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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2012 Air Force **DATE:** February 2011

<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0305099F: <i>Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM)</i>
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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
Total Program Element	6.754	5.708	4.604	-	4.604	4.549	4.525	4.299	4.404	Continuing	Continuing
674689: <i>Global Access Architecture</i>	6.754	5.708	4.604	-	4.604	4.549	4.525	4.299	4.404	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The program funding includes reductions for overhead efficiencies that are not intended to impact program content. The efficiencies reductions total \$0.766M in FY12.

Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM): This Air Force (AF) program centralizes engineering and technical expertise for CNS capability acquisitions and modifications to ensure that all AF aircraft and Unmanned Aerial Systems (UAS) comply with appropriate CNS/ATM and Navigation Safety performance standards and requirements enabling access to U.S. and international nation/state managed airspace. The Aerospace Management Systems Division (AMSD) supports AF aircraft and UAS CNS/ATM acquisitions as the AF's centralized focal point (Center of Excellence) for identifying, analyzing, and evaluating internationally accepted civil aviation authority operational airspace rules, procedures and requirements worldwide. This group of experts works to identify, analyze, and evaluate the technical performance standards and requirements of the prescribed CNS capabilities and assist platform program offices in the design and integration of the capabilities required to ensure access to civil airspace worldwide. Department of Defense policy states that military platforms conducting peacetime operations will conform to applicable rules to ensure interoperability and transparency within national and international airspace. AMSD verifies that the system's end-to-end performance for each CNS capability integrated into AF platforms complies with these internationally accepted rules and standards. Per AFD 63-1 and AFI 63-1301, AMSD will develop and maintain CNS/ATM performance matrices used to identify specific CNS/ATM requirements and will provide acquisition and engineering support services through the entire acquisition management effort to include development of technical architectures, program management reviews and test planning for each AF platform. Furthermore, AMSD will develop and award Indefinite Delivery/Indefinite Quantity contracts for centralized procurement and sustainment of CNS/ATM and Nav Safety products and promote commonality of CNS equipment and architectures between platforms. AMSD will also participate in the development of Operational Safety, Suitability and Effectiveness assurance and Airworthiness Certification Plans. Dual-use capabilities of avionics to satisfy both civil CNS/ATM and military unique capability requirements will be explored as well as interoperability enhancements to expand net-centric concepts. AMSD will facilitate and participate in development and testing of CNS box-level prototypes. AMSD conducts studies and prototyping efforts to ensure AF aircraft are postured to meet current and evolving civil standards leading to the concept of "free flight." AMSD also provides acquisition and engineering support to the DoD Lead Service Office for the interagency Next Generation Air Transportation System (NextGen) initiative. NextGen, and similar global initiatives (e.g. Single European Sky), will impact all AF platforms. AMSD will develop and coordinate CNS/ATM architectures with the FAA and other regulatory agencies to allow unrestricted access for UAS into global civil airspace. AMSD will identify UAS equipage roadmaps, facilitate technology development and advocate policy changes to allow unfettered airspace access.

BA7- This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012 Base</b>	<b>FY 2012 OCO</b>	<b>FY 2012 Total</b>
Previous President's Budget	5.654	5.708	5.429	-	5.429
Current President's Budget	6.754	5.708	4.604	-	4.604
Total Adjustments	1.100	-	-0.825	-	-0.825
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	1.125	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments	-0.025	-	-0.825	-	-0.825

**Change Summary Explanation**

FY10:

(1) \$1.125M - Reprogramming for emerging PMA requirements to provide direct engineering support to adequately address avionics acquisition and integration ensuring installed capabilities meet appropriate civil aviation requirements for access to global airspace. This added expertise is needed to address unforecasted engineering support requirements of Air Force aircraft/programs.

(2) -\$0.025M - Public Law 111-118, Section 8097, Economic Assumptions.

FY12:

(1) The program funding includes reductions for overhead efficiencies that are not intended to impact program content. The efficiencies reductions total \$0.766M in FY12.

(2) -\$0.059M - Economic Adjustments

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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
674689: <i>Global Access Architecture</i>	6.754	5.708	4.604	-	4.604	4.549	4.525	4.299	4.404	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

**A. Mission Description and Budget Item Justification**

The program funding includes reductions for overhead efficiencies that are not intended to impact program content. The efficiencies reductions total \$0.766M in FY12.

Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM): This Air Force (AF) program centralizes engineering and technical expertise for CNS capability acquisitions and modifications to ensure that all AF aircraft and Unmanned Aerial Systems (UAS) comply with appropriate CNS/ATM and Navigation Safety performance standards and requirements enabling access to U.S. and international nation/state managed airspace. The Aerospace Management Systems Division (AMSD) supports AF aircraft and UAS CNS/ATM acquisitions as the AF's centralized focal point (Center of Excellence) for identifying, analyzing, and evaluating internationally accepted civil aviation authority operational airspace rules, procedures and requirements worldwide. This group of experts works to identify, analyze, and evaluate the technical performance standards and requirements of the prescribed CNS capabilities and assist platform program offices in the design and integration of the capabilities required to ensure access to civil airspace worldwide. Department of Defense policy states that military platforms conducting peacetime operations will conform to applicable rules to ensure interoperability and transparency within national and international airspace. AMSD verifies that the system's end-to-end performance for each CNS capability integrated into AF platforms complies with these internationally accepted rules and standards. Per AFD 63-1 and AFI 63-1301, AMSD will develop and maintain CNS/ATM performance matrices used to identify specific CNS/ATM requirements and will provide acquisition and engineering support services through the entire acquisition management effort to include development of technical architectures, program management reviews and test planning for each AF platform. Furthermore, AMSD will develop and award Indefinite Delivery/Indefinite Quantity contracts for centralized procurement and sustainment of CNS/ATM and Nav Safety products and promote commonality of CNS equipment and architectures between platforms. AMSD will also participate in the development of Operational Safety, Suitability and Effectiveness assurance and Airworthiness Certification Plans. Dual-use capabilities of avionics to satisfy both civil CNS/ATM and military unique capability requirements will be explored as well as interoperability enhancements to expand net-centric concepts. AMSD will facilitate and participate in development and testing of CNS box-level prototypes. AMSD conducts studies and prototyping efforts to ensure AF aircraft are postured to meet current and evolving civil standards leading to the concept of "free flight." AMSD also provides acquisition and engineering support to the DoD Lead Service Office for the interagency Next Generation Air Transportation System (NextGen) initiative. NextGen, and similar global initiatives (e.g. Single European Sky), will impact all AF platforms. AMSD will develop and coordinate CNS/ATM architectures with the FAA and other regulatory agencies to allow unrestricted access for UAS into global civil airspace. AMSD will identify UAS equipage roadmaps, facilitate technology development and advocate policy changes to allow unfettered airspace access.

BA7- This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2012 Air Force		<b>DATE:</b> February 2011
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0305099F: <i>Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM)</i>	<b>PROJECT</b> 674689: <i>Global Access Architecture</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012 Base</b>	<b>FY 2012 OCO</b>	<b>FY 2012 Total</b>
<p><b>Title:</b> CNS/ATM</p> <p><b>Description:</b> Supporting platform program offices in their efforts to ensure the platform meets the performance standards to ensure access to airspace to conduct operations, assessing CNS capability compliance with nation/state rule making, acquisition of ID/IQ CNS avionics equipment components, Nav/Safety and GPS/NAVWAR integration and interoperability evaluations</p> <p><b>FY 2010 Accomplishments:</b> Gather data to build safety case for unrestricted UAS operations at Palmdale, CA/Grand Forks AFB, ND. UAS equipage roadmaps, technology development and policy changes will allow unfettered airspace access. CNS/ATM architectures will be developed and coordinated with the FAA and other regulatory agencies to allow unrestricted access for UAS into global civil airspace. Continuation of operational requirements analysis, demonstration, and evaluation of CNS/ATM, as well as system architecture design and development.</p> <p><b>FY 2011 Plans:</b> CNS/ATM architectures will be developed and coordinated with the FAA and other regulatory agencies to allow unrestricted access for UAS into global civil airspace. UAS equipage roadmaps, technology development and policy changes will allow unfettered airspace access. Continuation of operational requirements analysis, demonstration, and evaluation of CNS/ATM, as well as system architecture design and development. Gather data to build safety case for unrestricted UAS operations at Palmdale, CA/Grand Forks AFB, ND.</p> <p><b>FY 2012 Base Plans:</b> CNS/ATM architectures will be developed and coordinated with the FAA and other regulatory agencies to allow unrestricted access for UAS into global civil airspace. UAS equipage roadmaps, technology development and policy changes will allow unfettered airspace access. Continuation of operational requirements analysis, demonstration, and evaluation of CNS/ATM, as well as system architecture design and development. Gather data to build safety case for unrestricted UAS operations at Palmdale, CA/Grand Forks AFB, ND.</p> <p><b>FY 2012 OCO Plans:</b> Not applicable</p>	6.754	5.708	4.604	-	4.604
<b>Accomplishments/Planned Programs Subtotals</b>	6.754	5.708	4.604	-	4.604

