# Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-445

# Next Generation Jammer Mid-Band (NGJ Mid-Band)

As of FY 2020 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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## Sensitivity Originator

**Organization:** PMA-234 Airborne Electronic Attack Systems and EA-6B Program Office
**Organization Email:**
**Organization Phone:** 301-757-7994

## 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 |
| --- |
| Next Generation Jammer Mid-Band (NGJ Mid-Band) |

| DoD Component |
| --- |
| Navy |

## Responsible Office

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**Date Assigned:** June 28, 2017

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## References

**SAR Baseline (Development Estimate)**

Under Secretary of Defense (Acquisition, Technology & Logistics) Approved Acquisition Program Baseline (APB) dated April 04, 2016

**Approved APB**

Assistant Secretary of the Navy (Research, Development & Acquisition) (ASN(RDA)) Approved Acquisition Program Baseline (APB) dated November 5, 2018

## Mission and Description

The Next Generation Jammer Mid-Band (NGJ Mid-Band) program is an electronic attack system that will provide significantly improved Airborne Electronic Attack (AEA) capabilities against advanced threats in the Mid-Band frequency range through enhanced agility and precision within jamming assignments, increased interoperability and expanded broadband capacity for greater threat coverage against a wide variety of radio frequency emitters. The Effective Isotropic Radiated Power (EIRP) in the NGJ Mid-Band system will be sufficient to provide robust jamming at standoff distances from Integrated Air Defense Systems (IADS) radars, communications, and data links. The NGJ Mid-Band system will augment and then replace the legacy AN/ALQ-99 Tactical Jamming System (fielded 1971) for the EA-18G, providing significantly improved radar and communication jamming performance as well as improved reliability and maintainability.

The NGJ Mid-Band system will be required to engage sophisticated IADS and information operations (i.e., other electronic threat systems) in multiple areas of responsibility and across all phases of military operations. Threat operators and systems adapt and exploit available frequency ranges, employing techniques and tactics designed to confuse or otherwise defeat friendly AEA capabilities. In order to defeat these continuously evolving enemy radio frequency threats, the NGJ Mid-Band design must provide for sufficient EIRP to achieve threat systems engagement stand-off distances, support increased capacity (number of jamming assignments) as a result of increased threat density, and support agile employment by operators as well as provide a flexible system architecture that can be upgraded quickly to meet new mission demands.

# Executive Summary

## Program Highlights Since Last Report

The government/industry Integrated Structures Team completed the redesign of the pod structure that was required due to deficiencies identified during the program's Critical Design Review. This redesign was completed with no impact to system Weapons Replaceable Assemblies. Procurement and fabrication of the redesigned structure is on track with the first pod manufactured with the redesigned structure anticipated to be delivered by the second quarter of FY 2020 to support entry into flight test.

Program integration and verification of subsystems (antenna arrays, power generation system, software, Common Electronics Unit, etc.) into functional pods remains aligned with the EA-18G System Configuration Set (SCS) H16 schedule.

Developmental testing for the NGJ Mid-Band program continued in FY 2018 with antenna arrays testing/characterization in near and far field radio frequency chambers. Common Electronics Units have been delivered to labs for H16 integration testing. Preparation and readiness efforts are ongoing to support major developmental testing, which will include aeromechanical, mission systems, system and EA-18G integration, and product support tests culminating in Initial Operational Test and Evaluation.

Initial Engineering Development Model (EDM) pods will begin delivery in the third quarter of FY 2019 for developmental testing in anechoic chambers. These efforts will significantly reduce risk to follow-on flight test beginning in the second quarter of FY 2020.

A revised APB updating schedule and the cost threshold parameters impacted by the pod structure redesign was approved on November 5, 2018.

On December 3, 2018, the Assistant Secretary of the Navy (Research, Development & Acquistion) approved an ADM for the procurement of NGJ Mid-Band A-Kits and installs prior to Milestone C to maintain alignment with SCS H16 and minimize the impact to fleet readiness.

Principal technical risks for the program are associated with NGJ Mid-Band Effective Isotropic Radiated Power (EIRP) and EA-18G interoperability. The EIRP risk is driven by the requirement of the NGJ Mid-Band program to achieve significant capability increases over current airborne jammers while operating in a challenging electromagnetic and aeromechanical environment and packaged in a highly restrictive form factor for carriage on a carrier-based tactical aircraft. A very methodical test strategy and risk management approach has been implemented, utilizing technical knowledge points and a build-up test strategy (component-level build and test, subsystem build, integration and test, and system level test in system integration laboratories, anechoic chambers (installed on aircraft), and in-flight on test ranges). An incentive plan has been incorporated in the EMD contract tied specifically to the risks and associated technical knowledge points, with shared technical incentive fee between the aircraft contractor (Boeing) and the pod contractor (Raytheon) as well as specific pod system level technical incentive fee for Raytheon only. Continuous focus on supplier performance and management is also critical to success.

