

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	61.678	12.503	14.865	12.565	-	12.565	7.418	8.594	8.327	4.449	Continuing	Continuing
3373: <i>Common Aviation Command and Control System (CAC2S)</i>	61.678	9.081	14.865	12.565	-	12.565	7.418	8.594	8.327	4.449	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	3.422	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.422

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): MN36

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) is a Commandant of the Marine Corps Force Design program which provides the Aviation Combat Element with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. CAC2S accomplishes the missions with a family of systems to support the Marine Air Ground Task Force (MAGTF), Naval forces, Joint Services, and Coalition Forces. CAC2S integrates the functions of aviation command and control (C2) into an interoperable system that supports the core competencies of all Marine Corps warfighting concepts. CAC2S, in conjunction with the Marine Air Command and Control System organic sensors, AN/TPS-80 Ground/Air Task Oriented Radar, and the weapon system Composite Tracking Network (CTN) provides: enhanced air control, improved situational awareness, sensor integration, full Tactical Data Link integration, airspace and battle planning and command functionality, and sensor netting integration (CTN). CAC2S, with these organic MACCS programs, support the tenets of Expeditionary Maneuver Warfare and foster joint interoperability. CAC2S Increment I replaced legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center, Tactical Air Command Center, Tactical Air Operations Center, and Marine Air Traffic Control. In line with Force Design, CAC2S is to begin the development and prototyping of the Small Form Factor (SFF) variant in FY 2022. The SFF is a CAC2S variant required to meet the needs of Expeditionary Advance Base Operations and Force Design. The SFF variant will possess the same Tactical System, Data Link, and interface capabilities as the CAC2S Increment 1 system with the added benefits of being rapidly deployable, emitting at a lower signature, and reduced size and weight. The SFF's versatility will be a key enabling capability to support the task organization of the Marine Littoral Regiments as it meets the needs of Marine Corps Expeditionary Advance Base Operations.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	12.869	14.865	9.950	-	9.950
Current President's Budget	12.503	14.865	12.565	-	12.565
Total Adjustments	-0.366	0.000	2.615	-	2.615
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.366	0.000			
• Program Adjustments	0.000	0.000	-1.768	-	-1.768
• Rate/Misc Adjustments	0.000	0.000	4.383	-	4.383

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

Project: 9999: *Congressional Adds*

Congressional Add: *Common Aviation Command & Control System Naval Integrated Fire Control*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	FY 2022	FY 2023
Congressional Add Subtotals for Project: 9999	3.422	0.000
Congressional Add Totals for all Projects	3.422	0.000

Change Summary Explanation

The funding decrease of \$2.300M from FY 2023 to FY 2024 is due to completion of development and testing of the SFF variant in FY 2024 as CAC2S transitions to SFF production and fielding, and reduction in the scope required for continued development and analysis to investigate new capabilities associated with the CAC2S FD technology enhancement efforts.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>				Project (Number/Name) 3373 / <i>Common Aviation Command and Control System (CAC2S)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3373: <i>Common Aviation Command and Control System (CAC2S)</i>	61.678	9.081	14.865	12.565	-	12.565	7.418	8.594	8.327	4.449	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: MN36												

