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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0204136N / <i>F/A-18 Squadrons</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	5,441.932	182.014	185.084	189.224	-	189.224	-	-	-	-	-	-
1662: <i>F/A-18 Improvement</i>	4,540.511	94.606	127.461	145.613	-	145.613	-	-	-	-	-	-
2065: <i>F/A-18 Radar Upgrade</i>	752.084	8.370	8.113	7.678	-	7.678	-	-	-	-	-	-
2071: <i>F/A-18 Block III</i>	137.946	77.107	27.072	31.471	-	31.471	-	-	-	-	-	-
9099: <i>Physiological Episodes</i>	0.000	0.000	5.438	4.462	-	4.462	-	-	-	-	-	-
9999: <i>Congressional Adds</i>	11.391	1.931	17.000	0.000	-	0.000	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The F/A-18 is required to perform multiple missions. The continued F/A-18 E/F and EA-18G "Flight Plan" spiral capability development is critical to the baseline of the Super Hornet next generation mission system capability to maintain the platform's tactical relevance in support of Navy Aviation Plan 2030.

Development continues for a platform solution to threat Advanced Electronic Attack and Counter-Electronic Attack (CEA). F/A-18 solutions to CEA include upgrades to existing sensors such as F/A-18 Radar Upgrade, Infrared Search and Track Block I/II, and development of Nirvana (next increment of Common Tactical Picture (CTP)) that increases aircraft lethality and kill chain effectiveness through multi aircraft sensor fusion. Continued advanced development engineering for improvements in reliability and maintainability is required to ensure maximum benefit is achieved through reduced cost of ownership and provides enhanced availability.

Capabilities of the F/A-18 weapon system and ancillary equipment can be upgraded to accommodate and incorporate new or enhanced weapons and advances in technology to respond effectively to emerging future threats. Future integrated Carrier Air Wing Concept of Operations (CONOPS) demand changes to the base line Block II Super Hornet. In response, the Block III Super Hornet was submitted. None of the changes to the aircraft are revolutionary; however, the combined impact to the aircraft's capability and its contribution to the Airwing are significant. The initial F/A-18 Block III concept includes low risk changes which will be incorporated in the near term with a combination of forward fit production line incorporation and retrofit modifications to the aircraft already planned as part of the Service Life Modification (SLM) Plan.

USMC upgrades to the platform are being developed; to include integration and capability expansion of Active Electronically Scanned Array (AESA) Radar for F/A-18 A-D, evaluation and development of an Automatic Ground Collision Avoidance System (AUTOGCAS) for all F/A-18 variants, development of increased sensor and Electronic Warfare (EW) capability for F/A-18 A-D, weapons carriage and employment capability expansion, and enhancement of Mission Computer (MC) processing and memory capability.

Funding for Naval Aviation Physiological Episode (PE) mitigation and root cause investigation in aircraft.

Funding for the Digital Video Map Computer-Upgrade (DVMC-U)/Advanced Crew Station (ACS) Improved Tactical Displays which will enable Panoramic "Big Picture" view of the Battle Space for improved weapons employment and engagement. Leveraging completed work from F/A-18A-D to include the development of an

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AUTOGCAS for the F/A-18E/F and EA-18G is a logical extension of the DVMC-Upgrade using modifications to the Terrain Avoidance Warning System (TAWS) resident in the existing DVMC in fatal mishap prevention.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	187.911	171.030	160.460	-	160.460
Current President's Budget	182.014	185.084	189.224	-	189.224
Total Adjustments	-5.897	14.054	28.764	-	28.764
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.946			
• Congressional Rescissions	-	-			
• Congressional Adds	-	17.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.001	0.000			
• SBIR/STTR Transfer	-5.896	0.000			
• Program Adjustments	0.000	0.000	35.409	-	35.409
• Rate/Misc Adjustments	0.000	0.000	-6.645	-	-6.645

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

 Congressional Add: *Noise reduction research*

 Congressional Add: *Beacon Obsolescence Issues*

 Congressional Add: *Fifth Generation Sensor Fusion Study*

 Congressional Add: *Growler Noise Mitigation*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	FY 2020	FY 2021
	1.931	0.000
	0.000	3.000
	0.000	10.000
	0.000	4.000
Congressional Add Subtotals for Project: 9999	1.931	17.000
Congressional Add Totals for all Projects	1.931	17.000

Change Summary Explanation

Cost:

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<p>1662: The FY 2022 funding request was reduced by \$7.791 million for Automatic Collision Avoidance System due to USMC AVN Program balancing, \$5.326 million to account for the availability of prior year execution balances and an additional \$2.182 million reduction for Rate/Misc adjustments. The FY 2022 funding request was increased by \$14.0 million for Multi-Layered Obstructed Brokered (MOB) Hub prototype system into the F-18.</p> <p>2065: The FY 2022 funding request was reduced by \$1.202 million to account for the availability of prior year execution balances and an additional \$0.116 million reduction for Rate/Misc adjustments.</p> <p>2071: \$43.2 million was added in FY22 at the DON-22 budget cycle for continued Block III capability enhancements. The FY 2022 funding request was reduced by \$8.446 million to account for the availability of prior year execution balances and an additional \$3.283 million reduction for Rate/Misc adjustments.</p> <p>9099: The FY 2022 funding request was reduced by \$0.090 million for Rate/Misc adjustments.</p> <p>Technical:</p> <p>1662: Re-named Advanced Capability Display Computer (ACDC) to Digital Video Map Computer-Upgrade (DVMC-U) (ACDC is a registered trademark, DVMC-U is the government's product name used for kit procurement in APN-5 BLI 0525 OSIP 23-04).</p> <p>2065: Not Applicable</p> <p>2071: The 2071 budget was extended and provides for continued advanced development engineering and studies and analysis focused on enhanced aircraft survivability, sensor fusion and networking effectiveness, and targeting at the tactical leading edge in highly contested environments. These Block III improvements are necessary to deliver required combat capabilities and upgrades to the F/A-18 to meet the objectives outlined in the National Defense Strategy.</p> <p>9099: Not Applicable</p> <p>9999: Not Applicable</p> <p>Schedule:</p> <p>1662:</p> <ul style="list-style-type: none"> - Updated previous ACDC schedule to reflect name change to Digital Video Map Computer-Upgrade (DVMC-U) - Added MSI/CTP fleet release H20 and H22 - Updated MSI/CTP to break out H14 fleet release in to two releases, H14+ and H14* <p>2065:</p> <ul style="list-style-type: none"> - Added Aided Target Recognition (AiTR) Development beginning 1st Qtr FY21 - Added Distributed Target Development beginning 1st Qtr FY20 - Updated Instrumentation Development to complete 2nd Qtr FY22 - Updated ACM Mode Development to complete after FY22 - Updated H18 IT from 3rd Qtr FY20 to 4th Qtr FY21 - Updated H18 OT from 1st Qtr FY23 to 4th Qtr FY22 - Updated H16 software delivery from 4th Qtr FY21 to 2nd Qtr FY21 - Updated Retrofit Radar Deliveries from completing 1st Qtr FY21 to 2nd Qtr FY21 <p>2071:</p> <ul style="list-style-type: none"> - Added Block III Studies and Analysis beginning Q1 FY22 		

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<ul style="list-style-type: none">- Added Block III Development Engineering beginning Q3 FY229099:- N/A9999:- Added schedules for Beacon Obsolescence Research, Fifth Generation Sensor Fusion Study and Growler Noise Mitigation		

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy										Date: May 2021		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0204136N / <i>F/A-18 Squadrons</i>				Project (Number/Name) 1662 / <i>F/A-18 Improvement</i>			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
1662: <i>F/A-18 Improvement</i>	4,540.511	94.606	127.461	145.613	-	145.613	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The F/A-18 is required to perform multiple missions. The continued F/A-18 E/F and EA-18G "Flight Plan" spiral capability development is critical to the baseline of the Super Hornet next generation mission system capability to maintain the platform's tactical relevance in support of Navy Aviation Plan 2030.

Development continues for a platform solution to threat Advanced Electronic Attack and Counter-Electronic Attack (CEA). F/A-18 solutions to CEA include upgrades to existing sensors such as F/A-18 Radar Upgrade, Infrared Search and Track Block I/II, and development of Nirvana (next increment of Common Tactical Picture (CTP)) that increases aircraft lethality and kill chain effectiveness through multi aircraft sensor fusion. Continued advanced development engineering for improvements in reliability and maintainability is required to ensure maximum benefit is achieved through reduced cost of ownership and provides enhanced availability.

Capabilities of the F/A-18 weapon system and ancillary equipment can be upgraded to accommodate and incorporate new or enhanced weapons and advances in technology to respond effectively to emerging future threats. Future integrated Carrier Air Wing Concept of Operations (CONOPS) demand changes to the base line Block II Super Hornet. In response, the Block III Super Hornet was submitted. None of the changes to the aircraft are revolutionary; however, the combined impact to the aircraft's capability and its contribution to the Airwing are significant. The initial F/A-18 Block III concept includes low risk changes which will be incorporated in the near term with a combination of forward fit production line incorporation and retrofit modifications to the aircraft already planned as part of the Service Life Modification (SLM) Plan.

USMC upgrades to the platform are being developed; to include integration and capability expansion of AESA Radar for F/A-18 A-D, evaluation and development of an Automatic Ground Collision Avoidance System (AUTOGCAS) for all F/A-18 variants, development of increased sensor and Electronic Warfare (EW) capability for F/A-18 A-D, weapons carriage and employment capability expansion, and enhancement of Mission Computer (MC) processing and memory capability. The requirement for Automatic Ground Collision Avoidance System (Auto-GCAS and/or AGCAS) is documented in the F/A-18 C/D Automatic Ground Collision Avoidance System Requirement Letter, dated 20 July 2020: "Controlled Flight into Terrain (CFIT) has been the leading cause of F/A-18 aircraft loss and aircrew fatality. Protecting the lives of aircrew, and preserving Marine Corps' assets are vital to combat readiness. The F/A-18 community has consistently placed AGCAS as a top platform safety priority in Naval Aviation Readiness Groups, Operational Advisory Groups, and Systems Safety Working Groups. AGCAS aligns with Section 127 of the FY19 National Defense Authorization Act, which directs the Secretary of the Navy to mitigate the risk of pilot incapacitation posed by physiological episodes. Historically, USAF F-16 squadrons have experienced similar CFIT mishap rates. To address this, the F-16 community developed a variant of AGCAS, and has demonstrated real world success in preventing CFIT with at least eight documented "saves." Due to this capability, the risk of CFIT has been effectively mitigated in the USAF F-16 community. Most importantly, AGCAS would have prevented multiple fatal F/A-18 CFIT mishaps based on simulation re-enactments of these events. The USMC F/A-18 community requires AGCAS. The system must be capable of providing an Initial Operating Capability no later than the end of Fiscal Year 2022."

