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

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) 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	-	0.000	0.000	42.338	0.000	42.338	41.390	42.179	43.010	43.861	Continuing	Continuing
641334: <i>Common Data Link (CDL)</i>	-	0.000	0.000	42.338	0.000	42.338	41.390	42.179	43.010	43.861	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
In FY 2017, Project 4819, Common Data Link (CDL), efforts were transferred from PE 0305236F, Common Data Link Executive Agent (CDL EA), to PE 0305236F, Project 1334, Common Data Link (CDL), in order to transition from Budget Activity 7, Operational Systems Development, and align to Budget Activity 4, Advanced Component Development and Prototypes (ACD&P). The ACD&P phase includes system specific efforts that help expedite technology transition from the laboratory to operational use.

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 CDL 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 modernization, 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 Cryptographic Modernization thrust enables CDL to develop a miniaturized gigabit rate Communications Security (COMSEC) device capable of managing CDL data. The miniaturized COMSEC device will allow faster throughput while reducing Size, Weight, and Power (SWaP) requirements.

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This program is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P) because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	42.338	0.000	42.338
Total Adjustments	0.000	0.000	42.338	0.000	42.338
• Congressional General Reductions	0.000	0.000			
• 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	42.338	0.000	42.338

Change Summary Explanation

FY 2017: Other Adjustments row details Project 1334, Common Data Link Executive Agent, transition from Budget Activity 7 (BA-7) to BA-4.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Common Data Link (CDL) Technology Advancement	0.000	0.000	9.670	0.000	9.670
Description: CDL evolutionary concept development, exploratory prototyping, advanced technology demonstrations, and studies of emerging technologies and capability gaps.					
FY 2015 Accomplishments: In FY15 activities were reported in Budget Activity 7, PE 0305236F, Project 674819, CDL					
FY 2016 Plans: In FY16 activities were reported in Budget Activity 7, PE 0305236F, Project 674819, CDL					
FY 2017 Base Plans: - Will continue to research and evaluate technology developments for enhancing networking, as well as more effective ground and lightweight airborne terminal components - Will continue to develop multispectral operations flexibility, increased spectrum efficiency and integration of improved transmission components					

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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0305236F / <i>Common Data Link Executive Agent (CDL EA)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
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- Will continue development of enhanced, CDL-based ISR communication capabilities across multiple platforms and echelons
 - Will continue exploratory prototyping efforts and advanced technology demonstrations in 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
 - Will continue to research and develop upgrades to support current and future specification employment profiles

FY 2017 OCO Plans:
N/A

Title: Common Data Link (CDL) Specification Development, Validation, Test and Maintenance	0.000	0.000	25.672	0.000	25.672
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Description: Systems engineering lifecycle for CDL and NATO STANAG 7085 specification development: requirement decomposition, specification development (modeling, maturation, documentation), specification validation (and associated component prototyping), testing, configuration management, and process maintenance.

FY 2015 Accomplishments:
In FY15 activities were reported in Budget Activity 7, PE 0305236F, Project 674819, CDL

FY 2016 Plans:
In FY16 activities were reported in Budget Activity 7, PE 0305236F, Project 674819, CDL

FY 2017 Base Plans:

- Will 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 and integration of improved transmission components
- Will continue adding capabilities required to support the Joint Aerial Layer Network (JALN) High Capacity Backbone (HCB), Anti-Access Area-Denial (A2AD) requirements, and other emerging operational capabilities
- Will continue development of spectrally efficient CDL waveform specification
- Will continue to work with CDL industry partners and DoD Services to document, validate and implement common terminal control interfaces through use of commercially recognized standards
- Will maintain configuration control of the CDL architecture, standards, specifications and modules

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Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0305236F I Common Data Link Executive Agent (CDL EA)
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Will continue development of CDL test equipment capable of compliance testing to the latest, validated version of CDL specifications FY 2017 OCO Plans: N/A					
Title: Common Data Link (CDL) Cryptographic Modernization (previously listed as Gigabit Encryption) Description: Phased development effort to modernize CDL Communications Security (COMSEC) devices and standards to maximize performance and reduce SWaP requirements while supporting commonality, modularity, portability, remote management, multi-level security and releasability. FY 2015 Accomplishments: In FY15 activities were reported in Budget Activity 7, PE 0305236F, Project 674819, CDL FY 2016 Plans: In FY16 activities were reported in Budget Activity 7, PE 0305236F, Project 674819, CDL FY 2017 Base Plans: - Will continue development of generation two miniaturized (nano and mini) FVEY and NATO releasable cryptographic cores - Will continue development of FVEY multi-channel, gigabit data rate (mega) cryptographic cores - Will begin design and prototype for generation three multi-level security (MLS)-capable crypto cores FY 2017 OCO Plans: N/A	0.000	0.000	6.996	0.000	6.996
Accomplishments/Planned Programs Subtotals	0.000	0.000	42.338	0.000	42.338

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

Remarks

E. Acquisition Strategy
 The Air Force serves as the DoD Common Data Link Executive Agent, with support from each Service's designated CDL lead and the Airborne Network Division (AFLCMC/HNA). The CDL EA develops interoperable ISR data links mandated for use by Assistant Secretary of Defense (Networks and Information Integration) (ASD(NII)) policy. Once CDL technology development matures and a specification is published, platforms are responsible for CDL compliant terminal procurement;

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Appropriation/Budget Activity	R-1 Program Element (Number/Name)
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National Security Agency (NSA) and Joint Interoperability Test Command (JITC) compliance certifications; integration; and installation. Acquisition strategy varies by contract. When possible, contracts are awarded under full and open competition.

