Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0206335M *I (U)Common Aviation Command and Control Sys (CAC2S)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	45.527	6.934	7.343	4.826	-	4.826	4.506	4.356	4.439	4.540	Continuing	Continuing
3373: *Common Aviation Command and Control System (CAC2S)*	45.527	6.934	7.343	4.826	-	4.826	4.506	4.356	4.439	4.540	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** MN36												

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) - A coordinated modernization effort to replace the existing aviation command and control equipment of the Marine Air Command and Control System (MACCS) and to provide the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. The CAC2S system will accomplish the MACCS missions with a suite of operationally scalable modules to support the Marine Air Ground Task Force (MAGTF), Joint, and Coalition Forces. The CAC2S integrates the functions of aviation command and control into an interoperable system that will support the core competencies of all Marine Corps warfighting concepts. The CAC2S, in conjunction with the MACCS organic sensors (AN/TPS-63, AN/TPS-59 and AN/TPS-80 (Ground/Air Task Oriented Radar (G/ATOR)) and weapon system Composite Tracking Network (CTN) will provide enhanced air control, improved situational awareness, sensor integration (G/ATOR and AN/TPS-59), 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 fosters joint interoperability. CAC2S Increment I will replace legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), and Tactical Air Operations Center (TAOC).

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	11.850	7.343	4.936	-	4.936
Current President's Budget	6.934	7.343	4.826	-	4.826
Total Adjustments	-4.916	0.000	-0.110	-	-0.110
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.733	0.000			
• SBIR/STTR Transfer	-0.309	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.110	-	-0.110
• Congressional Directed Reductions Adjustments	-2.874	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0206335M *I (U)Common Aviation Command and Control Sys (CAC2S)*

Change Summary Explanation

Funding decrease of $2.517M from FY 2018 to FY 2019 largely due to the completion of interface support provided to G/ATOR during developmental test and operational assessment events conducted as well as completion of Communication Subsystem hardware development effort conducted in FY 2018.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*				Project (Number/Name) 3373 / *Common Aviation Command and Control System (CAC2S)*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3373: *Common Aviation Command and Control System (CAC2S)*	45.527	6.934	7.343	4.826	-	4.826	4.506	4.356	4.439	4.540	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: MN36

Note

Prior year funding is listed in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Operations Command & Control (C2) Systems.

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) - A coordinated modernization effort to replace the existing aviation command and control equipment of the Marine Air Command and Control System (MACCS) and to provide the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. The CAC2S system will accomplish the MACCS missions with a suite of operationally scalable modules to support the Marine Air Ground Task Force (MAGTF), Joint, and Coalition Forces. The CAC2S integrates the functions of aviation command and control into an interoperable system that will support the core competencies of all Marine Corps warfighting concepts. The CAC2S, in conjunction with the MACCS organic sensors (AN/TPS-63, AN/TPS-59, and AN/TPS-80 (Ground/Air Task Oriented Radar (G/ATOR)) and weapon system Composite Tracking Network (CTN) will provide enhanced air control, improved situational awareness, sensor integration (G/ATOR and AN/TPS-59), 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 fosters joint interoperability. CAC2S Increment I will replace legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), and Tactical Air Operations Center (TAOC). Funding decrease of $2.517M from FY 2018 to FY 2019 largely due to the completion of interface support provided to G/ATOR during developmental test and operational assessment events conducted as well as completion of Communication Subsystem hardware development effort conducted in FY 2018.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Title: Product Development	1.987	1.063	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Conduct integration of CAC2S with G/ATOR and associated CTN implementation. - Perform root cause analysis of G/ATOR and related CTN findings resulting from G/ATOR DT-1C and OA. - Implement the required corrections resulting from G/ATOR DT-1C and OA test events.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Complete CAC2S Phase 1 Communication Subsystem hardware modification development effort. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $1.063M from FY 2018 to FY 2019 due to the completion of hardware/software development efforts resulting from completion of CAC2S Phase 1 Communication Subsystem hardware modification development effort.					
Title: Support and Management Services ***Articles:*** ***FY 2018 Plans:*** - Conduct yearly Cyber Compliance Tests required with each of the CAC2S quarterly software releases and conduct the Annual Security Review testing to support the maintenance of the CAC2S Authority to Operate (ATO). - Perform root cause analysis of G/ATOR and related CTN findings and implement the required corrections to support the G/ATOR DT-1E test event. - Continue MITRE support during G/ATOR DT-1E test event. ***FY 2019 Base Plans:*** - Conduct yearly Cyber Compliance Tests required with each of the CAC2S quarterly software releases and conduct the Annual Security Review testing to support the maintenance of the CAC2S Authority to Operate (ATO). - Continue MITRE support during G/ATOR DT-1E, IOT&E, and CAC2S Phase 2 FOT&E test events. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $1.061M from FY 2018 to FY 2019 reflects reduction of hardware/software engineering efforts resulting from completion of G/ATOR DT-1C and OA in FY 2018.	2.251 -	2.094 -	1.033 -	0.000 -	1.033 -
Title: Test and Evaluation	2.696	4.186	3.793	0.000	3.793

