

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force **Date:** February 2019

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0604858F / <i>Tech Transition Program</i>							
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	-	1,079.458	167.277	128.476	26.450	154.926	280.495	259.521	158.734	75.159	Continuing	Continuing
645350: <i>Experimentation</i>	-	202.419	86.820	81.798	0.000	81.798	81.671	83.370	84.889	75.159	Continuing	Continuing
645351: <i>Prototyping</i>	-	877.039	80.457	46.678	26.450	73.128	198.824	176.151	73.845	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Tech Transition Program provides funding to demonstrate, prototype, and experiment with technologies and concepts to enable or accelerate their transition to acquisition programs and/or operational use. The Technology Transition Program addresses the gap between initial technology or concept development and demonstration, and successful acquisition and operational capability implementation. Experimentation explores new concepts and their applications in potential future operating environments within a system-of-systems context. Prototyping enables integration and demonstration of emerging technologies to quickly move them into warfighting capability. The Tech Transition Program allows acquisition program managers (the capability developers) and warfighters (the capability recipients and end users) to prototype, integrate, and demonstrate candidate technologies and assess them in an operational environment in partnership with Program Executive Officers, schoolhouses, simulation facilities, and development planning organizations.

In FY 2019, the following efforts were transferred from PE 0604858F, Tech Transition Program: Advanced Engine Transition Program to PE 0604004F, Advanced Engine Development, Project 643608, Advanced Engine Development; Hypersonics Prototyping to PE 0604033F, Hypersonics Prototyping, Project 643885, Hypersonic Conventional Strike Weapon, and Project 643882, Air-Launched Rapid Response Weapon; and Directed Energy Prototyping to PE 0604032F, Directed Energy Prototyping, Project 640200, Directed Energy Prototyping. These transfers were Congressionally directed in the Department of Defense Appropriations Act of 2019 for greater transparency of Air Force prototyping activities.

In addition, this program element may include necessary civilian pay expenses required to manage, execute, and deliver 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, 0605898F, and 0605833F.

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.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force				Date: February 2019	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0604858F I Tech Transition Program			
B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	840.650	1,186.075	923.367	0.000	923.367
Current President's Budget	1,079.458	167.277	128.476	26.450	154.926
Total Adjustments	238.808	-1,018.798	-794.891	26.450	-768.441
• Congressional General Reductions	-0.241	-0.385			
• Congressional Directed Reductions	-15.867	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	226.000	30.000			
• Congressional Directed Transfers	0.000	-1,048.413			
• Reprogrammings	66.659	0.000			
• SBIR/STTR Transfer	-37.743	0.000			
• Other Adjustments	0.000	0.000	-794.891	26.450	-768.441
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 645350: Experimentation				FY 2018	FY 2019
Congressional Add: Program Increase - Light Attack Experimentation				96.706	0.000
Congressional Add Subtotals for Project: 645350				96.706	0.000
Project: 645351: Prototyping					
Congressional Add: Program Increase - Competitively Awarded Technology Transition				9.638	0.000
Congressional Add: Program Increase - Directed Energy Prototyping				67.464	0.000
Congressional Add: Program Increase - Logistics Technologies				9.156	0.000
Congressional Add: Program Increase - Alternative Energy Research				5.783	5.000
Congressional Add: Program Increase - Assured Positioning Navigation and Timing (PNT)				28.913	0.000
Congressional Add: Program Increase - Laser Coating Removal Technology				0.000	10.000
Congressional Add: Program Increase - Health and Logistics Management Technology				0.000	5.000
Congressional Add: Program Increase - Competitively Awarded Technology Transition Initiatives				0.000	10.000
Congressional Add Subtotals for Project: 645351				120.954	30.000
Congressional Add Totals for all Projects				217.660	30.000