Funding for the Digital Video Map Computer-Upgrade (DVMC-U)/Advanced Crew Station (ACS) Improved Tactical Displays which will enable Panoramic "Big Picture" view of the Battle Space for improved weapons employment and engagement. Including the development of an AUTOGCAS for the F/A-18E/F and EA-18G as a logical

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extension of the DVMC-Upgrade leveraging completed work from F/A-18A-D using modifications to the TAWS resident in the existing Super Hornet/Growler DVMC in fatal mishap prevention.

Funding for Naval Aviation Physiological Episode (PE) mitigation and root cause investigation in aircraft.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>Title: USMC Capability Upgrades</p> <p align="right">Articles:</p> <p>Description: USMC upgrades to the platform are being developed to include evaluation and development of an Automatic Ground Collision Avoidance System (AUTOGCAS) for all F/A-18 variants, development of increased sensor and EW capability for F/A-18 A-D, weapons carriage and employment capability expansion, and enhancement of MC processing and memory capability. AUTOGCAS will provide the F/A-18 with an auto recovery capability that maneuvers the aircraft away from the ground in case of pilot incapacitation from G-Loss of Consciousness or a Physiological Episode (PE) event. This is a significant aircraft safety improvement that could have prevented multiple fatal F/A-18 mishaps over the past two decades.</p> <p>The requirement for Automatic Ground Collision Avoidance System (Auto-GCAS and/or AGCAS) is documented in the F/A-18 C/D Automatic Ground Collision Avoidance System Requirement Letter, dated 20 July 2020: "Controlled Flight into Terrain (CFIT) has been the leading cause of F/A-18 aircraft loss and aircrew fatality. Protecting the lives of aircrew, and preserving Marine Corps' assets are vital to combat readiness. The F/A-18 community has consistently placed AGCAS as a top platform safety priority in Naval Aviation Readiness Groups, Operational Advisory Groups, and Systems Safety Working Groups. AGCAS aligns with Section 127 of the FY19 National Defense Authorization Act, which directs the Secretary of the Navy to mitigate the risk of pilot incapacitation posed by physiological episodes. Historically, USAF F-16 squadrons have experienced similar CFIT mishap rates. To address this, the F-16 community developed a variant of AGCAS, and has demonstrated real world success in preventing CFIT with at least eight documented "saves." Due to this capability, the risk of CFIT has been effectively mitigated in the USAF F-16 community. Most importantly, AGCAS would have prevented multiple fatal F/A-18 CFIT mishaps based on simulation re-enactments of these events. The USMC F/A-18 community requires AGCAS. The system must be capable of providing an Initial Operating Capability no later than the end of Fiscal Year 2022."</p> <p>FY 2021 Plans:</p>	11.687	29.460	18.195	0.000	18.195
	-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
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Conduct testing on the AUTOGCAS subsystems (digital map computer and mission computer) for the F/A-18 A-D. Complete AUTOGCAS Phase 1 (Flight Control Computer Infrastructure Risk Reduction).

FY 2022 Base Plans:

Complete AUTOGCAS Phase 2 (Flight Control Computer OFP Update) and platform integration and testing.

FY 2022 OCO Plans:

N/A

FY 2021 to FY 2022 Increase/Decrease Statement:

FY2021 to FY2022 decrease of \$11.265 million is due to USMC Capability Upgrade completing Phase 1 efforts and transitioning to Phase 2.

Title: Digital Video Map Computer-Upgrade (DVMC-U)

Articles:

0.000	21.646	35.053	0.000	35.053
-	-	-	-	-

Description: Funds development of Digital Video Map Computer-Upgrade (DVMC-U) (formerly known as Advanced Capability Display Computer - ACDC) to leverage Large Area Displays and Advanced Networking Infrastructure (ANI) in Block III to provide greater situational awareness and incorporate Tactical Decision Aids such as Common Tactical Picture. AUTOGCAS will provide the F/A-18 with an auto recovery capability that maneuvers the aircraft away from the ground in case of pilot incapacitation or Controlled Flight Into Terrain (CFIT) incidents. This is a significant aircraft safety improvement that could have prevented multiple fatal F/A-18 mishaps over the past two decades and aligns with Section 127 of the FY19 National Defense Authorization Act directing the Secretary of the Navy to mitigate the risk posed by CFIT. Modifications to the Digital Mapping Computer (DMC), as well as the Terrain Avoidance Warning System (TAWS) and flight control laws to incorporate AUTOGCAS for the F/A-18A-D Hornet directly port over to incorporate this life-saving capability to the Super Hornet/Growler with reduced program development requirements. Including the development of an AUTOGCAS for the F/A-18E/F and EA-18G leveraging completed work from F/A-18A-D is scheduled to begin in FY22 as a logical extension of the DVMC-Upgrade using modifications to the TAWS resident in the existing DVMC in fatal mishap prevention.

FY 2021 Plans:

Begin design and development for the Digital Video Map Computer-Upgrade (DVMC-U) hardware & software that will enable Larger Area Display surface to be fully utilized with advanced graphical tactical displays and intuitive touch screen interface capabilities.

FY 2022 Base Plans:

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>Continue design and development for the Digital Video Map Computer-Upgrade (DVMC-U) hardware & software that will enable Larger Area Display surface to be fully utilized with advanced graphical tactical displays and intuitive touch screen interface capabilities.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: FY2021 to FY2022 increase of \$13.407 million is due to a ramp-up as project moves from design concept to hardware builds with integration development test requirements with material change requirements.</p>					
<p>Title: Multi-System Integration (MSI) / Common Tactical Picture (CTP)</p> <p align="right">Articles:</p> <p>Description: MSI transitions to integration of new sensors and tuning, while Common Tactical Picture (CTP) starts with H16 Block III efforts to merge data fusion and sensors from single aircraft to multiple aircraft. CTP represents an incremental approach to accelerating kill chains through multi aircraft sensor fusion and automation. System Configuration Set (SCS) methodology of bundling capabilities and modifications into a single fleet mission computer Operational Flight Program (OFP) continue, but at an increased delivery rate to meet rapid speed to fleet demands. This is being accomplished with an incremental modernization of the F/A-18 & EA-18G software lifecycle, that includes Scaled Agile Framework and Continuous Development & Integration (CCD&I) methodology.</p> <p>FY 2021 Plans: Flight Plan MSI and associated Common Tactical Picture (CTP) incremental capabilities continue through mission computer, JMPS UPC, and weapon system software SCS updates associated with each incremental Block (H build) software update to include Software Modernization, Cyber protections, and speed to fleet initiatives. Advances in Super Hornet Air and Surface Warfare will continue with ongoing integration of weapons and sensors into a CTP, Display Improvements to enhance air-to-air and air-to-surface situational awareness and aircrew decision superiority, continued development of third party software applications and protocols for rapid fleet capability delivery, and Counter Electronic Attack enhancements to improve survivability and lethality. Increased engineering efforts for integration of active and passive kill chain capabilities and sensors associated with Flight Plan NIFC and OASuW FNC Target Identification transition efforts continues. Airwing interoperability requirements, CTP algorithm and aircraft division level sensor fusion and management, and developmental test efforts also increase at test activities, including ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, Live Virtual</p>	44.766	67.516	83.884	0.000	83.884
	-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>Constructive developmental efforts, and Minotaur research and integration testing. FY 2021 funding continue CTP development and risk reduction, interoperability and testing associated with H16 Operational Testing, and transition to developmental tools such as Agile software.</p> <p>FY 2022 Base Plans: Flight Plan CTP and Nirvana incremental capabilities continue through mission computer, JMPS UPC, and weapon system software SCS updates associated with multiple releases every year of incremental Block (H build) software update to include Software Modernization, Cyber protections, and speed to fleet initiatives. Advances in Super Hornet Air and Surface Warfare will continue with ongoing integration of weapons and sensors into a Nirvana, Display Improvements to enhance air-to-air and air-to-surface situational awareness and aircrew decision superiority, continued development of third party software applications and protocols for rapid fleet capability delivery, and Counter Electronic Attack enhancements to improve survivability and lethality. Increased engineering efforts for integration of active and passive kill chain capabilities and sensors associated with Flight Plan NIFC and OASuW FNC Target Identification transition efforts continues. Airwing interoperability requirements, Nirvana algorithm and aircraft division level sensor fusion and management, and developmental test efforts also increase at test activities, including ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, Live Virtual Constructive developmental efforts, and Minotaur research and integration testing. FY 2022 funding continues CTP/Nirvana development and risk reduction, interoperability and testing associated with H16 Operational Testing, and transition to developmental tools such as Agile software.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: FY2021 to FY2022 increase of \$16.368 million. Increase of \$2.368 million is to support MSI/CTP ramp-up of Minotaur and Crypto Mod efforts. Increase of \$14.0 million for the non-recurring engineering associated with the incorporation of a Multi-Layered Obstructed Brokered (MOB) Hub prototype system into the F-18. Integration of the MOB Hub, which acts as a 1553 Remote Terminate (RT) allows for rapid technology integration and fusion of data to enhance operator awareness, increase platform survivability, disrupt red kill chains, while contributing to blue kill chains without having to update the Operational Flight Program of the aircraft.</p>					
<p>Title: Flight Plan Engineering / System Configuration Set Development and Integration</p> <p align="right">Articles:</p>	13.781	8.733	8.373	0.000	8.373
	-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
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Description: Continue F/A-18 E/F and EA-18G "Flight Plan" spiral capability development, which is critical to the baseline of the Super Hornet next generation mission system capability. Funding will support the development, test, and integration efforts required to maintain tactical relevance in support of the Naval Aviation Plan 2030.

FY 2021 Plans:

Continue Flight Plan Engineering efforts to include F/A-18E/F improvements necessary for Super Hornet relevance and tactical supremacy, Software Modernization and Cyber, Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhanced F/A-18 Cooperative Engagement Capability.