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) is a Commandant of the Marine Corps (CMC) Force Design (FD) program, which provides the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. CAC2S accomplishes the missions with a family of systems to support the Marine Air Ground Task Force (MAGTF), Naval forces, Joint Services, and Coalition Forces. CAC2S integrates the functions of aviation command and control (C2) into an interoperable system that supports the core competencies of all Marine Corps warfighting concepts. CAC2S, in conjunction with the Marine Air Command and Control System (MACCS) organic sensors, AN/TPS-80 Ground/Air Task Oriented Radar (G/ATOR), and the weapon system Composite Tracking Network (CTN) provides enhanced air control, improved situational awareness, sensor integration, full Tactical Data Link integration, airspace and battle planning and command functionality, as well as sensor netting integration (CTN). CAC2S, with these organic MACCS programs, support the tenets of Expeditionary Maneuver Warfare and foster joint interoperability. CAC2S Increment I replaced legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), Tactical Air Operations Center (TAOC), and Marine Air Traffic Control (MATC). CAC2S is the C2 system that enables the distribution of G/ATOR sensors and is critical to developing Naval and Marine integrated fire control methods. CAC2S sensor data correlation and distribution via the Composite Tracking Network (CTN) enables Marine Air Ground Task Force sensor data to be shared with Naval forces to inform the Joint targeting and decision-making process. In line with Force Design, CAC2S has begun the development and prototyping of an AN/TSQ-197 AC2S Small Form Factor (SFF) variant. The SFF is a CAC2S variant required to meet the needs of Expeditionary Advance Base Operations and Force Design. The SFF variant will possess the same Tactical System, Data Link, and interface capabilities as the CAC2S Increment 1 system with the added benefits of being rapidly deployable, emitting at a lower signature, and reduced size and weight. In addition, the SFF's versatility will be a key enabling capability to support the task organization of the Marine Littoral Regiments (MLRs) as it meets the needs of US Marine Corps Expeditionary Advance Base Operations (EABO).

The \$2.300M decrease from FY 2023 to FY 2024 is due to a reduction in the scope of support required to continue the development and testing of the SFF variant in FY 2024 as CAC2S transitions to SFF production and fielding, and reduction in the scope required for continued development and analysis to investigate new capabilities associated with the CAC2S FD technology enhancement efforts.

In FY 2024:

CAC2S will continue the development and testing of a small form factor (SFF) variant prototype of the AN/TSQ-297 Air Command & Control System. This is an approved FD initiative from the Capabilities Development Directorate (CDD) which is to take into account lessons learned from the Marine Corps Warfighting Laboratory (MCWL)

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy	Date: March 2023
--	-------------------------

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 3373 / <i>Common Aviation Command and Control System (CAC2S)</i>
--	--	--

Rapid Capabilities Office (RCO) initiatives with 15th Marine Expeditionary Unit (MEU) and war gaming exercises per CMC guidance, in support the USMC Expeditionary Advanced Base Operations (EABO) concept, which is an amphibious forward operating unit that will secure, sustain, and maintain warfighters and their weapons systems on a more amorphous and difficult-to-target forward-basing infrastructure. This system variant is to be developed and produced to meet the critical shortfalls of forward deployed small, scalable, survivable aviation C2 nodes capable of performing control of aircraft and missiles necessary for integration and defeat of dynamic targets performed by MAGTF, naval, joint, and national technical enabling capabilities like the current fielded AN/TSQ-297. The SFF variant will be fielded to the Marine Littoral Regiments (MLRs).

CAC2S will continue to develop and integrate Naval Integrated Fire Control (NIFC). This initiative allows CAC2S to be a key enabler in the Joint Fight in executing the Kill Web across the MAGTF and Joint Services, linking sensors and weapons in providing fire control solutions from information from multiple sensors. IFC capabilities complement and support sea-based sensor and weapon system extend the Sea Shield's engagement capabilities to provide early warning and engagement of airborne threats to the MAGTF and Naval Forces.

CAC2S will continue to develop and integrate the Automatic Dependent Surveillance - Broadcast (ADS-B) system, ADS-B receiver, and related peripheral equipment and data into CAC2S's AN/TSQ-197 AC2S. CAC2S will be able to leverage information provided by the ADS-B to produce a complete air picture to support commanders in the decision making process. ADS-B ground stations are small and adaptable and will allow CAC2S to reach farther than conventional radar to gather information needed to maintain situational awareness on the battlefield. With the Marine Corps transitioning to Expeditionary Advanced Base Operations (EABO) the ability to utilize ADS-B will also help enhance system survivability by utilizing a passive capability, vice active radar, to provide vital aircraft information and quickly conduct combat identification.

