Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
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 1206427F / *Space Systems Prototype Transitions (SSPT)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	142.045	0.000	142.045	142.855	100.265	77.584	76.065	Continuing	Continuing
645601: *Space System Prototype Transition*	-	0.000	0.000	142.045	0.000	142.045	142.855	100.265	77.584	76.065	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Note: This program, BA 04 PE 1206427F, project 645601, Space System Prototype Transition projects were previously funded in the Space Control Technology, PE 1206438F, Space Rapid Capabilities Office (SpRCO), PE 1206857F and Evolved Expendable Launch Vehicle (EELV) PE 1206853F.

A. Mission Description and Budget Item Justification

The Space System Prototype Transition (SSPT) Program will identify and address space technology and capability gaps in order to facilitate technology transition to military space prototypes and programs of record. It will conduct a wide array of activities to model, integrate, test, and provide launch integration and support on-orbit testing of prototype technologies. The supported activities include: systems engineering, technology planning, development, demonstrations and testing, as well as modeling, simulations and exercises to support the development and maturation of tactics and procedures. This includes the development and prototyping of critical technology within the Department of Defense, across other government agencies, academic institutions and industry partners that are identified and the necessary systems engineering to effectively employ such systems.

Specifically the SSPT project will include a cost-effective framework to identify, mature and transition demonstrations and prototypes to:

- Rapidly address identified technology or capability gaps
- Accelerate the maturation of systems intended demonstration/prototype that enhances/augment/compliment/replace an existing capability
- Support a more reliable, available, maintainable and survivable military space enterprise
- Energize the space industrial base supporting U.S. national security
- Focus S&T Innovation and facilitate its transition to military space programs of record

Space acquisition must respond with speed and agility to emerging adversary threats. Space & Missile Systems Center (SMC) is transforming the organization and implementation of space acquisition to an enterprise approach, maximizing innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SMC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver SSPT capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392F and 1206398F.

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Reduce 1 Payload Adapter Long Duration Propulsive ESPA (LDPE) saved $27.1M in FY 2020. Reduce 1 LDPE Description: Identified reduced requirement in core LDPE hardware items in FY 2020; decreases from two to one LDPE hardware items with minimal impact to the program. Funds redirected to support rapid prototype development and deployment.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This effort 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	142.045	0.000	142.045
Total Adjustments	0.000	0.000	142.045	0.000	142.045
• 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	142.045	0.000	142.045

Change Summary Explanation

FY 2020: Transfers $142.045M into new Program Element (PE) to consolidate funding of plans, development, field, test and transition of space system prototype technologies for increased efficiency and transparency.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Technology Maturation and Prototype Development	0.000	0.000	113.895
Description: Plan, develop, test and transition advanced technologies into space system prototypes and capabilities to meet known and emerging threats. Conduct architecture studies, modeling and simulation, technical development, integration and test activities in preparation for transition of critical technologies into prototypes or space programs of record. Develop advanced capabilities for rapid prototyping and integration into space system programs of record and, if requested, to warfighter Urgent			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
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 1206427F / *Space Systems Prototype Transitions (SSPT)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Operational Needs (UONs) and Joint Urgent Operational Needs (JUONs). Capitalize on rideshare opportunities and excess booster lift capacity to enable technology demonstrations and prototype experimental operations. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** Continue prototype/technology developments across multiple mission areas, including but not limited to: - Long Duration Propulsive (Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adaptor (ESPA)) (LDPE): Complete and deliver LDPE-2 and begin design, assembly, and integration and testing of LDPE-3 to support on-orbit technology demonstrations and prototypes. - Tetra: Continue development of Tetra-2 and -3 prototypes. Develop Tetra-4 micro-satellite to support experimentation and Tactics, Techniques and Procedure (TTP) development at Geostationary Earth Orbit (GEO). - Blackjack: Continue technical analysis, design, development, test, integration and delivery of prototype, cyber, ground and data processing architecture as well as develop concepts of operations to support Command and Control (C2) system integration. - Quasi-Zenith Satellite System (QZSS)- Hosted Payload (HP) development (International Cooperation): Continue design, development, build and test of the Hosted Payload Interface Unit and Space Situational Awareness (SSA) sensor for integration into a single payload intended for hosting on Japanese QZSS-HP. - Continue engineering of the XVI communications sensor prototype that will be used to develop concepts of operations to support Command and Control (C2) system integration. Air Force Research Laboratory's (AFRL) and SMC/AD's co-developed Sensor XVI prototype is a path-agnostic communications sensor for tactical fighters from Low Earth Orbit (LEO). Continue on orbit operations and data analysis. - Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $113.895M. Justification for this increase is described in plans above.			
Title: Prototype Integration, Test and On-Orbit Prototype Demonstration ***Description:*** Provide rideshare opportunities for prototypes and experiments, fund mission-unique payload integration to the rideshare or launch system, and conduct launch base integration, testing and launch operations. Conduct prototype integration and testing into the designated Command and Control system and provide operational support to conduct prototype testing, demonstration and operations. ***FY 2019 Plans:***	0.000	0.000	28.150