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
FY 2018 Plans: - Complete interface test support during G/ATOR DT-1C and OA test events. - Initiate interface test support during G/ATOR DT-1E test event. - Complete the Air Command and Control Interface Design Document (IDD). Implement the software changes resulting from the updated and approved IDD and support the certification testing of the associated IDD CTN software adaptive layer. CAC2S interfaces with G/ATOR through CTN or alternatively, through a direct connection to the radar. The IDD changes must be implemented and tested on CAC2S, CTN and G/ATOR in order to enable the systems to exchange data and support the required concepts of employment. - Implement the Mode 5, Mode S and CTN Web Identification software changes required to support the CAC2S FOT&E and close out the caveats identified in the CAC2S Joint Interoperability Certification memorandum. Mode 5/Mode S implementation is DOD directed. The G/ATOR and AN/TPS-59 radars will implement hardware and software changes to enable integration of M-5/M-S. CAC2S and CTN must implement and test software changes needed to read and integrate the radars M-5/M-S data. CTN Wed ID changes are required to enable use of M-5/M-S data in support of CEC network-wide, automated identification (ID) doctrine. ***FY 2019 Base Plans:*** - Conduct interface test support during G/ATOR DT-1E and IOT&E as well as CAC2S Phase 2 FOT&E to validate G/ATOR interface. - Conduct integration and test of Communication Subsystem hardware refresh to ensure operational readiness and compatibility with system baseline prior to fielding. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.393M from FY 2018 to FY 2019 due to reduction of field activity T&E support as a result of completing G/ATOR DT-1C and OA in FY 2018.					
Accomplishments/Planned Programs Subtotals	6.934	7.343	4.826	0.000	4.826

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/4644: *Common Aviation Command And Control System (CAC2S)*	52.487	44.928	35.467	-	35.467	34.412	33.781	16.710	17.476	0.000	265.677

Remarks

RDT&E prior to FY15 is listed in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Operations Command & Control (C2) Systems.

PMC funding for FY15 and beyond is listed in BLI 4644 Common Aviation Command and Control System (CAC2S). Prior to FY15 PMC funding is listed in BLI 4640 Air Operations C2 Systems, Common Aviation Command and Control Systems (CAC2S).

D. Acquisition Strategy

CAC2S will employ 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 will be accomplished through a two phased approach. Phase 1 addresses the requirements to establish the baseline CAC2S capabilities for the MACCS and improve Air Command and Control (AC2) performance and effectiveness. Phase 2 will address the requirements for remaining ACE Battle Management Command & Control (BMC2) requirements. Quantity nine (9) Limited Deployment Unit systems were procured in FY15 and FY16 and fielded in FY17. Full Deployment Unit (FDU) production contract awarded 24 August 2017 and will provide a total of forty one (41) systems to be fielded over three years (FY 2018-FY 2020). Approved Acquisition Objective is 50 systems.