FY 2022 Base Plans:

Continue Flight Plan Engineering efforts to include F/A-18E/F improvements necessary for Super Hornet relevance and tactical supremacy, Software Modernization and Cyber, Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhanced F/A-18 Cooperative Engagement Capability.

FY 2022 OCO Plans:

N/A

FY 2021 to FY 2022 Increase/Decrease Statement:

FY2021 to FY2022 decrease of \$0.360 million is due to reduction in support needed for flight plan engineering to NAWCWD China Lake.

Title: Physiological Episode Mitigation

Articles:

24.268	0.000	0.000	0.000	0.000	0.000
-	-	-	-	-	-

Description: Funding provides for design, development, integration and test of platform improvements for F/A-18A-F and EA-18G Weapon Systems as determined through a Root Cause and Corrective Action (RCCA) process to mitigate and reduce the occurrences of Physiological Episode (PE) in Naval Aviation.

FY2021 and out efforts are funded under Project Unit 9099.

FY 2021 Plans:

N/A

FY 2022 Base Plans:

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
N/A					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: N/A					
Title: F/A-18 Obsolescence Redesign	0.104	0.106	0.108	0.000	0.108
Articles:	-	-	-	-	-
Description: Develop and test modifications to address obsolescence issues.					
FY 2021 Plans: Develop and test design modifications to hardware components and software systems in response to F/A-18 weapon system and ancillary equipment obsolescence issues.					
FY 2022 Base Plans: Continue development and test design modifications to hardware components and software systems in response to F/A-18 weapon system and ancillary equipment obsolescence issues.					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: FY 2021 to FY 2022 increase for \$0.002 is due to MISC adjustments.					
Accomplishments/Planned Programs Subtotals	94.606	127.461	145.613	0.000	145.613

C. Other Program Funding Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• APN/0525: F-18 SERIES	1,127.699	369.600	327.571	-	327.571	-	-	-	-	-	-
• APN/0145: FA-18E/F	1,762.774	1,778.554	87.832	-	87.832	-	-	-	-	-	-
• APN/0145C: FA-18E/F	53.154	0.000	0.000	-	0.000	-	-	-	-	-	-
• APN/0505: F-18E/F and EA-18G Modernization and Sustainment	0.000	399.360	482.899	-	482.899	-	-	-	-	-	-

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy Date: May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / <i>F/A-18 Squadrons</i>	Project (Number/Name) 1662 / <i>F/A-18 Improvement</i>
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D. Acquisition Strategy

The F/A-18 Improvement program consists of extensive spiral development efforts mapped out in the capability-based approach F/A-18 E/F "Flight Plan". These efforts are critical to the baseline of the Super Hornet next generation mission system capability and maintaining tactical relevance in support of the Naval Aviation Plan 2030. The major programs within the F/A-18 Improvement project are based on multiple Weapon System Capabilities including: Net Centric Operations/Battle Space Management, Sensor Integration, Air to Ground and Maritime Attack, and Air to Air Attack. The major efforts included in this project are: Dual Mode Weapons integration; Nirvana (next increment of Common Tactical Picture (CTP)); continued advanced development and F/A-18E/F Flight Plan engineering and analysis; continued enhanced software capabilities development; and engineering support to perform technical evaluations, modeling and simulations, and investigative flight testing. Nirvana capability is being developed under the NAWCWD System Configuration Set (SCS) Cost Plus Fixed Fee contract. AUTOGCAS will provide the F/A-18 with an auto recovery capability that maneuvers the aircraft away from the ground through automatic throttle control, flying to a pre-defined waypoint and circling until pilot recovery in case of pilot incapacitation or Controlled Flight Into Terrain (CFIT) incidents. Including the development of an AUTOGCAS for the F/A-18E/F and EA-18G leveraging completed work from F/A-18A-D is scheduled to begin in FY22 as a logical extension of the DVMC-Upgrade (formerly known as Advanced Capability Display Computer - ACDC)using modifications to the TAWS resident in the existing DVMC in fatal mishap prevention.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 1662 / F/A-18 Improvement
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MSI/CTP Develop Sensor Integration	C/IDIQ	Boeing : St Louis, MO	19.307	10.015	Feb 2020	16.196	Feb 2021	27.119	Feb 2022	-		27.119	-	-	-
MSI/CTP Develop Sensor Integration	WR	NAWCWD : China Lake, CA	33.252	5.554	Nov 2019	8.481	Nov 2020	12.660	Nov 2021	-		12.660	-	-	-
MSI/CTP Development Support	WR	NSMA : Arlington, VA	0.000	0.000		2.636	Dec 2020	2.683	Dec 2021	-		2.683	-	-	-
MSI/CTP Strike Accelerator ASUW ICP3	WR	NAWCWD : China Lake, CA	11.295	20.391	Nov 2019	21.480	Nov 2020	20.758	Nov 2021	-		20.758	-	-	-
USMC Upgrades - Electronic Warfare	C/CPIF	Raytheon : El Segundo, CA	0.000	2.960	Jan 2020	1.912	Jan 2021	0.000		-		0.000	-	-	-
USMC Upgrades - Mission Computer	C/CPIF	General Dynamics : Reston, VA	0.000	1.015	Jan 2020	0.000		0.000		-		0.000	-	-	-
USMC Upgrades - Software development & Integration	C/CPIF	Boeing : St Louis, MO	0.000	1.485	Jan 2020	13.585	Jan 2021	5.681	Jan 2022	-		5.681	-	-	-
USMC Upgrades - AUTOGCAS - Software development & Risk Reduction	WR	NAWCWD : China Lake, CA	3.004	2.889	Nov 2019	4.410	Nov 2020	4.266	Nov 2021	-		4.266	-	-	-
USMC Upgrades - AUTOGCAS	C/CPIF	Boeing : St Louis, MO	0.000	0.000		3.101	Jan 2021	3.163	Jan 2022	-		3.163	-	-	-
USMC Upgrades - AUTOGCAS - ATAWS software development	Various	PMA 209 Various : Various	1.600	0.000		1.230	Nov 2020	0.000		-		0.000	-	-	-
DVMC-U (ACS) Improved Tactical Displays Development	C/CPIF	Boeing : St. Louis, MO	0.000	0.000		14.876	Feb 2021	30.045	Feb 2022	-		30.045	-	-	-
DVMC-U Advance Capability Mission Computer (ACMC)	WR	NSMA : Arlington, VA	0.000	0.000		1.100	Dec 2020	1.000	Dec 2021	-		1.000	-	-	-
DVMC-U Software Development	WR	NAWCWD : China Lake, CA	0.000	0.000		4.730	Nov 2020	3.050	Nov 2021	-		3.050	-	-	-
Flight Plan/SCS - PALC & Magic Carpet	C/CPIF	Boeing : St. Louis, MO	40.984	4.857	Dec 2019	0.000		0.000		-		0.000	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 1662 / F/A-18 Improvement
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Flight Plan/SCS Development	WR	NAWCAD : Pax River, MD	17.356	1.790	Nov 2019	0.000		0.000		-		0.000	-	-	-
Flight Plan/SCS Development	Various	DMEA : McClellan, CA	6.793	1.002	Dec 2019	0.000		0.000		-		0.000	-	-	-
Flight Plan/SCS ATFLIR Modernization	Various	Various : Various	0.840	0.100	Dec 2019	0.000		0.000		-		0.000	-	-	-
PE Design & Development	C/CPIF	Boeing : St Louis, MO	16.330	17.900	Mar 2020	0.000		0.000		-		0.000	-	-	-
PE Data Software Study	WR	NAWCTSD ORLANDO : ORLANDO, FL	3.744	1.432	Nov 2019	0.000		0.000		-		0.000	-	-	-
Prior Year Prod Dev cost no longer funded in FYDP	Various	Various : Various	800.217	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			954.722	71.390		93.737		110.425		-		110.425	-	-	N/A

Remarks
 FY22 increases to MSI/CTP due to increased Minotaur and Crypto Mod efforts with China Lake, Boeing DVMC-U (ACS) Improved Tactical Displays Development due to project ramp-up from design concept to hardware build with material change requirements and the non-recurring engineering associated with the incorporation of a Multi-Layered Obstructed Brokered (MOB) Hub system into the F-18. Prototype integration will begin and conclude within FY22.

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MSI/CTP Development Support - 31C SCS	WR	NSMA : Arlington, VA	11.931	1.082	Mar 2020	1.737	Mar 2021	1.768	Mar 2022	-		1.768	-	-	-
MSI/CTP Government Developmental Engineering Support	WR	Pt. Mugu : Pt. Mugu, CA	0.852	0.432	Nov 2019	0.435	Nov 2020	0.443	Nov 2021	-		0.443	-	-	-
MSI/CTP Gov't Engineering Support	WR	NAWCAD : Pax River, MD	3.672	0.189	Nov 2019	3.731	Nov 2020	5.819	Nov 2021	-		5.819	-	-	-
MSI/CTP Gov't Engineering Support	WR	NAWCWD : China Lake	1.364	0.716	Nov 2019	2.479	Nov 2020	4.029	Nov 2021	-		4.029	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 1662 / F/A-18 Improvement
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Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Flight Plan/SCS Gov't Engineering Support/Strike Accelerator	WR	NAWCWD : China Lake	6.145	4.646	Nov 2019	7.511	Nov 2020	7.135	Nov 2021	-		7.135	-	-	-
USMC Capability Upgrades /AUTOGCAS Gov't Engineering Support	C/BA	NAWCWD : China Lake	0.810	1.142	Nov 2019	1.530	Nov 2020	1.362	Nov 2021	-		1.362	-	-	-
DVMC-U Gov't Engineering Support	WR	NAWCAD : Pax River, MD	0.000	0.000		0.524	Nov 2020	0.534	Nov 2021	-		0.534	-	-	-
PE Developmental Engineering Support	Various	Various : Various	2.124	0.620	Nov 2019	0.000		0.000		-		0.000	-	-	-
PE Gov't Engineering Support	WR	NAWCAD : Pax River, MD	3.071	1.512	Nov 2019	0.000		0.000		-		0.000	-	-	-
Obsolescence Redesign	Various	Various : Various	2.000	0.104	Nov 2019	0.106	Nov 2020	0.108	Nov 2021	-		0.108	-	-	-
Prior Year Support costs no longer funded in FYDP	Various	Various : Various	3,116.442	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			3,148.411	10.443		18.053		21.198		-		21.198	-	-	N/A

Remarks
 FY22 increases to MSI/CTP accounts for the non-recurring engineering associated with the incorporation of a Multi-Layered Obstructed Brokered (MOB) Hub system into the F-18. Prototype integration will begin and conclude within FY22.

