Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*				R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	53.493	8.834	35.212	0.000	35.212	10.147	9.845	9.206	9.384	Continuing	Continuing
0117: *Reef Point*	0.000	0.000	0.093	0.000	0.093	0.092	0.092	0.092	0.093	Continuing	Continuing
2478: *Tactical Control System*	12.707	8.834	8.767	0.000	8.767	10.055	9.753	9.114	9.291	Continuing	Continuing
2501: *Medium Endurance Marinized UAS Technology Demonstration*	0.000	0.000	26.352	0.000	26.352	0.000	0.000	0.000	0.000	0.000	26.352
2768: *VTUAV*	15.514	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	514.521
2910: *Joint Tech Center/System Integ Lab*	1.719	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.623
3192: *STUAS*	19.464	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	25.569
9999: *Congressional Adds*	4.089	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	38.001

A. Mission Description and Budget Item Justification

Tactical Unmanned Aerial Vehicles (JMIP)

This PE includes non-lethal joint tactical UAV system support for DoD to provide the warfighters with the capability for day/night aerial reconnaissance, surveillance and target acquisition (RSTA); intelligence; communications/data relay; and minefield detection in limited adverse weather. This PE includes the Tactical Control System (TCS) which provides a multi-level, scaleable, and flexible control of the UAV air vehicles and payloads, as well as direct receipt of UAV imagery. This PE also includes Common Systems Development, which provides for the research and development of leading edge technology applicable across DoD UAV efforts.

2768 MQ-8B (Vertical Take-Off and Landing Tactical Unmanned Air Vehicle (VTUAV): Project code moved from PE 0305204N to PE 0305231N, in FY10.

2910 JTC/SIL (Joint Technology Center/System Integration Laboratory): Project code moved from PE 0305204N to PE 0603261N, in FY10.

3192 STUAS (Small Tactical Unmanned Aircraft System): Project code moved from PE 0305204N to PE 0305234N in FY10.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305204N: *Tactical Unmanned Aerial Vehicles*

2501 Medium Endurance Marinized UAS Technology Demostration: Project is a new start in FY11.

Congressional Adds:
UAS Tactical Control System Open Architecture: This initiative includes the open systems migration of unique military standard sensors, electronics, and software system components to lower cost/higher performance commercial equivalent capabilities.

Micro-munitions Interface for Tactical Unmanned Systems: This initiative is to develop an interface between Unmanned Air Systems (UAS) and micro-munitions, defined as weapons weighing less than 100 pounds. Integration of micro-munitions onto UASs requires a stores/weapons management interface that provides a safe and effective integration between the weapon and the unmanned system.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	51.588	8.971	0.000	0.000	0.000
Current President's Budget	53.493	8.834	35.212	0.000	35.212
Total Adjustments	1.905	-0.137	35.212	0.000	35.212
• Congressional General Reductions		-0.037			
• Congressional Directed Reductions		-0.100			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	3.900	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	35.212	0.000	35.212
• Congressional Recision Adjustments	0.005	0.000	0.000	0.000	0.000
• Congressional Add Adjustments	-2.000	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Unmanned Air Systems Tactical Control Systems*	2.493	0.000
Congressional Add: *MICRO-MUNITIONS INTERFACE FOR TACT UNMANNED SYS*	1.596	0.000
	4.089	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305204N: *Tactical Unmanned Aerial Vehicles*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add Subtotals for Project: 9999		
Congressional Add Totals for all Projects	4.089	0.000

Change Summary Explanation

Schedule:

TCS - Acquisition milestones have been adjusted due to software and flight test delays. IOC and the completion of OT-C1 OPEVAL moved from 4Q FY09 to 2Q FY10, and the completion of VTUAV EMD moved from the beginning of 4Q FY09 to the end of 2Q FY10. Added Littoral Combat Ship (LCS) Integration to enable VTUAV to integrate, test and deploy onboard LCS 1&2 for the Surface Warfare, Mine Counter-Measures and Anti Submarine Warfare modules.

VTUAV - FY10 thru FY15, VTUAV is budgeted for in PE 0305231N.

Technical: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 0117: *Reef Point*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0117: *Reef Point*	0.000	0.000	0.093	0.000	0.093	0.092	0.092	0.092	0.093	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

Note

A new start project for FY 2011.

A. Mission Description and Budget Item Justification

The Reef Point Sonochute UAV will provide an expendable organic UAV that can be launched from a P-3/P-8 Sono Buoy Launcher to support the host aircraft by 1) extending its on-station time, 2) extending on-board sensor range and 3) affording a margin of crew and platform safety not currently available to Maritime Surveillance Aircraft (MSA) community. The system supports the P-8A Multi-Mission Maritime Aircraft (MMA) Adjunct Unmanned Aerial Vehicle requirement of level II UAV command and control (threshold) to provide real-time receipt of UAV sensor data via direct link as well as the objective goal for later production blocks of P-8A for Level IV UAV command and control to enable on-board command and control of UAVs operating as remote sensors and C4ISR collection. This system supports the P-8A design for deployable systems which accommodates for the stowage, control, and dispensing of various non-lethal expendables for use in search, localization, tracking, classification/identification tasks, for enhancing survivability, and for Search and Rescue (SAR). The system supports Naval missions such as Maritime Interdiction. Naval Air Warfare Center Division will support the systems engineering.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Engineering and Maintenance	0.000	0.000	0.093	0.000	0.093
Government Technical Engineering Support and travel.					
FY 2011 Base Plans: FY11 funds this new start effort to provide an expendable organic UAV that can be launched from a P-3/P-8 Sono Buoy Launcher. Funding will support government engineering support and related travel requirements.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 0117: *Reef Point*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.093	0.000	0.093

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The project strategy is to develop and demonstrate an expendable organic sonochute launched UAV (SLUAV) for P-3/P-8 maritime missions. The demonstration project will support requirements developed and refined for input into the formal requirements (JCIDS) process and documentation. NAWCAD will provide government engineering support and manage the demonstration effort using the developers of SLUAVs currently under contract.