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
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C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
N/A ***FY 2020 Plans:*** Provide launch services, mission-unique payload integration, testing and launch operations for prototypes and experiments, to include but not limited to: - LDPE-2: Provide systems and subsystems level baselines, architecture and integration planning and support for LDPE -2 payload providers and pre-launch readiness reviews and support. - Tetra-2: Provide payload integration and testing support for Tetra-2. - Prototype experimental operations in support of LDPE-2 and Tetra-2 - Blackjack: Conduct technical reviews, integration and testing of prototypes with launch vehicle in support of launch and on-orbit demonstrations. - AFRL Sensor XVI continue Assembly Integration and Test (AI&T) and launch integration. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $28.150M. Justification for this increase is described in plans above.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	142.045

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

All contracts funded in this program element will be awarded using competitive procedures to the maximum extent possible. The SSPT program consists of numerous small projects in which the program office will leverage rapid prototyping authorities to the maximum extent possible.

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: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206427F / *Space Systems Prototype Transitions (SSPT)*	**Project (Number/Name)** 645601 / *Space System Prototype Transition*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TETRA-2 Integration & On-Orbit Prototype Demonstration	TBD	Various : Various	-	0.000		0.000		2.350	Nov 2019	-		2.350	Continuing	Continuing	-
TETRA 3 & 4 Development	C/FFP	TBD : TBD	-	0.000		0.000		11.660	Nov 2019	-		11.660	Continuing	Continuing	-
Sensor XVI	TBD	TBD : TBD	-	0.000		0.000		1.150	Jan 2020	-		1.150	Continuing	Continuing	-
LDPE-2 Launch Vehicle Integration & Ops	TBD	Northrop Grumman Info Sys : Dulles, VA	-	0.000		0.000		11.000	Nov 2019	-		11.000	Continuing	Continuing	-
LDPE-3 Development	C/CPFF	Northrop Grumman Info Sys : Dulles, VA	-	0.000		0.000		31.694	Apr 2020	-		31.694	Continuing	Continuing	-
Blackjack Development	MIPR	Various : Various	-	0.000		0.000		55.000	Nov 2019	-		55.000	Continuing	Continuing	-
QZSS-HP Development	Various	Various : Various	-	0.000		0.000		20.369	Nov 2019	-		20.369	Continuing	Continuing	-
Enterprise SE&I	TBD	Various : TBD	-	0.000		0.000		2.540	Dec 2019	-		2.540	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		135.763		-		135.763	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	MIPR	Various : Various	-	0.000		0.000		3.600	Jan 2020	-		3.600	Continuing	Continuing	-
A&AS	Various	Various : Various	-	-		-		2.342	Feb 2020	-		2.342	Continuing	Continuing	-
Other Support	Various	Various : El Segundo, CA	-	0.000		0.000		0.340	Oct 2019	-		0.340	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		6.282		-		6.282	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		0.000		142.045		-		142.045	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206427F / *Space Systems Prototype Transitions (SSPT)*	**Project (Number/Name)** 645601 / *Space System Prototype Transition*