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MSI/CTP - T&E	WR	OPTEVFOR : Norfolk, VA	9.972	4.354	Dec 2019	6.081	Dec 2020	6.300	Dec 2021	-		6.300	-	-	-
*MSI/CTP Multi-System Integration T&E	WR	NAWCAD : Pax River, MD	2.042	0.000		1.387	Nov 2020	0.000		-		0.000	-	-	-
MSI/CTP Developmental T&E	WR	NAWCAD : Pax River, MD	1.341	0.000		0.919	Nov 2020	0.000		-		0.000	-	-	-
USMC Developmental T&E	WR	NAWCWD : China Lake, CA	0.100	0.759	Nov 2019	2.300	Nov 2020	2.564	Nov 2021	-		2.564	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 1662 / F/A-18 Improvement
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Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DVMC-U - Developmental T&E	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.000		-		0.000	-	-	-
Flight Plan Engineering/ System Configuration Set Development & Integration	WR	NAWCAD : Pax River, MD	2.726	0.368	Nov 2019	0.376	Nov 2020	0.383	Nov 2021	-		0.383	-	-	-
Flight Plan /SCS ATFLIR Modernization Developmental T&E	WR	NAWCWD : China Lake, CA	0.100	0.200	Nov 2019	0.000		0.000		-		0.000	-	-	-
PE Developmental Test & Eval	WR	NAWCAD : Pax River, MD	3.433	2.268	Nov 2019	0.000		0.000		-		0.000	-	-	-
Prior Year T&E costs no longer funded in FYDP	Various	Various : Various	205.134	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			224.848	7.949		11.063		9.247		-		9.247	-	-	N/A

Remarks
FY22 decrease for MSI/CTP Multi-System Integration T&E for Pax River that is not required for FY2022. The Sentry Aloha test event takes place every other year.

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MSI/CTP- Program Management Support	WR	NAWCAD : Pax River, MD	9.630	0.753	Nov 2019	0.795	Nov 2020	0.799	Nov 2021	-		0.799	-	-	-
MSI/CTP- CSS Program Management Support	C/CPFF	Wyle Lab : Pax River, MD	29.465	1.107	Dec 2019	0.981	Apr 2021	0.000		-		0.000	-	-	-
MSI/CTP PMMAC CSS	C/CPFF	Tekla : Pax River, MD	0.000	0.000		0.000		0.989	Apr 2022	-		0.989	-	-	-
MSI/CTP Travel	Various	NAVAIR : Pax River, MD	6.014	0.173	Oct 2019	0.177	Oct 2020	0.516	Oct 2021	-		0.516	-	-	-
USMC Capability Upgrades Program Management Support	WR	NAWCAD : Pax River, MD	0.945	0.696	Nov 2019	0.701	Nov 2020	0.704	Nov 2021	-		0.704	-	-	-
USMC Capability Upgrades Seaport CSS	C/CPFF	Wyle Lab : Pax River, MD	0.829	0.741	Dec 2019	0.692	Apr 2021	0.000		-		0.000	-	-	-

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Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
USMC PMMAC CSS	C/CPFF	Tekla : Pax River, MD	0.000	0.000		0.000		0.455	Apr 2022	-		0.455	-	-	-
DVMC-U Program Management Support	WR	NAWCAD : Pax River, MD	0.000	0.000		0.191	Nov 2020	0.194	Nov 2021	-		0.194	-	-	-
DVMC-U Seaport CSS	C/CPFF	Wyle Lab : Pax River, MD	0.000	0.000		0.225	Apr 2021	0.000		-		0.000	-	-	-
DVMC-U PMMAC CSS	C/CPFF	Tekla : Pax River, MD	0.000	0.000		0.000		0.230	Apr 2022	-		0.230	-	-	-
Flight Plan Engineering/SCS Program Mgmt Support	WR	NAWCAD : Pax River, MD	45.980	0.401	Nov 2019	0.425	Nov 2020	0.426	Nov 2021	-		0.426	-	-	-
Flight Plan Engineering/SCS Seaport CSS	C/CPFF	Wyle Lab : Pax River, MD	1.175	0.417	Dec 2019	0.421	Apr 2021	0.000		-		0.000	-	-	-
Flight Plan/SCS PMMAC CSS	C/CPFF	Tekla : Pax River, MD	0.000	0.000		0.000		0.430	Apr 2022	-		0.430	-	-	-
PE Program Management Support	WR	NAWCAD : Pax River, MD	0.620	0.107	Nov 2019	0.000		0.000		-		0.000	-	-	-
PE Seaport CSS	C/CPFF	Wyle Lab : Pax River, MD	1.172	0.329	Dec 2019	0.000		0.000		-		0.000	-	-	-
PE Travel	Various	NAVAIR : Pax River, MD	0.146	0.100	Oct 2019	0.000		0.000		-		0.000	-	-	-
Prior Year Mgmt costs no longer funded in FYDP	Various	Various : Various	116.554	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			212.530	4.824		4.608		4.743		-		4.743	-	-	N/A

Remarks

FY21 to FY22 increase reflects a transition in CSS support contract efforts from Wyle Lab to Tekla.

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4,540.511	94.606	127.461	145.613	-	145.613	-	-	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 1662 / F/A-18 Improvement
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Digital Video Map Computer - Upgrade (DVMC-U)	FY20				FY21				FY22			
	1	2	3	4	1	2	3	4	1	2	3	4
System Development					DVMC-U Hardware Design and Development							
					ACS/DVMC-U Development							
Test and Evaluation									ACS/DVMC-U Integration			

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy **Date:** May 2021

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USMC Capability Upgrade	FY20				FY21				FY22			
	1	2	3	4	1	2	3	4	1	2	3	4
System Development	AUTOGCAS Design & Development											
Test and Evaluation	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="background-color: #008000; color: white; padding: 5px;">AUTOGCAS DT</div> <div style="background-color: #008000; color: white; padding: 5px;">AUTOGCAS IT</div> </div>											

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 1662 / F/A-18 Improvement

Flight Plan Engineering/System Configuration Set (SCS) Development & Integration	FY20				FY21				FY22				
	1	2	3	4	1	2	3	4	1	2	3	4	
System Development	Hardware and Software Development												
	Modeling and Simulation												
	Studies and Analysis												
Test and Evaluation	Development, Integration, and Operational Testing												
Deliveries Related Software Fleet Releases													H16 ■

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
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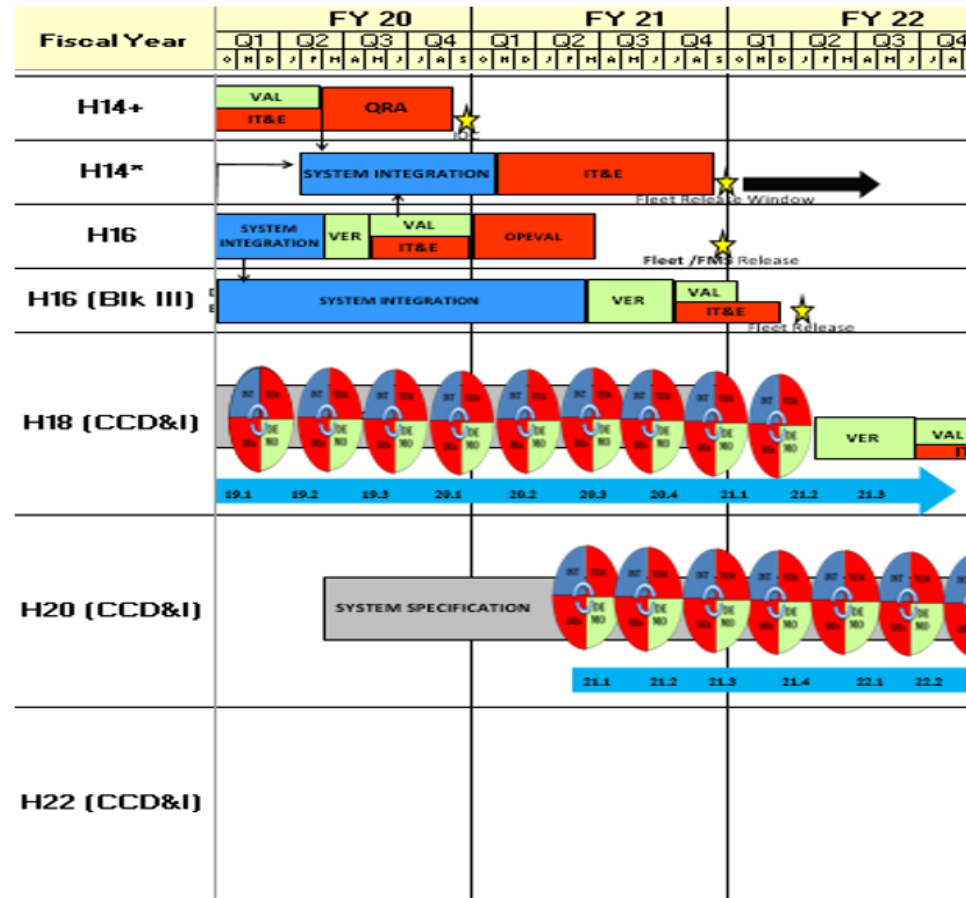
Obsolescence Redesign	FY20				FY21				FY22			
	1	2	3	4	1	2	3	4	1	2	3	4
System Development F/A-18 Weapon System & Ancillary Equipment	Modeling and Simulation											

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy Date: May 2021

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Multi-System Integration (MSI) / Common Tactical Picture (CTP)



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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy **Date:** May 2021

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Physiological Episode Mitigation	FY20				FY21				FY22			
	1	2	3	4	1	2	3	4	1	2	3	4
System Development	LSSI Design and Dev.											
	Data Software Study											
Support	Data Analytics Support											
	Studies and Engineering Analysis											
Test and Evaluation	Pressure Testing											
	Test and Evaluation											

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FY20 and prior PE Mitigation is funded under PU 1662 ↑ Beginning in FY2021 PE Mitigation is funded under PU: 9099

