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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 I BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0307581F / JSTARS Recap							
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	85.879	51.306	128.019	417.201	0.000	417.201	623.248	594.270	485.047	348.357	480.300	3,213.627
650003: JSTARS Recapitalization	85.879	51.306	128.019	417.201	0.000	417.201	623.248	594.270	485.047	348.357	480.300	3,213.627
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	2	1		
Program MDAP/MAIS Code: 513												
A. Mission Description and Budget Item Justification												
The Joint Surveillance Target Attack Radar System Recapitalization (JSTARS Recap) is an acquisition program to recapitalize the current Legacy E-8C at a significantly reduced operational cost by executing the current system capabilities with a modern aircraft and mission systems suite.												
The JSTARS Recap weapon system will replace the E-8C JSTARS which is a mature Command and Control (C2) weapon system that provides forward deployed battle management, robust communications, and stand-off target surveillance, detection, tracking, and combat identification of objects within specified combat engagement areas. JSTARS Recap will interact with all elements of the Theater Air Control System (TACS), including other JSTARS, Airborne Warning and Control System (AWACS), Control and Reporting Centers (CRC), Air Operations Centers (AOC), and Brigade Combat Teams (BCT), through multiple Line of Sight (LOS) and Beyond Line of Sight (BLOS) communications paths.												
The JSTARS Recap solution will incorporate currently available technology to recapitalize the Joint STARS BMC2 Mission capability on a smaller, more efficient airframe, thereby reducing life cycle costs of the weapon system. JSTARS Recap will be comprised of four integrated subsystems: the aircraft, the radar, a communications suite, and a BMC2 suite. Additionally, JSTARS Recap will include mission and maintenance trainers, and a Full Flight Simulation (FFS) Level D-equivalent flight training capability. The JSTARS Recap solution will integrate high Technology Readiness Level (TRL) components, and will utilize Open Systems Architecture (OSA) to reduce integration risk and lifecycle cost. The Government defines OSA as a system for which major interfaces are collaboratively defined and maintained by an established community of interest (COI) for unconstrained usage by all who require them, and are subject to the review and approval of the Government program office.												
Activities may also include studies, analysis, and risk reduction activities addressing all subsystems to support both current program planning/execution and future AF program planning.												
This program is in budget Activity 5, System Development and Demonstration (SDD) because it is projected to receive Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production.												

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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	
Previous President's Budget	44.343	128.019	413.991	0.000	413.991	
Current President's Budget	51.306	128.019	417.201	0.000	417.201	
Total Adjustments	6.963	0.000	3.210	0.000	3.210	
• 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	8.551	0.000				
• SBIR/STTR Transfer	-1.588	0.000				
• Other Adjustments	0.000	0.000	3.210	0.000	3.210	
Change Summary Explanation						
FY16: Below Threshold Reprogramming applied to Radar Risk Reduction effort						
FY18: Change due to AF funding to the approved MS-A Independent Cost Estimate						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2016	FY 2017	FY 2018
Title: Technology Maturation and Risk Reduction (TMRR)				51.306	128.019	-
Description: JSTARS Recap TMRR/Pre-Engineering and Manufacturing Development (EMD) Contract activities leverage DoD's prior investments and Industry's Independent Research and Development (IR&D) investments to conduct technical reviews and subsystem prototype demonstrations. The goal of TMRR/Pre-EMD activities is to validate industry's system-level design readiness/maturity with respect to top integration risks and use of Open Systems Architecture (OSA) and Open Mission System (OMS) standards. The TMRR/Pre-EMD activities inform the government about the integration complexity and associated lifecycle risks involved with different system-level design solutions including radar risk reduction. Activities also include studies, analyses, and risk reduction addressing all subsystems to support current program planning/execution and future program planning.						
FY 2016 Accomplishments:						
- Received MS A decision 10 December 2015						
- Exercised contract option in 1QFY16 for Industry Teams to complete system level designs						
- Conducted multiple system-level technical reviews (to include System Functional Reviews (SFRs) and Preliminary Design Reviews (PDRs))						
- Conducted subsystem prototype demonstrations						
- Awarded two UCAs for radar risk reductions (Raytheon Space and Airborne Systems and Northrop Grumman Mission Systems)						

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Conducted Radar Risk Reduction in process Reviews - Completed Development Request For Proposal (RFP) release decision review 4QFY16 FY 2017 Plans: <ul style="list-style-type: none"> - Released EMD RFP to industry - Conducting Radar Risk Reduction activities to mature radar designs specific to JSTARS Recap - Continuing other subsystem and weapon systems risk reduction activities - Continuing associated activities to obtain MS B - Continuing EMD source selection 				
Title: Engineering Manufacturing Development (EMD) Description: JSTARS Recap EMD activities include the modification of mature technology (radar, BMC2, and communications subsystems) and integration onto a commercial derivative aircraft. Three RECAP EMD/Test Articles (missionized aircraft) will be procured to support Initial Operational Capability (IOC) in 4QFY24. Additional activities include, but not limited to: studies, analyses, and risk reduction activities addressing all subsystems to support current program planning/execution and future program planning. FY 2018 Plans: <ul style="list-style-type: none"> - Complete Radar Risk Reductions Activities - Award EMD Contract - Conduct Post Award Conference - Conduct Integrated Baseline Review (IBR) - Conduct System Requirements Review / System Functional Review (SRR / SFR) - Procure Green Aircraft and Mission Systems (Radar, BMC2, and Communications) and associated Group A hardware. - May perform studies, analyses, and risk reduction activities addressing all subsystems to support current program planning/execution and future program planning. 		-	-	417.201
Accomplishments/Planned Programs Subtotals		51.306	128.019	417.201
D. Other Program Funding Summary (\$ in Millions) N/A Remarks				