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

## History of Significant Developments Since Program Initiation

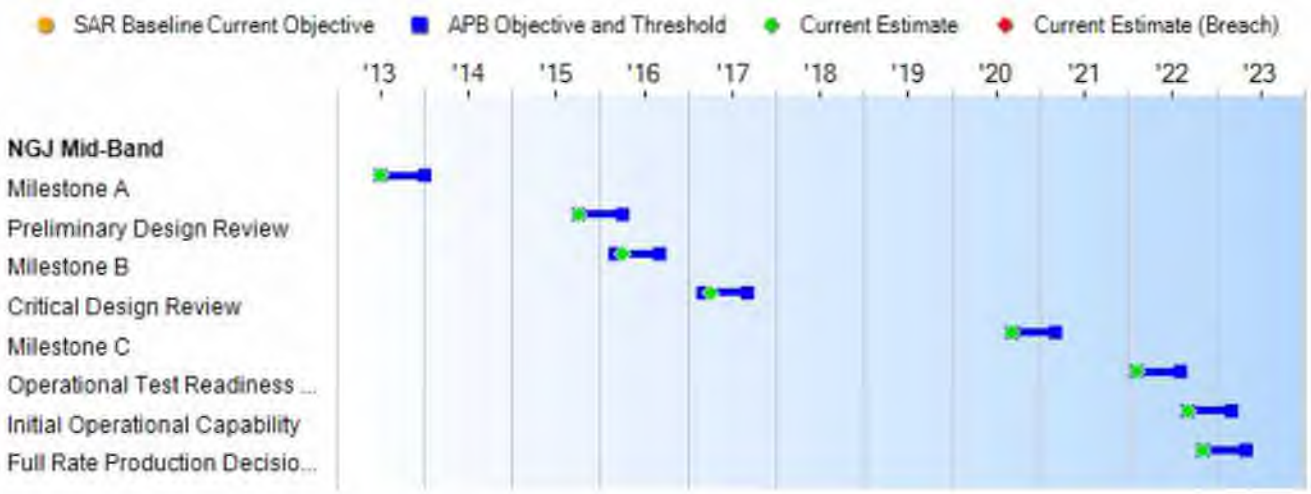
| History of Significant Developments Since Program Initiation | |
|---|---|
| **Date** | **Significant Development Description** |
| April 2016 | The NGJ Mid-Band program received Milestone B approval to enter EMD. |
| April 2016 | A 56-month sole source Cost Plus Incentive Fee (CPIF) contract was awarded to The Raytheon Company for the EMD phase. During the performance of this contract, the NGJ Mid-Band program will conduct a Critical Design Review (CDR) and begin delivery of 15 Engineering Development Models that will be used for initial testing. |
| December 2016 | A sole source CPIF contract modification was awarded to The Boeing Company for the integration of the NGJ Mid-Band pod onto the EA-18G aircraft.This effort is in support of the EMD phase of the NGJ Mid-Band program and includes the design and manufacturing of 15 engineering change proposal 6472 A kits, and the integration, demonstration and test of NGJ Mid-Band pods on the EA-18G aircraft. |
| April 2017 | On April 27, 2017, the program completed its CDR. |
| October 2017 | On October 18, 2017, Australia became a cooperative partner for NGJ Mid-Band development. |

## 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 Development Estimate** | **Current APB Development Objective/Threshold** | | **Current Estimate** | |
| Milestone A | Jul 2013 | Jul 2013 | Jan 2014 | Jul 2013 | |
| Preliminary Design Review | Oct 2015 | Oct 2015 | Apr 2016 | Oct 2015 | |
| Milestone B | Mar 2016 | Mar 2016 | Sep 2016 | Apr 2016 | |
| Critical Design Review | Mar 2017 | Mar 2017 | Sep 2017 | Apr 2017 | |
| Milestone C | Sep 2019 | Sep 2020 | Mar 2021 | Sep 2020 | (Ch-1) |
| Operational Test Readiness Review | Dec 2020 | Feb 2022 | Aug 2022 | Feb 2022 | (Ch-1) |
| Initial Operational Capability | Sep 2021 | Sep 2022 | Mar 2023 | Sep 2022 | |
| Full Rate Production Decision Review | Nov 2021 | Nov 2022 | May 2023 | Nov 2022 | (Ch-1) |

**Change Explanations**

(Ch-1) The Milestone C current estimate changed from August 2020 to September 2020, Operational Test Readiness Review changed from January 2022 to February 2022, and FRP Decision Review changed from December 2022 to November 2022 due to rebaselining the program after the completion of the pod structure redesign.

## (U//~~FOUO~~) Performance

| (U//~~FOUO~~) Performance Characteristics | | | |
|---|---|---|---|
| **SAR Baseline Development Estimate** | **Current APB Development Objective/Threshold** | **Demonstrated Performance** | **Current Estimate** |
| (b)(3):10 USC § 130 | | | |

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

### Requirements Reference

Next Generation Jammer CDD, dated August 18, 2015

### Change Explanations

None

## Track to Budget

**RDT&E**

| Appn | BA | PE |
|---|---|---|
| Navy | 05 | 0604274N |

| Project | Name |
|---|---|
| 0557 | Next Generation Jammer |

**Procurement**

| Appn | BA | PE |
|---|---|---|
| Navy | 05 | 0204154N |

| Line Item | Name |
|---|---|
| 0591 | Next Generation Jammer (NGJ) |

| Appn | BA | PE |
|---|---|---|
| Navy | 06 | 0204161N |

| Line Item | Name | |
|---|---|---|
| 0605 | Spares and Repair Parts | (Shared) |