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 1662 / F/A-18 Improvement
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Multi-System Integration / Common Tactical Picture</i>				
Systems Development & Testing: H12K Development & Testing	1	2020	4	2022
Systems Development & Testing: H14+ Development & Testing	1	2020	4	2020
Systems Development & Testing: H14* Development & Testing	1	2020	3	2022
Systems Development & Testing: H16 Development & Testing	1	2020	4	2021
Systems Development & Testing: H16 (Blk III) Development & Testing	1	2020	4	2021
Systems Development & Testing: H18 (CCD&I) Development & Testing	1	2020	4	2022
Systems Development & Testing: H20 (CCD&I) Development & Testing	1	2020	4	2022
Systems Development & Testing: H22 (CCD&I) Development & Testing	2	2022	4	2022
<i>Flight Plan Engineering</i>				
System Development: Hardware and Software Development	1	2020	4	2022
System Development: Modeling and Simulation	1	2020	4	2022
System Development: Studies and Analysis	1	2020	4	2022
Test and Evaluation: Developmental, Integration and Operational Testing	1	2020	4	2022
Deliveries: Software Fleet Release: H16 Fleet Release	4	2021	4	2021
<i>Physiological Episode Mitigation</i>				
System Development: LSSI Design & Development	1	2020	2	2022
System Development: Support: Data Software Study	1	2020	4	2022
Support: Office of Naval Research Data Analytics Support Studies & Eng Analysis	1	2020	4	2022
Test and Evaluation: Capsule Manned Studies - Pressure Testing	1	2020	4	2020
Test and Evaluation: Physiological Episdoe Test and Evaluation	1	2020	4	2022
<i>Obsolescence Redesign</i>				

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / <i>F/A-18 Squadrons</i>	Project (Number/Name) 1662 / <i>F/A-18 Improvement</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
System Development: F/A-18 Weapon System & Ancillary Equipment: Obsolescence Redesign Development & Testing	1	2020	1	2022
<i>USMC Capability Upgrade</i>				
AUTOGCAS Design and Development	1	2020	2	2021
AUTOGCAS DT	2	2021	2	2022
AUTOGCAS IT	4	2021	4	2022
<i>Digital Video Map Computer - Upgrade</i>				
System Development: DVMC-U Hardware Design and Development	1	2021	4	2022
System Development: ACS Situational Awareness w/ DVMC-U Development	1	2021	4	2022
Test and Evaluation: ACS Situational Awareness w/ DVMC-U SCS Integration	1	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy										Date: May 2021		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons				Project (Number/Name) 2065 / F/A-18 Radar Upgrade			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
2065: F/A-18 Radar Upgrade	752.084	8.370	8.113	7.678	-	7.678	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

F/A-18 Radio Detection and Ranging (RADAR) Upgrade: The F/A-18 RADAR Upgrade, Active Electronically Scanned Array (AESA) development program, which began in FY 1999, is the last of three pre-planned upgrades to the F/A-18 EF/EA-18G RADAR. The AESA system corrects operational test deficiencies noted in the AN/APG-73. It provides multi-target tracking, Synthetic Aperture RADAR (SAR) imagery, SAR Target Location Error (TLE), and improved spotlight map resolution. In addition, it provides greater lethality than previous F/A-18 RADARs by allowing full tactical support of existing and planned air-to-air (A/A) and air-to-ground (A/G) weapons and it significantly increases A/A and A/G detection and tracking ranges. The AESA system provides greater survivability through self-protection and standoff jamming capabilities, while its greater range allows for reduced detection by enemy RADAR. AN/APG-73 will be upgrade to AN/APG-79. The APG-79 AESA Radar system improvement will significantly advance the radar technology - from the front-end array to the back-end processor and operational software. This combat-proven AESA radar system substantially increases the power of the F/A-18E/F EA-18G. This budget continues spiral capability development of AESA with increased efforts to address Phase II Operational Requirements Document requirements such as Counter-Electronic Attack(CEA) against multiple Radio Frequency Emitters, AESA Multi-Jammer Electronic Protection, Precision TLE Improvement, Monopulse and 5th/6th Channel development and Air Combat Maneuvering/Short Range Search and Track development and includes upgrades to RADAR Instrumentation, test and evaluation assets, threat assets, and upgraded modeling and simulation of both clean and Electronic Attack threat environments. This budget includes the overarching Anti-Surface Warfare (ASuW) software improvements, which includes Aided Target Recognition (AiTR), and Strike Accelerator/Kill Chain capabilities. This budget request supports development and testing of design modifications to address obsolescence issues with APG-65, APG-73 and APG-79 RADAR systems. USMC upgrades to the platform are being developed to include capability expansion of AESA Radar for F/A-18 A-D.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Distributed Targeting - Counter-Electronic Attack (CEA) Software Development, Developmental Testing, Operational Testing, & Integration	7.967	7.629	7.239	0.000	7.239
Articles:	-	-	-	-	-
Description: Funding being utilized to support hardware (HW) and software (SW) capabilities development, integration and associated testing for AESA, ASuW and Strike Accelerator.					
FY 2021 Plans: Continue Counter-Electronic Attack II(CEA) HW/SW development in support of AESA radar capability upgrades. Funds engineering efforts for software development and integration of active and passive kill chain capabilities and sensors into the AESA Radar in support of CEA. Funding supports USMC capability upgrades for integration					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 2065 / F/A-18 Radar Upgrade

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>and capability expansion of AESA Radar for F/A-18 A-D. Begin the development of Aided Target Recognition software and hardware.</p> <p>FY 2022 Base Plans: Continue Counter-Electronic Attack II(CEA) HW/SW development in support of AESA radar capability upgrades. Funds engineering efforts for software development and integration of active and passive kill chain capabilities and sensors into the AESA Radar in support of CEA. Funding supports USMC capability upgrades for integration and capability expansion of AESA Radar for F/A-18 A-D. Continue the development of Aided Target Recognition software and hardware.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: FY2021 to FY2022 decrease of \$0.390 million is for aided target recognition efforts.</p>					
<p>Title: F/A-18 RADAR Obsolescence Redesign</p> <p align="right">Articles:</p> <p>Description: Funding provided for development and design modifications to address obsolescence issues in the RADAR.</p> <p>FY 2021 Plans: Funding provided for the continued development and redesign of the Anti-Surface Warfare (ASuW) Radar and Strike Accelerator.</p> <p>FY 2022 Base Plans: Funding provided for the continued development and redesign of the Anti-Surface Warfare (ASuW) Radar and Strike Accelerator.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: FY2021 to FY2022 decrease of \$0.045 due to the ramp-down of obsolescence redesign for RADAR efforts.</p>	0.403 -	0.484 -	0.439 -	0.000 -	0.439 -
Accomplishments/Planned Programs Subtotals	8.370	8.113	7.678	0.000	7.678

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy	Date: May 2021
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Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 2065 / F/A-18 Radar Upgrade
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• APN/0525: F-18 Series Mod (OSIP 002-07)	1,127.699	369.600	327.571	-	327.571	-	-	-	-	-	-
• APN/0145: FA-18E/F	1,762.774	1,778.554	87.832	-	87.832	-	-	-	-	-	-
• APN/0145C: FA-18E/F	53.154	0.000	0.000	-	0.000	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Active Electronically Scanned Array program continues developmental efforts following a successful Full Rate Production milestone decision, after completing a two-phase Acquisition approach during the FY 1999 through FY 2007 timeframe. This strategy continues utilization of reform initiatives such as: early partnering with industry; leveraging industry investment; optimizing use of Commercial Off-The Shelf software and Non-Developmental Item; using Cost as an Independent Variable; and Electronic Data Deliverables. Basic Ordering Agreement orders for Request for Proposal developments are in place for Boeing, the airframe prime manufacturer/integrator, and Raytheon, the Radio Detection and Ranging RADAR manufacturer, for focused risk reduction and sustainment of prior developmental activities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy											Date: May 2021				
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons					Project (Number/Name) 2065 / F/A-18 Radar Upgrade				

Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Distributed Targeting Systems Engineering - Capabilities	WR	NAWCWD : China lake, CA	1.877	1.242	Nov 2019	1.077	Nov 2020	0.500	Nov 2021	-		0.500	-	-	-
Distributed Targeting Systems Engineering	WR	NAWCAD : Pax River, MD	10.022	2.356	Nov 2019	2.133	Nov 2020	1.084	Nov 2021	-		1.084	-	-	-
Distributed Targeting Product Development Aided Target Recongnition	WR	NAWCWD CL : China lake, CA	0.000	0.000		0.372	Nov 2020	0.851	Nov 2021	-		0.851	-	-	-
Distributed Targeting CEA	WR	NSMA : Arlington, VA	0.000	0.000		0.000		0.875	Nov 2021	-		0.875	-	-	-
Prior Year Prod Dev Cost no longer funded in FYDP	Various	Various : Various	557.047	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			568.946	3.598		3.582		3.310		-		3.310	-	-	N/A

Remarks
 FY22 decrease in China Lake and Pax River primary hardware development engineering support for distributed targeting recognition.
 FY22 increase for development efforts for distributed targeting/aided target recognition at NAWCWD, CL.
 FY22 added classified NSMA support for Distributing Targeting CEA.