E. Performance Metrics

Attainment of a sonochute launched expendable organic UAV for use on P-3/P-8 aircraft.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2478: *Tactical Control System*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2478: *Tactical Control System*	12.707	8.834	8.767	0.000	8.767	10.055	9.753	9.114	9.291	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This program supports the Tactical Control System (TCS), a standards-based system that provides interoperability and commonality for Command and Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) interfaces, and Command and Control of Naval Unmanned Air Systems (UASs). Capability to provide Interoperability across the Naval UAS Family of Systems (FoS) through use of TCS software operating on Ground Control Station hardware utilizing a NATO STANAG-4586 architecture communicating across a Tactical Common Data Link.

TCS provides a full range of scaleable UAS capabilities from passive receipt of air vehicle and payload data to full air vehicle and payload command and control. TCS offers the war fighter a common core operating environment to simultaneously receive, process, and disseminate data from different UAS types for reconnaissance, surveillance, and combat assessment.

This program supports enhancements and updates to TCS in order to continue to meet supported air vehicle enhancements, incorporation of new technologies that will be used to enhance overall system performance, incorporate new payloads and payload capabilities (such as advanced sensors and weapons), incorporate Multi-Vehicle Control, incorporate NATO STANAG-4586 and C4I enhancements, and alignment with OSD direction for UAS control segments.

TCS software will be incorporated into the MQ-8B Vertical Take-off and Landing Tactical Unmanned Air Vehicle (VTUAV) system, and will IOC inconjunction with MQ-8B. TCS software addresses MQ-8B requirements validated by the Joint Requirements Oversight Council in the VTUAV Capability Production Document (May 2007).

TCS maximizes the use of contractor and government off-the-shelf hardware and software whenever possible and incorporates software/hardware enhancements where appropriate to maintain growth potential and minimize hardware and operating system dependence. TCS software is interoperable, and is compliant with the OSD Command and Control, Communications, Intelligence (C3I) Joint Technical Architecture, and Distributed Common Ground System standards, and NATO standards.

B. Accomplishments/Planned Program ($ in Millions)

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2478: *Tactical Control System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
TCS Development and Integration	11.543	7.631	7.921	0.000	7.921
FY 2009 Accomplishments: Continued TCS Integration with MQ-8B development and to support requirements for Littoral Combat Ship (LCS) Integration. Continued TCS NATO STANAG 4586 compliance. Continued TCS Command and Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) interface testing for MQ-8B required C4ISR systems. Continued hardware and operating system independence initiatives. *FY 2010 Plans:* Continue TCS integration with MQ-8B development. Continue new TCS capabilities to support requirements for Littoral Combat Ship (LCS) integration. Continue TCS NATO STANAG 4586 compliance. Continue TCS Command and Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) interface testing for MQ-8B required C4ISR systems. Continue hardware and operating system independence initiatives. *FY 2011 Base Plans:* Continue TCS integration with MQ-8B development. Continue new TCS capabilities to support requirements for Littoral Combat Ship (LCS) integration. Continue TCS NATO STANAG 4586 compliance. Continue TCS Command and Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) interface testing for MQ-8B required C4ISR systems. Continue hardware and operating system independence initiatives.					
Technical and Engineering Services	1.164	1.203	0.846	0.000	0.846
FY 2009 Accomplishments: Continued government engineering support, contractor support, program support, and travel for the TCS program.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2478: *Tactical Control System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Continued government engineering support, contractor support, program support, and travel for the TCS program. *FY 2011 Base Plans:* Continue government engineering support, contractor support, program support, and travel for the TCS program.					
Accomplishments/Planned Programs Subtotals	12.707	8.834	8.767	0.000	8.767

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The Tactical Control System (TCS) program is developing Government owned, non-proprietary software that supports multiple UAS control. The TCS program continues under the FY04 Congressionally-directed restructure of the program to focus on Navy requirements and standards based on interoperability. Navy requirements for TCS include supporting fielding of the Navy MQ-8B Vertical Take-off and Landing Tactical Unmanned Aerial Vehicle (VTUAV) aboard the Littoral Combat Ship (LCS), FFG, DDG-1000, the addition of plug-and-play payloads, and implementation of NATO Standardization Agreement for Standard Interfaces of UAV Control System for NATO UAV Interoperability (STANAG 4586).

E. Performance Metrics

Successfully achieve Initial Operational Capability. Successfully complete COBRA Integration. Successfully complete Radar Sensor Integration. Successfully complete LCS Ship Integration. Successfully complete Operational Test.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2478: *Tactical Control System*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Software Development	C/CPAF	Raytheon Falls Church,VA	113.682	7.145	Nov 2009	7.449	Nov 2010	0.000		7.449	0.000	128.276	128.276
Award Fees	C/CPAF	Raytheon Falls Church,VA	9.175	0.456	Jul 2010	0.475	Jul 2011	0.000		0.475	0.000	10.106	10.106
		Subtotal	122.857	7.601		7.924		0.000		7.924	0.000	138.382	138.382

Remarks

Awarded 85.6% of award fees in past award fee periods.

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test and Evaluation	WR	Various Various	1.260	0.030	Nov 2009	0.030	Nov 2010	0.000		0.030	Continuing	Continuing	Continuing
		Subtotal	1.260	0.030		0.030		0.000		0.030			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2478: *Tactical Control System*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various/ Various	Various Various	2.142	0.373	Nov 2009	0.213	Nov 2010	0.000		0.213	Continuing	Continuing	Continuing
Government Engineering Support	WR	Various Various	7.676	0.355	Nov 2009	0.280	Nov 2010	0.000		0.280	Continuing	Continuing	Continuing
Program Management Support	Various/ Various	Various Various	3.101	0.430	Nov 2009	0.275	Nov 2010	0.000		0.275	Continuing	Continuing	Continuing
Travel	WR	NAVAIR PAXRV, MD	0.143	0.045	Oct 2009	0.045	Oct 2010	0.000		0.045	Continuing	Continuing	Continuing
		Subtotal	13.062	1.203		0.813		0.000		0.813			

Remarks

Travel Contract Type is TO.

