subtotal	+221.2	+312.7	--	+533.9
Total Changes	+220.9	+211.8	+0.1	+432.8
CE - Cost Variance	5561.9	11560.4	337.6	17459.9
CE - Cost & Funding	5561.9	11560.4	337.6	17459.9

Summary BY 2016 $M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	5383.5	9357.5	323.3	15064.3
Previous Changes				
Economic	--	--	--	--
Quantity	--	-69.3	--	-69.3
Schedule	--	-3.1	--	-3.1
Engineering	--	--	--	--
Estimating	+10.2	+88.5	-0.4	+98.3
Other	--	--	--	--
Support	--	-31.2	--	-31.2
Subtotal	+10.2	-15.1	-0.4	-5.3
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	-23.8	-28.2	--	-52.0
Engineering	--	--	--	--
Estimating	+205.2	+79.3	-1.5	+283.0
Other	--	--	--	--
Support	--	+104.9	--	+104.9
Subtotal	+181.4	+156.0	-1.5	+335.9
Total Changes	+191.6	+140.9	-1.9	+330.6
CE - Cost Variance	5575.1	9498.4	321.4	15394.9
CE - Cost & Funding	5575.1	9498.4	321.4	15394.9

Previous Estimate: December 2017

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+9.5
Schedule variance resulting from re-phase of Future Capabilities activities from FY 2021 to FY 2022. (Schedule)	-23.8	-26.8
Adjustment for current and prior escalation. (Estimating)	-5.3	-5.5
Revised estimate due to increase in Multiple Intelligence (Multi-INT) development. (Estimating)	+61.9	+68.3
Revised estimate to complete Baseline Triton System Development and Demonstration / System Demonstration Test Article contract. (Estimating)	+7.6	+7.9
Revised estimate due to increase in Future Capabilities development (Estimating)	+141.0	+167.8
RDT&E Subtotal	+181.4	+221.2

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+103.9
Schedule Variance associated with moving one Aircraft from FY2020 to FY2024 and one Aircraft from FY2021 to FY2033. (Schedule)	-28.2	-3.0
Adjustment for current and prior escalation. (Estimating)	-11.7	-12.7
Revised estimate to reflect the application of new out-year inflation indices. (Estimating)	-69.3	-85.5
Revised estimate driven by realized risk in Electromagnetic Interference Measurements requiring additional hardware to mitigate. (Estimating)	+32.0	+38.0
Revised estimate for the funded Multi-INT retrofits driven by a reduction in the hardware reuse. (Estimating)	+94.3	+112.5
Revised estimate resulting from a change in the Ground Segment procurement profile which incorporates the required Multi-INT hardware updates. (Estimating)	+9.9	+14.2
Revised estimate for LRIP 3 Multi-INT In-Line Modification driven by a reduction in the hardware reuse. (Estimating)	+24.1	+26.0
Adjustment for current and prior escalation. (Support)	-6.5	-6.8
Decrease in Other Support resulting from a reduction in resources for sustainment support. (Support)	-77.0	-83.3
Increase in Initial Spares due to change in the Material Support date from FY2020 to FY2023. (Support)	+188.4	+209.4
Procurement Subtotal	+156.0	+312.7

MILCON	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+1.6
Adjustment for current and prior escalation. (Estimating)	-1.0	-1.0
Revised estimate to reflect the application of new out-year inflation indices. (Estimating)	-0.5	-0.6
MILCON Subtotal	-1.5	0.0

Contracts

General Notes

The program is reporting all CLINs on the System Development and Demonstration and LRIP contracts individually to increase transparency as each individual effort is over $40M TY.

Contract Identification

Appropriation: RDT&E
Contract Name: Triton UAS SDD Contract FTA CLIN
Contractor: Northrop Grumman Systems Corporation
Contractor Location: 17066 Goldentop Rd
San Diego, CA 92150
Contract Number: N00019-08-C-0023/403
Contract Type: Cost (CR)
Award Date: July 13, 2016
Definitization Date: July 13, 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
69.5	N/A	0	69.5	N/A	0	74.3	90.6

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (11/23/2018)	-6.3	-7.5
Previous Cumulative Variances	-2.6	-4.0
Net Change	-3.7	-3.5

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to additional efforts for Shear/Moment/Torsion testing and assembly associated with full scale fatigue test.

The unfavorable net change in the schedule variance is due to overall program delay associated with full scale Shear/Moment/Torsion and control surface testing.

Contract Identification

Appropriation: Procurement
Contract Name: Triton UAS LRIP Contract LRIP 1 CLIN
Contractor: Northrop Grumman Systems Corporation
Contractor Location: 17066 Goldentop Rd
San Diego, CA 92150
Contract Number: N00019-15-C-0002
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: September 27, 2016
Definitization Date: September 27, 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
331.5	343.4	3	331.5	343.4	3	329.6	331.5

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (11/23/2018)	+5.2	-5.6
Previous Cumulative Variances	+7.2	-7.7
Net Change	-2.0	+2.1

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to Ground Segment Integration activities at Orbit 1.

The favorable net change in the schedule variance is due to schedule recovery with material deliveries.