CAC2S will begin to develop and test engineering changes for the integration of its AN/TSQ-297 and AN/MRQ-13 Communications Subsystem onto the M1279 Joint Light Tactical Vehicle (JLTV) and the M1289 trailer. CAC2S will begin the replacement of its current aging prime mover, the legacy HMMWV (Humvee), in FY 2025.

Lastly, CAC2S will continue to investigate Force Design Technology Enhancements. It will research new capabilities derived from Force Design and EABO, and conduct analysis on the technical approaches needed to align efforts and prepare for future initiatives. All efforts directly support CAC2S's anticipated roles within EABO and Littoral Operations in a Contested Environment concept of operations, and provide the ability to conduct sea control and sea denial operations both from sea and from key maritime terrain. Analysis is necessary to inform priorities and FD initiatives.

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

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Product Development	4.800	9.419	6.496	0.000	6.496
Articles:	-	-	-	-	-
FY 2023 Plans:					
- To begin the development and integration Naval Integrated Fire Control (NIFC).					
- To begin research of new capabilities derived from Force Design and the Expeditionary Advance Base Operations (EABO) concept, and conduct analysis on the technical approaches needed.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 3373 / <i>Common Aviation Command and Control System (CAC2S)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- To continue the development required to integrate MIDS JTRS for the AN/TSQ-297 AC2S Link-16 modernization.</p> <p>- To begin the engineering support for the integration of the Automatic Dependent Surveillance - Broadcast (ADS-B) system capability.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The funding increase from FY 2023 to FY 2024 is due to a increase in support for MIDS-JTRS interface development support.</p>					
<p>Title: Management Services</p> <p align="right">Articles:</p> <p>FY 2023 Plans: - To fund continued support from vendor MITRE to monitor CAC2S integration efforts with the MACS sensors, G/ATOR, CTN/CEC, and GBAD development. MITRE continue its development of prototype radar and track data injection tools to facilitate contractor integration and Government laboratory testing of CAC2S.</p> <p>FY 2024 Base Plans: - To fund continued support from vendor MITRE to monitor CAC2S integration efforts with the MACS sensors, G/ATOR, CTN/CEC, and GBAD development. MITRE continue its development of prototype radar and track data injection tools to facilitate contractor integration and Government laboratory testing of CAC2S.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The funding increase from FY 2023 to FY 2024 is due to the increase in support from MITRE for development tools to support government laboratory testing.</p>	0.682	0.700	1.200	0.000	1.200
	-	-	-	-	-
<p>Title: Test and Evaluation</p> <p align="right">Articles:</p> <p>FY 2023 Plans: - To continue required integration and interface testing of upgraded hardware components and software enhancements.</p>	2.063	2.814	2.683	0.000	2.683
	-	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 3373 / <i>Common Aviation Command and Control System (CAC2S)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- To continue testing to support system software capability enhancements for capability improvement and to maintain system ATO and ATC. - To complete interface testing for new military-grade COTS IT hardware and software for the technology refresh of the AN/TSQ-297 Air Command & Control Systems. - To begin the development testing for the Automatic Dependent Surveillance - Broadcast (ADS-B) system capability. FY 2024 Base Plans: - To continue required integration and interface testing of upgraded hardware components and software enhancements. - To continue testing to support system software capability enhancements for capability improvement and to maintain system ATO and ATC. - To continue the development testing for the Automatic Dependent Surveillance - Broadcast (ADS-B) system capability. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The funding decrease from FY 2023 to FY 2024 is due to the reduction of scope required for the developmental testing for ADS-B system integration.					
Accomplishments/Planned Programs Subtotals	9.081	14.865	12.565	0.000	12.565

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• PMC/4644: <i>Common Aviation Command And Control System (CAC2S)</i>	18.247	30.292	75.382	-	75.382	77.304	69.807	12.965	11.970	0.000	524.089

Remarks
RDT&E prior to FY 2015 was in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Operations Command & Control (C2) Systems.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 3373 / <i>Common Aviation Command and Control System (CAC2S)</i>

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

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
PMC funding for FY 2015 and beyond was in BLI 4644 Common Aviation Command and Control System (CAC2S). Prior to FY 2015 PMC funding is listed in BLI 4640 Air Operations C2 Systems, Common Aviation Command and Control Systems (CAC2S).											

