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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force										Date: February 2018		
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 I JSTARS Recap							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	170.185	113.334	417.201	0.000	0.000	0.000	0.000	0.000	0.000	0.000	480.300	1,181.020
650003: JSTARS Recapitalization	170.185	113.334	417.201	0.000	0.000	0.000	0.000	0.000	0.000	0.000	480.300	1,181.020
Quantity of RDT&E Articles	-	-	-	-	-	-	-	2	1	-		
Program MDAP/MAIS Code: 513												
<b>Note</b> FY17 funding reduced by reprogramming.												
<b>A. Mission Description and Budget Item Justification</b> The Joint Surveillance Target Attack Radar System Recapitalization (JSTARS Recap) weapon system will replace the currently fielded E-8C Joint STARS weapon system and will execute in both global and regional conflicts in support of operations ranging from peacetime engagements to conventional, high intensity, general warfare. JSTARS Recap will provide airborne, stand-off range, surveillance and target acquisition radar and Battle Management Command and Control (BMC2) capabilities. JSTARS Recap will provide theater, ground and air commanders with ground surveillance to support attack operations and targeting that contributes to the delay, disruption, and destruction of enemy forces.  FY18 to FY23 RDT&E BA required to execute the Engineering Manufacturing and Development (EMD) phase of this acquisition. The focus of EMD will be to procure three Commercial Derivative Aircraft (CDA) and integrate the various subsystems (i.e. BMC2, Communications, Radar and ground support systems) to verify that system performance meets required capabilities. The primary evaluation of the weapon system development will occur during the EMD phase. Additionally, there will be major Technical Reviews accomplished during this phase: Combined System Requirements Review/System Functional Review (SRFR); Preliminary Design Review (PDR); Critical Design Review (CDR); Test Readiness Reviews (TRR); Production Readiness Review (PRR), Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA).  Funding may also support studies, analyses, and risk reduction activities addressing all subsystems to support both current program planning/execution and future Air Force program planning.  This program element may include necessary civilian pay expenses required to manage, execute, and deliver JSTARS Recap weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F  This program is in Budget Activity 5, System Development and Demonstration (SDD) because it is projected to receive Milestone B approval and is conducting EMD tasks aimed at meeting validated requirements prior to Full Rate Production (FRP).												

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B. Program Change Summary (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget		128.019	417.201	623.248	0.000	623.248
Current President's Budget		113.334	417.201	0.000	0.000	0.000
Total Adjustments		-14.685	0.000	-623.248	0.000	-623.248
• 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		-9.999	0.000			
• SBIR/STTR Transfer		-4.686	0.000			
• Other Adjustments		0.000	0.000	-623.248	0.000	-623.248
Change Summary Explanation FY17 funding reduced by reprogramming.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2017	FY 2018	FY 2019
Title: Technology Maturation and Risk Reduction (TMRR)				113.334	0.000	-
Description: JSTARS Recap TMRR Contract activities leveraged DoD prior investments and Industry's Independent Research and Development (IR&D) investments to conduct technical reviews and subsystem prototype demonstrations. TMRR activities assessed 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 contract activities informed 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. These activities informed the Engineering, Manufacturing and Development with Production (add better words) Request for Proposal released 26 Dec 16.						
FY 2018 Plans:						
- Conduct Training Systems Requirements Analysis						
- Execute EMD Source Selection						
- Prepare for EMD Phase						
- Enhance government's JSTARS Recap Systems Integration Lab for EMD readiness						
- Prepare for Milestone B Defense Acquisition Board						
- Prepare Statutory and Regulatory documentation in support of Milestone B						
- Conduct and complete studies and analysis to reduce EMD risk						