UNCLASSIFIED

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 I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604858F I Tech Transition Program	
<p>Change Summary Explanation</p> <p>Decrease in FY 2018 of \$15.867 million due to Congressional directed reduction in the Consolidated Appropriation Act of 2018 for unjustified growth in experimentation campaigns.</p> <p>Increase in FY 2018 of \$66.659 million due to reprogrammings for Hypersonics Prototyping and Multi-Domain Command and Control (MDC2) experimentation.</p> <p>Decrease in FY 2019 of \$1,048.413 million due to the Congressional directed transfer of Advanced Engine Development (Advanced Engine Transition Program (AETP)), Hypersonics Prototyping, and Directed Energy Prototyping into separate program elements.</p> <p>Decrease in FY 2020 base funding of \$789.927 million due to Congressional directed transfer of Advanced Engine Development (AETP), Hypersonics Prototyping, and Directed Energy Prototyping into separate program elements.</p> <p>FY 2020 includes \$26.450 million of OCO.</p>		

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0604858F / Tech Transition Program				Project (Number/Name) 645350 / Experimentation			
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
645350: Experimentation	-	202.419	86.820	81.798	0.000	81.798	81.671	83.370	84.889	75.159	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Experimentation project funds experimentation campaigns to explore new concepts and their applications in potential future operating environments within a system-of-systems context. Concepts and enabling technologies such as, but not limited to, artificial intelligence, machine learning, directed energy weapons and multi-domain operations hold great promise, yet their transition to acquisition programs and fielded capabilities is typically hampered due to uncertainties regarding their military application and organizational implications. Implementing successful transition approaches for complex and widely applicable concepts requires a comprehensive and coordinated campaign of learning. Experimentation campaigns enable organizational learning through the methodical and systematic application of experimentation and supporting analysis. Experimentation campaigns are centered on an operational level warfighting concept to provide context for assessment, and use wargaming, simulation, and field experimentation to evolve, refine, and validate the warfighting concept leading to solid, evidentiary-based materiel and non-materiel capability development approaches with associated recommendations. Experimentation campaigns improve the effectiveness of operations by developing concepts and generating new information to address challenging threats of the future which aids the fielding of advanced technologies by providing the credible evidence decision makers need to make sound strategic decisions and investment choices. Experimentation campaigns are directed by the Air Force Capability Development Council, Air Force Warfighting Integration Capability, and SAF/AQ, to ensure funding supports the highest Air Force priorities. Experimentation is focused on rapid learning and then pivoting based on that learning. Therefore, specific plans are not detailed to prevent locking into an approach that will likely shift based on current experimentation efforts. Further details can be provided in the appropriate forum.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Experimentation Campaigns	105.713	86.820	81.798	-	81.798
Description: Execution of experimentation campaigns to explore promising concepts and enabling technologies. Activities may include facilitated workshops, wargaming, modeling and simulation, and virtual and hardware prototyping to enable experimentation campaigns.					
FY 2019 Plans: Conduct experimentation campaigns to include directed energy weapons for base defense, commercial space internet, as well as other high priority areas, as directed by the Air Force Capability Development Council, Air Force Warfighting Integration Capability, and SAF/AQ. Perform live-fly testing and connectivity with initial commercial demonstration spacecraft and conduct ground test of current Air Force unmanned aerial vehicle communication hardware with commercial systems to assess performance. Further details can be provided in the appropriate forum.					
FY 2020 Base Plans:					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019			
Appropriation/Budget Activity 3600 / 4		R-1 Program Element (Number/Name) PE 0604858F / <i>Tech Transition Program</i>		Project (Number/Name) 645350 / <i>Experimentation</i>		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continue experimentation campaigns to advance multi-domain operations and other high priority areas, as directed by the Air Force Capability Development Council, Air Force Warfighting Integration Capability, and SAF/AQ. Experimentation is focused on rapid learning and then pivoting based on that learning. Therefore, specific plans are not detailed to prevent locking into an approach that will likely shift based on current experimentation efforts.						
FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 decreased compared to FY 2019 by \$5.022 million. Funding decreased due to higher Department of Defense priorities.						
Accomplishments/Planned Programs Subtotals		105.713	86.820	81.798	-	81.798
		FY 2018	FY 2019			
Congressional Add: Program Increase - Light Attack Experimentation		96.706	0.000			
FY 2018 Accomplishments: Conducted Congressionally-directed efforts						
FY 2019 Plans: Not Applicable						
Congressional Adds Subtotals		96.706	0.000			
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Experimentation campaigns will aid the advancement and transition of advanced technologies by providing the credible evidence decision makers need to make sound strategic decisions and investment choices, to provide the warfighter with advanced capabilities. The Air Force Capability Development Council, Air Force Warfighting Integration Capability, and/or SAF/AQ directs experimentation campaigns. The Air Force Strategic Development Planning and Experimentation office manages and executes each experimentation campaign. Contracting strategies vary based on the activities of each campaign.						
E. 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.						