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	137.179	8.834		8.767		0.000		8.767			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305204N: *Tactical Unmanned Aerial Vehicles*	**PROJECT** 2478: *Tactical Control System*

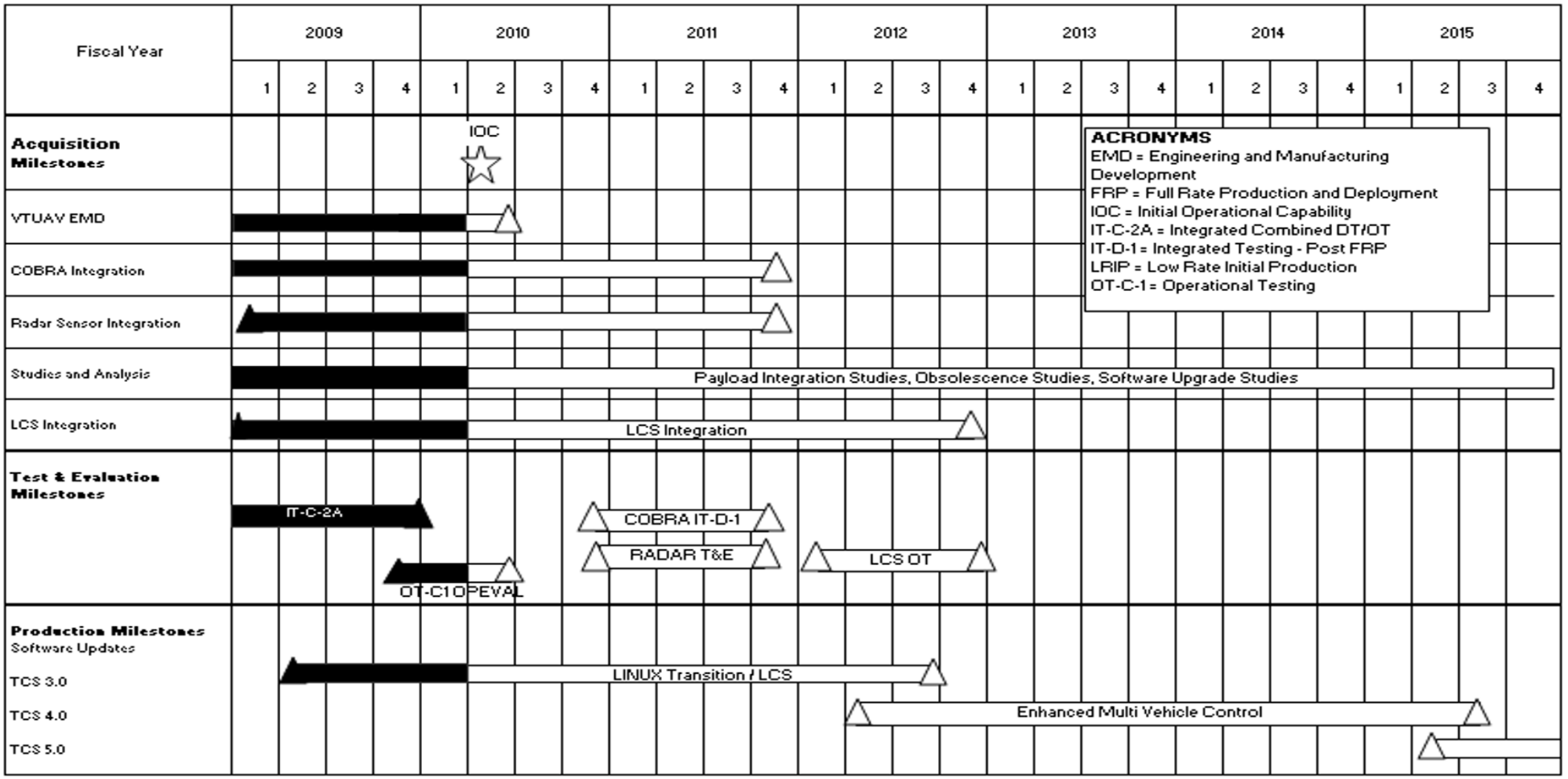


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305204N: *Tactical Unmanned Aerial Vehicles*	**PROJECT** 2478: *Tactical Control System*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones TCS/VTUAV IOC	1	2009	4	2015
- Initial Operational Capability	2	2010	2	2010
- VTUAV EMD (MQ-8B)	1	2009	2	2010
- COBRA Integration	1	2009	4	2011
- Radar Sensor Integration	1	2009	4	2011
- Studies and Analysis	1	2009	4	2015
- LCS Integration	1	2009	4	2012
Test & Evaluation Milestones	1	2009	4	2015
- IT-C-2A	1	2009	4	2009
- OT-C-1	4	2009	2	2010
- IT-D-1	4	2010	4	2011
- Radar R&E	4	2010	4	2011
- LCS OT	1	2012	4	2012
Software Upgrades	1	2009	4	2015
- TCS 3.0	2	2009	3	2012
- TCS 4.0	2	2012	3	2015
- TCS 5.0	2	2015	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2501: *Medium Endurance Marinized UAS Technology Demonstration*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2501: *Medium Endurance Marinized UAS Technology Demonstration*	0.000	0.000	26.352	0.000	26.352	0.000	0.000	0.000	0.000	0.000	26.352
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

Note

A new start program for FY 2011.

A. Mission Description and Budget Item Justification

The Medium Endurance Marinized UAS Technology Demonstration - This demonstration evaluates medium endurance VTOL (Vertical Take Off and Landing) UAS at sea. The ability to launch and recover vertically, enable a system to be used operationally aboard air capable ships or unimproved landing sites. Potential operational capabilities include intelligence, surveillance and reconnaissance (ISR) or cargo services. Both capabilities would allow US and Joint forces to augment existing manned missions with a relatively lower cost of ownership/operation without sacrificing real time needs. VTOL UAS aircraft used in the demonstration will need to leverage the existing TCS based Ship Control Station.

Slated as developmental test initiative, the goal is to fly both land based incremental build test flights as well as sufficient shipboard test flights to technically understand system maturity. This data will then be analyzed and compiled for determine future requirements for evolving requirements.