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2019 Air Force		<b>Date:</b> February 2018		
<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 5: System Development &amp; Demonstration (SDD)</i>		<b>R-1 Program Element (Number/Name)</b> PE 0307581F / JSTARS Recap		
<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>
- Conduct and complete Radar Risk Reduction  <b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> Program was cancelled.				
<b>Title:</b> Engineering Manufacturing Development (EMD)  <b>Description:</b> The focus of EMD will be to procure three Commercial Derivative Aircraft (CDA) and integrate the various subsystems (i.e. BMC2, Communications, Radar and ground support systems) to verify that system performance meets required capabilities. Testing will occur throughout EMD using both contractor and Government provided data through various methods that include testing in System Integration Labs (SIL), ground testing, and flight testing. Major Technical Reviews will be accomplished during EMD: Combined System Requirements Review/System Functional Review (SRFR); Preliminary Design Review (PDR); Critical Design Review (CDR); Test Readiness Reviews; Production Readiness Review (PRR), Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA).  <b>FY 2018 Plans:</b> <ul style="list-style-type: none"> <li>- Execute Milestone B Defense Acquisition Board</li> <li>- Award EMD Contract</li> <li>- Conduct Post Award Conference</li> <li>- Conduct Integrated Baseline Review (IBR)</li> <li>- Initiate long-lead Group A hardware procurement.</li> <li>- Establish (or upgrade?) government's JSTARS Recap Systems Integration Lab</li> <li>- Perform potential studies, analysis, and risk reduction activities addressing all subsystems to support current program planning/execution and future program planning.</li> </ul> <b>FY 2019 Plans:</b> <ul style="list-style-type: none"> <li>- Conduct System Requirements Review / System Functional Review (SRR / SFR)</li> <li>- Conduct Preliminary and Critical Design Reviews</li> <li>- Procure BMC2 and Communications Mission Systems and associated Group A hardware after CDR</li> <li>- Begin DT&amp;E</li> </ul> <b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> Part of EMD ramp up, the contractor will have to increase manning to support accelerated CDR potentially within a year of contract award and multiple integration activities. Concurrently, the remaining hardware and software purchases for the BMC2 and Communications subsystem, as well as any remaining hardware and software purchases for the radar and CDA		-	417.201	0.000
<b>Accomplishments/Planned Programs Subtotals</b>		113.334	417.201	0.000

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D. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
E. Acquisition Strategy 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, received Request for Proposal (RFP) release decision review Acquisition Decision Memorandum (ADM) on 7 September 2016, and commenced source selection on 2 March 2017. The MS B decision review is currently scheduled for 2QFY18, with a contract award anticipated 3-4QFY18. JSTARS Recap is comprised of a business-class CDA with integrated BMC2, radar and communication subsystems, as well as ground support systems (trainers, simulators, mission planning, etc). The Program will leverage available systems and mature technologies using Open Systems Architecture (OSA) to minimize risks during the EMD phase while lowering life cycle costs. The Program developed a Government Reference Architecture (GRA) to define 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 OTB, aimed to reduce cost throughout the system's life cycle, foster competition during the Operations and Support (O&S) acquisition phase, and allow flexibility to readily incorporate new technologies and capabilities.  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 MS A approval, the Program exercised the 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) focused on advancing radar design, assessing manufacturing readiness, and mitigating both technical and schedule risk during the EMD Phase. The Program commenced source selection on 2 March 2017. This was separate, full and open competition for the EMD phase of the Program. Contract Award is expected between 2-4QFY18 and will include the EMD effort as well as options for Low-Rate Initial Production (LRIP) and FRP Lots #1-3.  The Program will develop a total of seventeen (17) JSTARS Recap WS. The first three (3) WS produced during EMD will be instrumented to support Developmental Test and Evaluation (DT&E). After DT&E, two (2) of these instrumented WS will be reconfigured to production representative WS in support of Initial Operational Capability (IOC); the one (1) remaining WS will maintain instrumentation for testing purposes. Two (2) LRIP WS will be developed to meet the four (4) WS required for IOC. FRP will consist of three (3) production lots to procure an additional twelve (12) WS to support Full Operational Capability (FOC) by 2QFY28.		
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 2019 Air Force** **Date:** February 2018