D. Acquisition Strategy

CAC2S employs an evolutionary acquisition strategy utilizing an incremental and phased approach for development and fielding of the CAC2S. The Capability Production Document (CPD) identifies two increments to achieve the full requirements of CAC2S. The current acquisition strategy addresses Increment I of the CAC2S development process and focuses on the requirements that will modernize the assault and air support, air defense and control, and Aviation Combat Element (ACE) battle management capabilities of the Marine Air Command and Control System (MACCS). Increment I of the CAC2S has been accomplished through a two phased approach. Phase 1 addressed the requirements to establish the baseline CAC2S capabilities for the MACCS and improved Air Command and Control (AC2) performance and effectiveness. Phase 2 addresses the requirements for remaining ACE Battle Management Command & Control (BMC2) requirements. Nine (9) Phase 2 Limited Deployment Unit systems were procured in FY 2015 and FY 2016 and fielded in FY 2017. The Full Deployment Unit (FDU) production contract was awarded 24 August 2017 and a total of forty one (41) systems were procured and fielded over three years (FY 2018-FY 2020).

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 3373 / <i>Common Aviation Command and Control System (CAC2S)</i>
--	--	--

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
AC2S SFF Development	C/BA	NSWC Crane : Crane, IN	0.000	4.800	Nov 2021	3.140	Nov 2022	0.238	Nov 2023	-		0.238	0.000	8.178	-
NIFC Development	C/BA	NSWC Crane : Crane, IN	0.000	0.000		2.229	Nov 2022	0.648	Nov 2023	-		0.648	0.000	2.877	-
Force Design Technology Enhancements	C/BA	NSWC Crane : Crane, IN	0.000	0.000		4.050	Feb 2023	1.100	Feb 2024	-		1.100	0.000	5.150	-
NIFC Development	C/FFP	Raytheon Solipsys : Fulton, MD	0.000	0.000		0.000		0.485	May 2024	-		0.485	0.000	0.485	-
Prime Mover Integration Development	C/BA	NSWC Crane : Not Specified	0.000	0.000		0.000		4.025	Mar 2024	-		4.025	0.000	4.025	-
Subtotal			0.000	4.800		9.419		6.496		-		6.496	0.000	20.715	N/A

Remarks
The funding decrease from FY 2023 to FY 2024 is due to the completion of AC2S SFF development and decrease in scope required for CAC2S system research for Force Design Technology Enhancements.

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Travel	Various	Travel : TBD	0.409	0.075	Oct 2021	0.095	Oct 2022	0.096	Oct 2023	-		0.096	Continuing	Continuing	Continuing
Engineering Support	WR	NSWC DD : Dahlgren, VA	2.761	0.000		0.000		0.253	Nov 2023	-		0.253	0.000	3.014	-
Acquisition Support	WR	NSWC CD : Crane, IN	1.663	0.796	Nov 2021	1.238	Nov 2022	0.820	Nov 2023	-		0.820	0.000	4.517	-
Software Support	C/FFP	Raytheon Solipsys : Fulton, MD	1.081	0.249	May 2022	0.249	May 2023	0.250	May 2024	-		0.250	0.000	1.829	-
Software Support	C/FFP	Ternion : Huntsville, AL	0.344	0.198	May 2022	0.000		0.000		-		0.000	0.000	0.542	-
Software Support	C/FFP	Ultra : San Diego, CA	0.298	0.218	Jun 2022	0.350	Jun 2023	0.767	Jun 2024	-		0.767	0.000	1.633	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 3373 / <i>Common Aviation Command and Control System (CAC2S)</i>
--	--	--

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Prior Years Cumulative Funding	Various	Various : Various	4.121	0.000		0.000		0.000		-		0.000	0.000	4.121	-
Subtotal			10.677	1.536		1.932		2.186		-		2.186	Continuing	Continuing	N/A

Remarks
The funding increase from FY 2023 to FY 2024 is due to a increase in support for MIDS-JTRS interface development support.