This technology demonstration will integrate air vehicle(s) with various program systems to determine compatability; Tactical Control System by Raytheon (TCS), Unmanned Common Automatic Recovery System by Sierra Nevada (UCARS), and Tactical Common Data Link by L3 (TCDL). A full on open competition will be used to select the aircraft used in the demonstration.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
SD&D Hardware and System Development	0.000	0.000	18.352	0.000	18.352

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2501: *Medium Endurance Marinized UAS Technology Demonstration*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: System development and software integration to incorporate air vehicles with the selected LHA hull, TCS, TCDL and UCARS landing systems. Purchase necessary equipment, cover material purchases from vendors and fund program personnel to complete all project objectives including pre and post demonstration briefs and reporting.					
Development Testing *FY 2011 Base Plans:* Funds cover all scheduled land and sea based test flights, oversight and supporting efforts and materials. Developmental testing, based on an incremental build approach, will be used to ensure system capabilities perform in a reliable, safe manner aboard ship.	0.000	0.000	4.000	0.000	4.000
Engineering and Technical Services *FY 2011 Base Plans:* Development of a technical program staff to support and manage this project will be the primary use for these funds. Additional uses include transportation of system assets, program personnel travel and use of contract support services personnel.	0.000	0.000	4.000	0.000	4.000
Accomplishments/Planned Programs Subtotals	0.000	0.000	26.352	0.000	26.352

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

This effort is a technology demonstration. A competition will be conducted to select vendors to integrate aircraft to existing Navy TCS based Ship Control Station to support future requirements development. Fixed Price Contract(s) will be used for the demonstration.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305204N: *Tactical Unmanned Aerial Vehicles*	**PROJECT** 2501: *Medium Endurance Marinized UAS Technology Demonstration*

E. Performance Metrics

Ability to carry a 700 pound payload for up to 9 hours of flight at standard day conditions.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2501: *Medium Endurance Marinized UAS Technology Demonstration*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/FFP	TBD TBD	0.000	0.000		10.900	Apr 2011	0.000		10.900	0.000	10.900	10.900
		Subtotal	0.000	0.000		10.900		0.000		10.900	0.000	10.900	10.900

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	C/FFP	Raytheon Corp Falls Church, VA	0.000	0.000		5.452	Dec 2010	0.000		5.452	0.000	5.452	5.452
Integrated Logistics Support	C/FFP	Sierra Nevada Sparks NV	0.000	0.000		1.000	Dec 2010	0.000		1.000	0.000	1.000	1.000
Integrated Logistics Support	C/FFP	L3 Comm Camden NJ	0.000	0.000		1.000	Dec 2010	0.000		1.000	0.000	1.000	1.000
		Subtotal	0.000	0.000		7.452		0.000		7.452	0.000	7.452	7.452

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2501: *Medium Endurance Marinized UAS Technology Demonstration*	

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD Patuxent River, MD	0.000	0.000		4.000	Oct 2010	0.000		4.000	0.000	4.000	Continuing
		Subtotal	0.000	0.000		4.000		0.000		4.000	0.000	4.000	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD Patuxent River, MD	0.000	0.000		3.000	Oct 2010	0.000		3.000	0.000	3.000	Continuing
Program Management Support	Various/ Various	NAWCAD Patuxent River, MD	0.000	0.000		0.500	Oct 2010	0.000		0.500	0.000	0.500	Continuing
Travel	WR	NAVAIR Patuxent River, MD	0.000	0.000		0.500	Oct 2010	0.000		0.500	0.000	0.500	Continuing
		Subtotal	0.000	0.000		4.000		0.000		4.000	0.000	4.000	

Remarks

Travel Contract Type is TO.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2501: *Medium Endurance Marinized UAS Technology Demonstration*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		26.352		0.000		26.352	0.000	26.352	18.352

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305204N: *Tactical Unmanned Aerial Vehicles*	**PROJECT** 2501: *Medium Endurance Marinized UAS Technology Demonstration*