E. Performance Metrics

Integrated Master Schedule
OSD Financial Benchmarks
Technical Performance Measures
Probability of Program Success (PoPS) Assessments

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	WR	NSWC CD : Crane, IN	1.784	0.258	Nov 2016	0.264	Nov 2017	0.000		-		0.000	0.896	3.202	-
Engineering Manufacturing and Development	C/FPIF	General Dynamics : Pheonix, AZ	3.800	0.000		0.000		0.000		-		0.000	16.544	20.344	59.922
Software Development	WR	NSWC DD : Dahlgren, VA	2.373	0.532	Nov 2016	0.799	Nov 2017	0.000		-		0.000	0.000	3.704	-
Hardware and Software Engineering	C/CPIF	NSWC CD : Crane, IN	0.000	1.197	Mar 2017	0.000		0.000		-		0.000	0.000	1.197	-
		Subtotal	7.957	1.987		1.063		0.000		-		0.000	17.440	28.447	N/A

Remarks

Decrease of $1.063M from FY 2018 to FY 2019 due to the completion of hardware/software development efforts resulting from completion of CAC2S Phase 1 Communication Subsystem hardware modification development effort.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Reliability Assessment	MIPR	AMSSA : Aberdeen, MD	0.801	0.185	Nov 2016	0.000		0.000		-		0.000	0.238	1.224	-
Interoperability Certification	MIPR	JITC : Fort Huachuca, AZ	0.800	0.074	Nov 2016	0.000		0.000		-		0.000	0.265	1.139	-
Safety Engineering	C/FP	MCSC Safety : TBD	0.425	0.119	Nov 2016	0.000		0.000		-		0.000	0.095	0.639	-
Travel	Various	Travel : TBD	0.143	0.072	Oct 2016	0.050	Oct 2017	0.039	Oct 2018	-		0.039	Continuing	Continuing	Continuing
Engineering Support	WR	NSWC DD : Dahlgren, VA	0.528	1.035	Nov 2016	1.151	Nov 2017	0.233	Nov 2018	-		0.233	0.000	2.947	-
Acquisition Support	WR	NSWC CD : Crane, IN	0.000	0.199	Nov 2016	0.372	Nov 2017	0.241	Nov 2018	-		0.241	0.000	0.812	-
Prior Years Cumulative Funding	Various	Various : Various	1.717	0.000		0.000		0.000		-		0.000	0.000	1.717	-
		Subtotal	4.414	1.684		1.573		0.513		-		0.513	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	Project (Number/Name) 3373 / *Common Aviation Command and Control System (CAC2S)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Decrease of $1.060M from FY 2018 to FY 2019 reflects reduction of hardware/software engineering and acquisition support resulting from completion of G/ATOR DT-1C and OA in FY 2018.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing and Evaluation	WR	NSWC - Port Huenueme : Port Huenueme, CA	1.751	0.558	Nov 2016	0.623	Nov 2017	0.442	Nov 2018	-		0.442	0.955	4.329	-
Testing and Evaluation	Sub Allot	MCOTEA : Quantico, VA	2.538	0.500	Jan 2017	0.000		0.000		-		0.000	3.465	6.503	-
Testing and Evaluation	Sub Allot	MCTSSA : Camp Pendleton, CA	7.076	0.178	Nov 2016	0.250	Nov 2017	0.118	Nov 2018	-		0.118	0.952	8.574	-
Testing and Evaluation	WR	NSWC CD : Crane, IN	7.078	0.325	Nov 2016	0.907	Nov 2017	0.878	Nov 2018	-		0.878	7.445	16.633	-
Testing and Evaluation	WR	NSWC DD : Dahlgren, VA	1.351	1.135	Nov 2016	2.406	Nov 2017	2.355	Nov 2018	-		2.355	0.000	7.247	-
Prior Years Cumulative Funding	Various	Various : Various	8.624	0.000		0.000		0.000		-		0.000	0.000	8.624	-
		Subtotal	28.418	2.696		4.186		3.793		-		3.793	12.817	51.910	N/A

Remarks

Decrease of $0.393M from FY 2018 to FY 2019 due to reduction of field activity T&E support as a result of completing G/ATOR DT-1C and OA in FY 2018.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	Various : Various	2.732	0.000		0.000		0.000		-		0.000	0.000	2.732	19,096.227

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	Project (Number/Name) 3373 / *Common Aviation Command and Control System (CAC2S)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sensor Management	C/FFP	MITRE : Bedford, MA	2.006	0.567	Oct 2016	0.521	Oct 2017	0.520	Oct 2018	-		0.520	2.958	6.572	-
		Subtotal	4.738	0.567		0.521		0.520		-		0.520	2.958	9.304	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	45.527	6.934		7.343		4.826		-		4.826	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