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2012 Air Force		<b>DATE:</b> February 2011
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**C. Other Program Funding Summary (\$ in Millions)**

<u>Line Item</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u> <u>Base</u>	<u>FY 2012</u> <u>OCO</u>	<u>FY 2012</u> <u>Total</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• N/A:	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

**D. Acquisition Strategy**

AMSD CNS/ATM Acquisition Strategy guides CNS and NAV safety equipment procurements for AF aircraft/UAS single managers. This strategy ensures systems standardization and interoperability and directly supports the airworthiness certification of AF aircraft/UAS that operate in national and international air traffic environments. The AMSD will collaborate to provide technical support and expertise, execute system performance assessments and will interface with product/support centers, battle labs, and DoD research facilities in the execution of the assigned task. Program research and development agreements, cooperative research and development agreements, and Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts will be competitively awarded.

**E. Performance Metrics**

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Air Force** **DATE:** February 2011

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<b>Product Development (\$ in Millions)</b>				<b>FY 2011</b>		<b>FY 2012 Base</b>		<b>FY 2012 OCO</b>		<b>FY 2012 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total Prior Years Cost</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Develop systems to monitor avionics equipage of US military aircraft, participate in US/international specification and standards-setting, and develop resource material in support of CNS/ATM	C/TBD	MIT/Lincoln Laboratory:Lexington, MA	1.992	1.683	Jan 2011	1.358	Jan 2012	-		1.358	Continuing	Continuing	0.000
Providing various technical support, operational requirements, and assessing CNS capabilities	C/TBD	MITRE Corporation:Bedford, MA	2.871	2.426	Oct 2010	1.957	Oct 2011	-		1.957	Continuing	Continuing	0.000
Provide various technical support-A&AS-ETASS	C/TBD	Jacobs Technology:Lincoln, MA	1.391	1.176	Dec 2010	0.948	Dec 2011	-		0.948	Continuing	Continuing	0.000
<b>Subtotal</b>			6.254	5.285		4.263		-		4.263			0.000

<b>Support (\$ in Millions)</b>				<b>FY 2011</b>		<b>FY 2012 Base</b>		<b>FY 2012 OCO</b>		<b>FY 2012 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total Prior Years Cost</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Provide program office support-A&AS-PASS	C/TBD	Quantech Services:Bedford, MA	0.099	0.084	Dec 2010	0.068	Dec 2011	-		0.068	Continuing	Continuing	0.000
Provide program office support-A&AS-SCS	C/TBD	Tecolote:Bedford, MA	0.034	0.029	Nov 2010	0.023	Nov 2011	-		0.023	Continuing	Continuing	0.000
Program Office Support	Various	TBD:Bedford, MA	0.367	0.310	Oct 2010	0.250	Aug 2012	-		0.250	Continuing	Continuing	0.000
<b>Subtotal</b>			0.500	0.423		0.341		-		0.341			0.000

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2011</b>		<b>FY 2012 Base</b>		<b>FY 2012 OCO</b>		<b>FY 2012 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total Prior Years Cost</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Subtotal</b>			-	-		-		-		-	0.000	0.000	0.000

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2012 Air Force		<b>DATE:</b> February 2011
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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2012 Air Force		<b>DATE:</b> February 2011
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Continue support for C-5 AMP/RERP upgrade	1	2010	4	2011
Continue support for C-17 Block 17/18/19 upgrades	1	2010	4	2016
Continue support for C-130 AMP upgrade	1	2010	4	2016
Continue support to C-130J Block 7/8 upgrades	1	2010	4	2016
Continue support for KC-135 Block 40.5/45 upgrades	1	2010	4	2016
Continue support for B-52 FM/8.33 Radio/BRNAV upgrades	1	2010	4	2012
Continue support for E-3 DRAGON upgrade	1	2010	4	2016
Continue support for F-35 RSVM, RNP/RNAV, ADS-B upgrades	1	2010	4	2016
Continue support for F-16 Mode S ELS upgrade	1	2010	4	2013
Continue support for EC-130 CNS/ATM avionics, requirements, acquisition, and integration	1	2010	4	2016
Continue CNS/ATM requirements development, acquisition, and integration for AFSOC fixed/rotary wing aircraft	1	2010	4	2016
Continue AETC CNS/ATM capability analysis	1	2010	4	2016
Continue UAS ground based sense and avoid capabilities development	1	2010	4	2016
Continue Nav/Safety and GPS/NAVWAR integration and interoperability evaluations	1	2010	4	2016
Continue acquisition of ID/IQ CNS avionics equipment and components	1	2010	2	2014