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Operational Test & Evaluation (OT&E)	WR	NSWC CD : Crane, IN	12.537	1.477	Nov 2021	1.626	Nov 2022	1.010	Nov 2023	-		1.010	7.445	24.095	-
Operational Test & Evaluation (OT&E)	WR	NSWC DD : Dahlgren, VA	5.691	0.000		0.000		0.000		-		0.000	0.000	5.691	-
Developmental Test & Evaluation (DT&E)	WR	NSWC Corona : Corona, CA	1.418	0.381	Nov 2021	1.113	Nov 2022	1.648	Nov 2023	-		1.648	0.000	4.560	-
Operational Test & Evaluation (OT&E)	C/BA	JITC : Ft. Huachuca, NM	0.166	0.205	Jan 2022	0.075	Jan 2023	0.025	Jan 2024	-		0.025	0.000	0.471	-
Developmental Test & Evaluation (DT&E)	Various	Various : Various	22.795	0.000		0.000		0.000		-		0.000	0.000	22.795	-
Subtotal			42.607	2.063		2.814		2.683		-		2.683	7.445	57.612	N/A

Remarks
The funding decrease from FY 2023 to FY 2024 is due to the reduction of scope required for the developmental testing for the Automatic Dependent Surveillance - Broadcast (ADS-B) system.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 3373 / <i>Common Aviation Command and Control System (CAC2S)</i>
--	--	--

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
T&E Mgmt Support	C/FFP	GID : Fredericksburg, VA	0.266	0.000		0.000		0.000		-		0.000	0.000	0.266	-
Sensor Management	C/FFP	MITRE : Bedford, MA	5.396	0.682	Sep 2022	0.700	Sep 2023	1.200	Sep 2024	-		1.200	2.958	10.936	-
Prior Years Cumulative Funding	Various	Various : Various	2.732	0.000		0.000		0.000		-		0.000	0.000	2.732	19,096.227
Subtotal			8.394	0.682		0.700		1.200		-		1.200	2.958	13.934	N/A

Remarks
The funding increase from FY 2023 to FY 2024 is due to the increase in support from MITRE for development tools to support government laboratory testing.