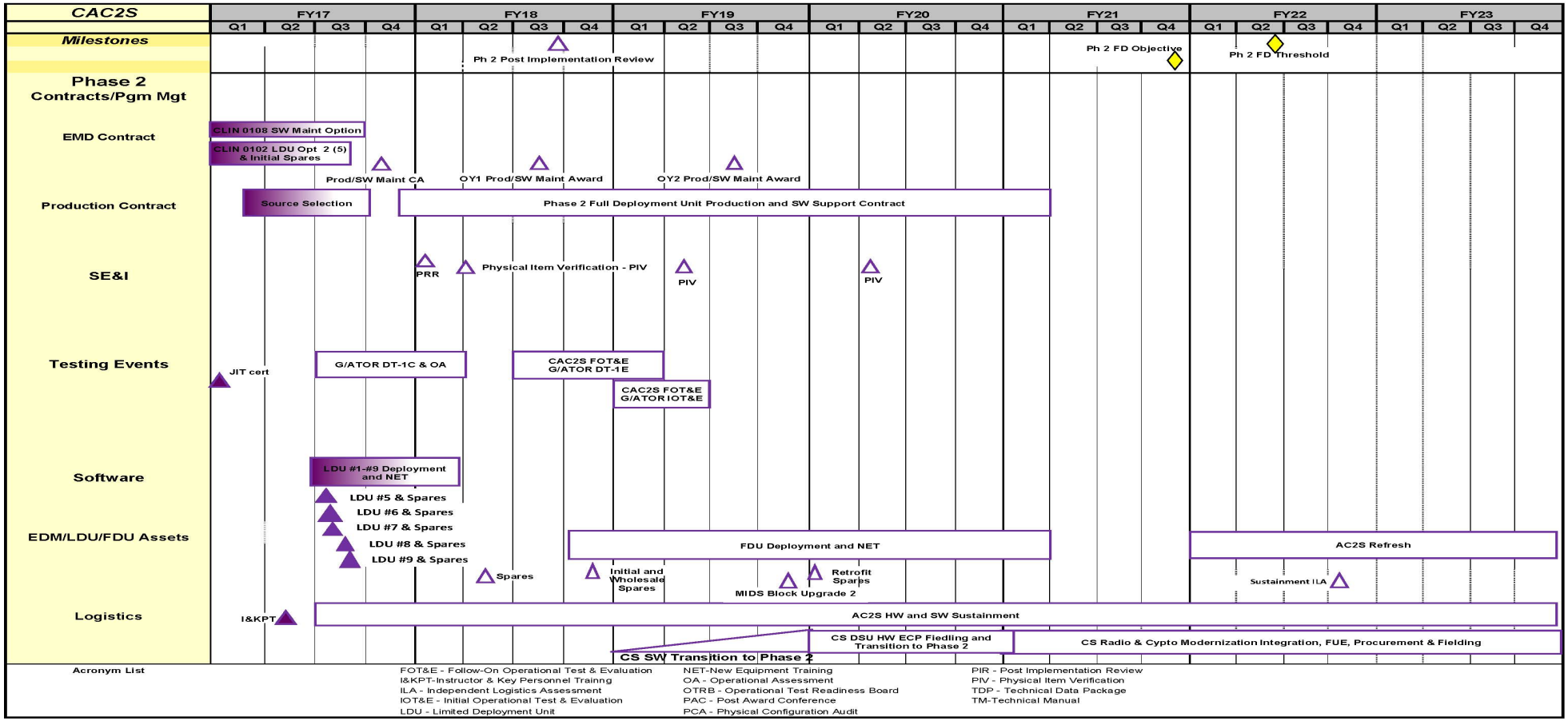

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3373				
Full Deployment Unit (FDU) Production Contract	4	2017	1	2021
Communication Subsystem (CS) Hardware Integration and Test	1	2019	4	2019
Limited Deployment Units (LDU) 1-9 deliveries, deployment and NET	3	2017	2	2018
Interoperability Testing for G/ATOR Developmental Test - 1C & Operational Assessment	2	2017	1	2018
Full Deployment Unit (FDU) deployment and NET	4	2018	1	2021
CAC2S Phase 2 FOT&E	3	2018	2	2019
G/ATOR Initial Operational Test & Evaluation	1	2019	2	2019
G/ATOR Developmental Test - 1E	3	2018	1	2019