Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army											Date: May 2017	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*							
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	-	15.370	8.218	9.433	7.492	16.925	12.657	8.263	8.476	8.531	Continuing	Continuing
11A: *Advanced Payload Develop & Spt (MIP)*	-	3.589	2.830	3.241	7.492	10.733	1.279	0.172	0.175	0.000	Continuing	Continuing
11B: *Tsp Development (MIP)*	-	9.283	1.446	1.480	-	1.480	6.630	3.137	3.200	3.300	0.000	28.476
123: *Joint Technology Center System Integration*	-	2.498	3.942	4.712	-	4.712	4.748	4.954	5.101	5.231	Continuing	Continuing

Note

The Fiscal Year (FY) 2018 funding was re-aligned in accordance to Project 11B scheduled OT Event in FY19.

A. Mission Description and Budget Item Justification

Project 11A: The Advanced Payloads Development project line is a shared funding line between multiple Payload programs. These Payload programs support the Army's transformation by developing Reconnaissance, Surveillance and Target Acquisition (RSTA) and Intelligence, Surveillance and Reconnaissance (ISR) payload systems for Brigade Combat Teams, Divisions, and Corps Unmanned Aircraft Systems (UAS). This is in accordance with Headquarters Department of the Army (HQDA) and Training and Doctrine Command (TRADOC) UAS priorities. Additionally, this Program Element (PE) supports Future Advanced Payloads for Army UAS systems.

Small Tactical Radar - Lightweight (STARLite) Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI)is a lightweight, high performance, all weather, multi-functional radar system for the Gray Eagle UAS. The STARLite system provides wide area, near real time Reconnaissance, Surveillance and Target Acquisition (RSTA) capabilities. It operates throughout the UAS flight mission profile in adverse weather and through battlefield obscurants. The Synthetic Aperture Radar (SAR) mode generates quality images for the battlefield commander for detection, classification and location of stationary commercial wheeled vehicle-size targets. The MTI mode detects moving ground targets, to include man-sized detection, and provides location information and performs cross-cue with the Electro-Optic/Infrared (EO/IR) sensors. STARLite is increasing its software capabilities based on Initial Operational Test and Evaluation (IOT&E) results which will increase automation and upgrade to a common Graphical User Interface (GUI) to align with the Common Operating Environment (COE) requirement to enable Sensor Processing and Exploitation (SPE). The SPE software enhancements will improve performance, reduce operator workload and enhance operator effectiveness.

Common Sensor Payload (CSP) - Electro Optical / Infra Red / Laser Designator (EO/IR/LD) provides High Definition (HD) Full Motion Video (FMV) in both the Electro Optical and Mid Wave IR spectrums with day/night capability to collect and display continuous imagery with the ability to designate targets of interest for attack by laser guided precision weapons. It is the EO/IR/LD sensor for Gray Eagle UAS which supports force applications, battlespace awareness, force protection, and net-centric operations across the battlefield to provide wide area, near real time RSTA capabilities. Additional initiatives will continue to focus on the transition of technologies directly supporting emerging requirements and the Army's Current and Future Force. CSP is being procured for the Gray Eagle UAS program and has potential application to other platforms.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305204A *I Tactical Unmanned Aerial Vehicles*

Project 11B: The Tactical Signals Intelligence (SIGINT) Payload (TSP) is a SIGINT sensor for the Gray Eagle that detects radio frequency (RF) emitters. The TSP system will provide a SIGINT capability to the tactical commander. The TSP system will be a modular, scalable payload using an architecture that is software reconfigurable to allow for growth and flexibility as technology, and as the adversaries use of technology, changes. This flexible architecture allows for third party software applications to be integrated into the TSP system. The TSP system processing, control and data dissemination is integrated into the Distributed Common Ground System - Army (DCGS-A) via the Operational Ground Station. It supports Manned/Unmanned (MUM) teaming with Brigade Combat Team ground SIGINT Terminal Guidance (STG) teams and manned airborne assets. The TSP system improves situational awareness and shortens the targeting cycle by detecting and identifying emitters associated with high value targets (HVTs). The TSP system is capable of processing conventional signals, standard military signals, and modern signals of interest. This includes detection, recognition, identification, direction finding, and high confidence geo-location.