UNCLASSIFIED

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 0604858F / Tech Transition Program				Project (Number/Name) 645350 / Experimentation					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Experimentation Campaigns	C/Various	Various : Various	-	19.642	Oct 2018	39.230	Mar 2019	74.798	Mar 2020	-		74.798	Continuing	Continuing	-
Congressional Add - Light Attack Experimentation Ph II	C/FFP	Sierra Nevada Corp : Sparks, NV	-	3.000	May 2018	-		-		-		-	0.000	3.000	-
Congressional Add - Light Attack Experimentation Ph II Contract Award	C/FFP	Textron Aviation Defense : Wichita, KS	-	3.000	Jun 2018	-		-		-		-	0.000	3.000	-
Congressional Add - Light Attack Experimentation	TBD	TBD : TBD	-	32.000	Jun 2019	-		-		-		-	0.000	32.000	-
Congressional Add - Light Attack Experimentation Program Office Standup	Various	Various : Various	-	20.070	Jun 2019	-		-		-		-	0.000	20.070	-
Congressional Add - Light Attack Experimentation Risk Reduction	MIPR	TBD : TBD	-	10.035	Jun 2019	-		-		-		-	0.000	10.035	-
Experimentation Campaign: Commercial Space Internet/Global Lightning	C/Various	Various : Various	-	11.401	Jul 2018	11.623	Mar 2019	-		-		-	0.000	23.024	-
Experimentation Campaign - Multi-Domain Command and Control (MDC2)	Various	Various : Various	-	31.849	Feb 2019	-		-		-		-	0.000	31.849	-
Experimentation Campaign - Data To Decision (D2D)	Various	Various : Various	-	14.327	Jun 2018	-		-		-		-	0.000	14.327	-
Experimentation Campaign - Defeat of Agile Intelligent Targets (DAIT)	Various	Various : Various	-	8.644	Jan 2019	-		-		-		-	0.000	8.644	-
Artificial Intelligence for Air Combat	TBD	TBD : TBD	-	3.000	Mar 2019	-		-		-		-	0.000	3.000	-
Subtotal			-	156.968		50.853		74.798		-		74.798	Continuing	Continuing	N/A
Remarks Further budget details can be provided in the appropriate forum.															