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E. Acquisition Strategy <p>The JSTARS Recap program (hereinafter, the "Program") is a pre-Major Defense Acquisition Program (MDAP). The Program achieved Milestone (MS) A approval on 10 December 2015 and MS B is currently planned for FY18. JSTARS Recap is comprised of a business-class Commercial Derivative Aircraft (CDA) with integrated Battle Management Command and Control (BMC2) along with radar and communication subsystems. The Program will leverage available systems and mature technologies using Open Systems Architecture (OSA) to minimize the risks during the Engineering and Manufacturing Development (EMD) phase, thus, lowering life cycle costs.</p> <p>The Program developed a Government Reference Architecture (GRA) intended to define the functional capabilities of the JSTARS Recap Weapon System (WS). The GRA enabled subsystem technical analysis and risk reduction to validate technical maturity. The GRA also supports the Program's strategy to Own the Technical Baseline (OTB) aimed to reduce cost throughout the system's life cycle, foster competition during Operations and Support acquisition phase, and allow flexibility to readily incorporate new technologies and capabilities.</p> <p>Prior to MS A, the Program executed three (3) contracts to conduct system-level System Requirements Reviews (SRR) (collectively, the "Pre-EMD Contracts"). The Pre-EMD Contracts focused on requirements analysis, assessing the WS design, design maturity, and risk reduction. Upon receiving the MS A approval, the Program exercised the Technology Maturation and Risk Reduction (TMRR) options for system-level design reviews and subsystems prototype demonstrations. In parallel with the Pre-EMD Contracts, the Program also executed contracts with the two (2) viable radar Original Equipment Manufacturers (OEMs) that focused on advancing radar design, assessing manufacturing readiness, and mitigating both technical and schedule risk during the EMD Phase. Subsequent to the Pre-EMD Contracts and a successful Development RFP Release Decision Point Review, the Program will conduct a separate, full and open competition for the EMD phase of the Program (hereinafter, the "EMD Contract"). The EMD Contract award is planned for FY18 and will include the EMD effort as well as options for Low-Rate Initial Production (LRIP) and Full-Rate Production (FRP) Lots #1-3.</p> <p>The Program will develop a total of seventeen (17) JSTARS Recap WSs. The first three (3) WSs produced during EMD will be instrumented to support Developmental Test and Evaluation (DT&E). Subsequent to DT&E, two (2) of these instrumented WSs will be reconfigured to production representative WSs in support of Initial Operational Capability (IOC); the one (1) remaining WS will maintain instrumentation for testing purposes. Two (2) LRIP WSs will be developed to meet the four (4) WSs required for IOC. Full-Rate Production (FRP) will consist of three (3) production lots to procure an additional twelve (12) WSs to support Full Operational Capability (FOC) by 2QFY28.</p>		
F. Performance Metrics <p>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.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0307581F / JSTARS Recap	Project (Number/Name) 650003 / JSTARS Recapitalization
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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JSTARS Recap Pre-EMD Contract #1	C/FFP	Boeing Service Co. : Richardson, TX	17.695	9.685	Jan 2016	0.000		0.000		0.000		0.000	0.000	27.380	27.380
JSTARS Recap Pre-EMD Contract #2	C/FFP	Northrop Grumman Systems Corp : Melbourne, FL	17.695	7.055	Dec 2015	0.000		0.000		0.000		0.000	0.000	24.750	24.750
JSTARS Recap Pre-EMD Contract #3	C/FFP	Lockheed Martin Corp : King of Prussia, PA	17.695	7.028	Dec 2015	0.000		0.000		0.000		0.000	0.000	24.723	24.723
JSTARS Recap Radar Risk Reduction Contract #1	C/CPFF	Raytheon : McKinney, TX	5.188	5.277	Mar 2016	26.000	Oct 2016	0.000		0.000		0.000	0.000	36.465	60.465
JSTARS Recap Radar Risk Reduction Contract #2	C/CPFF	Northrop Grumman Systems Corp : Linthicum Heights, MD	5.400	5.090	Mar 2016	42.000	Oct 2016	0.000		0.000		0.000	0.000	52.490	63.408
JSTARS Recap EMD	Various	TBD : TBD	0.000	0.000		0.000		373.600	Oct 2017	0.000		373.600	2,348.283	2,721.883	2,721.883
Subtotal			63.673	34.135		68.000		373.600		0.000		373.600	2,348.283	2,887.691	2,922.609