**MILCON**

| Appn | BA | PE |
|---|---|---|
| Navy | 01 | 0712876N |

| Project | Name |
|---|---|
| 00620258 | Next Generation Jammer Facility |

# Cost and Funding

## Cost Summary

| Total Acquisition Cost | | | | | | | |
|---|---|---|---|---|---|---|---|
| Appropriation | BY 2016 $M | | | BY 2016 $M | TY $M | | |
| | SAR Baseline Development Estimate | Current APB Development Objective/Threshold | | Current Estimate | SAR Baseline Development Estimate | Current APB Development Objective | Current Estimate |
| RDT&E | 3454.1 | 3822.9 | 4205.2 | 3793.3 | 3586.2 | 3998.7 | 3985.1 |
| Procurement | 4002.6 | 3853.1 | 4238.4 | 3925.6 | 4836.9 | 4844.4 | 4980.0 |
| Flyaway | -- | -- | -- | 3236.9 | -- | -- | 4129.7 |
| Recurring | -- | -- | -- | 3206.6 | -- | -- | 4087.3 |
| Non Recurring | -- | -- | -- | 30.3 | -- | -- | 42.4 |
| Support | -- | -- | -- | 688.7 | -- | -- | 850.3 |
| Other Support | -- | -- | -- | 561.3 | -- | -- | 701.1 |
| Initial Spares | -- | -- | -- | 127.4 | -- | -- | 149.2 |
| MILCON | 7.0 | 7.0 | 7.7 | 7.0 | 7.8 | 7.8 | 7.9 |
| Acq O&M | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 7463.7 | 7683.0 | N/A | 7725.9 | 8430.9 | 8850.9 | 8973.0 |

### Current APB Cost Estimate Reference

The Program Office Estimate (POE) is an update to the NGJ Mid-Band Milestone B Program Life Cycle Cost Estimate (PLCCE) and is supported by the methods employed by the Naval Air Systems Command Cost Team (AIR-4.2) dated August 21, 2018

### Cost Notes

No cost estimate for the program has been completed in the previous year. The updated PLCCE that supported the current APB cost estimate was updated for actuals to date and phasing of funding based on the revised program schedule. A complete cost estimate will be completed to support Milestone C.

| Total Quantity | | | |
|---|---|---|---|
| Quantity | SAR Baseline Development Estimate | Current APB Development | Current Estimate |
| RDT&E | 4 | 7 | 7 |
| Procurement | 131 | 128 | 128 |
| Total | 135 | 135 | 135 |

## Cost and Funding

## Funding Summary

| Appropriation Summary<br>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 | 2398.8 | 449.4 | 524.3 | 434.2 | 178.4 | 0.0 | 0.0 | 0.0 | 3985.1 |
| Procurement | 0.0 | 0.0 | 6.2 | 176.4 | 360.9 | 525.6 | 534.0 | 3376.9 | 4980.0 |
| MILCON | 0.0 | 7.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.9 |
| Acq O&M | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| PB 2020 Total | 2398.8 | 457.3 | 530.5 | 610.6 | 539.3 | 525.6 | 534.0 | 3376.9 | 8973.0 |
| PB 2019 Total | 2447.2 | 468.4 | 829.0 | 648.2 | 537.9 | 530.1 | 520.9 | 2844.7 | 8826.4 |
| Delta | -48.4 | -11.1 | -298.5 | -37.6 | 1.4 | -4.5 | 13.1 | 532.2 | 146.6 |

| Quantity Summary<br>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 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Production | 0 | 0 | 0 | 0 | 1 | 6 | 12 | 14 | 95 | 128 |
| PB 2020 Total | 7 | 0 | 0 | 0 | 1 | 6 | 12 | 14 | 95 | 135 |
| PB 2019 Total | 7 | 0 | 0 | 7 | 3 | 8 | 14 | 14 | 82 | 135 |
| Delta | 0 | 0 | 0 | -7 | -2 | -2 | -2 | 0 | 13 | 0 |

## Cost and Funding

## Annual Funding By Appropriation

| Annual Funding<br>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 |
| 2010 | -- | -- | -- | -- | -- | -- | 111.7 |
| 2011 | -- | -- | -- | -- | -- | -- | 83.7 |
| 2012 | -- | -- | -- | -- | -- | -- | 154.9 |
| 2013 | -- | -- | -- | -- | -- | -- | 153.3 |
| 2014 | -- | -- | -- | -- | -- | -- | 153.5 |
| 2015 | -- | -- | -- | -- | -- | -- | 224.6 |
| 2016 | -- | -- | -- | -- | -- | -- | 373.5 |
| 2017 | -- | -- | -- | -- | -- | -- | 559.1 |
| 2018 | -- | -- | -- | -- | -- | -- | 584.5 |
| 2019 | -- | -- | -- | -- | -- | -- | 449.4 |
| 2020 | -- | -- | -- | -- | -- | -- | 524.3 |
| 2021 | -- | -- | -- | -- | -- | -- | 434.2 |
| 2022 | -- | -- | -- | -- | -- | -- | 178.4 |
| Subtotal | 7 | -- | -- | -- | -- | -- | 3985.1 |