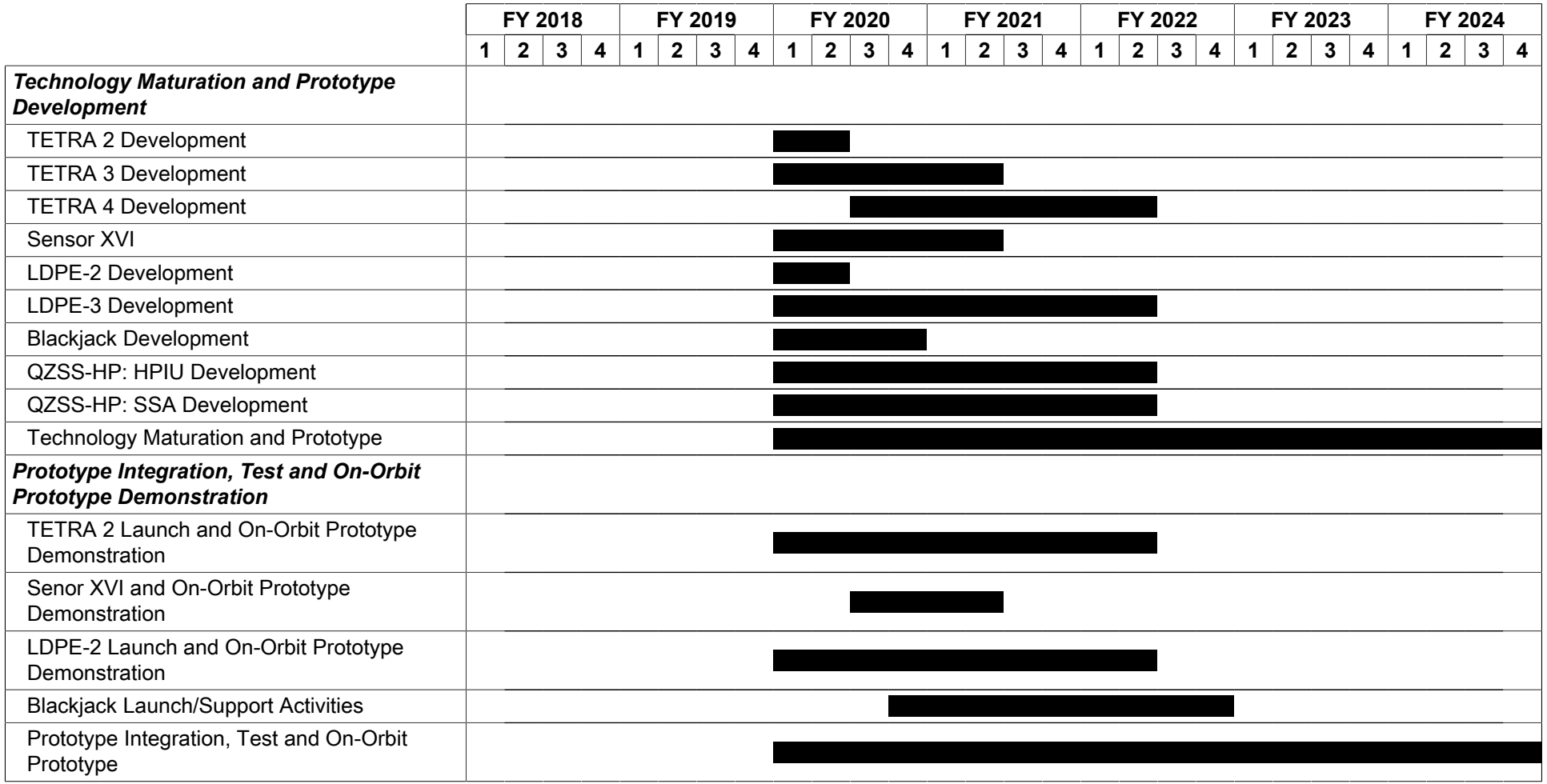

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206427F / *Space Systems Prototype Transitions (SSPT)*	**Project (Number/Name)** 645601 / *Space System Prototype Transition*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Technology Maturation and Prototype Development				
TETRA 2 Development	1	2020	2	2020
TETRA 3 Development	1	2020	2	2021
TETRA 4 Development	3	2020	2	2022
Sensor XVI	1	2020	2	2021
LDPE-2 Development	1	2020	2	2020
LDPE-3 Development	1	2020	2	2022
Blackjack Development	1	2020	4	2020
QZSS-HP: HPIU Development	1	2020	2	2022
QZSS-HP: SSA Development	1	2020	2	2022
Technology Maturation and Prototype	1	2020	4	2024
Prototype Integration, Test and On-Orbit Prototype Demonstration				
TETRA 2 Launch and On-Orbit Prototype Demonstration	1	2020	2	2022
Senor XVI and On-Orbit Prototype Demonstration	3	2020	2	2021
LDPE-2 Launch and On-Orbit Prototype Demonstration	1	2020	2	2022
Blackjack Launch/Support Activities	4	2020	4	2022
Prototype Integration, Test and On-Orbit Prototype	1	2020	4	2024

Note

This program was previously funded from the Space Control Technology, PE 1206438F, Space Rapid Capabilities Office (SpRCO), PE 1206857F and Evolved Expendable Launch Vehicle (EELV) PE 1206853F.