Project 123: The UAS Joint Technology Center/Systems Integration Laboratory (JTC/SIL) is a Joint facility that develops, integrates, and supports the enhancement of its Multiple Unified Simulation Environment (MUSE) capability for Army systems and operational concepts. The JTC/SIL conducts prototype hardware and software development, builds the UAS Institutional Mission Simulator (IMS) trainers for the Shadow, Hunter, and Gray Eagle programs, and provides modeling and simulation support. The MUSE is a real-time, operator in-the-loop simulation that may be integrated with larger simulations in support of Army and Joint training and exercises. The MUSE is also employed as a Mission Rehearsal Tool for ongoing combat operations. This project funds the management of the JTC/SIL and MUSE enhancements. This system supports the Legacy to Objective transition path of the Transformation Campaign Plan (TCP).

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	13.225	8.218	14.303	-	14.303
Current President's Budget	15.370	8.218	9.433	7.492	16.925
Total Adjustments	2.145	0.000	-4.870	7.492	2.622
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	2.145	0.000	-4.870	7.492	2.622

Change Summary Explanation

The FY2018 funding of $4,700,000 was re-aligned in accordance to Project 11B scheduled OT Event in FY19.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*	Project (Number/Name) 11A / *Advanced Payload Develop & Spt (MIP)*	

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
11A: *Advanced Payload Develop & Spt (MIP)*	-	3.589	2.830	3.241	7.492	10.733	1.279	0.172	0.175	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Payloads Development project is a shared funding line between multiple Payload programs. These Payload programs support the Army's transformation by developing Reconnaissance, Surveillance and Target Acquisition (RSTA) and Intelligence, Surveillance and Reconnaissance (ISR) payload systems for Brigade Combat Teams, Divisions, and Corps Unmanned Aircraft Systems (UAS). This is in accordance with Headquarters Department of the Army (HQDA) and Training and Doctrine Command (TRADOC) UAS priorities. Additionally, this Program Element (PE) supports Future Advanced Payloads for Army UAS systems.

Small Tactical Radar - Lightweight (STARLite) ACAT III - Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI) is a lightweight, high performance, all weather, multi-functional radar system for the Gray Eagle UAS. The STARLite system provides wide area, near real time RSTA capabilities. It operates throughout the UAS flight mission profile in adverse weather and through battlefield obscurants. The Synthetic Aperture Radar (SAR) mode generates quality images for the battlefield commander for detection, classification and location of stationary commercial wheeled vehicle-size targets. The MTI mode detects moving ground targets, to include man-sized detection, and provides location information and performs cross-cue with the Electro-Optic/Infrared (EO/IR) sensors. STARLite is increasing its software capabilities based on Initial Operational Test and Evaluation (IOT&E) results which will increase automation and upgrade to a common Graphical User Interface (GUI) to align with the Common Operating Environment (COE) requirement to enable Sensor Processing and Exploitation (SPE). The SPE software enhancements will improve performance, reduce operator workload and enhance operator effectiveness.

Common Sensor Payload (CSP)- ACAT III - Electro Optical / Infra-Red / Laser Designator (EO/IR/LD) provides Standard Definition (SD) (or High Definition (HD)as an upgrade.) Full Motion Video (FMV) in both the Electro Optical and Mid Wave IR spectrums with day/night capability to collect and display continuous imagery with the ability to designate targets of interest for attack by laser guided precision weapons. It is the EO/IR/LD sensor for Gray Eagle UAS which supports intelligence gathering, force applications, battlespace awareness, force protection, and net-centric operations across the battlefield to provide wide area, near real time RSTA capabilities. Additional initiatives will continue to focus on the transition of technologies directly supporting emerging requirements and the Army's Current and Future Force. CSP is being procured for the Gray Eagle UAS program and has potential application to other platforms. Additional updates to enhance the CSP’s usability for the Warfighter are to begin develop the CSP as a metric sensor providing rapid and enhanced Target Location Accuracy (TLA) and reduce cognitive burden by providing improved situational awareness, while providing multiple fields of view in a simplified manner through Hardware (H/W) and Software (S/W) improvements