F. 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 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0305236F / <i>Common Data Link Executive Agent (CDL EA)</i>	Project (Number/Name) 641334 / <i>Common Data Link (CDL)</i>
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Product Development (\$ in Millions)				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			
Air Force Information Assurance Modernization / Network Management	MIPR	NSA : Ft Meade, MD	-	0.000		0.000		6.996	Nov 2016	0.000		6.996	Continuing	Continuing	TBD
Marine CDL for Tactical UAS	Various	Various : Various	-	0.000		0.000		5.000	Mar 2017	0.000		5.000	Continuing	Continuing	TBD
Terminal Database	C/CPFF	Booze Allen : McClean, VA	-	0.000		0.000		1.000	Nov 2016	0.000		1.000	Continuing	Continuing	TBD
Compliance Test Tool	C/Various	Various : Various	-	0.000		0.000		5.000	Dec 2016	0.000		5.000	Continuing	Continuing	TBD
Under Threshold Combined	Various	Various : Various	-	0.000		0.000		3.042	Dec 2016	0.000		3.042	Continuing	Continuing	TBD
Subtotal			-	0.000		0.000		21.038		0.000		21.038	-	-	-

Support (\$ in Millions)				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	-	0.000		0.000		0.450	Jan 2017	0.000		0.450	Continuing	Continuing	TBD
Service Tech Support & Spec Development	MIPR	Various : Various	-	0.000		0.000		8.140	Jan 2017	0.000		8.140	Continuing	Continuing	TBD
Subtotal			-	0.000		0.000		8.590		0.000		8.590	-	-	-

Test and Evaluation (\$ in Millions)				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 : Ft Huachuca, AZ	-	0.000		0.000		1.250	Jan 2017	0.000		1.250	Continuing	Continuing	TBD
46 Test Squadron	PO	46 TS/OGEX : Eglin AFB, FL	-	0.000		0.000		0.290	Feb 2017	0.000		0.290	Continuing	Continuing	TBD

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Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0305236F / <i>Common Data Link Executive Agent (CDL EA)</i>	Project (Number/Name) 641334 / <i>Common Data Link (CDL)</i>
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Test and Evaluation (\$ in Millions)				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			
Subtotal			-	0.000		0.000		1.540		0.000		1.540	-	-	-

Management Services (\$ in Millions)				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	-	0.000		0.000		0.790	Oct 2016	0.000		0.790	Continuing	Continuing	TBD
PMO/Service- MITRE Engineering Direct Mission Support (FFRDC)	SS/T&M	MITRE Corp. : Bedford, MA	-	0.000		0.000		6.070	Oct 2016	0.000		6.070	Continuing	Continuing	TBD
PMA - PASS Financial and PM Support (A&AS)	C/CPFF	PE Systems : Littleton, MA	-	0.000		0.000		1.200	Jul 2017	0.000		1.200	Continuing	Continuing	TBD
PMA - Under Threshold Program Mgmt/Tech Support	Various	Various : Various	-	0.000		0.000		3.110	Dec 2016	0.000		3.110	Continuing	Continuing	TBD
Subtotal			-	0.000		0.000		11.170		0.000		11.170	-	-	-

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000	0.000	42.338	0.000	42.338	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0305236F / <i>Common Data Link Executive Agent (CDL EA)</i>	Project (Number/Name) 641334 / <i>Common Data Link (CDL)</i>

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
CDL Technology Advancement																												
- Spectrum efficient/Frequency agile CDL																												
- Capability Gap Analysis / Roadmap Update																												
- Multi-access / Mesh Network Advancements																												
CDL Specification Development, Validation, Test and Maintenance																												
- SUAS SWAP Constrained Rev B Terminals																												
- CDL Compliance Test Set																												
CDL Cryptographic Modernization																												
- Multi-algorithm US/Coalition crypto core modules (Generation 2)																												
- Multi-sensor aware/Shared state crypto core modules (Generation 3)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0305236F / <i>Common Data Link Executive Agent (CDL EA)</i>	Project (Number/Name) 641334 / <i>Common Data Link (CDL)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CDL Technology Advancement	1	2017	4	2021
- Spectrum efficient/Frequency agile CDL	1	2017	4	2018
- Capability Gap Analysis / Roadmap Update	1	2017	4	2017
- Multi-access / Mesh Network Advancements	1	2017	4	2019
CDL Specification Development, Validation, Test and Maintenance	1	2017	4	2021
- SUAS SWAP Constrained Rev B Terminals	1	2017	4	2017
- CDL Compliance Test Set	1	2017	4	2018
CDL Cryptographic Modernization	1	2017	2	2019
- Multi-algorithm US/Coalition crypto core modules (Generation 2)	1	2017	2	2018
- Multi-sensor aware/Shared state crypto core modules (Generation 3)	2	2017	2	2019

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