UNCLASSIFIED

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 0604858F / Tech Transition Program				Project (Number/Name) 645350 / Experimentation					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Experimentation Campaign: Directed Energy Modeling and Simulation/Wargaming Support	MIPR	AFRL : Kirtland, NM	-	0.300	May 2018	0.970	Feb 2019	-		-		-	0.000	1.270	-
Congressional Add - Light Attack Experimentation	MIPR	Aeronet : various	-	2.455	Jun 2018	-		-		-		-	0.000	2.455	-
Congressional Add - Light Attack Experimentation Support	MIPR	DTIC : Ft. Belvoir, VA	-	1.696	Jan 2019	-		-		-		-	0.000	1.696	-
Congressional Add Light Attack Experimentation Program Life Cycle Support	MIPR	GSA : Chicago, IL	-	4.500	Aug 2018	-		-		-		-	0.000	4.500	-
Congressional Add Light Attack Experimentation Training Systems Requirements Analysis	MIPR	GSA : Washington, DC	-	0.664	Mar 2019	-		-		-		-	0.000	0.664	-
Light Attack Experimentation AERO Net Integration	MIPR	AeroNet : Various	-	1.450	May 2018	-		-		-		-	0.000	1.450	-
Experimentation Campaign: Directed Energy Modeling and Simulation Support, Data Analysis and Vignette Support	MIPR	AFRL : WPAFB, OH	-	1.820	Mar 2018	1.150	Mar 2019	-		-		-	0.000	2.970	-
Experimentation Campaign Data to Decision Support	Various	Various : Various	-	2.811	Jun 2018	-		-		-		-	0.000	2.811	-
Experimentation Campaign: Multi Domain Command and Control	Various	Various : Various	-	2.330	Sep 2018	-		-		-		-	0.000	2.330	-
Experimentation Campaign Defense of Agile Intelligent Targets	Reqn	Utah State University Res : North Logan, UT	-	0.200	Sep 2018	-		-		-		-	0.000	0.200	-

UNCLASSIFIED

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 0604858F / Tech Transition Program				Project (Number/Name) 645350 / Experimentation					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Experimentation Campaign DAIT	MIPR	GSA : Fairborn, OH	-	0.565	Aug 2018	-		-		-		-	0.000	0.565	-
Subtotal			-	18.791		2.120		-		-		-	0.000	20.911	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Directed Energy Experimentation Government Modeling and Test Planning Support	MIPR	AFRL : Kirtland, NM	-	1.150	Mar 2018	2.500	Feb 2019	-		-		-	0.000	3.650	-
Congressional Add - Light Attack Experimentation Live Fire Test	PO	704th Test Group : Holloman, NM	-	6.430	Oct 2018	-		-		-		-	0.000	6.430	-
Congressional Add - Light Attack Experimentation Test Group	MIPR	704th Test Group : Holloman, NM	-	0.730	Nov 2018	-		-		-		-	0.000	0.730	-
Congressional Add - Light Attack Experimentation Test	Various	Various : Various	-	1.061	Sep 2018	-		-		-		-	0.000	1.061	-
Directed Energy Experimentation Test Support	Various	Various : Various	-	6.431	Jun 2018	20.020	Mar 2019	-		-		-	0.000	26.451	-
Commercial Space Internet Government Test	MIPR	Various : Various	-	0.025	Sep 2018	0.377	Feb 2019	-		-		-	0.000	0.402	-
Light Attack Experimentation Test	MIPR	Aeronet : Eglin, FL	-	0.524	Jun 2018	-		-		-		-	0.000	0.524	-
Defeat of Agile Intelligent Targets Test	MIPR	Sandia Labs : Washington, DC	-	0.770	May 2018	-		-		-		-	0.000	0.770	-
Subtotal			-	17.121		22.897		-		-		-	0.000	40.018	N/A

UNCLASSIFIED

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 0604858F / Tech Transition Program				Project (Number/Name) 645350 / Experimentation					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Congressional Add Light Attack Program Management Administration Costs	Various	Various : Various	-	5.065	Sep 2018	-		-		-		-	0.000	5.065	-
Directed Energy Campaign Program Management Administration Costs	Various	Various : Various	-	0.300	Aug 2018	0.360	Aug 2019	-		-		-	0.000	0.660	-
Light Attack Experiment Program Management Experimentation	Various	Various : Various	-	1.026	Sep 2018	-		-		-		-	0.000	1.026	-
Experimentation Campaign Contractor Support	Various	Various : Various	-	-		7.700	Mar 2019	4.000	Mar 2020	-		4.000	Continuing	Continuing	-
Experimentation Campaign Program Management Administration Costs	Various	Various : Various	-	-		2.890	Aug 2019	3.000	Aug 2020	-		3.000	Continuing	Continuing	-
Experimentation Campaign Multi Domain Command Control Program Management Administration	Various	Various : Various	-	2.421	Dec 2018	-		-		-		-	0.000	2.421	-
Experimentation Campaign Data To Decisions	Various	Various : Various	-	0.662	Jan 2018	-		-		-		-	0.000	0.662	-
Experimentation Campaign Defense of Agile Intelligent targets	Various	Various : Various	-	0.065	Aug 2018	-		-		-		-	0.000	0.065	-
Subtotal			-	9.539		10.950		7.000		-		7.000	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			-	202.419		86.820		81.798		-		81.798	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