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Distributed Targeting Software Development (Instrumentation)	WR	NAWCWD : China Lake, CA	45.393	0.156	Nov 2019	0.161	Nov 2020	0.163	Nov 2021	-		0.163	-	-	-
Distributed Targeting Chamber Support	WR	NSMA : Arlington, VA	0.000	0.520	Dec 2019	0.536	Dec 2020	0.544	Dec 2021	-		0.544	-	-	-
Distributed Targeting Gov't Engineering Support	WR	NAWCAD : PAX River, MD	1.217	1.687	Nov 2019	1.689	Nov 2020	1.749	Nov 2021	-		1.749	-	-	-
Prior Year Support cost no longer funded in the FYDP	Various	Various : Various	4.684	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			51.294	2.363		2.386		2.456		-		2.456	-	-	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 2065 / F/A-18 Radar Upgrade
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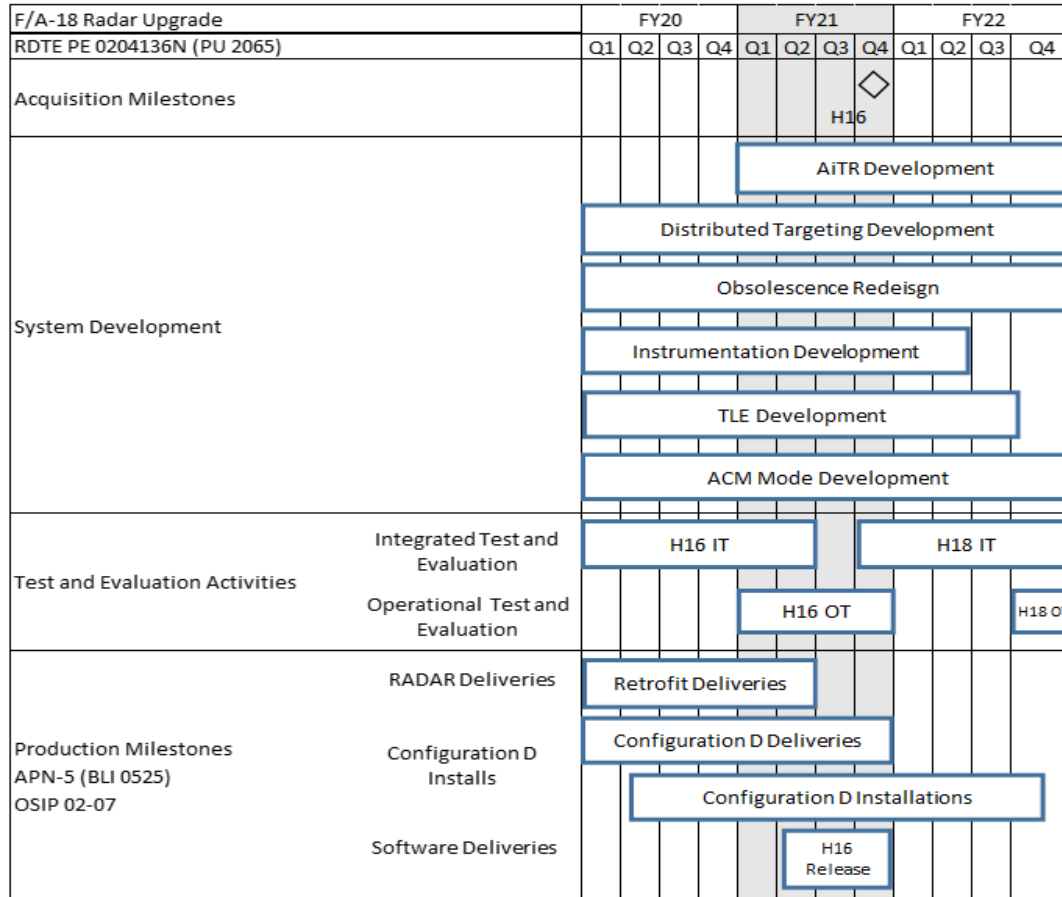
Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Distributed Targeting Operational Test	WR	NAWCWD : China Lake, CA	2.070	1.411	Nov 2019	1.052	Nov 2020	0.881	Nov 2021	-		0.881	-	-	-
Radar Obsol Redesign Operational Test	WR	NAWCAD : PAX River, MD	0.000	0.210	Nov 2019	0.288	Nov 2020	0.239	Nov 2021	-		0.239	-	-	-
Radar Obsol Redesign Operational Test	WR	NSWC : Crane, IN	0.175	0.000		0.000		0.000		-		0.000	-	-	-
Prior Year T&E cost no longer funded in FYDP	Various	Various : Various	111.911	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			114.156	1.621		1.340		1.120		-		1.120	-	-	N/A

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Distributed Targeting CSS Program Management Support (Seaport CSS)	C/CPFF	Various : Various	8.915	0.495	Dec 2019	0.505	Dec 2020	0.510	Dec 2021	-		0.510	-	-	-
Distributed Targeting Gov't Program Management Support	WR	NAWCAD : Pax River, MD	2.304	0.065	Nov 2019	0.068	Nov 2020	0.066	Nov 2021	-		0.066	-	-	-
Distributed Targeting Travel	Various	NAVAIR : Pax River, MD	1.797	0.035	Oct 2019	0.036	Oct 2020	0.017	Oct 2021	-		0.017	-	-	-
Radar Obsol Redesign CSS Support	C/CPFF	Various : Various	3.354	0.159	Dec 2019	0.162	Dec 2020	0.165	Dec 2021	-		0.165	-	-	-
Radar Obsol Redesign Gov't Program Management	WR	NAWCAD : Pax River, MD	1.181	0.022	Nov 2019	0.022	Nov 2020	0.022	Nov 2021	-		0.022	-	-	-
Radar Obsol Redesign Travel	Various	NAVAIR : Pax River, MD	0.137	0.012	Oct 2019	0.012	Oct 2020	0.012	Oct 2021	-		0.012	-	-	-
Subtotal			17.688	0.788		0.805		0.792		-		0.792	-	-	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy **Date: May 2021**

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 2065 / F/A-18 Radar Upgrade
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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / <i>F/A-18 Squadrons</i>	Project (Number/Name) 2065 / <i>F/A-18 Radar Upgrade</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>F/A-18 Radar Upgrade</i>				
Acquisition Milestones: Milestones: H16 IOC	4	2021	4	2021
Systems Development: Hardware/Software Development: AiTR Development	1	2021	4	2022
Systems Development: Hardware/Software Development: Distributed Targeting Development	1	2020	4	2022
Systems Development: Hardware/Software Development: Obsolescence Redesign Development & Testing	1	2020	4	2022
Systems Development: Hardware/Software Development: Instrumentation Development	1	2020	2	2022
Systems Development: Hardware/Software Development: TLE Development	1	2020	3	2022
Systems Development: Hardware/Software Development: ACM Mode Development	1	2020	4	2022
Test & Evaluation: Integrated Test & Evaluation: H16 Integration Testing	1	2020	2	2021
Test & Evaluation: Integrated Test & Evaluation: H18 Integration Testing	4	2021	4	2022
Test & Evaluation: Operational Test & Evaluation: H16 Operational Testing	1	2021	4	2021
Test & Evaluation: Operational Test & Evaluation: H18 Operational Testing	4	2022	4	2022
Production Milestones: Software Deliveries: H16 FLEET RELEASE	2	2021	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons				Project (Number/Name) 2071 / F/A-18 Block III			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
2071: F/A-18 Block III	137.946	77.107	27.072	31.471	-	31.471	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

F/A-18 Block III is a series of development efforts that are required to deliver necessary combat capabilities to meet the objectives outlined in the National Defense Strategy and provide aircraft lethality and kill chain effectiveness. Enhancements under development include: Conformal Fuel Tank (CFT) provisions, improved radar cross section, AESA Radar upgrades, alternative fire control solutions, and other improvements that enhance aircraft survivability, lethality, sensor fusion and networking effectiveness, and targeting upgrades at the tactical leading edge in highly contested environments. F/A18 Block III is a follow-on to Block II upgrades and the combined impact of these upgrades will ensure that the numerically predominant strike-fighter aircraft in the USN inventory remains lethal and survivable into the 2030's.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: F/A-18 Block III	77.107	27.072	31.471	0.000	31.471
Articles:	-	-	-	-	-
Description: F/A-18 Block III is a series of development efforts that are required to deliver necessary combat capabilities to meet the objectives outlined in the National Defense Strategy and provide aircraft lethality and kill chain effectiveness.					
FY 2021 Plans: FY 2021 provides for continued CFT design & development efforts, lab test planning, and supportability development that will continue in support of the CFT program. Additionally in FY21 Critical Design Review (CDR) for retrofit design & B-kit along with Retrofit Validation installation will begin.					
FY 2022 Base Plans: The FY2022 funding provides for continued advanced development engineering and studies and analysis focused on enhanced aircraft survivability, sensor fusion and networking effectiveness, and targeting at the tactical leading edge in highly contested environments. These Block III improvements are necessary to deliver required combat capabilities and upgrades to the F/A-18 to meet the objectives outlined in the National Defense Strategy					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / <i>F/A-18 Squadrons</i>	Project (Number/Name) 2071 / <i>F/A-18 Block III</i>
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Increase of \$4.399 million from FY2021 to FY2022 provides for continued advanced development engineering and studies and analysis focused on enhanced aircraft survivability, sensor fusion and networking effectiveness, and targeting at the tactical leading edge in highly contested environments.					
Accomplishments/Planned Programs Subtotals	77.107	27.072	31.471	0.000	31.471

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APN/0525: <i>F-18 Series</i>	1,127.699	369.600	327.571	-	327.571	-	-	-	-	-	-
• APN/0145: <i>FA-18E/F</i>	1,762.774	1,778.554	87.832	-	87.832	-	-	-	-	-	-
• APN/0505: <i>FA-18E/F & EA-18G Modernization & Sustainment</i>	0.000	399.360	482.899	-	482.899	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Block III capability upgrades will be incorporated into production line aircraft and retrofit through a series of Block III Engineering Change Proposals (ECPs) The ECPs will provide capability upgrades to Block II aircraft to give them Block III capabilities. Block II Fleet aircraft (Lots 26 and up) will receive capability upgrades when inducted for Service Life Modification (SLM) events.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 2071 / F/A-18 Block III
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Block III Primary Development	Various	Boeing : St Louis, MO	117.234	69.524	Dec 2019	23.663	Dec 2020	28.726	Dec 2021	-		28.726	-	-	-
Subtotal			117.234	69.524		23.663		28.726		-		28.726	-	-	N/A

Remarks
FY22 increase with Boeing to address required design and development changes to Block III aircraft.

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development Support (AD)	WR	NAWCAD : Pax River, MD	11.067	4.154	Nov 2019	1.711	Nov 2020	2.595	Dec 2021	-		2.595	-	-	-
Development Support (WD)	WR	NAWCWD : China Lake, CA	4.707	2.138	Nov 2019	0.565	Nov 2020	0.000		-		0.000	-	-	-
BLK III Price Fighters	WR	NAVSUP : Philadelphia, PA	0.079	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			15.853	6.292		2.276		2.595		-		2.595	-	-	N/A

Remarks
FY22 increase for Studies & Analysis support at Pax River for Block III capability upgrades.

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test & Evaluation (NASA)	MIPR	NASA : Moffett Field, CA	4.317	0.000		0.000		0.000		-		0.000	-	-	-
Test & Evaluation (NASA)	MIPR	NASA : Langley, VA	0.255	0.682	Dec 2019	0.000		0.000		-		0.000	-	-	-
Test & Evaluation (AD)	WR	NAWCAD : Pax River, MD	0.000	0.464	Dec 2019	0.985	Dec 2020	0.000		-		0.000	-	-	-
Subtotal			4.572	1.146		0.985		0.000		-		0.000	-	-	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 2071 / F/A-18 Block III
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Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
FY22 decrease due to completion of flight test efforts related to CFT.