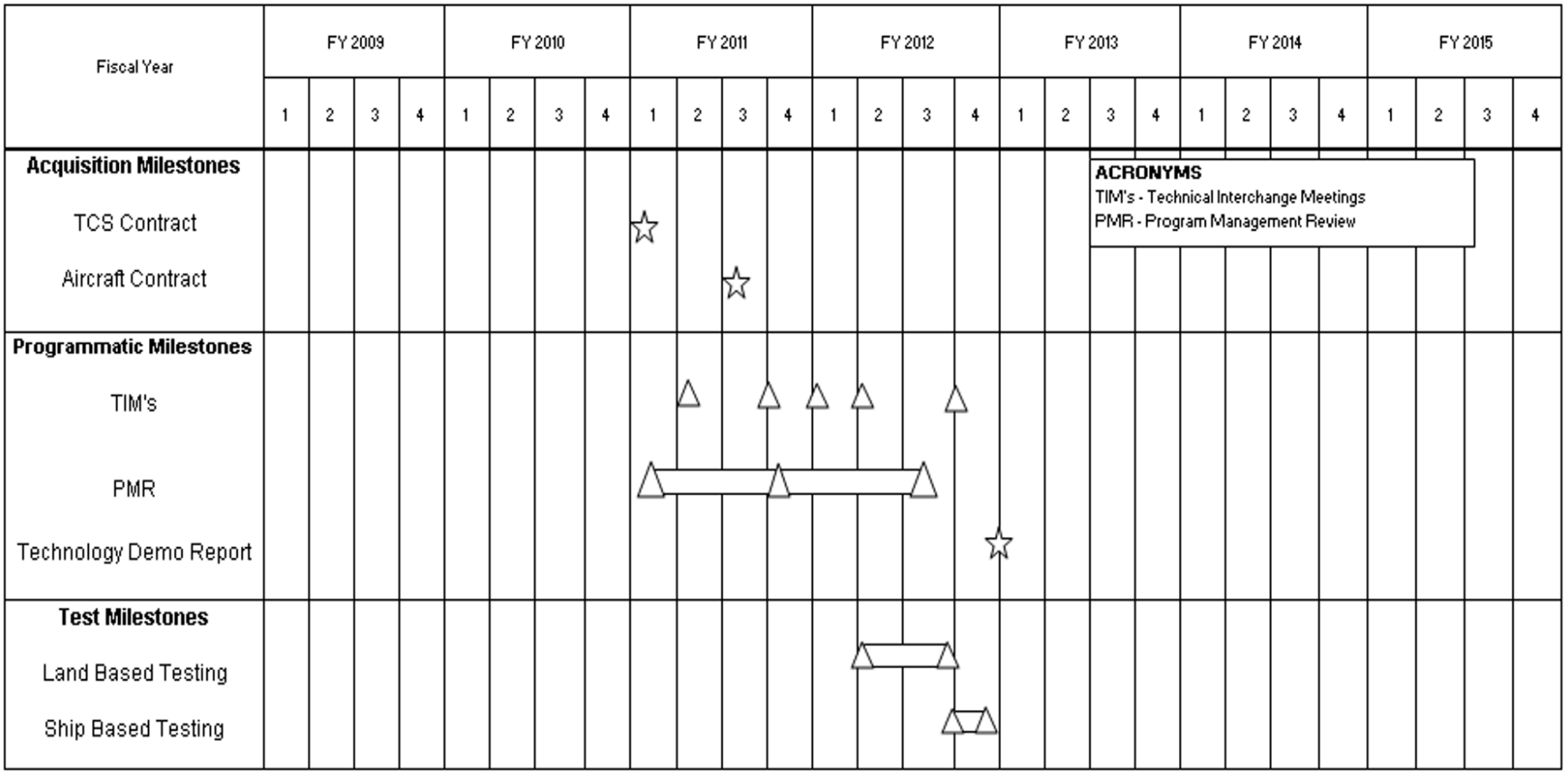


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305204N: *Tactical Unmanned Aerial Vehicles*	**PROJECT** 2501: *Medium Endurance Marinized UAS Technology Demonstration*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones	1	2009	4	2015
- TCS Contract	1	2011	1	2011
- Aircraft Contract	3	2011	3	2011
Programmatic Milestones	1	2009	4	2015
- TIM's	2	2011	4	2012
- PMR	1	2011	3	2012
- Technology Demo Report	4	2012	4	2012
Test Milestones	1	2009	4	2015
- Land based Testing	2	2012	3	2012
- Ship Based Testing	3	2012	4	2012

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2768: *VTUAV*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2768: *VTUAV*	15.514	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	514.521
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The MQ-8B (Vertical Take-Off and Landing Tactical Unmanned Air Vehicle (VTUAV); popular name "Fire Scout") provides real-time and non-real-time Intelligence, Surveillance and Reconnaissance (ISR) data to tactical users without the use of manned aircraft or reliance on limited joint theater or national assets. The baseline MQ-8B can accomplish missions including over-the-horizon tactical reconnaissance, classification, targeting, laser designation and battle management (including communications relay). The MQ-8B launches and recovers vertically and can operate from air capable ships, as well as confined area land bases. Other characteristics include autonomous air vehicle launch and recovery, autonomous waypoint navigation with command override capability, and the incorporation of an electro-optical/ infrared laser designator-laser range finder modular mission payload. Interoperability is achieved through the use of the Tactical Control System (TCS) software in the ground control station, and through the use of the Tactical Common Data Link (TCDL). The data from the MQ-8B will be provided through standard DoD Command, Control, Communications, Computers and Intelligence, Surveillance, and Reconnaissance (C4ISR) system architectures and protocols.

A MQ-8B system is comprised of air vehicles, electro-optical/infrared/laser designator-rangefinder payloads, Ground Control Stations (with TCS and TCDL integrated for interoperability), and a UAV Common Automatic Recovery System (UCARS) for automatic take-off and landings, and associated spares and support equipment. The MQ-8B system will support Surface Warfare, Mine Interdiction Warfare, and Anti-Submarine Warfare mission modules while operating onboard LCS, and system procurement is tied to mission modules supporting LCS, vice sea frames. The System Design will also be integrated on select surface combatants that are air capable and can host MQ-8B ancillary equipment. A limited number of land-based ground control stations supplement the system to support shore-based operations, such as predeployment or acceptance functional check flights. These land-based ground control stations will also support depot level maintenance/post-maintenance activities.

A program to continue development of the MQ-8B to meet the Littoral Combat Ship (LCS) mission requirements was initiated in FY04. Program funding in FY08-10 includes efforts required to integrate the Coastal Battlefield Reconnaissance and Analysis (COBRA) payload, a mine detection sensor, under development by PMS-495. MQ-8B development and testing activities will continue in FY09. Funding is also provided in FY09 for integration of a multi-mode radar sensor.

The U.S. Army has selected the MQ-8B as their Class IV UAV for the Future Combat Systems (FCS). Coordination with the U.S. Army FCS Program is on-going to investigate the potential cost savings for both programs where system commonalities and common logistics support can be identified.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305204N: *Tactical Unmanned Aerial Vehicles*	**PROJECT** 2768: *VTUAV*

USN planning is to integrate MQ-8B on FFG-8 to maintain the MQ-8B OPEVAL in FY09. First deployment of the MQ-8B system will be on FFG. MQ-8B is also supporting LCS integration schedule.

The MQ-8B program received Milestone C approval in May 2007, authorizing Low Rate Initial Production (LRIP).

MQ-8B (VTUAV) project code moved from PE 0305204N to PE 0305231N, in FY10.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
SD&D Hardware and System Development	12.200	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Continued incremental procurement and integration of EMD MQ-8B Air Vehicles to support the Engineering and Manufacturing Development (EMD) program. Continued to completion EMD of the MQ-8B system. Continued combined developmental and operational testing. Continued integration of the Coastal Battlefield Reconnaissance and Analysis (COBRA) payload. Began integration of a multi-mode radar sensor.					
Integrated Logistics Support (ILS) and Training Systems	1.300	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Continued ILS, technical data, and training system development. Procurement of trainers and spares to support OPEVAL.					
Development Testing	1.044	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Completed developmental testing of the MQ-8B system. Continued combined developmental and operational testing, TECHEVAL, and planning for OPEVAL.					
Engineering and Technical Services	0.970	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2768: *VTUAV*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Continued engineering management, program technical management, and management support for the MQ-8B system. These included transportation of system assets, fleet introduction team and program office personnel travel, and contract support services. Continued to support system development, system integration and test, and TECHEVAL.					
Accomplishments/Planned Programs Subtotals	15.514	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• RDTEN 0305231N: *MQ-8 UAV*	0.000	25.533	10.665	0.000	10.665	3.638	0.508	0.516	0.524	0.000	41.384
• APN 044300: *MQ-8 UAV*	50.189	90.777	47.484	0.000	47.484	46.242	67.442	89.553	89.485	1,309.849	1,865.872
• APN 060510 : *Initial Spares: MQ-8 UAV*	6.894	2.333	3.488	0.000	3.488	0.982	2.300	0.734	0.744	127.184	158.650

D. Acquisition Strategy

Continue with the MQ-8B EMD program. Design and develop an improved system initiated in FY04 to support the Littoral Combat Ship Program. Achieved Milestone C in 3Q FY 2007. FRP and IOC will follow completion of OPEVAL.