| Annual Funding<br>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 |
| 2010 | -- | -- | -- | -- | -- | -- | 120.4 |
| 2011 | -- | -- | -- | -- | -- | -- | 88.1 |
| 2012 | -- | -- | -- | -- | -- | -- | 160.4 |
| 2013 | -- | -- | -- | -- | -- | -- | 157.1 |
| 2014 | -- | -- | -- | -- | -- | -- | 155.1 |
| 2015 | -- | -- | -- | -- | -- | -- | 224.1 |
| 2016 | -- | -- | -- | -- | -- | -- | 366.2 |
| 2017 | -- | -- | -- | -- | -- | -- | 538.3 |
| 2018 | -- | -- | -- | -- | -- | -- | 551.3 |
| 2019 | -- | -- | -- | -- | -- | -- | 415.6 |
| 2020 | -- | -- | -- | -- | -- | -- | 475.3 |
| 2021 | -- | -- | -- | -- | -- | -- | 385.9 |
| 2022 | -- | -- | -- | -- | -- | -- | 155.5 |
| Subtotal | 7 | -- | -- | -- | -- | -- | 3793.3 |

| Annual Funding<br>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 |
| 2020 | -- | -- | 6.1 | -- | 6.1 | 0.1 | 6.2 |
| 2021 | 1 | 60.1 | 14.3 | -- | 74.4 | 102.0 | 176.4 |
| 2022 | 6 | 214.5 | 15.5 | -- | 230.0 | 130.9 | 360.9 |
| 2023 | 12 | 387.3 | 15.9 | -- | 403.2 | 122.4 | 525.6 |
| 2024 | 14 | 439.4 | 14.4 | -- | 453.8 | 80.2 | 534.0 |
| 2025 | 14 | 431.7 | 5.7 | -- | 437.4 | 92.1 | 529.5 |
| 2026 | 14 | 424.2 | -- | -- | 424.2 | 94.4 | 518.6 |
| 2027 | 14 | 423.8 | -- | -- | 423.8 | 56.7 | 480.5 |
| 2028 | 14 | 425.0 | -- | -- | 425.0 | 34.2 | 459.2 |
| 2029 | 14 | 427.7 | -- | -- | 427.7 | 34.9 | 462.6 |
| 2030 | 14 | 432.3 | -- | 9.8 | 442.1 | 35.6 | 477.7 |
| 2031 | 11 | 349.4 | -- | 13.1 | 362.5 | 34.8 | 397.3 |
| 2032 | -- | -- | -- | 19.5 | 19.5 | 32.0 | 51.5 |
| Subtotal | 128 | 4015.4 | 71.9 | 42.4 | 4129.7 | 850.3 | 4980.0 |

| Annual Funding<br>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 |
| 2020 | -- | -- | 5.4 | -- | 5.4 | 0.1 | 5.5 |
| 2021 | 1 | 52.5 | 12.5 | -- | 65.0 | 89.2 | 154.2 |
| 2022 | 6 | 183.8 | 13.3 | -- | 197.1 | 112.1 | 309.2 |
| 2023 | 12 | 325.3 | 13.4 | -- | 338.7 | 102.8 | 441.5 |
| 2024 | 14 | 361.8 | 11.9 | -- | 373.7 | 66.0 | 439.7 |
| 2025 | 14 | 348.5 | 4.6 | -- | 353.1 | 74.4 | 427.5 |
| 2026 | 14 | 335.8 | -- | -- | 335.8 | 74.7 | 410.5 |
| 2027 | 14 | 328.9 | -- | -- | 328.9 | 44.0 | 372.9 |
| 2028 | 14 | 323.3 | -- | -- | 323.3 | 26.0 | 349.3 |
| 2029 | 14 | 319.0 | -- | -- | 319.0 | 26.0 | 345.0 |
| 2030 | 14 | 316.1 | -- | 7.2 | 323.3 | 26.0 | 349.3 |
| 2031 | 11 | 250.5 | -- | 9.4 | 259.9 | 24.9 | 284.8 |
| 2032 | -- | -- | -- | 13.7 | 13.7 | 22.5 | 36.2 |
| Subtotal | 128 | 3145.5 | 61.1 | 30.3 | 3236.9 | 688.7 | 3925.6 |

| Annual Funding<br>1205 \| MILCON \| Military Construction, Navy and Marine Corps | |
|---|---|
| **Fiscal Year** | **TY $M**<br>**Total Program** |
| 2019 | 7.9 |
| Subtotal | 7.9 |

| Annual Funding<br>1205 \| MILCON \| Military Construction, Navy and Marine Corps | |
|---|---|
| **Fiscal Year** | **BY 2016 $M**<br>**Total Program** |
| 2019 | 7.0 |
| Subtotal | 7.0 |

## Low Rate Initial Production

| Item | Initial LRIP Decision | Current Total LRIP |
|---|---|---|
| **Approval Date** | 4/5/2016 | 4/5/2016 |
| **Approved Quantity** | 30 | 14 |
| **Reference** | Milestone B ADM | Milestone B ADM |
| **Start Year** | | |
| **End Year** | | |

The Current Total LRIP Quantity is more than 10% of the total production quantity in order to provide production-representative NGJ Mid-Band systems in support of Initial Operational Test and Evaluation, ensure adequate and efficient manufacturing capability while maintaining the industrial base, and permit an orderly increase, and hence reduced risk, in the NGJ Mid-Band production rate leading to the current planned maximum/optimal economic production rate of 14 ship-sets per year at FRP.