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Seaport CSS	C/CPFF	Ausley : Pax River, MD	0.287	0.000		0.000		0.000		-		0.000	-	-	-
Seaport CSS	C/CPFF	Tekla : Pax River, MD	0.000	0.145	Apr 2020	0.148	Apr 2021	0.150	Apr 2022	-		0.150	-	-	-
Subtotal			0.287	0.145		0.148		0.150		-		0.150	-	-	N/A

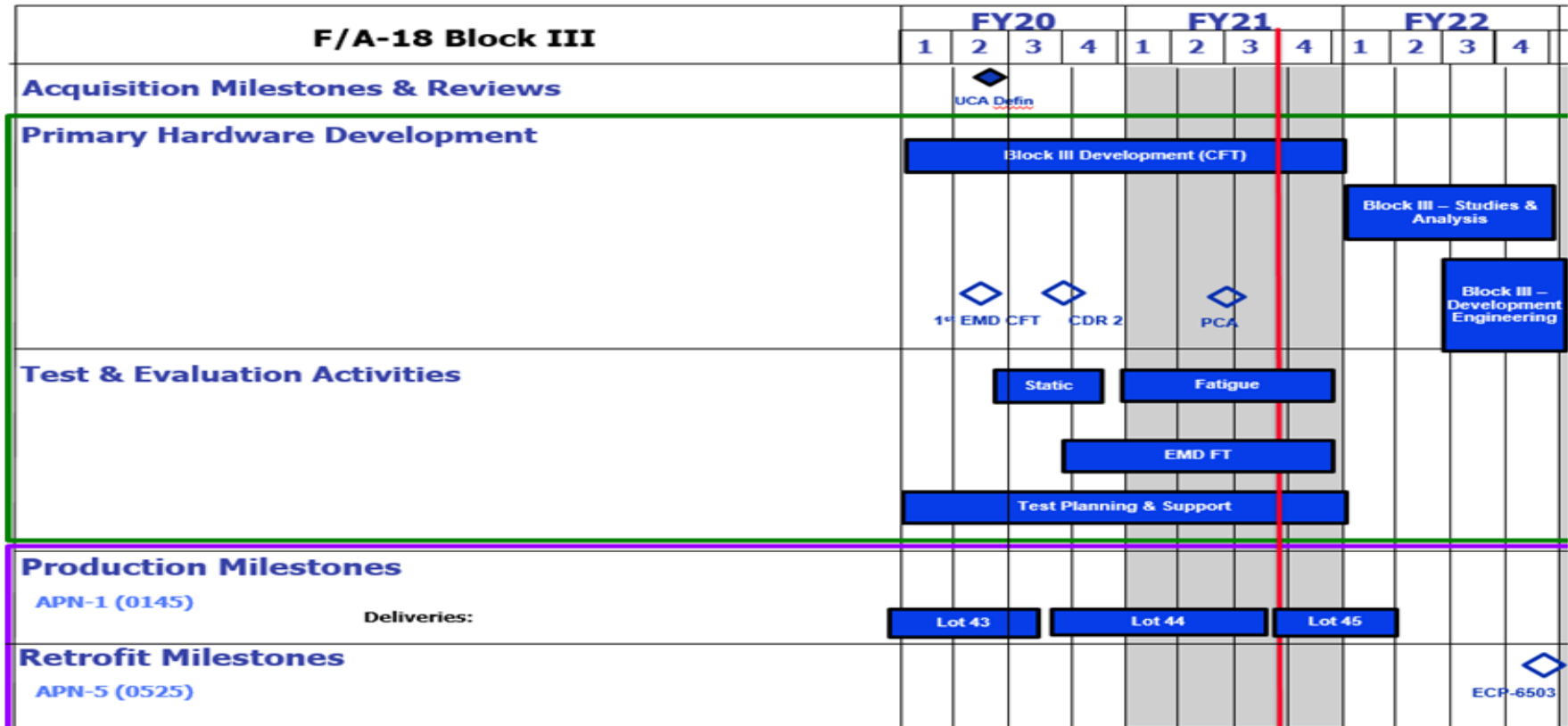
	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	137.946	77.107	27.072	31.471	-	31.471	-	-	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy Date: May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 2071 / F/A-18 Block III
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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / <i>F/A-18 Squadrons</i>	Project (Number/Name) 2071 / <i>F/A-18 Block III</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>F/A-18 Block III</i>				
Acquisition Milestone: Contract Milestones: DEFIN	2	2020	2	2020
System Development: Block III CFT Development	1	2020	4	2021
System Development: Block III Studies and Analysis	1	2022	4	2022
System Development: Block III Development Engineering	3	2022	4	2022
System Development: Reviews: Critical Design Review	3	2020	3	2020
Test & Evaluation: Development Testing: Fatigue Test	1	2021	4	2021
Test & Evaluation: Development Testing: Static Test	2	2020	4	2020
Test & Evaluation: Development Testing: EMD Flight Test	3	2020	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy										Date: May 2021		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons				Project (Number/Name) 9099 / Physiological Episodes			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
9099: <i>Physiological Episodes</i>	0.000	0.000	5.438	4.462	-	4.462	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-	-

Note

Efforts funded under Project Unit 9099 were previously funded under Project Unit 1662 in FY2020 and prior.

A. Mission Description and Budget Item Justification

Funding provides for design, development, integration, and test of platform improvements for F/A-18A-F and EA-18G Weapon Systems, as determined through a Root Cause and Corrective Action (RCCA) process, to mitigate and reduce the occurrences of Physiological Episode (PE) in Naval Aviation.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Physiological Episode Mitigation	0.000	5.438	4.462	0.000	4.462
Articles:	-	-	-	-	-
Description: Funding provides for design, development, integration, and test of platform improvements for F/A-18A-F and EA-18G Weapon Systems, as determined through a Root Cause and Corrective Action (RCCA) process, to mitigate and reduce the occurrences of Physiological Episode (PE) in Naval Aviation.					
FY 2021 Plans: Completion of the RCCA investigation efforts. Continued work of the directed studies from RCCA to include further development of the Hornet health Assessment and Readiness Tool (HhART), and development efforts for platform improvements in the F/A-18A-F and EA-18G Weapon Systems to include flight test. Continue required logistics and engineering support.					
FY 2022 Base Plans: Completion of any directed studies from RCCA. Continued supports of the Hornet health Assessment and Readiness Tool (HhART), and development efforts for platform improvements in the F/A-18A-F and EA-18G Weapon Systems to include flight test. Continue required logistics and engineering support.					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy	Date: May 2021
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Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 9099 / Physiological Episodes
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Decrease of \$0.976 million from FY21 to FY22 is due to completion of RCCA investigation development efforts in support of PE mitigation.					
Accomplishments/Planned Programs Subtotals	0.000	5.438	4.462	0.000	4.462

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APN/0525: F-18 SERIES	1,127.699	369.600	327.571	-	327.571	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The F/A-18 Physiological Episode PU consists of efforts in support of finalizing the Root Cause and Corrective Action Investigation process, as well as any additional design, development, integration, and testing that will be required to mitigate and reduce the occurrence of Physiological Episodes (PE).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 9099 / Physiological Episodes
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PE Data Software Study	WR	NAWCTSD Orlando : Orlando, FL	0.000	0.000		1.724	Nov 2020	1.644	Nov 2021	-		1.644	-	-	-
Subtotal			0.000	0.000		1.724		1.644		-		1.644	-	-	N/A

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PE Developmental Engineering Support	Various	Various : Various	0.000	0.000		0.501	Nov 2020	0.476	Nov 2021	-		0.476	-	-	-
PE Gov't Engineering Support	WR	NAWCAD : Pax River, MD	0.000	0.000		1.101	Nov 2020	0.759	Nov 2021	-		0.759	-	-	-
Subtotal			0.000	0.000		1.602		1.235		-		1.235	-	-	N/A

Remarks
Decrease from FY21 to FY22 in Gov't Engineering support is due to the completion of Root Cause and Corrective Action (RCCA) investigation efforts.

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PE Developmental Test & Eval	WR	NAWCAD : Pax River, MD	0.000	0.000		1.653	Nov 2020	1.117	Nov 2021	-		1.117	-	-	-
Subtotal			0.000	0.000		1.653		1.117		-		1.117	-	-	N/A

Remarks
Decrease from FY21 to FY22 in Developmental Test and Evaluation is due to the completion of Root Cause and Corrective Action (RCCA) investigation efforts.

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 9099 / Physiological Episodes
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Physiological Episode Mitigation	FY20				FY21				FY22			
	1	2	3	4	1	2	3	4	1	2	3	4
System Development	LSSI Design and Dev.											
	Data Software Study											
Support	Data Analytics Support											
	Studies and Engineering Analysis											
Test and Evaluation	Pressure Testing											
	Test and Evaluation											

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FY20 and prior PE Mitigation is funded under PU 1662 ↑ Beginning in FY2021 PE Mitigation is funded under PU: 9099

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / <i>F/A-18 Squadrons</i>	Project (Number/Name) 9099 / <i>Physiological Episodes</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Physiological Episodes Mitigation</i>				
System Development: LSSI Design and Development	1	2020	1	2022
System Development: Data Software Study	1	2021	4	2022
Support: Office of Naval Research Data Analytics Support	1	2021	4	2022
Support: Physiological Episodes Studies and Analysis Engineering	1	2021	4	2022
Test and Evaluation: Physiological Episode Test and Evaluation	1	2021	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy										Date: May 2021		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	11.391	1.931	17.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Noise Reduction: Research, Development, Test and Evaluation (RDT&E) funding to support the redesign of Chevron seals to reduce engine exhaust plume noise. Numerous solutions have been evaluated. Chevron seals were determined to be the favorable solution for the F/A-18 and EA-18G. Previous testing of F414 chevrons demonstrated satisfactory noise reduction up to 80% power, but did not satisfy noise reduction requirements at full power. A possible cause of this problem has been identified. There are re-design options available to sustain noise reduction up to full power. Additional development and test will be required to finalize the Chevron design to achieve the desired noise reduction at all power levels. The subject funding will support the initial development efforts.