E. Performance Metrics

Successfully begin COBRA Integration. Successfully begin Radar Sensor Integration. Successfully begin LCS Ship Integration. Successfully begin Operational Test.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2768: *VTUAV*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPFF	Northrop Grumman Corp San Diego, CA	483.582	0.000		0.000		0.000		0.000	0.000	483.582	483.582
		Subtotal	483.582	0.000		0.000		0.000		0.000	0.000	483.582	483.582

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	Various/ Various	Various Various	18.397	0.000		0.000		0.000		0.000	0.000	18.397	Continuing
		Subtotal	18.397	0.000		0.000		0.000		0.000	0.000	18.397	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2768: *VTUAV*	

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD PAXRV, MD	4.701	0.000		0.000		0.000		0.000	0.000	4.701	Continuing
Developmental Test & Evaluation	Various/ Various	Various Various	3.971	0.000		0.000		0.000		0.000	0.000	3.971	Continuing
Operational Test & Evaluation	WR	NAWCAD PAXRV, MD	0.480	0.000		0.000		0.000		0.000	0.000	0.480	Continuing
Operational Test & Evaluation	WR	NAWCWD CHLK, CA	0.264	0.000		0.000		0.000		0.000	0.000	0.264	Continuing
		Subtotal	9.416	0.000		0.000		0.000		0.000	0.000	9.416	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCWD CHLK, CA	0.080	0.000		0.000		0.000		0.000	0.000	0.080	Continuing
Government Engineering Support	WR	NAWCAD PAXRV, MD	29.623	0.000		0.000		0.000		0.000	0.000	29.623	Continuing
Program Management Support	Various/ Various	NAWCAD PAXRV, MD	20.322	0.000		0.000		0.000		0.000	0.000	20.322	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2768: *VTUAV*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVAIR PAXRV, MD	0.717	0.000		0.000		0.000		0.000	0.000	0.717	Continuing
		Subtotal	50.742	0.000		0.000		0.000		0.000	0.000	50.742	

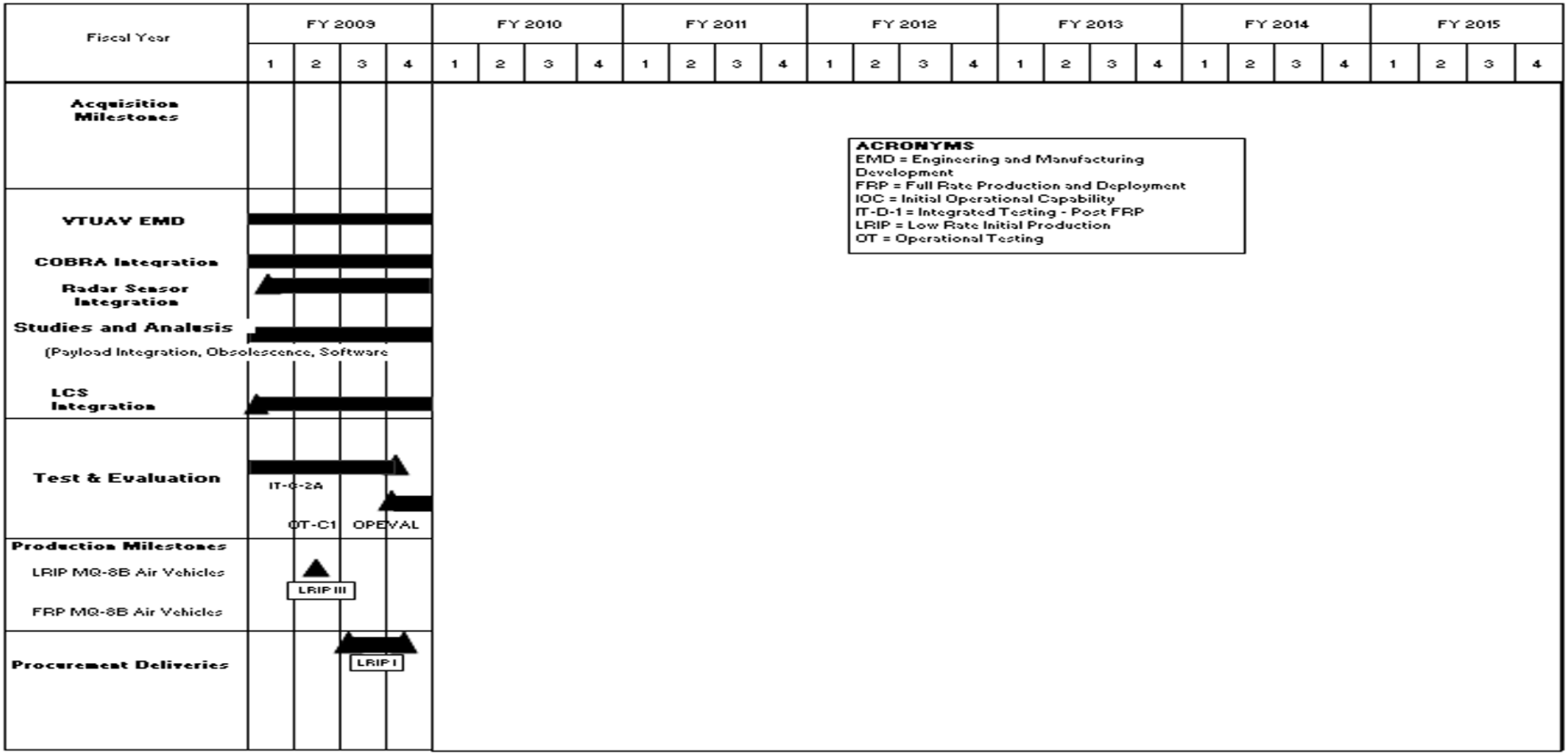
Remarks

Travel Contract Type is TO.

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	562.137	0.000		0.000		0.000		0.000	0.000	562.137	483.582

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2768: *VTUAV*



Remarks: FY10 thru FY15, VTUAV is budgeted for in PE 0305231N.