Fiscal Year (FY) 2018 base dollars in the amount of $3.241 million is for STARLite SPE Software integration onto Gray Eagle and enhanced CSP to reduce cognitive burden on the Warfighter. FY 2018 OCO development dollars in the amount of $7.492 million is for beginning the development of the CSP as a metric sensor to provide rapid and enhanced TLA for the Warfighter.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 11A / *Advanced Payload Develop & Spt (MIP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: STARLite SPE ***Description:*** Software Development to improve STARLite SPE Development, Testing and Integration. ***FY 2016 Accomplishments:*** Continued Software Development for STARLite SPE ***FY 2017 Plans:*** Complete test and integration of SPE Software improvements onto Gray Eagle ***FY 2018 Base Plans:*** Complete test and integration of SPE (v.500) Software improvements onto Gray Eagle	1.795	1.415	1.620	-	1.620
Title: CSP Increased Usability ***Description:*** S/W development to increase the usability of the CSP. Development to increase the usability of the CSP while reducing cognitive burden on the Warfighter. ***FY 2016 Accomplishments:*** S/W development to increase the usability of the CSP. ***FY 2017 Plans:*** H/W and S/W enhancements to reduce cognitive burden on the Warfighter and program office management support ***FY 2018 Base Plans:*** H/W and S/W enhancements to reduce cognitive burden on the Warfighter and program office management support. ***FY 2018 OCO Plans:*** Develop the CSP as a metric sensor enabling rapid and enhanced Target Location Accuracy (TLA) and program office management support.	1.794	1.415	1.621	7.492	9.113
Accomplishments/Planned Programs Subtotals	3.589	2.830	3.241	7.492	10.733

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 11A / *Advanced Payload Develop & Spt (MIP)*

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• A00020: *MQ-1 PAYLOAD - UAS - A00020*	-	-	-	-	-	-	-	-	-		
• A01003: *SAR/MTI (MIP) - A01003*	30.220	27.324	0.000	15.300	15.300	-	-	-	-	Continuing	Continuing
• A01005: *CSP FMV (MIP) - A01005*	68.472	26.729	4.410	22.400	26.810	-	-	-	-	Continuing	Continuing

Remarks

MQ-1 PAYLOAD - UAS - A00020 was a shared Aircraft Procurement, Army (APA) funding line for CSP, STARLite and Tactical Signals Intelligence (SIGINT) Payload (TSP).
STARLite (A01003), and CSP (A01005) are broken into individual lines within MQ-1Payload (MIP) (A01001).
SAR/MTI (MIP) - A01003: Procurement funding line for STARLite
CSP FMV (MIP) - A01005: Procurement funding line for CSP

D. Acquisition Strategy

STARLite SAR/MTI is a threshold requirement for the Gray Eagle UAS. The acquisition strategy for STARLite program was based on a full and open competition for the Army. Full Rate Production (FRP) was successfully achieved in June 2013. A follow-on production contract was awarded in April 2014 to procure all remaining STARLite Payloads required for the Gray Eagle platform. Based on Initial Operational test and Evaluation (IOT&E) results, STARLite is increasing its software capabilities to increase automation and upgrade to a common Graphical User Interface (GUI) and aligns SPE with the COE requirements. The SPE software enhancements will improve performance, reduce operator workload and enhance operator effectiveness. A competitive Research, Development, Test, and Evaluation (RDTE) funded contract was awarded to Northrop Grumman in October 2013 to perform trade studies and begin the development of the software improvements. Integration onto the Gray Eagle will be done via a sole source cost-plus fixed fee contract with the UAS prime contractor, General Atomics ASI.