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 0604858F / <i>Tech Transition Program</i>	Project (Number/Name) 645350 / <i>Experimentation</i>
--	--	---

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
Experimentation																												
Experimentation Campaigns																												
Congressional Add - Light Attack Experimentation																												
Congressional Add Light Attack Experimentation																												
Light Attack Experimentation																												
Light Attack Experimentation Campaign																												
Multi Domain Command and Control																												
Multi Domain Command and Control Experiment																												
Directed Energy Experimentation Campaign																												
Directed Energy Campaign																												
Data to Decision																												
Data to Decisions Experiment																												
Defeat of Agile Intelligent Targets																												
Defense of Agile Intelligent Targets Experiments																												
Commercial Space Internet																												
Commercial Space Internet Experimentation																												

UNCLASSIFIED

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 0604858F / Tech Transition Program

Project (Number/Name)

645350 / Experimentation

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Experimentation				
Experimentation Campaigns	1	2018	4	2024
Congressional Add - Light Attack Experimentation				
Congressional Add Light Attack Experimentation	3	2018	4	2019
Light Attack Experimentation				
Light Attack Experimentation Campaign	1	2018	4	2019
Multi Domain Command and Control				
Multi Domain Command and Control Experiment	1	2018	4	2019
Directed Energy Experimentation Campaign				
Directed Energy Campaign	1	2018	4	2020
Data to Decision				
Data to Decisions Experiment	1	2018	4	2019
Defeat of Agile Intelligent Targets				
Defense of Agile Intelligent Targets Experiments	1	2018	4	2019
Commercial Space Internet				
Commercial Space Internet Experimentation	2	2018	4	2023

Note

Further schedule details regarding individual experimentation campaigns can be provided in the appropriate forum.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0604858F / Tech Transition Program				Project (Number/Name) 645351 / Prototyping			
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
645351: Prototyping	-	877.039	80.457	46.678	26.450	73.128	198.824	176.151	73.845	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Prototyping project enables integration and demonstration of emerging technologies in an operational or operational-like environment in order to capitalize on successful research and development efforts with high warfighter priority. Integration and demonstration of prototypes also allow leadership to make informed strategy and resource decisions based on the results of such prototype demonstrations. Prototyping efforts funded in this project capitalize on various emerging warfighter technology areas such as communications, cyber weapons, or novel aircraft technology.