The Milestone B ADM approves an LRIP quantity of up to 30. The start year and end year are not specified.

## Foreign Military Sales

| Notes |
| --- |

On October 07, 2016 a $4M dollar FMS case was signed with Australia for technical data and support.

On October 18, 2017 Australia became a cooperative partner for NGJ Mid-Band development.

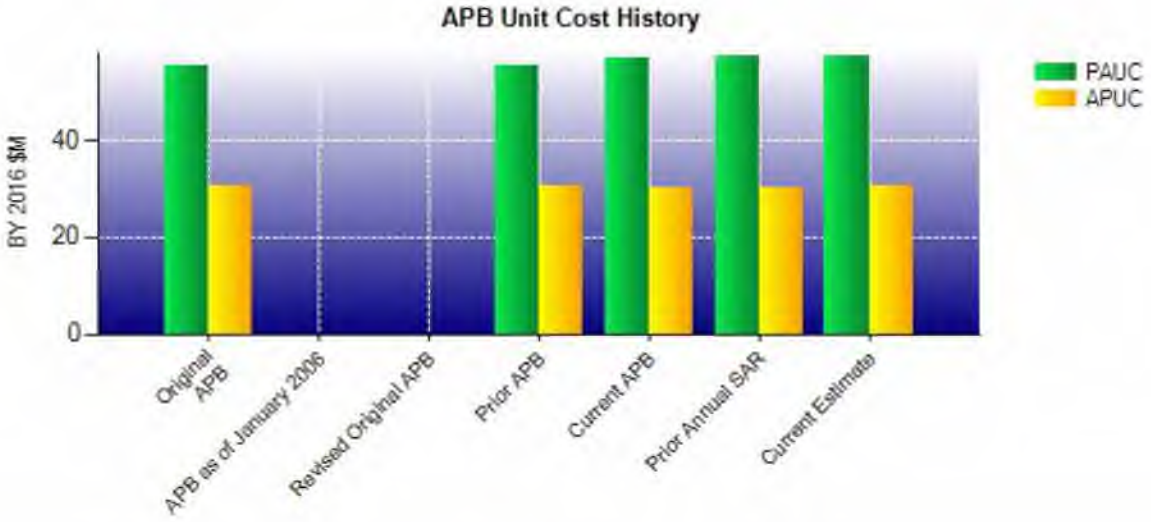
## Nuclear Costs

None

## Unit Cost

| Current UCR Baseline and Current Estimate (Base-Year Dollars) | | | |
|---|---|---|---|
| Item | BY 2016 $M<br>Current UCR Baseline (Nov 2018 APB) | BY 2016 $M<br>Current Estimate (Dec 2018 SAR) | % Change |
| Program Acquisition Unit Cost | | | |
| Cost | 7683.0 | 7725.9 | |
| Quantity | 135 | 135 | |
| Unit Cost | 56.911 | 57.229 | +0.56 |
| Average Procurement Unit Cost | | | |
| Cost | 3853.1 | 3925.6 | |
| Quantity | 128 | 128 | |
| Unit Cost | 30.102 | 30.669 | +1.88 |

| Original UCR Baseline and Current Estimate (Base-Year Dollars) | | | |
|---|---|---|---|
| Item | BY 2016 $M<br>Original UCR Baseline (Apr 2016 APB) | BY 2016 $M<br>Current Estimate (Dec 2018 SAR) | % Change |
| Program Acquisition Unit Cost | | | |
| Cost | 7463.7 | 7725.9 | |
| Quantity | 135 | 135 | |
| Unit Cost | 55.287 | 57.229 | +3.51 |
| Average Procurement Unit Cost | | | |
| Cost | 4002.6 | 3925.6 | |
| Quantity | 131 | 128 | |
| Unit Cost | 30.554 | 30.669 | +0.38 |




| APB Unit Cost History | | | | | |
|---|---|---|---|---|---|
| Item | Date | BY 2016 $M | | TY $M | |
| | | PAUC | APUC | PAUC | APUC |
| Original APB | Apr 2016 | 55.287 | 30.554 | 62.451 | 36.923 |
| 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 2016 | 55.287 | 30.554 | 62.451 | 36.923 |
| Current APB | Nov 2018 | 56.911 | 30.102 | 65.562 | 37.847 |
| Prior Annual SAR | Dec 2017 | 57.330 | 30.195 | 65.381 | 37.297 |
| Current Estimate | Dec 2018 | 57.229 | 30.669 | 66.467 | 38.906 |