Common Sensor Payload (CSP) EO/IR/LD enables the Gray Eagle to meet a KPP (Key Performance Parameter) requirement. The acquisition strategy for the CSP program was based on a full and open competition for the Army. A competitive contract was awarded in Nov 2007 to Raytheon for the build, integration, test and delivery of the CSP. Full Rate Production (FRP) was completed June 2013. A three (3) year system support contract was awarded in July 2015 for sustainment and upgrade of the CSP to include retrofitting standard definition sensors with high definition sensors and to perform RDT&E activities. The Enhanced EO/IR Capability Production Document, projected for approval in 1QFY17, defines additional KPP requirements for Full Motion Video (FMV) sensors. The first KPP increases detection, recognition, and identification requirements which can only be met with the High Definition (HD) variation of the CSP. Currently, select units have been fielded HD CSPs, with additional HD CSPs in production and retrofit. The second KPP requirement is for the CSP to be a metric sensor with rapid and enhanced Target Location Accuracy (TLA). The acquisition strategy for CSP in FY 2018 is to mature Software and Hardware efforts for CSP to reduce cognitive burdens on the Warfighter and begin to develop the CSP as a metric sensor providing rapid and enhanced TLA and through a sole source cost-plus-fixed-fee contract to Raytheon.

The acquisition strategy is to complete STARLite SPE software developmental test and integration onto Gray Eagle; begin development of the CSP as a metric sensor enabling rapid and enhanced Target Location Accuracy (TLA); and Non-Recurring Engineering (NRE) support to the Night Vision and Electronic Sensors Directorate

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 11A / *Advanced Payload Develop & Spt (MIP)*

(NVESD) to continue enhancing CSP's usability for the Warfighter to reduce cognitive burden by providing improved situational awareness, while providing multiple fields of view in a simplified manner through Hardware (H/W) and S/W improvements.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*	Project (Number/Name) 11A / *Advanced Payload Develop & Spt (MIP)*	

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
TSP Program Management	Various	PM ARES : Aberdeen, MD	11.255	-		-		-		-		-	0.000	11.255	0.000
CSP/STARLite Program Management	Various	PM RUS : Aberdeen, MD	8.524	-		-		-		-		-	0.000	8.524	0.000
CSP Program Management	MIPR	PM EOIR : Fort Belvoir, VA	0.000	0.090		0.100		0.108	Dec 2017	0.524	Dec 2017	0.632	Continuing	Continuing	Continuing
STARLite Program Mgmt Personnel	Various	PM SAI : Aberdeen, MD	1.000	-		0.150		0.617	Jan 2018	-		0.617	Continuing	Continuing	Continuing
		Subtotal	20.779	0.090		0.250		0.725		0.524		1.249	-	-	-

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
CSP Development	C/CPFF	Raytheon : McKinney, TX	84.022	-		-		-		-		-	0	84.022	0
STARLite SPE Software Integration onto Gray Eagle\Improved Gray Eagle	SS/CPFF	General Atomics ASI : Potway, CA	0.000	1.295		1.265		1.003	Jun 2018	-		1.003	Continuing	Continuing	Continuing
CSP HW/SW Improvements Reduce Cognitive Burden	MIPR	Night Vision Labs : Fort Belvoir, VA	0.000	1.704		1.115		1.202	Mar 2018	-		1.202	Continuing	Continuing	Continuing
CSP Target Location Accuracy (TLA)	SS/CPFF	Raytheon : McKinney, TX	0.000	-		-		0.000		6.187	Jan 2018	6.187	Continuing	Continuing	Continuing
		Subtotal	84.022	2.999		2.380		2.205		6.187		8.392	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*	Project (Number/Name) 11A / *Advanced Payload Develop & Spt (MIP)*	

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
CSP TLA Integration (NRE)	SS/CPFF	PM MAE(General Automics) : San Diego, CA	0.000	-		-		0.000		0.781	Mar 2018	0.781	Continuing	Continuing	Continuing
		Subtotal	0.000	-		-		0.000		0.781		0.781	-	-	-

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
CSP Testing	MIPR	Various : Various	17.086	-		-		-		-		-	0.000	17.086	0.000
CSP HW/SW Improvements Reduce Cognitive Burden	MIPR	Night Vision Labs : Fort Belvoir, VA	0.000	-		0.200		0.311	Mar 2018	-		0.311	Continuing	Continuing	Continuing
STARLite YTC Software Development Testing	MIPR	YPG : Yuma Proving Ground	0.000	0.500		-		-		-		-	Continuing	Continuing	Continuing
STARLite IGE Testing	MIPR	Various : Various	13.441	-		-		-		-		-	0.000	13.441	0.000
		Subtotal	30.527	0.500		0.200		0.311		-		0.311	-	-	-

