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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2017 Air Force **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0305236F / <i>Common Data Link Executive Agent (CDL EA)</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	32.015	43.796	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
674819: <i>Common Data Link (CDL)</i>	-	32.015	43.796	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

Common Data Link Executive Agent (CDL EA) provides the DoD standard for interoperable, multi-service, multi-agency, Intelligence, Surveillance, and Reconnaissance (ISR) datalinks for 10,000+ DoD manned/unmanned airborne and ground platforms. As the DoD CDL EA, the Air Force is responsible for cross-service application of CDL RDT&E Military Intelligence Program (MIP) funds facilitating compliance to Congressional and DoD mandates. The EA develops, modifies, distributes, and maintains specifications for the CDL waveform family; ensuring design configuration control, commonality, and interoperability among ISR platforms. Additionally, funds support managing resources allocated for development, maturation, and migration of CDL technologies.

CDL EA enables compliance with OSD and Congressional mandates to effectively utilize spectrum, use approved cryptographic equipment, and provide direct support to current operations. CDL is a vital link in DoD's existing and emerging communication architectures, providing flexibility to accommodate Command and Control (C2) data and myriad types of Signals Intelligence (SIGINT), Geospatial Intelligence (GEOINT), and Full-Motion Video (FMV) data. The CDL specifications permit current and future ISR asset operations worldwide by providing sensor data directly via point-to-point broadcast to ground sites, airborne platforms and dismounted users. Also, CDL provides the capability to relay data via air-to-air or compatible satellite links when the asset and ground site are not in line-of-sight.

CDL EA's research and development activities support a broad swath of tactical, operational, and strategic ISR users and include achieving higher data rates, multi-access and multi-node network management, crypto upgrade, advancements needed to operate in contested environments, terminal and antenna design enhancements, operations in other spectral bands, and improving spectrum efficiency. Further, CDL development improves large area surveillance missions while supporting continuous improvements and implementation of line-of-sight platform and CDL terminal Command and Control (C2), plus increased ISR (C2ISR) capabilities. Activities also include studies and analysis to support current and future requirements documentation, program planning and execution. CDL prototype terminal designs provide for future technology insertion and reduce non-recurring engineering and life-cycle costs to the user.

In addition, the Gigabit Encryption thrust enables CDL to develop a miniaturized gigabit rate Communication Security (COMSEC) device capable of managing CDL data. The miniaturized COMSEC device will allow faster throughput while reducing Size, Weight, and Power (SWaP) requirements.

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 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	32.015	43.986	42.760	0.000	42.760
Current President's Budget	32.015	43.796	0.000	0.000	0.000
Total Adjustments	0.000	-0.190	-42.760	0.000	-42.760
• Congressional General Reductions	0.000	-0.190			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-42.760	0.000	-42.760

**Change Summary Explanation**

FY 2017: PE 0305236F, Common Data Link Executive Agent (CDL EA), Project 674819, Common Data Link (CDL) efforts were transferred to PE 0305236F, Common Data Link Executive Agent (CDL EA), Project 641334, Common Data Link (CDL)

**C. Accomplishments/Planned Programs (\$ in Millions)**

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> Common Data Link (CDL) Technology Advancement	18.229	31.796	0.000	0.000	0.000
<b>Description:</b> CDL evolutionary terminal development, advanced technology insertion, demonstrations and studies per CDL Integrated Product Team (IPT) direction to the CDL Executive Agent (CDL EA).					
<b>FY 2015 Accomplishments:</b> Continued development and testing of Higher Data Rates to existing and emerging terminals, while also prototyping terminal development that combines Size, Weight and Power (SWaP) improvements with higher data rate capability. Continued development of technology that allows for adapting and testing of networking, as well as more effective ground and lightweight airborne terminal components. Continued to move forward with development of multispectral operations flexibility, increased spectrum efficiency and integration of improved transmission components. Continued development of enhanced, CDL-based ISR communications capabilities across multiple platforms and rapid prototyping efforts. Continued support of emerging communication backbone architecture development across air, space and terrestrial layers, to include: agile high capacity data transport, assured communications and multi-mode access networks.					
<b>FY 2016 Plans:</b>					

