Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force											Date: May 2017	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0305236F / *Common Data Link Executive Agent (CDL EA)*							
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	42.338	41.509	0.000	41.509	42.196	43.029	43.866	44.761	Continuing	Continuing
641334: *Common Data Link (CDL)*	-	0.000	42.338	41.509	0.000	41.509	42.196	43.029	43.866	44.761	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 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 and 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 array of tactical, operational, and strategic ISR users and include achieving higher data rates, open architecture development, 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.

This program was previously in Budget Activity 7, Operational System Development, but was migrated to BA4 due to better fit of specification development and prototype terminal development activities.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*

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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	42.338	41.390	0.000	41.390
Current President's Budget	0.000	42.338	41.509	0.000	41.509
Total Adjustments	0.000	0.000	0.119	0.000	0.119
• 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	0.119	0.000	0.119

C. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Common Data Link (CDL) Technology Advancement	0.000	9.670	10.000

Description: CDL evolutionary concept development, exploratory prototyping, advanced technology demonstrations, and studies of emerging technologies and capability gaps.

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

FY 2017 Plans:
- Continue to research and evaluate technology developments for enhancing networking, as well as more effective ground and lightweight airborne terminal components
- Continue to develop multispectral operations flexibility, increased spectrum efficiency and integration of improved transmission components
- Continue development of enhanced, CDL-based ISR communication capabilities across multiple platforms and echelons
- 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
- Continue to research and develop upgrades to support current and future specification employment profiles

FY 2018 Plans:

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
- 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 - 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			
Title: Common Data Link (CDL) Specification Development, Validation, Test and Maintenance	0.000	25.668	24.690
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 2016 Accomplishments:*** In FY16 activities were reported in Budget Activity 7, PE 0305236F, Project 674819, CDL ***FY 2017 Plans:*** - Continue development and testing of Higher Data Rates to existing and emerging terminals, while also prototyping Small Unmanned Airborne Systems (SUAS) terminal development that combines Size, Weight and Power (SWaP) improvements with higher data rate capability and integration of improved transmission components - 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 - Continue development of spectrally efficient CDL waveform specification - 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 - Continue configuration control of the CDL architecture, standards, specifications and modules - Continue development of CDL test equipment capable of compliance testing to the latest, validated version of CDL specifications ***FY 2018 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			

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
- 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 continue configuration control of the CDL architecture, standards, specifications and modules - Will continue development of CDL test equipment capable of compliance testing to the latest, validated version of CDL specifications			
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 2016 Accomplishments:*** In FY16 activities were reported in Budget Activity 7, PE 0305236F, Project 674819, CDL ***FY 2017 Plans:*** - Continue development of Generation Two Nano and Mini cryptographic cores for U.S. and NATO release - Continue development of multi-channel, gigabit data rate (Mega) cryptographic cores ***FY 2018 Plans:*** - Will complete development of generation two Nano and Mini cryptographic cores for U.S. and NATO release - Will continue development of multi-channel, gigabit data rate (Mega) cryptographic cores	0.000	7.000	6.819
Accomplishments/Planned Programs Subtotals	0.000	42.338	41.509

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;