	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	135.328	3.589		2.830		3.241		7.492		10.733	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 11A / *Advanced Payload Develop & Spt (MIP)*

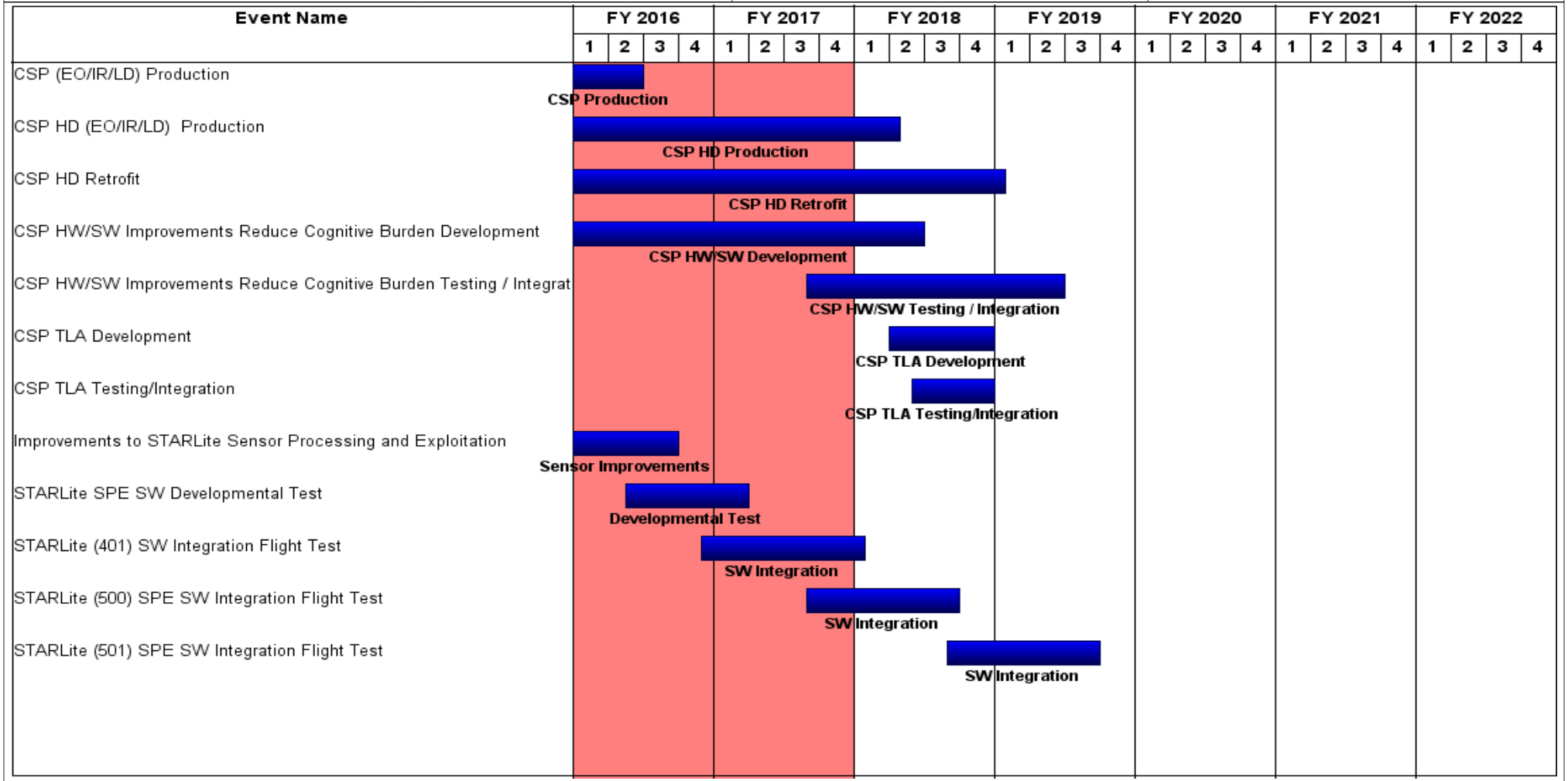

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 11A / *Advanced Payload Develop & Spt (MIP)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CSP (EO/IR/LD) Production	1	2008	2	2016
CSP HD (EO/IR/LD) Production	2	2013	2	2018
CSP HD Retrofit	4	2013	1	2019
CSP HW/SW Improvements Reduce Cognitive Burden Development	1	2016	2	2018
CSP HW/SW Improvements Reduce Cognitive Burden Testing / Integration	3	2017	2	2019
CSP TLA Development	2	2018	4	2018
CSP TLA Testing/Integration	2	2018	4	2018
Improvements to STARLite Sensor Processing and Exploitation	1	2014	3	2016
STARLite SPE SW Developmental Test	2	2016	1	2017
STARLite (401) SW Integration Flight Test	4	2016	1	2018
STARLite (500) SPE SW Integration Flight Test	3	2017	3	2018
STARLite (501) SPE SW Integration Flight Test	3	2018	3	2019

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*	Project (Number/Name) 11B / *Tsp Development (MIP)*	

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
11B: *Tsp Development (MIP)*	-	9.283	1.446	1.480	-	1.480	6.630	3.137	3.200	3.300	0.000	28.476
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Tactical Signals Intelligence (SIGINT) Payload (TSP) is a SIGINT sensor for the Gray Eagle that detects radio frequency (RF) emitters. The TSP system will provide a SIGINT capability to the tactical commander. The TSP system will be a modular, scalable payload using an architecture that is software reconfigured to allow for growth and flexibility as technology, and as the adversaries use of technology, changes. This flexible architecture allows for third party software applications to be integrated into the TSP system. The TSP system processing, control and data dissemination is integrated into the Distributed Common Ground System - Army (DCGS-A) via the Operational Ground Station. It supports Manned/Unmanned (MUM) teaming with Brigade Combat Team ground SIGINT Terminal Guidance (STG) teams and manned airborne assets. The TSP system improves situational awareness and shortens the targeting cycle by detecting and identifying emitters associated with high value targets (HVTs). The TSP system is capable of processing conventional signals, standard military signals, and modern signals of interest. This includes detection, recognition, identification, direction finding, and high confidence geo-location.