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>Continue development and testing of Higher Data Rates to existing and emerging terminals, while also prototyping terminal development that combines Size, Weight and Power (SWaP) improvements with higher data rate capability. Continue development of technology that allows for adapting and testing of networking, as well as more effective ground and lightweight airborne terminal components. Continue to move forward with development of multispectral operations flexibility, increased spectrum efficiency and integration of improved transmission components. Continue development of enhanced, CDL-based ISR communications capabilities across multiple platforms and rapid prototyping efforts. Continue support of emerging communication backbone architecture development across air, space and terrestrial layers, to include: agile high capacity data transport, assured communications and multi-mode access networks.</p> <p><b>FY 2017 Base Plans:</b> In FY17 these activities will be reported in Budget Activity 4, PE 0305236F, Project 641334, CDL</p> <p><b>FY 2017 OCO Plans:</b> N/A</p>					
<p><b>Title:</b> Common Data Link (CDL) Specification Maintenance and Development</p> <p><b>Description:</b> CDL specification testing, maintenance, development, validation, configuration control, and distribution per CDL Integrated Product Team (IPT) direction to CDL Executive Agent (EA).</p> <p><b>FY 2015 Accomplishments:</b> Continued research and development upgrades of current and future specification employment profiles to include the adding of capabilities required to support the Joint Aerial Layer Network (JALN) High Capacity Backbone (HCB) and other emerging operational capabilities. Continued development of spectrally efficient CDL waveform specification, while planning for future A2AD enhancements. Continued to work with CDL industry partners and DoD Services to document, validate and implement common terminal control interfaces through the use of commercially recognized standards. Maintained configuration control of the CDL architecture, standards, specifications and modules. Continued development of CDL test equipment capable of compliance testing to the latest, validated version of CDL specifications.</p> <p><b>FY 2016 Plans:</b> Continue to research and development upgrades of current and future specification employment profiles that include the adding of capabilities required to support the Joint Aerial Layer Network (JALN) High Capacity Backbone (HCB), A2AD requirements, and other emerging operational capabilities. Continue the development of spectrally efficient CDL waveform specification, while gathering requirements and planning for future mesh</p>	11.586	5.000	0.000	0.000	0.000

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<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0305236F / <i>Common Data Link Executive Agent (CDL EA)</i>
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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
networking enhancements. Continue to work with CDL industry partners and DoD Services to document, validate and implement common terminal control interfaces through the use of commercially recognized standards. Maintain configuration control of the CDL architecture, standards, specifications and modules. Continue the development of CDL test equipment capable of compliance testing to the latest, validated version of CDL specifications.  <b>FY 2017 Base Plans:</b> In FY17 these activities will be reported in Budget Activity 4, PE 0305236F, Project 641334, CDL  <b>FY 2017 OCO Plans:</b> N/A					
<b>Title:</b> Gigabit Encryption  <b>Description:</b> Develop a miniaturized gigabit rate COMSEC device capable of handling CDL data rates. Miniaturizing COMSEC components will enable faster data throughput (greater than 12 GBPS) and reduce size, weight, and power. Once developed, CDL users will have to procure COMSEC components and fund installation/integration.  <b>FY 2015 Accomplishments:</b> Continued the development effort to build the gigabit encryption device to be fielded on numerous platforms. This device allows faster data throughput and reduced size, weight and power constraints.  <b>FY 2016 Plans:</b> Continue the development effort for small form factor modular COMSEC devices capable of gigabit rates. Conduct prototyping and testing of the second generation crypto core and design/development of the third generation crypto core.  <b>FY 2017 Base Plans:</b> In FY17 these activities will be reported in Budget Activity 4, PE 0305236F, Project 641334, CDL  <b>FY 2017 OCO Plans:</b> N/A	2.200	7.000	0.000	0.000	0.000
<b>Accomplishments/Planned Programs Subtotals</b>	32.015	43.796	0.000	0.000	0.000