<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0307581F / JSTARS Recap	<b>Project (Number/Name)</b> 650003 / JSTARS Recapitalization
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	37.380	-		-		-		-		-	0.000	37.380	27.380
JSTARS Recap Pre-EMD Contract #2	C/FFP	Northrop Grumman Systems Corp : Melbourne, FL	24.750	-		-		-		-		-	0.000	24.750	24.750
JSTARS Recap Pre-EMD Contract #3	C/FFP	Lockheed Martin Corp : King of Prussia, PA	24.723	-		-		-		-		-	0.000	24.723	24.723
JSTARS Recap Radar Risk Reduction Contract #1	C/CPFF	Raytheon : McKinney, TX	12.820	26.000	Oct 2016	-		-		-		-	0.000	38.820	60.465
JSTARS Recap Radar Risk Reduction Contract #2	C/CPFF	Northrop Grumman Systems Corp : Linthicum Heights, MD	12.569	42.000	Oct 2016	-		-		-		-	0.000	54.569	63.408
JSTARS Recap EMD	Various	TBD : TBD	-	-		373.600	May 2018	-		-		-	1,772.283	2,145.883	2,721.883
<b>Subtotal</b>			112.242	68.000		373.600		-		-		-	1,772.283	2,326.125	N/A

**Remarks**

EMD contract award assumption is last half of FY18 (3QFY18 used for budgetary purposes). Pre-Engineering and Manufacturing Development (EMD) contracts were 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 FY16 with follow-on efforts in FY17.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	1.467	2.070	Oct 2016	5.251	Oct 2017	-		-		-	21.716	30.504	37.020
<b>Subtotal</b>			1.467	2.070		5.251		-		-		-	21.716	30.504	N/A

**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 may be accomplished utilizing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018			
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	10.500	11.080	Oct 2016	12.100	Oct 2017	-		-		-	83.800	117.480	130.000
PASS Support (A and AS)	Various	Various : Bedford, MA	2.400	2.608	Nov 2016	5.200	Nov 2017	-		-		-	6.600	16.808	26.654
ETASS Support (A and AS)	Various	Various : Bedford, MA	2.100	2.200	Nov 2016	6.200	Nov 2017	-		-		-	6.150	16.650	24.749
PMA and additional risk reduction activities	Various	Various : Bedford, MA	41.476	27.376	Dec 2016	14.850	Oct 2017	-		-		-	17.425	101.127	86.325
Subtotal			56.476	43.264		38.350		-		-		-	113.975	252.065	N/A
Remarks															
EMD contract award assumption is last half of FY18 (3QFY18 used for budgetary purposes). Management services are required to support an aggressive schedule leading to a Critical Design Review (CDR) within one year of contract award. This will require expertise and manpower to review CDRLs, software and documentation; analyze and model performance; and identify and mitigate risks.															
Leading up to contract award, management services will support source selection and EMD preparation activities. These activities focus on ensuring operational effectiveness through Owning the Technical Baseline: modeling and simulation to understand design trade-space, establishment of a System Integration Lab (SIL) and tool development to assess Open Systems Architecture (OSA) and Open Mission Systems (OMS) compliance that ensures future affordability and agility.															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			170.185	113.334		417.201		-		-		-	1,907.974	2,608.694	N/A
Remarks															

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2019 Air Force															<b>Date:</b> February 2018				
<b>Appropriation/Budget Activity</b> 3600 / 5										<b>R-1 Program Element (Number/Name)</b> PE 0307581F / JSTARS Recap					<b>Project (Number/Name)</b> 650003 / JSTARS Recapitalization				

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
<b>JSTARS Recap</b>																												
Engineering and Manufacturing Development RFP Release (DEC 2016)																												
Radar Risk Reduction Activities																												
Milestone B																												
Contract Award																												
Engineering and Manufacturing Development																												
CDA buys/deliveries																												
Developmental Test and Evaluation																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Air Force			<b>Date:</b> February 2018
<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0307581F / JSTARS Recap	<b>Project (Number/Name)</b> 650003 / JSTARS Recapitalization	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>JSTARs Recap</b>				
Engineering and Manufacturing Development RFP Release (DEC 2016)	1	2017	1	2017
Radar Risk Reduction Activities	2	2017	1	2018
Milestone B	2	2018	2	2018
Contract Award	3	2018	4	2018
Engineering and Manufacturing Development	3	2018	4	2022
CDA buys/deliveries	3	2018	2	2022
Developmental Test and Evaluation	4	2019	4	2022