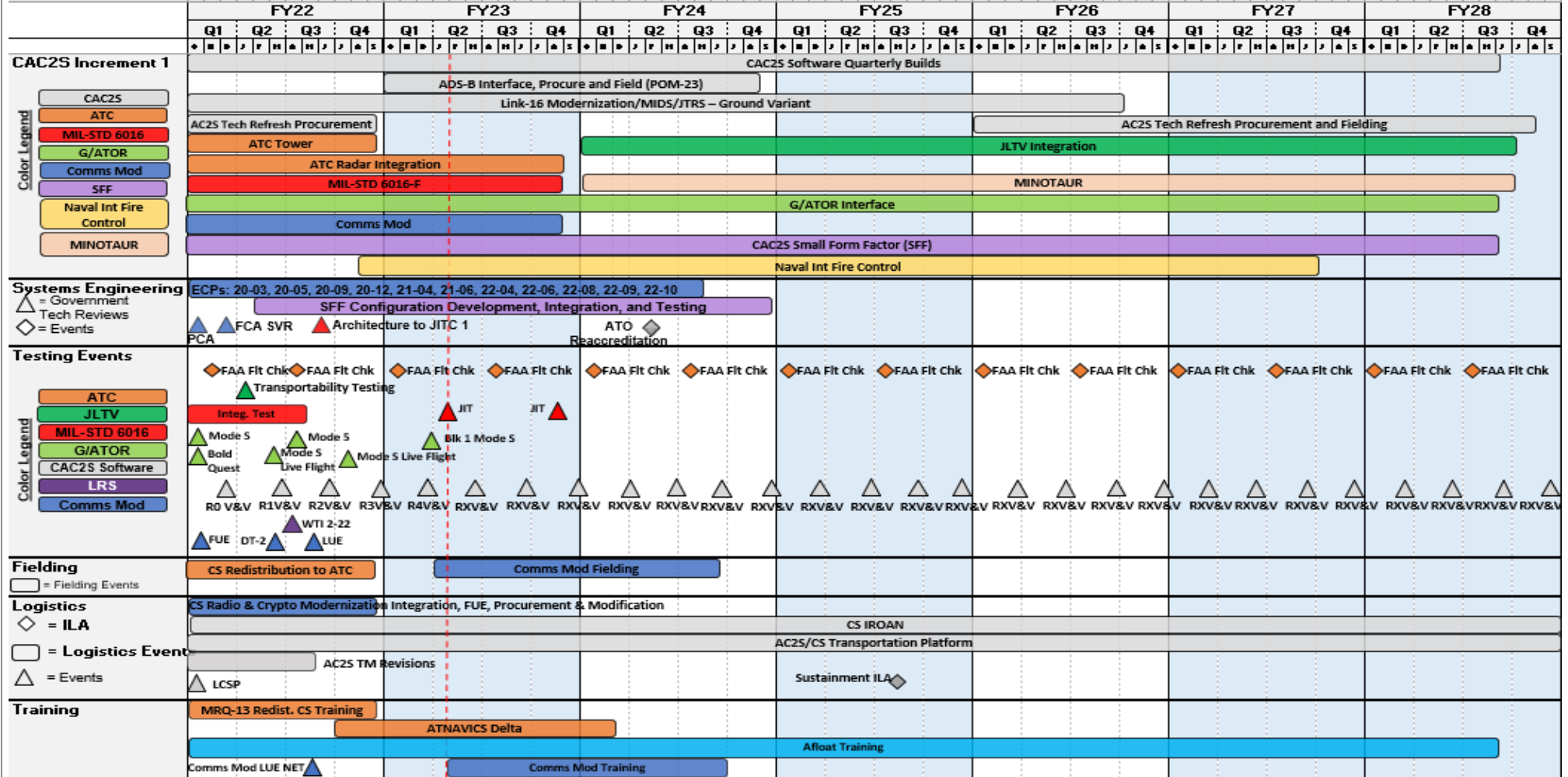
	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	61.678	9.081	14.865	12.565	-	12.565	Continuing	Continuing	N/A

Remarks
The funding decrease from FY 2023 to FY 2024 is due to completion of development and testing of the SFF variant in FY 2024 as CAC2S transitions to SFF production and fielding, and reduction in the scope required for continued development and analysis to investigate new capabilities associated with the CAC2S FD technology enhancement efforts.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy Date: March 2023

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / Common Aviation Command and Control Sys (CAC2S)	Project (Number/Name) 3373 / Common Aviation Command and Control System (CAC2S)
--	---	---