**D. Other Program Funding Summary (\$ in Millions)**  
N/A

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<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0305236F / <i>Common Data Link Executive Agent (CDL EA)</i>	
<b>D. Other Program Funding Summary (\$ in Millions)</b>		
<b>Remarks</b>		
<b>E. Acquisition Strategy</b> The Air Force, designated as the Common Data Link (CDL) Executive Agent, supported by each of the Services' CDL program's Service laboratories, the Airborne Network Division (AFLCMC/HNA), and the Defense Information Systems Agency (DISA), provide for development of interoperable ISR data links as mandated by the Assistant Secretary of Defense (Networks and Information Integration) (ASD(NII)) policy. Once CDL technology development matures, platforms are responsible for program CDL procurement, National Security Agency (NSA), Joint Interoperability Test Command (JITC), and DISA certifications, integration, and installation. Acquisition strategy varies by contract. When possible, contracts are awarded under full and open competition.		
<b>F. Performance Metrics</b> 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 2017 Air Force** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0305236F / <i>Common Data Link Executive Agent (CDL EA)</i>	<b>Project (Number/Name)</b> 674819 / <i>Common Data Link (CDL)</i>
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<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AF Gigabit Plus, AF IA Modernization, Army Spec, Army Through the Rotors, Network Management	C/CPFF	L-3 Communications : Salt Lake City, UT	-	7.451	Feb 2015	12.250	Feb 2016	0.000		0.000		0.000	Continuing	Continuing	-
Advanced Waveform Validation, Digital Beam Effort	C/CPFF	Cubic : San Diego, CA	-	2.024	Feb 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Multi-Access and Assured Communications Development	C/Various	Various : Various	-	2.200	Dec 2014	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Marine CDL for Tactical UAS	C/Various	Various : Various	-	8.900	Feb 2015	8.540	Feb 2016	0.000		0.000		0.000	Continuing	Continuing	-
Terminals Database & Enterprise Roadmap	C/CPFF	Booz Allen : McClean, VA	-	1.010	Nov 2014	0.700	Jan 2016	0.000		0.000		0.000	Continuing	Continuing	-
Compliance Test Tool	C/Various	Various : Various	-	0.586	Dec 2014	3.921	Mar 2016	0.000		0.000		0.000	Continuing	Continuing	-
Under Threshold Combined	Various	Various : Various	-	0.000		1.375	Mar 2016	0.000		0.000		0.000	Continuing	Continuing	-
<b>Subtotal</b>			-	22.171		26.786		0.000		0.000		0.000	-	-	-

<b>Support (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Special studies, analysis, and engineering services	SS/CPFF	Johns Hopkins University/Applied Physics Lab : Laurel, MD	-	0.300	Jan 2015	0.300	Jan 2016	0.000		0.000		0.000	Continuing	Continuing	-
Service Tech Support & Spec Development	MIPR	Various : Various	-	2.565	Jan 2015	5.250	Jan 2016	0.000		0.000		0.000	Continuing	Continuing	-
ETASS Engineering Services	C/CPFF	Various : Various	-	0.524	Dec 2014	0.524	Feb 2016	0.000		0.000		0.000	Continuing	Continuing	-
<b>Subtotal</b>			-	3.389		6.074		0.000		0.000		0.000	-	-	-

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<b>Test and Evaluation (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Joint Interoperability Test Center (JITC)	MIPR	JITC : Fort Huachuca, AZ	-	0.000		0.925	Jan 2016	0.000		0.000		0.000	Continuing	Continuing	-
46 Test Squadron	PO	46 TS/OGEX : Eglin AFB, FL	-	0.140	Feb 2015	0.127	Feb 2016	0.000		0.000		0.000	Continuing	Continuing	-
<b>Subtotal</b>			-	0.140		1.052		0.000		0.000		0.000	-	-	-

<b>Management Services (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA- MITRE Engineering Support (FFRDC)	SS/T&M	MITRE Corp. : Bedford, MA	-	0.390	Oct 2014	0.390	Oct 2015	0.000		0.000		0.000	Continuing	Continuing	-
PMO/Service- MITRE Engineering Direct Mission Support (FFRDC)	SS/T&M	MITRE Corp. : Bedford, MA	-	4.479	Oct 2014	5.284	Oct 2015	0.000		0.000		0.000	Continuing	Continuing	-
PMA - PASS Financial and PM Support (A&AS)	C/CPFF	PE Systems : Littleton, MA	-	0.748	Feb 2015	0.766	Feb 2016	0.000		0.000		0.000	Continuing	Continuing	-
PMA - Under Threshold Program Mgmt/Tech Support	Various	Various : Various	-	0.698	Dec 2014	3.444	Mar 2016	0.000		0.000		0.000	Continuing	Continuing	-
<b>Subtotal</b>			-	6.315		9.884		0.000		0.000		0.000	-	-	-

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>		-	32.015	43.796	0.000	0.000	-	-	-

**Remarks**



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Air Force		<b>Date:</b> February 2016
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CDL Technology Advancement	1	2015	4	2016
- CDL Waveform RDTE	1	2015	4	2016
- Terminal Component Evolution and Test	1	2015	1	2016
- High Data Rate Terminal Development	1	2015	2	2016
- Low SWAP (SUAS) Prototype Terminal Development	1	2015	4	2016
- Assured Comm/Multi-Access Studies	1	2015	4	2016
CDL Specification Maintenance and Development	1	2015	4	2016
- Specification CM, Maintenance and Update (BE, Capstone)	1	2015	2	2016
- Development/Test Equipment (CWCT, RIL, CCI)	1	2015	4	2016
Gigabit Encryption	1	2015	4	2016
- US and Coalition Releasable Crypto Modules	1	2015	3	2015
- Multi-algorithm US/Coalition Crypto Modules	3	2015	4	2016
- Multi-sensor Aware/Shared State Crypto Modules	2	2016	4	2016

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