In FY 2019 and beyond, the Adaptive Engine Transition Program effort is reported in PE 0604004F, Advanced Engine Development, the Hypersonics Prototyping efforts for Air Launched Rapid Response Weapon (ARRW) and Hypersonic Conventional Strike Weapon (HCSW) are reported in PE 0604033F, Hypersonics Prototyping, and the Directed Energy Prototyping effort is reported in PE 0604032F, Directed Energy Prototyping. These efforts were transferred as Congressionally directed in the Department of Defense Appropriations Act of 2019 for greater transparency of Air Force prototyping activities.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Adaptive Engine Transition Program (AETP)	565.450	0.000	0.000	0.000	0.000
Description: AETP will design and manufacture multiple flight-weight adaptive engine prototypes, complete component rig assessments, characterize materials, and inform manufacturing process improvements. By producing flight-weight prototypes, the program will demonstrate adaptive engine technology can be scaled to meet military fighter engine size requirements, while ensuring appropriate manufacturing- and technology-readiness levels. By performing sea-level, altitude, and durability assessments across multiple power settings, the prototype engines will demonstrate fuel efficiency increases, thrust increases, and new component technologies. These assessments will provide data to quantify the capability and reduce risk in areas such as thermal capacity, reliability, and supportability, among others.					
FY 2019 Plans: In FY 2019 and beyond, this effort will be reported in PE 0604004F, Advanced Engine Development, Project 643608, Advanced Engine Development.					
FY 2020 Base Plans: Not Applicable					
FY 2020 OCO Plans:					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019			
Appropriation/Budget Activity 3600 / 4		R-1 Program Element (Number/Name) PE 0604858F / Tech Transition Program		Project (Number/Name) 645351 / Prototyping		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Not Applicable						
FY 2019 to FY 2020 Increase/Decrease Statement: Not Applicable						
Title: Lifecycle Prototyping		190.635	50.457	46.678	26.450	73.128
Description: Lifecycle prototyping, product support and sustainment technologies.						
In FY 2018 Hypersonics Prototyping is included in Lifecycle Prototyping. In FY 2019 and beyond, Hypersonics Prototyping is reported in PE 0604033F, Hypersonics Prototyping, Project 643885, Hypersonic Conventional Strike Weapon (HCSW), and Project 643882, Air-Launched Rapid Response Weapon (ARRW).						
FY 2019 Plans: Conduct Spectral Halo Pod prototyping effort to enable multi-generation aircraft to employ multiple domain effects to disrupt, degrade, and collapse adversarial targets. Design and manufacture the low-cost attritable aircraft prototype with representative payloads and subsystems. Develop product support and sustainment technologies to support the warfighter and reduce sustainment costs. Initiate space internet prototyping effort to enable broad connectivity across multiple platforms. Additional prototyping activities for emerging technologies may be added based on Department guidance.						
FY 2020 Base Plans: Continue Spectral Halo Pod prototyping effort to enable multi-generation aircraft to employ multiple domain effects to disrupt, degrade, and collapse adversarial targets. Continue space internet prototyping effort to enable broad connectivity across multiple platforms. Additional prototyping activities for emerging technologies may be based on Department guidance.						
FY 2020 OCO Plans: Provide forces with persistent overhead intelligence, surveillance and reconnaissance for special operations by replacing prototype airborne Group 4 unmanned aerial systems (UAS) and mission payloads lost through combat attrition in performance of special operations forces operational assessment; and developing and delivering three field-testable persistent (6+ day sortie) systems of aircraft, ground systems, and other equipment for operational evaluation in theater for high value targets. Provide expeditionary system and mobile counter-UAS airborne payload suite integrated with affordable, persistent Group 4 UAS for detection, identification,						

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019		
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / Tech Transition Program	Project (Number/Name) 645351 / Prototyping			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
and defeat of threat small UAS. Provide instant curing fuel leak repair technology for all weapon systems in all theaters.					
FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 increased compared to FY 2019 by \$22.671 million. Funding increased due to OCO requests to support instant curing fuel leak repair research and development, persistent overhead surveillance and reconnaissance, and counter unmanned aerial systems prototyping efforts in FY 2020.					
Accomplishments/Planned Programs Subtotals	756.085	50.457	46.678	26.450	73.128
	FY 2018	FY 2019			
Congressional Add: Program Increase - Competitively Awarded Technology Transition	9.638	0.000			
FY 2018 Accomplishments: Conducted Congressionally-directed efforts					
FY 2019 Plans: Not Applicable					
Congressional Add: Program Increase - Directed Energy Prototyping	67.464	0.000			
FY 2018 Accomplishments: Conducted Congressionally-directed efforts					
FY 2019 Plans: In FY 2019, this effort is reported in PE 0604032F, Directed Energy Prototyping, Project 640200, DE Prototyping.					
Congressional Add: Program Increase - Logistics Technologies	9.156	0.000			
FY 2018 Accomplishments: Conducted Congressionally-directed efforts					
FY 2019 Plans: Not Applicable					
Congressional Add: Program Increase - Alternative Energy Research	5.783	5.000			
FY 2018 Accomplishments: Conducted Congressionally-directed efforts					
FY 2019 Plans: Conduct Congressionally-directed efforts					
Congressional Add: Program Increase - Assured Positioning Navigation and Timing (PNT)	28.913	0.000			
FY 2018 Accomplishments: Conducted Congressionally-directed efforts					
FY 2019 Plans: Not Applicable					
Congressional Add: Program Increase - Laser Coating Removal Technology	0.000	10.000			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / Tech Transition Program	Project (Number/Name) 645351 / Prototyping	