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 3373 / <i>Common Aviation Command and Control System (CAC2S)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3373				
Milestones: AN/TSQ-297 AC2S FRP/FDU FOC Threshold	2	2022	2	2022
Milestones: ATC IOC	3	2022	3	2022
Milestones: Comms Mod Fielding Decision	4	2022	4	2022
Milestones: Comms Mod IOC	3	2023	3	2023
CAC2S Increment 1: Quarterly SW Releases	1	2022	4	2028
CAC2S Increment 1: Air Traffic Control (ATC) Integration	1	2022	4	2022
CAC2S Increment 1: Comms Mod	1	2022	2	2023
CAC2S Increment 1: CAC2S Small Form Factor	1	2022	4	2028
CAC2S Increment 1: G/ATOR Interface	1	2022	4	2028
CAC2S Increment 1: MIL-STD 6016-F	1	2022	4	2023
CAC2S Increment 1: Link-16 Modernization (MID-JTRS)	1	2022	4	2026
CAC2S Increment 1: AC2S Tech Refresh procurement	1	2022	4	2023
CAC2S Increment 1: AC2S Tech Refresh procurement and fielding	1	2026	1	2028
CAC2S Increment 1: ADS-B Interface	1	2023	4	2026
CAC2S Increment 1: JLTV Integration	1	2024	4	2028
CAC2S Increment 1: MINOTAUR development and integration	1	2024	4	2028
Systems Engineering: Small Form Factor Development, Integration, and Testing	2	2022	1	2025
Systems Engineering: Comms Mod ECPs	1	2022	3	2024
Testing Events: Air Traffic Control (ATC) FAA Flight Checks	1	2022	1	2028
Testing Events: AN/MRQ-13 CS FUE	1	2022	1	2022
Testing Events: MIL-STD 6016-F Integration Test	1	2022	3	2022

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 3373 / <i>Common Aviation Command and Control System (CAC2S)</i>
--	--	--

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Testing Events: G/ATOR Interface Mode S Testing	2	2022	4	2022
Testing Events: Link-16 Modernization V&Vs	1	2022	4	2028
Logistics: AN/MRQ-13 CS IROAN	1	2022	4	2028
Logistics: AC2S/CS Transportation Platform	1	2022	4	2028
Logistics: AC2S Tech Manual Revisions	1	2022	3	2022
Fielding: Comms Mod Fielding	2	2023	3	2024
Fielding: CS Redistribution to ATC	1	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	3.422	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.422
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) is a Commandant of the Marine Corps (CMC) Force Design (FD) program, which provides the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. CAC2S accomplishes the missions with a family of systems to support the Marine Air Ground Task Force (MAGTF), Naval forces, Joint Services, and Coalition Forces. CAC2S integrates the functions of aviation command and control (C2) into an interoperable system that supports the core competencies of all Marine Corps warfighting concepts. CAC2S, in conjunction with the Marine Air Command and Control System (MACCS) organic sensors, AN/TPS-80 Ground/Air Task Oriented Radar (G/ATOR), and the weapon system Composite Tracking Network (CTN) provides enhanced air control, improved situational awareness, sensor integration, full Tactical Data Link integration, airspace and battle planning and command functionality, as well as sensor netting integration (CTN). CAC2S, with these organic MACCS programs, support the tenets of Expeditionary Maneuver Warfare and foster joint interoperability. CAC2S Increment I replaced legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), Tactical Air Operations Center (TAOC), and Marine Air Traffic Control (MATC). CAC2S is the C2 system that enables the distribution of G/ATOR sensors and is critical to developing Naval and Marine integrated fire control methods. CAC2S sensor data correlation and distribution via the Composite Tracking Network (CTN) enables Marine Air Ground Task Force sensor data to be shared with Naval forces to inform the Joint targeting and decision-making process. In line with Force Design, CAC2S is to begin the development and prototyping of the Small Form Factor (SFF) variant in FY 2022. The SFF is a CAC2S variant required to meet the needs of Expeditionary Advance Base Operations and Force Design. The SFF variant will possess the same Tactical System, Data Link, and interface capabilities as the CAC2S Increment 1 system with the added benefits of being rapidly deployable, emitting at a lower signature, and reduced size and weight. In addition, the SFF's versatility will be a key enabling capability to support the task organization of the Marine Littoral Regiments (MLRs) as it meets the needs of US Marine Corps Expeditionary Advance Base Operations (EABO).