Fiscal Year (FY) 2018 Base funding in the amount of $1.480 million will be used to complete engineering corrective actions and regression testing from DT/LUT testing and preparations for TSP Block 2.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Low Rate Initial Production (LRIP) Research and Development (R&D) Support.	9.283	1.446	1.480	-	1.480
Description: Low Rate Initial Production (LRIP) R&D: Logistics, Training, Testing and corrective action engineering support and test activities for TSP for ongoing system improvements.					
FY 2016 Accomplishments: Continued Testing of TSP Block 1 LRIP. Continued improvements of system performance on a continuous basis. Executed CFQT/PQT#2, Phase I IOT&E with required MQ-1C. Preparation being made for Urgent Material Release approval, and First Unit Equipped. Executed Initiate the Interim Contractor Logistics Support (ICLS) contract.					
FY 2017 Plans: Continues TSP Block 1 LRIP, support TSP integration into Improved Gray Eagle (IGE). Preparations to retest TSP system fixes from PQT#2 and Phase I IOT&E with scheduled DT/LUT Testing Event June 2017. Continue support of TSP Interim Contractor Logistics Support (ICLS).					
FY 2018 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 11B / *Tsp Development (MIP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Executed corrective engineering actions resulting from DT/LUT Testing Event. Initiate the required development work for TSP Beyond Block 1 for Future upgrades. Continue support of TSP Interim Contractor Logistics Support (ICLS).					
Accomplishments/Planned Programs Subtotals	9.283	1.446	1.480	-	1.480

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• A00020: *A00020 - MQ-1 Payload (MIP)*	-	-	-	-	-	-	-	-	-	0.000	0.000
• A01004: *A01004 - SIGINT (MIP)*	49.661	37.682	1.500	-	1.500	3.397	3.460	3.406	3.474	0	102.580
• 0605766A: *TSP Theater Net-Centric Geolocation (TNG) - PE0605766A, Project DX9: TNG funding included in Tactical Exploitation of National Capabilities (TENCAP) funding line.*	-	-	-	-	-	1.000	1.800	1.000	-	1.000	4.800

Remarks

MQ-1 PAYLOAD - UAS - A00020: Shared Aircraft Procurement, Army (APA) procurement funding line for CSP, STARLite, TSP, and Advanced Payloads.