## SAR Unit Cost History

| Current SAR Baseline to Current Estimate (TY $M) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PAUC Development Estimate | Changes | | | | | | | | PAUC Current Estimate |
| | Econ | Qty | Sch | Eng | Est | Oth | Spt | Total | |
| 62.451 | 0.267 | 0.160 | 4.247 | 0.270 | -1.491 | 0.000 | 0.563 | 4.016 | 66.467 |

| Current SAR Baseline to Current Estimate (TY $M) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Initial APUC Development Estimate | Changes | | | | | | | | APUC Current Estimate |
| | Econ | Qty | Sch | Eng | Est | Oth | Spt | Total | |
| 36.923 | 0.198 | 0.175 | 2.628 | 0.000 | -1.612 | 0.000 | 0.594 | 1.983 | 38.906 |

| SAR Baseline History | | | | |
|---|---|---|---|---|
| Item | SAR Planning Estimate | SAR Development Estimate | SAR Production Estimate | Current Estimate |
| Milestone A | N/A | Jul 2013 | N/A | Jul 2013 |
| Milestone B | N/A | Mar 2016 | N/A | Apr 2016 |
| Milestone C | N/A | Sep 2019 | N/A | Sep 2020 |
| IOC | N/A | Sep 2021 | N/A | Sep 2022 |
| Total Cost (TY $M) | N/A | 8430.9 | N/A | 8973.0 |
| Total Quantity | N/A | 135 | N/A | 135 |
| PAUC | N/A | 62.451 | N/A | 66.467 |

PAUC is reflected as TY $M.

## Cost Variance

| Summary TY $M | | | | |
|---|---|---|---|---|
| **Item** | **RDT&E** | **Procurement** | **MILCON** | **Total** |
| SAR Baseline (Development Estimate) | 3586.2 | 4836.9 | 7.8 | 8430.9 |
| Previous Changes | | | | |
| Economic | -8.2 | -21.4 | -- | -29.6 |
| Quantity | +109.7 | -88.2 | -- | +21.5 |
| Schedule | +237.0 | +263.8 | -- | +500.8 |
| Engineering | +36.4 | -- | -- | +36.4 |
| Estimating | +83.4 | -166.3 | +0.1 | -82.8 |
| Other | -- | -- | -- | -- |
| Support | -- | -50.8 | -- | -50.8 |
| Subtotal | +458.3 | -62.9 | +0.1 | +395.5 |
| Current Changes | | | | |
| Economic | +18.9 | +46.7 | +0.1 | +65.7 |
| Quantity | -- | -- | -- | -- |
| Schedule | -- | +72.6 | -- | +72.6 |
| Engineering | -- | -- | -- | -- |
| Estimating | -78.3 | -40.1 | -0.1 | -118.5 |
| Other | -- | -- | -- | -- |
| Support | -- | +126.8 | -- | +126.8 |
| Subtotal | -59.4 | +206.0 | -- | +146.6 |
| Total Changes | +398.9 | +143.1 | +0.1 | +542.1 |
| CE - Cost Variance | 3985.1 | 4980.0 | 7.9 | 8973.0 |
| CE - Cost & Funding | 3985.1 | 4980.0 | 7.9 | 8973.0 |

| Summary BY 2016 $M | | | | |
|---|---|---|---|---|
| **Item** | **RDT&E** | **Procurement** | **MILCON** | **Total** |
| SAR Baseline (Development Estimate) | 3454.1 | 4002.6 | 7.0 | 7463.7 |
| Previous Changes | | | | |
| Economic | -- | -- | -- | -- |
| Quantity | +99.9 | -66.4 | -- | +33.5 |
| Schedule | +204.0 | +121.4 | -- | +325.4 |
| Engineering | +34.1 | -- | -- | +34.1 |
| Estimating | +75.4 | -141.3 | +0.1 | -65.8 |
| Other | -- | -- | -- | -- |
| Support | -- | -51.3 | -- | -51.3 |
| Subtotal | +413.4 | -137.6 | +0.1 | +275.9 |
| Current Changes | | | | |
| Economic | -- | -- | -- | -- |
| Quantity | -- | -- | -- | -- |
| Schedule | -- | -4.8 | -- | -4.8 |
| Engineering | -- | -- | -- | -- |
| Estimating | -74.2 | -32.7 | -0.1 | -107.0 |
| Other | -- | -- | -- | -- |
| Support | -- | +98.1 | -- | +98.1 |
| Subtotal | -74.2 | +60.6 | -0.1 | -13.7 |
| Total Changes | +339.2 | -77.0 | -- | +262.2 |
| CE - Cost Variance | 3793.3 | 3925.6 | 7.0 | 7725.9 |
| CE - Cost & Funding | 3793.3 | 3925.6 | 7.0 | 7725.9 |