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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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.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0305236F / *Common Data Link Executive Agent (CDL EA)*	Project (Number/Name) 641334 / *Common Data Link (CDL)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Force Information Assurance Modernization / Network Management	MIPR	NSA : Ft Meade, MD	-	0.000		7.000	Nov 2016	6.843	Nov 2017	0.000		6.843	Continuing	Continuing	-
Marine CDL for Tactical UAS	Various	Various : Various	-	0.000		3.000	Nov 2016	2.933	Mar 2018	0.000		2.933	Continuing	Continuing	-
Terminal Database	C/CPFF	Booze Allen : McClean, VA	-	0.000		0.700	May 2017	0.684	Nov 2017	0.000		0.684	Continuing	Continuing	-
Compliance Test Tool	C/Various	Various : Various	-	0.000		3.637	Jun 2017	3.556	Dec 2017	0.000		3.556	Continuing	Continuing	-
Under Threshold Combined	Various	Various : Various	-	0.000		7.045	Dec 2016	6.887	Dec 2017	0.000		6.887	Continuing	Continuing	-
		Subtotal	-	0.000		21.382		20.903		0.000		20.903	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Special studies, analysis, and engineering services	SS/CPFF	Johns Hopkins University/Applied Physics Lab : Laurel, MD	-	0.000		0.790	May 2017	0.684	Jan 2018	0.000		0.684	Continuing	Continuing	-
Service Tech Support & Spec Development	MIPR	Various : Various	-	0.000		7.800	Jan 2017	7.625	Jan 2018	0.000		7.625	Continuing	Continuing	-
		Subtotal	-	0.000		8.590		8.309		0.000		8.309	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Interoperability Test Center (JITC)	MIPR	JITC : Ft Huachuca, AZ	-	0.000		1.000	Jun 2017	0.978	Jan 2018	0.000		0.978	Continuing	Continuing	-
46 Test Squadron	PO	46 TS/OGEX : Eglin AFB, FL	-	0.000		0.369	Nov 2016	0.192	Feb 2018	0.000		0.192	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*	**Project (Number/Name)** 641334 / *Common Data Link (CDL)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	0.000		1.369		1.170		0.000		1.170	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA-MITRE Engineering Support (FFRDC)	SS/T&M	MITRE Corp : Bedford, MA	-	0.000		0.100	Nov 2016	0.167	Oct 2017	0.000		0.167	Continuing	Continuing	-
PMO/Service- MITRE Engineering Direct Mission Support (FFRDC)	SS/T&M	MITRE Corp. : Bedford, MA	-	0.000		6.059	Nov 2016	6.198	Oct 2017	0.000		6.198	Continuing	Continuing	-
PMA - PMO Support (A&AS)	C/CPFF	PE Systems : Littleton, MA	-	0.000		0.766	Mar 2017	0.749	Jul 2018	0.000		0.749	Continuing	Continuing	-
PMA - Under Threshold Program Mgmt/Tech Support	Various	Various : Various	-	0.000		4.072	Jun 2017	4.013	Dec 2017	0.000		4.013	Continuing	Continuing	-
		Subtotal	-	0.000		10.997		11.127		0.000		11.127	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		42.338		41.509		0.000		41.509	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*	**Project (Number/Name)** 641334 / *Common Data Link (CDL)*

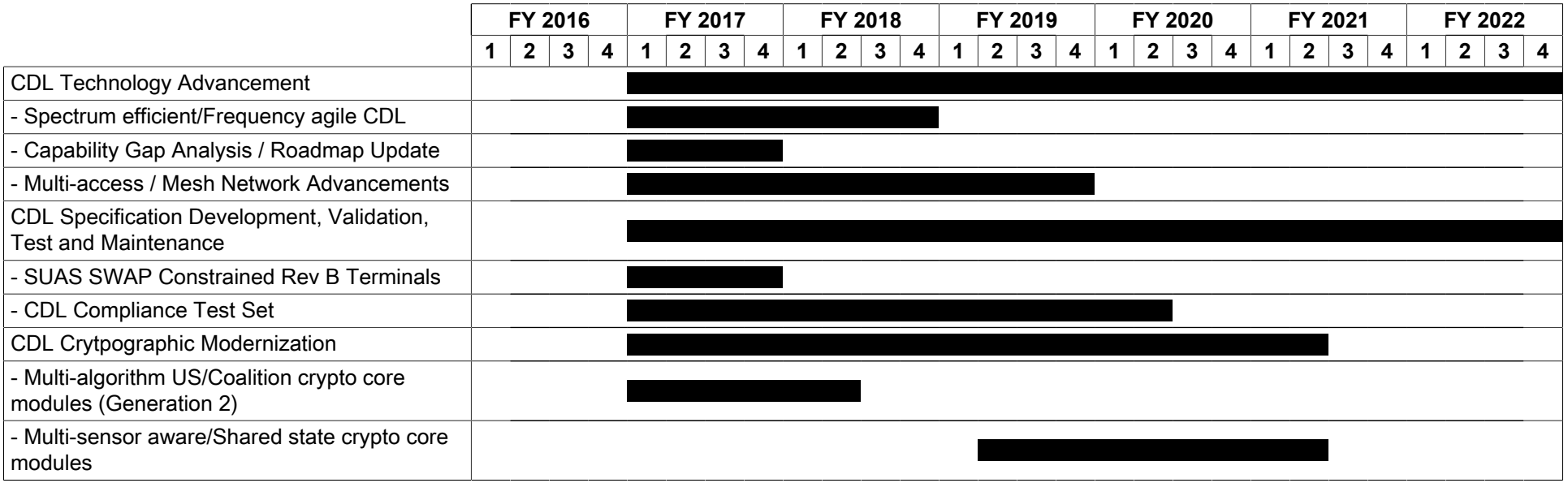

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*	**Project (Number/Name)** 641334 / *Common Data Link (CDL)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CDL Technology Advancement	1	2017	4	2022
- 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	2022
- SUAS SWAP Constrained Rev B Terminals	1	2017	4	2017
- CDL Compliance Test Set	1	2017	2	2020
CDL Crytpographic Modernization	1	2017	2	2021
- Multi-algorithm US/Coalition crypto core modules (Generation 2)	1	2017	2	2018
- Multi-sensor aware/Shared state crypto core modules	2	2019	2	2021