SIGINT (MIP) - A01004: Procurement funding line for TSP Payloads. Under Parent Line MQ-1 Payloads (MIP) - A01001.

TSP Theater Net-Centric Geolocation (TNG) - PE0605766A, Project DX9: TNG funding included in Tactical Exploitation of National Capabilities (TENCAP) funding line.

D. Acquisition Strategy

TSP is a threshold requirement for the MQ-1C Gray Eagle UAS. The TSP program completed the Engineering and Manufacturing Development (EMD) phase with a Milestone B decision in September 2011. The TSP Program EMD contract award was based on full-and-open competition with a period of performance that was completed in October 2015, and focused on integration and test onto the Gray Eagle platform, and integration and test of TSP software into the Operational Ground Station. The TSP EMD program is a derivative of systems that were fielded as a Quick Reaction Capability on the MQ-1C UAS and a variety of other manned platforms. The demonstrated scalability of these fielded materiel solutions allows the TSP EMD program to leverage effort that directly supports the TSP EMD program.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 11B / *Tsp Development (MIP)*

The TSP program entered the Low Rate Initial Production (LRIP) phase with a Milestone C decision that was approved on 2 May 2014. The TSP Program LRIP contract award was based on sole source selection with a period of performance that was completed on June 2016, and primarily focused on the obsolescence of the EMD phase assets via the required Engineering Change Proposals, and the first initial production of 30 TSP Payloads in support of the Gray Eagle Platform.

The TSP Block 1 is the current Program of Record capability. TSP Beyond Block 1 will address objectives and remaining deferred Block 1 threshold requirements as reflected in the approved Capability Production Document (CPD).

Improved Gray Eagle (IGE)- Program Manager Unmanned Aircraft Systems(PM UAS)received a Congressional plus up of $49M President's Budget15(PB15) to procure Extended Range UAS which increases the CPD objective endurance requirements for the current GE configuration to an Improved Gray Eagle (IGE). TSP is scheduled for integration and testing on the IGE platform upon completion of the platform's Follow on Test Evaluation#2 scheduled 1QFY18.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*	Project (Number/Name) 123 / *Joint Technology Center System Integration*	

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
123: *Joint Technology Center System Integration*	-	2.498	3.942	4.712	-	4.712	4.748	4.954	5.101	5.231	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Unmanned Aircraft System (UAS) Joint Technology Center/System Integration Laboratory (JTC/SIL) is a Joint facility that develops, integrates, and supports the enhancement of its Multiple Unified Simulation Environment (MUSE) capability for Army systems and operational concepts. The JTC/SIL conducts prototype hardware and software development, builds the UAS Institutional Mission Simulator (IMS) trainers for the Shadow, Hunter, and Gray Eagle programs, and provides modeling and simulation support. The MUSE is a real-time, operator in-the-loop simulation that may be integrated with larger simulations in support of Army and Joint training exercises. The MUSE is also employed as a Mission Rehearsal Tool for ongoing combat operations. This project funds the management of the JTC/SIL and MUSE enhancements.

This system supports the Legacy to Objective transition path of the Transformation Campaign Plan (TCP).