Previous Estimate: December 2017

| RDT&E | $M | |
|---|---|---|
| Current Change Explanations | Base Year | Then Year |
| Revised escalation indices. (Economic) | N/A | +18.9 |
| Revised estimate for execution adjustments. (Estimating) | -9.4 | -10.0 |
| Revised estimate for Small Business Innovative Research in FY 2018. (Estimating) | -18.4 | -19.4 |
| Revised estimate to reflect Navy Working Capital Funds labor rates adjustments. (Estimating) | -0.9 | -1.1 |
| Revised estimate for Congressional marks in FY 2018 and FY 2019. (Estimating) | -27.2 | -29.1 |
| Revised estimate for under-execution reduction in FY 2020 with payback in FY 2021 and FY 2022. (Estimating) | -1.2 | 0.0 |
| Revised estimate for Miscellaneous Adjustments (Estimating) | -6.2 | -7.0 |
| Revised estimate for contractor support services reductions. (Estimating) | -1.7 | -1.9 |
| Adjustment for current and prior escalation. (Estimating) | -9.2 | -9.8 |
| RDT&E Subtotal | -74.2 | -59.4 |

| Procurement | $M | |
|---|---|---|
| Current Change Explanations | Base Year | Then Year |
| Revised escalation indices. (Economic) | N/A | +46.7 |
| Stretch-out of procurement buy profile one additional year from FY 2030 to FY 2031 due to schedule delays. (Schedule) | 0.0 | +81.9 |
| Additional Schedule Variance due to the rephasing of pod shipsets from FY 2019-FY 2031. (Schedule) | -4.0 | -9.0 |
| Additional Schedule Variance is due to the rephasing of production line shutdown funding to align with updated procurement buy profile delay of one year from FY 2031 to FY 2032. (Schedule) | -0.8 | -0.3 |
| Revised estimate for A-kit procurement and installation. (Estimating) | -0.4 | -0.4 |
| Revised estimate to reflect application of new outyear escalation indices. (Estimating) | -32.3 | -39.7 |
| Increase in Other Support due to an estimating methodology update for Support Equipment, Data, and Training. (Support) | +44.6 | +62.4 |
| Increase in Initial Spares is due to one-year schedule delay which required rephasing of spares. (Support) | +53.5 | +64.4 |
| Procurement Subtotal | +60.6 | +206.0 |

| MILCON | $M | |
|---|---|---|
| Current Change Explanations | Base Year | Then Year |
| Revised escalation indices. (Economic) | N/A | +0.1 |
| Adjustment for current and prior escalation. (Estimating) | -0.1 | -0.1 |
| MILCON Subtotal | -0.1 | 0.0 |

# Contracts

## Contract Identification

**Appropriation:** RDT&E
**Contract Name:** NGJ Mid-Band EMD Integraton
**Contractor:** The Boeing Company
**Contractor Location:** 6200 JS McDonnell Blvd
Saint Louis, MO 63134-1939
**Contract Number:** N00019-16-C-0032
**Contract Type:** Cost Plus Incentive Fee (CPIF)
**Award Date:** April 07, 2016
**Definitization Date:** April 07, 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 |
| 20.0 | N/A | N/A | 279.4 | N/A | N/A | 254.1 | 254.1 |

## Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the award of contract modifications to provide for the integration of the NGJ Mid-Band pod onto the EA-18G aircraft.

The difference between the Current Contract Price and the Estimated Price at Completion is due to contractor efficiencies in the areas of software and test. This delta will be reallocated to mitigate the impact of the pod structure redesign.

| Contract Variance | | |
|---|---|---|
| Item | Cost Variance | Schedule Variance |
| Cumulative Variances To Date (1/31/2019) | +6.0 | -0.3 |
| Previous Cumulative Variances | +12.5 | -3.0 |
| Net Change | -6.5 | +2.7 |

## Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to Boeing implementing a partial single point adjustment (SPA) driven by the pod structure redesign.

The favorable net change in the schedule variance is due to Boeing implementing a partial SPA driven by the pod structure redesign.

## Contract Identification

**Appropriation:** RDT&E

**Contract Name:** Engineering and Manufacturing Development

**Contractor:** Raytheon Company

**Contractor Location:** 2000 East El Segundo Blvd
El Segundo, CA 90245

**Contract Number:** N00019-16-C-0002

**Contract Type:** Cost Plus Incentive Fee (CPIF)

**Award Date:** April 13, 2016

**Definitization Date:** April 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 |
| 977.2 | N/A | 0 | 1041.5 | N/A | 0 | 1265.7 | 1265.7 |

## Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the award of contract modifications for Australian FMS support, Ground Power and Cooling modifications to enable full pod functionality in ground test chambers, Prime Power Generation Capability, and the structure redesign effort. The difference between the Current Contract Price and the Program Manager's Estimated Price At Completion is the unnegotiated contract price for the Structures 2.0 Phase 2 modification and the contract incentive fee.

| Contract Variance | | |
|---|---|---|
| Item | Cost Variance | Schedule Variance |
| Cumulative Variances To Date (12/31/2018) | -31.9 | -47.1 |
| Previous Cumulative Variances | -8.6 | +5.0 |
| Net Change | -23.3 | -52.1 |

## Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to inefficiencies primarily in arrays, Common Electronic Unit (CEU), and software. During the year, arrays has experienced several integration issues requiring additional rework and resources. Software and CEU development also encountered many issues during the year requiring additional effort and resources.

The unfavorable net change in the schedule variance is due to early material receipt, which portrayed a positive schedule variance last year, and delays in arrays, software, and the CEU. The contractor is in the process of a single point adjustment as a result of the structure redesign.