Contract Identification

Appropriation: Procurement
Contract Name: Triton UAS LRIP Contract LRIP 2 CLIN
Contractor: Northrop Grumman Systems Corporation
Contractor Location: 17066 Goldentop Rd
San Diego, CA 92150
Contract Number: N00019-15-C-0002/201
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: May 16, 2017
Definitization Date: May 16, 2017

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
353.3	365.9	3	350.8	363.3	3	349.4	350.8

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to de-scope of the MD-3A Main Operating Base Material and the MD-3B Forward Operating Material.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (11/23/2018)	+9.1	-3.0
Previous Cumulative Variances	+1.5	+1.3
Net Change	+7.6	-4.3

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to lower than anticipated labor cost.

The unfavorable net change in the schedule variance is due to late material deliveries.

Contract Identification

Appropriation: Procurement
Contract Name: Triton UAS LRIP 3 Contract
Contractor: Northrop Grumman Systems Corporation
Contractor Location: 17066 Goldentop Rd
San Diego, CA 92127
Contract Number: N00019-17-C-0018
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 28, 2017
Definitization Date: December 28, 2017

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
303.1	314.1	3	303.1	314.1	3	305.2	303.1

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (11/23/2018)	+1.8	-0.9
Previous Cumulative Variances	--	--
Net Change	+1.8	-0.9

Cost and Schedule Variance Explanations

The favorable cumulative cost variance is due to lower than anticipated labor cost.

The unfavorable cumulative schedule variance is due to late material issuance.

Notes

The initial contract price changed in order to correct the information in the last SAR as it only included one CLIN.

Deliveries and Expenditures

Deliveries				
Delivered to Date	**Planned to Date**	**Actual to Date**	**Total Quantity**	**Percent Delivered**
Development	4	4	5	80.00%
Production	0	0	65	0.00%
Total Program Quantity Delivered	4	4	70	5.71%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	17459.9	Years Appropriated	16
Expended to Date	5524.3	Percent Years Appropriated	53.33%
Percent Expended	31.64%	Appropriated to Date	7740.2
Total Funding Years	30	Percent Appropriated	44.33%

The above data is current as of March 11, 2019.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	December 20, 2016
Source of Estimate:	CAPE ICE
Quantity to Sustain:	68
Unit of Measure:	Aircraft
Service Life per Unit:	20.00 Years
Fiscal Years in Service:	FY 2018 - FY 2046

The average monthly flight hour utilization rate is 256.2 flight hours/month/aircraft beginning at IOC, and the average annual flight hour utilization rate is 3,074.4 flight hours/year/aircraft. Primary Authorized Aircraft is 20, and these 20 aircraft are to be distributed equally across five orbits. The program is estimated to have a five year ramp up period, followed by a 20 year service period, followed by a four year ramp down period, and after accounting for the specific months of delivery and attrition, this results in 450.572 aircraft years. The predicted attrition rate of the Unmanned Aircraft is four per 100,000 flight hours. The quantity of aircraft to sustain is 68, comprised of three operationalized System Demonstration Test Article aircraft and 65 production aircraft.

Sustainment Strategy

The MQ-4C Triton UAS logistics focuses on total platform supportability to include air vehicle, mission control, information technology (e.g., networks) and payload sustainment across the program life cycle. The Triton Product Support team is organized, resourced, and executing the plan to establish organic supply support, repair capability, and sustaining engineering, to include Software Support, that will meet future operational readiness requirements and operating cost objectives. The prime contractor will provide some Interim Contractor Support as the organic infrastructure is established beginning with Early Operational Capability (EOC) in FY 2019.

Antecedent Information

No Antecedent. The MQ-4C Triton is projected to fly significantly more hours than the closest analogous airframe and has different missions, different concept of operations, and different payloads; resulting in substantially different projected avionics repair costs (the next major O&S cost driver after the number of flight hours).

Annual O&S Costs BY2016 $M		
Cost Element	**MQ-4C Triton Average Annual Cost Per Aircraft**	**No Antecedent (Antecedent) N/A**
Unit-Level Manpower	4.601	0.000
Unit Operations	1.764	0.000
Maintenance	19.093	0.000
Sustaining Support	1.697	0.000
Continuing System Improvements	4.053	0.000
Indirect Support	1.654	0.000
Other	0.000	0.000
Total	32.862	--

Item	Total O&S Cost $M			
	MQ-4C Triton			No Antecedent (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	14806.7	16287.4	14806.7	0.0
Then Year	20551.1	N/A	20551.1	0.0

Equation to Translate Annual Cost to Total Cost

Total Aircraft O&S = Unitized cost * number of operational aircraft years
($14,806.7M = $32.862M * 450.572 aircraft years)

O&S Cost Variance		
Category	**BY 2016 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Dec 2017 SAR	14806.7	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	0.0	
Current Estimate	14806.7	

Disposal Estimate Details

Date of Estimate: December 20, 2016
Source of Estimate: CAPE ICE
Disposal/Demilitarization Total Cost (BY 2016 $M): 17.5

Disposal of attrition aircraft is included in the Disposal estimate.