Continued integration of Night Vision Image Generator (NVIG) into the Modeling & Simulation domain as it pertains to UAS simulation. Terrain, and model development for NVIG and Virtual Reality Scene Generator (VRSG) to increase fidelity. Support of theater level Exercises, Ulchi Freedom Guardian (UFG), Yama Sakura (YS) and Key Resolve (KR). Improvement of mapping capability for mission planning. Redesign of Windows Entity Server (WES) and NetLink to improve network routing, thus lessening bandwidth consumption. Incorporation of Common Image Generator Interface to provide an Image Generator (IG) agnostic solution thereby allowing for other IGs to be supported that are currently not supported. Continued implementation of tactical protocols into the simulation domain to enhance interoperability. Development of a Heads Up Display (HUD) designer application that will allow for the creation and modification of HUDs without having to touch the software baseline thereby reducing costs and increasing fidelity and speed of solution in theater. Redesign of generic 6 Degree of Freedom (DoF) application that will allow for creation of new platforms without touching code; again a reduction in costs and increased solution delivery speed.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Product Development	2.298	3.611	4.212	-	4.212
Description: Funding is provided for the following efforts. ***FY 2016 Accomplishments:*** Redesign Vignette Planning and Rehersal Software (ViPRS) by implementing a Service Oriented Architecture (SOA) to facilitate external users developing generic solutions without Joint Technology Center System Integration Laboratory (JSIL) assistance and to optimize the software baseline to keep up with training					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 123 / *Joint Technology Center System Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
audience requirements, thereby reducing the costs of travel and training. Redesign MUSE/ Air Force Synthetic Environment for regognizance and Surveillance (AFSERS) U2/GlobalHawk, Tactical Exploitation of National Capabilities (TENCAP), to meet the growing demands of the war fighter training audience and to optimize User Interface for ease of use, which will reduce training costs and the need for JSIL personnel to attend every event. Design and implement a Heads Up Display (HUD) capability for the UAS platforms that MUSE/ AFSERS simulates. This will reduce costs since HUD modifications will be able to be modified without having to implement code changes. Continued examination of all Graphical User Interfaces (GUIs) to ensure maximum usability for the war fighter. ***FY 2017 Plans:*** Re-design and implementation of Windows Entity Server (WES) and NetLink to maintain pace with ever expanding Military Exercises. Continued integration with Night Vision Electronics & Sensors Directorate's (NVEDS's), Night Vision Imagery Generator (NVIG). Implementation of a Weather server that will facilitate the injection of weather, into the modeling and simulation domain, for Military Exercises. 4586 tech insertion into MUSE for Command & Control (C2) to facilitate the testing of data feeds prior to using the C2 feed on the live asset. 4609 technical insertion into MUSE for video with embedded Key Line Value (KLV) to be compliant with standard video feeds and to work with US ally standard video feeds. ***FY 2018 Base Plans:*** Continued integration of Night Vision Image Generator (NVIG) into the Modeling & Simulation domain as it pertains to UAS simulation. Terrain, and model development for NVIG and Virtual Reality Scene Generator (VRSG) to increase fidelity. Support of theater level Exercises, Ulchi Freedom Guardian (UFG), Yama Sakura (YS) and Key Resolve (KR). Improvement of mapping capability for mission planning. Redesign of Windows Entity Server (WES) and NetLink to improve network routing, thus lessening bandwidth consumption. Incorporation of Common Image Generator Interface to provide an Image Generator (IG) agnostic solution thereby allowing for other IGs to be supported that are currently not supported. Continued implementation of tactical protocols into the simulation domain to enhance interoperability. Development of a Heads Up Display (HUD) designer application that will allow for the creation and modification of HUDs without having to touch the software baseline thereby reducing costs and increasing fidelity and speed of solution in theater. Redesign of generic 6 Degree of Freedom (DoF) application that will allow for creation of new platforms without touching code; again a reduction in costs and increased solution delivery speed.					
Title: Management Services ***Description:*** Funding is provided for the following efforts.	0.200	0.331	0.500	-	0.500

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 123 / *Joint Technology Center System Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2016 Accomplishments: Continue coordination and oversight of MUSE product development. ***FY 2017 Plans:*** Continue coordination and oversight of MUSE product development. ***FY 2018 Base Plans:*** Continue coordination and oversight of MUSE product development.					
Accomplishments/Planned Programs Subtotals	2.498	3.942	4.712	-	4.712

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• PE 0305206F Air Force: *PE 0305206F Air Force*	3.475	3.841	3.419	-	3.419	3.479	3.544	3.607	3.672	Continuing	Continuing

Remarks

The JTC/SIL and the MUSE receive funding from the Air Force. This effort is a continuing effort in support of Service UAS programs.

D. Acquisition Strategy

Continued MUSE development will be accomplished through a combination of Government in-house functional directorate support using a variety of existing contract vehicles.

E. Performance Metrics

N/A