## Deliveries and Expenditures

| Deliveries | | | | |
|---|---|---|---|---|
| **Delivered to Date** | **Planned to Date** | **Actual to Date** | **Total Quantity** | **Percent Delivered** |
| Development | 0 | 0 | 7 | 0.00% |
| Production | 0 | 0 | 128 | 0.00% |
| Total Program Quantity Delivered | 0 | 0 | 135 | 0.00% |

| **Expended and Appropriated (TY $M)** | | | |
|---|---|---|---|
| Total Acquisition Cost | 8973.0 | Years Appropriated | 10 |
| Expended to Date | 2219.2 | Percent Years Appropriated | 43.48% |
| Percent Expended | 24.73% | Appropriated to Date | 2856.1 |
| Total Funding Years | 23 | Percent Appropriated | 31.83% |

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

# Operating and Support Cost

## Cost Estimate Details

| | |
|---|---|
| **Date of Estimate:** | January 03, 2019 |
| **Source of Estimate:** | POE |
| **Quantity to Sustain:** | 135 |
| **Unit of Measure:** | System |
| **Service Life per Unit:** | 20.00 Years |
| **Fiscal Years in Service:** | FY 2022 - FY 2041 |

- Unit of measure (system) is defined as a shipset, which consists of 2 pods.

- The pod structure service life was reduced from 7,200 hours to 4,000 hours. However, the estimated pod structure life is still sufficient to meet the program of record and support the EA-18G program of record. There is no impact to the O&S cost estimate.

- The service life and usage is tied to the EA-18G platform.

- Total System Operating Years: 1,153

- Inflation Indices Utilized: FY 2018 OSD indices.

## Sustainment Strategy

- Contractor Logistics Support covering the total system through the Developmental Test and Evaluation Phase (initial).

- Organizational, Intermediate, and Depot level maintenance capabilities; military maintenance support (future).

- All systems and sub-systems will have Performance Based Agreements with organic depots or the Original Equipment Manufacturer for repair support.

## Antecedent Information

- Antecedent program: ALQ-99 Tactical Jamming System

- The dataset used in the antecedent costs below are reported FY 2008 costs, which are most representative of steady state prior to de-commissioning EA-6B squadrons.

- The dataset includes data from the ALQ-99 system, which covers a larger frequency spectrum than the NGJ Mid-Band system, and is not normalized to specific mid-band data.

- Due to data limitations, the antecedent is represented in dollars per aircraft operating years based on Primary Aircraft Authorization.

- Data sources: Decision Knowledge Programming for Logistics Analysis and Technical Evaluation, Naval Visibility and Management of Operating and Support Costs database, and various technical sources, including Naval Air Systems Command AIR 4.2.2, Naval Air Warfare Center Weapons Division Point Mugu, Naval Sea Systems Command Crane, and Center for Naval Aviation Technical Training.

| Annual O&S Costs BY2016 $M | | |
|---|---|---|
| **Cost Element** | **NGJ Mid-Band Average Annual Cost Per System** | **ALQ-99 (Antecedent) Average Annual Cost Per System** |
| Unit-Level Manpower | 0.059 | 0.060 |
| Unit Operations | 0.000 | 0.000 |
| Maintenance | 0.381 | 0.538 |
| Sustaining Support | 0.126 | 0.065 |
| Continuing System Improvements | 0.404 | 0.078 |
| Indirect Support | 0.067 | 0.027 |
| Other | 0.000 | 0.000 |
| Total | 1.037 | 0.768 |

| Item | Total O&S Cost $M | | | |
|---|---|---|---|---|
| | NGJ Mid-Band | | | ALQ-99 (Antecedent) |
| | Current Development APB Objective/Threshold | | Current Estimate | |
| **Base Year** | 1243.7 | 1368.1 | 1195.7 | 885.1 |
| **Then Year** | 1673.0 | N/A | 1649.7 | N/A |

The antecedent average annual cost above is multiplied by the total number of operating system years associated with the NGJ Mid-Band to provide an O&S cost comparison.

**Equation to Translate Annual Cost to Total Cost**

NGJ Mid-Band Total O&S Cost = NGJ Mid-Band Average Annual O&S Cost per System * Total System Operating Years

$1195.7M Total O&S Cost = $1.037M/System/Year * 1,153 System Operating Years. The derivation of the system operating years is the summation of the estimated cumulative shipset (system) quantity profile for the FYs in service.

| O&S Cost Variance | | |
|---|---|---|
| **Category** | **BY 2016 $M** | **Change Explanations** |
| Prior SAR Total O&S Estimates - Dec 2017 SAR | 1238.3 | |
| Programmatic/Planning Factors | -42.6 | Updated NGJ Mid-Band procurement and delivery profiles, fielding plan, and program dates. |
| 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 | -42.6 |
| Current Estimate | 1195.7 |

## Disposal Estimate Details

**Date of Estimate:** January 03, 2019
**Source of Estimate:** POE
**Disposal/Demilitarization Total Cost (BY 2016 $M):** 2.1

The Demil/Disposal estimate for NGJ Mid-Band will be refined at Milestone C based on the System Disposal Plan Annex to the Life Cycle Sustainment Plan.