Remarks

Pre-Engineering and Manufacturing Development (EMD) contracts will be incrementally funded with the basic contract (Materiel Solution Analysis) awarded on 7 August 2015 and options for Technology Maturation and Risk Reduction (TMRR) activities exercised in FY16. Two Radar Risk Reduction contracts were awarded in FY17. EMD contract is planned for 2QFY18.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force												Date: May 2017			
Appropriation/Budget Activity 3600 / 5						R-1 Program Element (Number/Name) PE 0307581F / JSTARS Recap				Project (Number/Name) 650003 / JSTARS Recapitalization					
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Responsible Test Organization (RTO)	MIPR	Various : Various	1.217	1.467	Oct 2015	2.070	Oct 2016	5.251	Oct 2017	0.000		5.251	27.015	37.020	37.020
Subtotal			1.217	1.467		2.070		5.251		0.000		5.251	27.015	37.020	37.020
Remarks															
Activities include, but not limited to, detailed test planning and provisioning to include the writing of a detailed test and safety plans, setting up the test execution data and documentation management infrastructure, developing data analysis tools, provisioning for test assets, instrumentation and ranges. Activities will be accomplished utilizing the DoD Major Ranges & Test Facilities which include, but not limited to, the AFTC (412TW and 96TH), Joint Interoperability Test Center (JITC), the 346th TS, Live Fire Test Organizations (AFLMC/EZJA and 96th TG Det 1), and Operational Test Agencies (AFOTEC).															
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	Various	Various : Bedford, MA	11.125	8.941	Oct 2015	11.080	Oct 2016	12.100	Oct 2017	0.000		12.100	56.840	100.086	100.086
PASS Support (A and AS)	Various	Various : Bedford, MA	5.395	0.951	Nov 2015	2.608	Nov 2016	5.200	Nov 2017	0.000		5.200	12.500	26.654	26.654
ETASS Support (A and AS)	Various	Various : Bedford, MA	1.484	2.115	Nov 2015	2.200	Nov 2016	6.200	Nov 2017	0.000		6.200	12.750	24.749	24.749
PMA and additional risk reduction activities	Various	Various : Bedford, MA	2.985	3.697	Dec 2015	42.061	Dec 2016	14.850	Oct 2017	0.000		14.850	73.834	137.427	102.509
Subtotal			20.989	15.704		57.949		38.350		0.000		38.350	155.924	288.916	253.998
Remarks															
High percentage of management services are a result of FFRDC and other contractor support required to conduct studies and other risk reducing analysis to better inform the government about integration risks, use of Open System Architecture (OSA), and subsystem performance towards Service Acquisition Executive (SAE) initiative "owning the technical baseline." Specific activities include modeling and analysis/simulation to better understand/anticipate performance, establishment of System Integration Lab (SIL) for development/integration, and Open Mission Systems (OMS) compliance testing. In addition, contractor support is necessary for all the required acquisition documentation.															
			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			85.879	51.306		128.019		417.201		0.000		417.201	2,531.222	3,213.627	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force							Date: May 2017				
Appropriation/Budget Activity 3600 / 5				R-1 Program Element (Number/Name) PE 0307581F / JSTARS Recap			Project (Number/Name) 650003 / JSTARS Recapitalization				
	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract		
Remarks											

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force			Date: May 2017		
Appropriation/Budget Activity 3600 / 5		R-1 Program Element (Number/Name) PE 0307581F / JSTARS Recap			Project (Number/Name) 650003 / JSTARS Recapitalization

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Milestone A (DEC 2015)	■																											
Pre Engineering and Manufacturing Development activities	■																											
Technology Maturation and Risk Reduction		■	■	■																								
System Requirements Review	■																											
System Functional Review		■																										
Preliminary Design Review - TMRR			■																									
Capability Development Document (AUG 2016)				■																								
Development RFP Release Decision Point (SEP 2016)				■																								
Engineering and Manufacturing Development RFP Release (DEC 2016)		■	■	■																								
Radar Risk Reduction Activities		■	■	■	■	■	■	■																				
Milestone B										■	■																	
Engineering and Manufacturing Development													■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1, T2, and T3 Article buys/deliveries													■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Developmental Test and Evaluation																	■	■	■	■	■	■	■	■	■	■	■	■

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0307581F / JSTARS Recap	Project (Number/Name) 650003 / JSTARS Recapitalization	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Milestone A (DEC 2015)	1	2016	1	2016
Pre Engineering and Manufacturing Development activities	1	2016	1	2016
Technology Maturation and Risk Reduction	2	2016	4	2016
System Requirements Review	1	2016	1	2016
System Functional Review	2	2016	2	2016
Preliminary Design Review - TMRR	3	2016	3	2016
Capability Development Document (AUG 2016)	4	2016	4	2016
Development RFP Release Decision Point (SEP 2016)	4	2016	4	2016
Engineering and Manufacturing Development RFP Release (DEC 2016)	2	2016	1	2017
Radar Risk Reduction Activities	2	2016	1	2018
Milestone B	2	2018	3	2018
Engineering and Manufacturing Development	3	2018	4	2022
T1, T2, and T3 Article buys/deliveries	3	2018	2	2022
Developmental Test and Evaluation	4	2019	4	2022