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305204N: *Tactical Unmanned Aerial Vehicles*	**PROJECT** 2768: *VTUAV*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones VTUAV	1	2009	4	2015
- VTUAV EMD (MQ-8B)	1	2009	4	2009
- COBRA Integration	1	2009	4	2009
- Radar Sensor integration	1	2009	4	2009
- Studies & Analysis	1	2009	4	2009
- LCS Integration	1	2009	4	2009
Test & Evaluation Milestones	1	2009	4	2015
- IT-C-2A	1	2009	4	2009
- OT-C-1	4	2009	4	2009
Production Milestones	1	2009	4	2015
- LRIP III	2	2009	2	2009
Procurement Deliveries	1	2009	4	2015
- LRIP I	3	2009	4	2009

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*				R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*				PROJECT 2910: *Joint Tech Center/System Integ Lab*			
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
2910: *Joint Tech Center/System Integ Lab*	1.719	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.623
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Joint Technology Center/Systems Integration Laboratory (JTC/SIL) is a center of technical excellence to support all Unmanned Air Vehicle (UAV) programs within the services. The mission includes Service-specific and Joint Command, Control, Communications, Computers and Intelligence, Surveillance, and Reconnaissance (C4ISR) programs throughout DoD. The JTC/SIL provides a Government test bed for rapid prototyping, technology insertion and transition, systems engineering, modeling/simulation, training and Command and Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) optimization. The cornerstone of JTC/SIL's diverse tool set is the Multiple Unified Simulation Environment (MUSE), which is the Department's simulation/training system of choice for ISR systems, sensors, and platforms.

The Services and Warfighting Commanders have a requirement for the capability to train with a system that provides a real-time simulation environment containing multiple intelligence systems that can be integrated with larger force-on-force simulations. The MUSE creates a realistic operational environment which supports the ability to assess military utility, architecture and CONOPS development, Tactics, Techniques, and Procedures (TTP) development and refinement, conduct emerging concepts experimentation, and C4ISR optimization within warfighting exercises and experiments. It is the only simulation system used by the Combat Commanders and Joint Services to support command and battle staff C4ISR training; there is no alternative available to satisfy those requirements.

The MUSE also creates a realistic operational environment that supports an embedded training capability for multiple Program Managers; tools to minimize acquisition and life cycle cost and schedule impacts; the ability to conduct emerging concepts experimentation, future systems exploration, systems integration, and technology insertion; applications for Joint and Service-specific warfighting exercises; and C4ISR optimization.

MUSE is currently in use within all services and unified commands simulating Predator, Global Hawk, Hunter, and MCTUAS UAVs, national and commercial satellite collectors, P-3, and the U-2. During warfighting exercises, the JTC/SIL integrates imagery simulations with associated C4ISR systems to support execution of critical imagery processes. For those assets normally not available for training, the JTC/SIL provides surrogate systems and interfaces. Distributed training environments, virtually linking participants from various locations worldwide, are routinely supported within the MUSE architecture. The MUSE is also used as a mission rehearsal tool for current, on-going military combat operations.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2910: *Joint Tech Center/System Integ Lab*

Additionally, the JTC/SIL supports a range of materiel developers, integrating prototypes and trainers into the C4ISR and training environments of supported units. The Tactical UAV (TUAV) ground station developed by the JTC/SIL includes an embedded MUSE trainer, and is planned to be incorporated into the VTUAV Ground Control Station (GCS). Interim training capabilities for the Tactical Exploitation System (TES) are currently employed in the joint exercises.

JTC/SIL Project Code moved from PE 0305204N to PE0603261N in FY2010.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MUSE Development *FY 2009 Accomplishments:* FY09 funding supported the continuing development and evolution of the MUSE operational simulation environment, the annual support of the MUSE including its maintenance, necessary licensing and equipment purchases to maintain daily operations and funded government oversight and administration of the lab, MUSE development and associated efforts.	0.851	0.000	0.000	0.000	0.000
Engineering and Maintenance Maintenance, Licenses and Equipment Purchases to include the day-to-day maintenance of lab equipment, license maintenance and license renewals from vendors for individual pieces of equipment, purchases of equipment to support the MUSE, and purchases to upgrade the MUSE capability. *FY 2009 Accomplishments:* FY09 funding provided for the annual support of the MUSE including its maintenance, necessary licensing and equipment purchases to maintain daily operations.	0.500	0.000	0.000	0.000	0.000
Program Management Includes government management, contracts administration, cost accounting, configuration management, administrative support of the lab, MUSE architecture development, property management/accountability, and procurement of equipment.	0.368	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2910: *Joint Tech Center/System Integ Lab*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: FY09 efforts funded government oversight and administration of the lab, MUSE development and associated efforts.					
Accomplishments/Planned Programs Subtotals	1.719	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• RDT&E,N/0603261N: *Joint Tech Center / System Integ Lab*	0.000	1.722	1.754	0.000	1.754	1.790	1.829	1.871	1.912	0.000	10.878

D. Acquisition Strategy

Not applicable.

E. Performance Metrics

Improve the assessment of military utility, Tactics, Techniques and Procedures (TTPs) and C4ISR optimization through realistic training of command and battle staffs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2910: *Joint Tech Center/System Integ Lab*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	MIPR	JTC/SIL Redstone Arsenal, AL	5.954	0.000		0.000		0.000		0.000	0.000	5.954	Continuing
		Subtotal	5.954	0.000		0.000		0.000		0.000	0.000	5.954	

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	MIPR	JTC/SIL Redstone Arsenal, AL	5.251	0.000		0.000		0.000		0.000	0.000	5.251	Continuing
		Subtotal	5.251	0.000		0.000		0.000		0.000	0.000	5.251	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2910: *Joint Tech Center/System Integ Lab*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	MIPR	JTC/SIL Redstone Arsenal, AL	2.651	0.000		0.000		0.000		0.000	0.000	2.651	Continuing
		Subtotal	2.651	0.000		0.000		0.000		0.000	0.000	2.651	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	13.856	0.000		0.000		0.000		0.000	0.000	13.856	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 2910: *Joint Tech Center/System Integ Lab*

	FY 2009				FY 2010				FY 2011				FY 2012				FY 2013				FY 2014				FY 2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MUSE Support to UAS Developers	▮	▮	▮	▮																								

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305204N: *Tactical Unmanned Aerial Vehicles*	**PROJECT** 2910: *Joint Tech Center/System Integ Lab*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
MUSE Support to UAS Developers	1	2009	4	2009

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 3192: *STUAS*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3192: *STUAS*	19.464	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	25.569
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Small Tactical Unmanned Aircraft System (STUAS) provides Persistent Intelligence, Surveillance, and Reconnaissance/Target Acquisition (ISR/TA) support for tactical level maneuver decisions and unit level force defense/force protection for Naval ships (multi-ship classes) and Navy land forces. This system will fill the ISR capability shortfalls currently filled by services contracts. This system will support Naval Missions such as building the Recognized Maritime Picture, Maritime Security Operations, Maritime Interdiction Operations, and support of Naval Units operating from sea/shore in the global war on terror.