	FY 2018	FY 2019
FY 2018 Accomplishments: Not Applicable		
FY 2019 Plans: Conduct Congressionally-directed efforts		
Congressional Add: Program Increase - Health and Logistics Management Technology	0.000	5.000
FY 2018 Accomplishments: Not Applicable		
FY 2019 Plans: Conduct Congressionally-directed efforts		
Congressional Add: Program Increase - Competitively Awarded Technology Transition Initiatives	0.000	10.000
FY 2018 Accomplishments: Not Applicable		
FY 2019 Plans: Conduct Congressionally-directed efforts		
Congressional Adds Subtotals	120.954	30.000

C. Other Program Funding Summary (\$ in Millions)

Line Item	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
• RDTE 04 0604033F: <i>Hypersonics Prototyping</i>	0.000	508.858	576.000	-	576.000	201.200	28.500	0.000	0.000	0.000	1,314.558
• RDTE 04 0604032F: <i>Directed Energy Prototyping</i>	0.000	50.000	10.000	-	10.000	15.000	5.000	0.000	0.000	0.000	80.000
• RDTE 04 0604004F: <i>Advanced Engine Development</i>	0.000	720.355	878.442	-	878.442	637.657	0.000	0.000	0.000	0.000	2,236.454

Remarks

In FY 2019 and beyond, Adaptive Engine Transition Program is reported in PE 0604004F, Advanced Engine Development.

In FY 2019 and beyond, Hypersonics Prototyping is reported in PE 0604033F, Hypersonics Prototyping.

In FY 2019 and beyond, Directed Energy Prototyping is reported in PE 0604032F, Directed Energy Prototyping.

D. Acquisition Strategy

For the Adaptive Engine Transition Program (AETP), the Air Force has awarded two limited source, cost plus incentive fee contracts to General Electric and Pratt & Whitney due to their unique qualifications to design a high performance, flight-weight adaptive turbine engine in the thrust class for AETP. Incentive categories include engine weight, performance factors, and maintainability and supportability, with specific metrics for each area incentivized. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Propulsion Directorate, Wright-Patterson Air Force Base, Ohio.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / Tech Transition Program	Project (Number/Name) 645351 / Prototyping
<p>For Spectral Halo, the Air Force awarded to existing cost plus type contracts with Herrick Technology Laboratories, Inc (MD), Northeast Information Discovery, Inc (NY), Advanced Geolocation Solutions, Inc (VA), and Mitre, (MA). Follow on contracts planned in 3rd quarter FY 2019 and 2nd quarter FY 2020 to accelerate prototyping.</p> <p>For Low Cost Attributable Aircraft Technology, the Air Force leveraged the Defense Innovation Unit Experimental Other Transaction Authority to award a Firm Fixed Price Contract to the following contractors: Lockheed Martin, Aurora, Autonodyne, Venator, and Fregata.</p> <p>Acquisition Decision Memorandum (signed 3 May 2018) designated Air-Launched Rapid Response Weapon (ARRW) as Section 804 Rapid Prototyping Program. The Air Force applied funding to an existing DARPA Other Transaction Authority contract to Lockheed Martin in order to leverage the synergistic efforts ongoing in the Tactical Boost Glide technology demonstration. In August 2018, the Air Force awarded an undefinitized contract in order to complete a critical design review and procure all long lead parts and materials. Upon definitization, the ARRW program will modify the contract to award the entire RDT&E effort (through the end of flight test). The cost type contract includes schedule incentives to earn a higher fixed fee. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Armament Directorate, Eglin AFB, FL.</p> <p>Acquisition Decision Memorandum (signed 3 May 2018) designated Hypersonic Conventional Strike Weapon (HCSW) as Section 804 Rapid Prototyping Program. The Air Force awarded in April 2018 an Indefinite Delivery / Indefinite Quantity to Lockheed Martin Corp. - Space for the design, development, engineering, systems integration, test, logistics planning, and aircraft integration support of all the elements of a hypersonic, conventional, air-launched, stand-off weapon. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Armament Directorate, Eglin AFB, FL.</p> <p>Acquisition strategies for other prototypes from Congressional adds and OCO funding vary based on the activities of each prototype.</p> <p>Miscellaneous emerging prototyping will be based on guidance from Department leadership.</p> <p>E. Performance Metrics</p> <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>		