Beacon Obsolescence Research: Research, Development, Test and Evaluation (RDT&E) funding to support APN-245 Automatic Carrier Landing System (ACLS) redesign needed due to obsolescence. The ACLS Radar Beacon enables long-range acquisition and precision guidance of F-18 to the carrier deck in all-weather conditions by providing a high-power, fixed, point-source radar return that eliminates radar scintillation noise.

Fifth Generation Sensor Fusion Study: Research, Development, Test and Evaluation (RDT&E) funding to support the maturation of the SLATE (Secure LVC Advanced Training Environment) technologies through an Advanced Technology Demonstration (ATD) effort. The ATD is expected to inform US Navy Programs of Record (POR) regarding technical and operational requirements for usable LVC (Live, Virtual, Constructive) capabilities and Joint Service PORs options for support to the warfighter.

Growler Noise Mitigation: Research, Development, Test and Evaluation (RDT&E) funding to support reduction of F414 noise by 3dB with no measurable impact to engine thrust.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2020	FY 2021
Congressional Add: Noise reduction research	1.931	0.000
FY 2020 Accomplishments: N/A		
FY 2021 Plans: N/A		
Congressional Add: Beacon Obsolescence Issues	0.000	3.000
FY 2020 Accomplishments: N/A		
FY 2021 Plans: N/A		
Congressional Add: Fifth Generation Sensor Fusion Study	0.000	10.000

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy	Date: May 2021
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Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 9999 / Congressional Adds
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021
<i>FY 2020 Accomplishments:</i> N/A		
<i>FY 2021 Plans:</i> N/A		
Congressional Add: Growler Noise Mitigation	0.000	4.000
<i>FY 2020 Accomplishments:</i> N/A		
<i>FY 2021 Plans:</i> N/A		
Congressional Adds Subtotals	1.931	17.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

Noise Reduction: Noise Reduction development and test is required to study the Chevron design to achieve the desired noise reduction at all power levels.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 9999 / Congressional Adds
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Noise Reduction	C/CPFF	GE Aviation : Lynn, Massachusetts	1.931	1.931	Sep 2020	0.000		0.000		-		0.000	-	-	-
Beacon Obsolescence Research	C/CPFF	SNC : Lakehurst, NJ	0.000	0.000		2.750	Aug 2021	0.000		-		0.000	-	-	-
Growler Noise Mitigation (Tollgate 3-6)	C/CPFF	GE Aviation : Lynn, Massachusetts	0.000	0.000		0.500	Jun 2021	0.000		-		0.000	-	-	-
Growler Noise Mitigation (Tollgate 6-9)	C/CPFF	GE Aviation : Lynn, Massachusetts	0.000	0.000		1.900	Sep 2022	0.000		-		0.000	-	-	-
5th Gen Sensor Fusion	C/CPFF	Boeing : St. Louis, MO	0.000	0.000		3.310	May 2021	0.000		-		0.000	-	-	-
5th Gen Sensor Fusion	C/CPFF	Cubic : Orlando, FL	0.000	0.000		4.000	May 2021	0.000		-		0.000	-	-	-
Need Item Text	C/CPFF	GTRi : Atlanta, GA	0.000	0.000		0.500	May 2021	0.000		-		0.000	-	-	-
Prior Year Prod Dev no longer funded in FYDP	Various	Various : Various	7.051	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			8.982	1.931		12.960		0.000		-		0.000	-	-	N/A

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
5th Gen Sensor Fusion	MIPR	MIT : Lexington, MA	0.000	0.000		0.120	May 2021	0.000		-		0.000	-	-	-
5th Gen Sensor Fusion	C/CPFF	2 Circle : Arlington, VA	0.000	0.000		0.800	May 2021	0.000		-		0.000	-	-	-
Prior Year Support no longer funded in FYDP	Various	Various : Various	0.200	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			0.200	0.000		0.920		0.000		-		0.000	-	-	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy **Date: May 2021**

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 9999 / Congressional Adds
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Noise Reduction	FY20				FY21				FY22			
	1	2	3	4	1	2	3	4	1	2	3	4
<div style="display: flex; justify-content: center; align-items: center; gap: 20px;"> <div style="border: 1px solid black; background-color: #4a86e8; color: white; padding: 5px; text-align: left;"> Previous Design Iteration Failure Root Cause </div> <div style="border: 1px solid black; background-color: #4a86e8; color: white; padding: 5px; text-align: left;"> Develop Redesign Concepts to address previous test failures (Tollgate 1-3) </div> <div style="border: 1px solid black; background-color: #4a86e8; color: white; padding: 5px; text-align: left;"> Component Testing, Material/Full Scale Design Down Select (Tollgate 3-6) </div> </div>												

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 9999 / Congressional Adds

Beacon Obsolescence	FY21				FY22			
	1	2	3	4	1	2	3	4
Contract with SNC (Lakehurst Task Order)		▲	EDMs & Drawing Package Delivered	★				
			Contract Award					
SNC System Development (from GTRI Drawing Package)				▲				▲
							PRUs Delivered	
Test and Evaluation				■				■
				EDM Flight Test				PRU Flight Test

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy **Date: May 2021**

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 9999 / Congressional Adds
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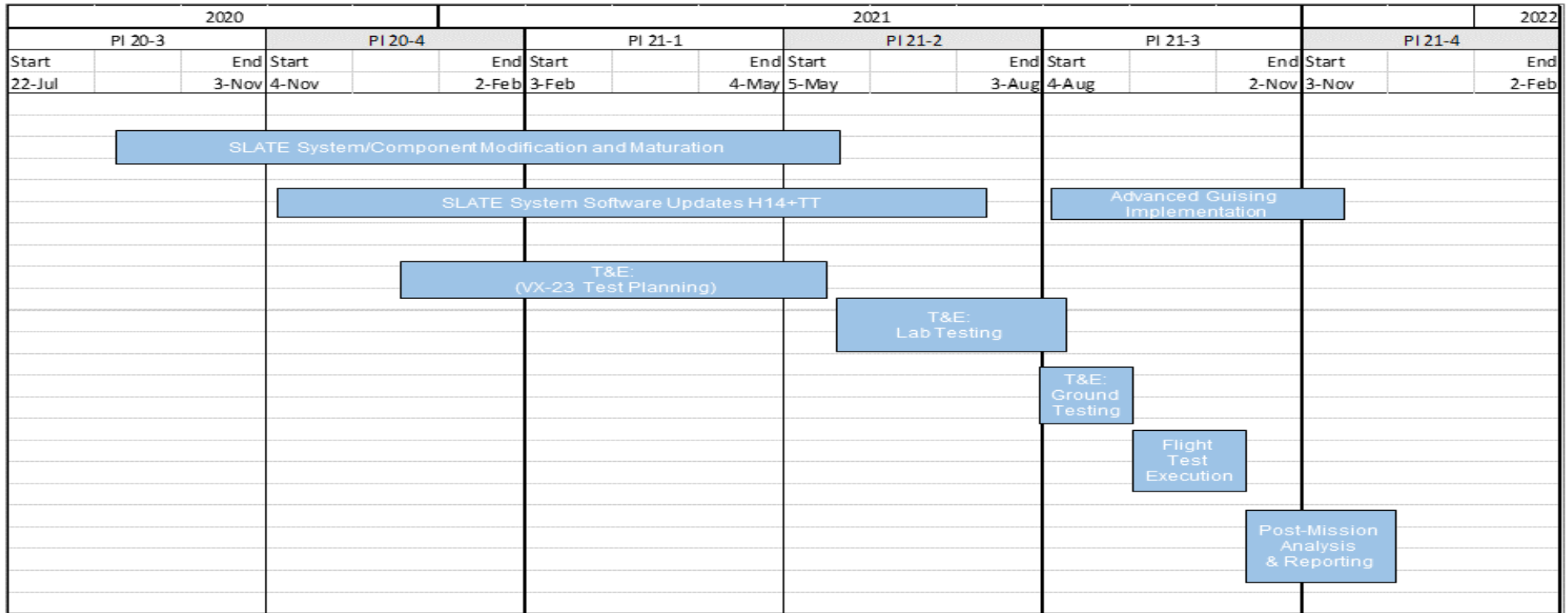
Growler Noise Mitigation	FY20				FY21				FY22			
	1	2	3	4	1	2	3	4	1	2	3	4
	Previous Design Iteration Failure Root Cause											
					Develop Redesign Concepts to address previous test failures (Tollgate 1-3)							
					Component Testing, Material/Full Scale Design Down Select (Tollgate 3-6)							
									Flight Test Planning & Execution			
									Chevron Seal Product Design Refinement and Validation for all other Component Requirements (TG6-9). Included s ECP Delivery			

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 9999 / Congressional Adds
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Fifth Generation Sensor Fusion Study



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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / F/A-18 Squadrons	Project (Number/Name) 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Noise Reduction				
Previous Design Iteration Failure Root Cause	2	2020	3	2021
Develop Redesign Concepts to address previous test failures (Tollgate 1-3)	4	2020	2	2021
Component Testing, Material/Full Scale Design Down Select (Tollgate 3-6)	4	2020	3	2021
Beacon Obsolescence Research				
Beacon Obsolescence EDMs & Drawings	2	2021	4	2021
Beacon Obsolescence Contract Award	4	2021	4	2021
Beacon Obsolescence System Development	4	2021	4	2022
EDM Flight Test	3	2021	4	2021
PRU Flight Test	3	2022	4	2022
Growler Noise Mitigation				
Previous Design Iteration Failure Root Cause	2	2020	3	2021
Develop Redesign Concepts to address previous test failures (Tollgate 1-3)	4	2020	3	2021
Component Testing, Material/Full Scale Design Down Select (Tollgate 3-6)	4	2020	3	2021
Flight Test Planning & Execution	2	2021	3	2022
Chevron Seal Product Design Refinement and Validation	3	2022	4	2022
Fifth Generation Sensor Fusion Study				
SLATE System/Component Modification and Maturation	3	2020	3	2021
SLATE System Software Updates H14+ TT	1	2021	4	2021
T&E: VX-23 Test Planning	2	2021	3	2021
T&E: Lab Testing	3	2021	4	2021
T&E: Ground Testing	4	2021	4	2021
Advanced Guising Implementation	4	2021	1	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy	Date: May 2021
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Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / <i>F/A-18 Squadrons</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Flight Test Execution	1	2022	1	2022
Post Mission Analysis & Reporting	1	2022	2	2022