A notional system consists of four air vehicles, ground control station (s), multi-mission (plug-and-play) payloads, and associated launch, recovery and support equipment.

The STUAS system will continue to evolve and upgrade capabilities to satisfy capabilities shortfalls, new requirements, and reliability, maintainability, and safety issues. Upgraded capabilities may include Navy C2 integration, signals intelligence and synthetic aperture radar payloads and weapons integration.

STUAS project code moved from PE 0305204N to PE 0305234N, in FY10.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
STUAS Engineering and Technical Support	19.464	0.000	0.000	0.000	0.000
Provides for non-prime contractor support services. *FY 2009 Accomplishments:* FY09 funds Government Engineering Technical Support, Logistics Support, test and evaluation, Contractor Support services, Program Management Support and program related travel.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 3192: *STUAS*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Accomplishments/Planned Programs Subtotals	19.464	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• RDT&E,N/0305234N: *STUAS*	0.000	23.496	18.098	0.000	18.098	12.603	5.740	5.869	5.992	Continuing	Continuing
• RDT&E,N/0206625M: *Tier II UAS*	13.183	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.614
• RDT&E,N/0305234M: *Tier II UAS*	0.000	18.685	26.209	0.000	26.209	16.864	22.764	11.546	9.657	Continuing	Continuing
• APN-4/044400: *STUASL0*	0.000	0.000	23.912	0.000	23.912	13.097	9.707	9.876	10.043	Continuing	Continuing
• APN-6/060510: *STUASL0*	0.000	0.000	0.000	0.000	0.000	2.177	3.712	5.014	6.624	Continuing	Continuing
• PMC-475700: *Tier II UAS*	0.000	0.000	26.301	23.500	49.801	39.343	67.893	65.071	67.106	Continuing	Continuing

D. Acquisition Strategy

The program office is utilizing a competitive acquisition approach to quickly field a capability to meet threshold requirements. Incremental development will be utilized to field a system fully compliant with documented requirements.

E. Performance Metrics

Attainment of STUAS IOC in accordance with approved schedule.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 3192: *STUAS*	

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	Various Various	3.551	0.000		0.000		0.000		0.000	0.000	3.551	Continuing
		Subtotal	3.551	0.000		0.000		0.000		0.000	0.000	3.551	

Remarks

Funding moved to PE 0305234N beginning FY10.

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	OPTEVFOR Norfolk, VA	0.743	0.000		0.000		0.000		0.000	0.000	0.743	Continuing
Operational Test & Evaluation	WR	OPTEVFOR Norfolk, VA	0.225	0.000		0.000		0.000		0.000	0.000	0.225	Continuing
		Subtotal	0.968	0.000		0.000		0.000		0.000	0.000	0.968	

Remarks

Funding moved to PE 0305234N beginning FY10.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 3192: *STUAS*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various/ Various	Various Various	2.074	0.000		0.000		0.000		0.000	0.000	2.074	Continuing
Government Engineering Support	WR	Various Various	9.346	0.000		0.000		0.000		0.000	0.000	9.346	Continuing
Program Management Support	Various/ Various	Various Various	2.560	0.000		0.000		0.000		0.000	0.000	2.560	Continuing
Travel	WR	Navair HQ Pax River, MD	0.070	0.000		0.000		0.000		0.000	0.000	0.070	Continuing
		Subtotal	14.050	0.000		0.000		0.000		0.000	0.000	14.050	

Remarks

Funding moved to PE 0305234N beginning FY10.
Travel Contract Type is TO.

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	18.569	0.000		0.000		0.000		0.000	0.000	18.569	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 3192: *STUAS*	

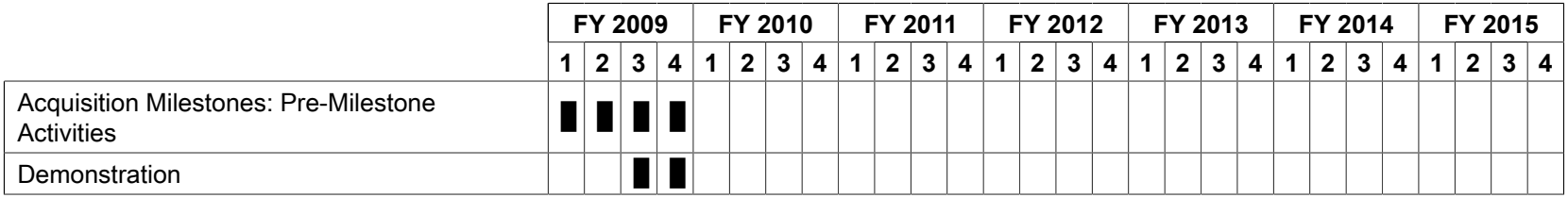


Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305204N: *Tactical Unmanned Aerial Vehicles*	**PROJECT** 3192: *STUAS*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Pre-Milestone Activities	1	2009	4	2009
Demonstration	3	2009	4	2009

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	4.089	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	38.001
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Adds.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Unmanned Air Systems Tactical Control Systems *FY 2009 Accomplishments:* Develop and accelerate Open Architecture Technology Insertion solution. Government Engineering Support, contractor support services, and travel.	2.493	0.000
Congressional Add: MICRO-MUNITIONS INTERFACE FOR TACT UNMANNED SYS *FY 2009 Accomplishments:* Develop an interface between Unmanned Air Systems and micro-munitions, defined as weapons weighing less than 100 pounds. Government engineering support, contractor support services, and travel.	1.596	0.000
Congressional Adds Subtotals	4.089	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305204N: *Tactical Unmanned Aerial Vehicles*	PROJECT 9999: *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not required for Congressional Adds.

E. Performance Metrics

Not required for Congressional Adds.