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

	FY 2022	FY 2023
Congressional Add: Common Aviation Command & Control System Naval Integrated Fire Control	3.422	0.000
FY 2022 Accomplishments: - To begin the development and integration of Naval Integrated Fire Control (NIFC).		
FY 2023 Plans: N/A		
Congressional Adds Subtotals	3.422	0.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy	Date: March 2023
--	-------------------------

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
--	--	--

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

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• PMC/4644: <i>Common Aviation Command And Control System (CAC2S)</i>	18.247	30.292	34.739	-	34.739	11.391	5.998	6.064	6.185	0.000	341.038

Remarks

PMC funding for FY 2015 and beyond was in BLI 4644 Common Aviation Command and Control System (CAC2S). Prior to FY 2015 PMC funding is listed in BLI 4640 Air Operations C2 Systems, Common Aviation Command and Control Systems (CAC2S).

D. Acquisition Strategy

CAC2S employs an evolutionary acquisition strategy utilizing an incremental and phased approach for development and fielding of the CAC2S. The Capability Production Document (CPD) identifies two increments to achieve the full requirements of CAC2S. The current acquisition strategy addresses Increment I of the CAC2S development process and focuses on the requirements that will modernize the assault and air support, air defense and control, and Aviation Combat Element (ACE) battle management capabilities of the Marine Air Command and Control System (MACCS). Increment I of the CAC2S has been accomplished through a two phased approach. Phase 1 addressed the requirements to establish the baseline CAC2S capabilities for the MACCS and improved Air Command and Control (AC2) performance and effectiveness. Phase 2 addresses the requirements for remaining ACE Battle Management Command & Control (BMC2) requirements. Nine (9) Phase 2 Limited Deployment Unit systems were procured in FY 2015 and FY 2016 and fielded in FY 2017. The Full Deployment Unit (FDU) production contract was awarded 24 August 2017 and a total of forty one (41) systems were procured and fielded over three years (FY 2018-FY 2020).

CAC2S completed the procurement and integration of upgraded components for the technology refresh of its AN/MRQ-13 Communications Subsystem (CS) for Radio and Crypto Modernization. The CS upgrade replaces 2006-era, obsolete voice/data communications components with modernized equipment that is more reliable, readily supportable and cyber-secure, enabling integration with CAC2S networks and interoperability with joint forces.

In FY 2022, CAC2S received a Congressional Add to begin the development and integration of Naval Integrated Fire Control (NIFC). This initiative will allow CAC2S to be a key enabler in the Joint Fight in executing the Kill Web across the MAGTF and Joint Services linking sensors and weapons in providing fire control solutions from information from multiple sensors. IFC capabilities complement and support sea-based sensor and weapon system extend the Sea Shield's engagement capabilities to provide early warning and engagement of airborne threats to the MAGTF and Naval Forces.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
--	--	--

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
NIFC Development	C/FFP	Raytheon Solipsys : Fulton, MD	0.000	1.745	Jul 2022	0.000		0.000		-		0.000	0.000	1.745	-
NIFC Development	C/BA	NSWC Crane : Crane, IN	0.000	1.677	Jun 2022	0.000		0.000		-		0.000	0.000	1.677	-
Subtotal			0.000	3.422		0.000		0.000		-		0.000	0.000	3.422	N/A

Remarks
The net decrease of \$3.545M from FY 2022 to FY 2023 is due to Congressional add funding provided to support the development and integration of Naval Integrated Fire Control (NIFC) in FY22.

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	3.422	0.000	0.000	-	0.000	0.000	3.422	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
--	--	--

CAC2S	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
NIFC Development, Integration, & Testing																																

2024DON - 0206335M - 9999

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / <i>Common Aviation Command and Control Sys (CAC2S)</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
CAC2S				
NIFC Development, Integration, & Testing: CAC2S Naval Integrated Fire Control Development, Integration, & Testing	3	2022	4	2025