UNCLASSIFIED

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 0604858F / Tech Transition Program				Project (Number/Name) 645351 / Prototyping					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Adaptive Engine Transition Program - GE	C/CPIF	GE : Evendale, OH	-	287.510	Oct 2017	-		-		-		-	0.000	287.510	-
Adaptive Engine Transition Program - PW	C/CPIF	PW : East Hartford, CT	-	274.686	Oct 2017	-		-		-		-	0.000	274.686	-
Hypersonics Prototyping - ARRW DARPA OTA	SS/FFP	Lockheed Martin : Various	-	34.995	Jan 2018	-		-		-		-	0.000	34.995	-
Hypersonics Prototyping - ARRW Mission Planning	MIPR	Various : TBD	-	1.555	Mar 2018	-		-		-		-	0.000	1.555	-
Hypersonics Prototyping - ARRW AF UCA	SS/CPFF	Lockheed Martin : Various	-	30.000	Aug 2018	-		-		-		-	0.000	30.000	-
Hypersonics Prototyping - HCSW Hypersonic program office support, analysis, technical risk reduction, development and integration	Various	Lockheed Martin : Huntsville, AL	-	14.016	May 2018	-		-		-		-	0.000	14.016	-
Hypersonics Prototyping - HCSW Hypersonic program office support, analysis, technical risk reduction,	Various	Lockheed Martin : Huntsville, AL	-	5.275	Jan 2019	-		-		-		-	0.000	5.275	-
Spectral Halo Pod Prototyping	C/CPFF	Various : Rome, NY	-	47.132	Jul 2018	26.000	Apr 2019	25.650	Apr 2020	-		25.650	Continuing	Continuing	-
Low-Cost Attritable Aircraft Technology Prototyping	Various	Various : Various	-	11.740	Jan 2018	12.319	Jan 2019	-		-		-	0.000	24.059	-
Commercial Space Internet Prototyping	C/FFP	Space X : Hawthorne, CA	-	0.000		12.138	Jan 2019	21.028	Jan 2020	-		21.028	Continuing	Continuing	-
Congressional Add - Competitively Awarded Technology Transition	Reqn	Various : Various	-	9.638	Jan 2019	-		-		-		-	0.000	9.638	-
Congressional Add - Alternate Energy Reserach	Various	Various : Various	-	5.783	Apr 2019	5.000	Sep 2019	-		-		-	0.000	10.783	-
Congressional Add - Assured PNT	Various	Various : Various	-	28.913	Aug 2018	-		-		-		-	0.000	28.913	-

UNCLASSIFIED

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 0604858F / Tech Transition Program				Project (Number/Name) 645351 / Prototyping					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Congressional Add - Logistics Technologies	Various	Various : Various	-	9.156	Mar 2019	-		-		-		-	0.000	9.156	-
Congressional Add Directed Energy Prototyping	Various	Various : Various	-	61.464	Jun 2019	-		-		-		-	0.000	61.464	-
Congressional Add Laser Coating Removal Technology	Various	Various : Various	-	-		10.000	Feb 2019	-		-		-	0.000	10.000	-
Congressional Add Health and Logistics Management Technology	Various	Various : Various	-	-		5.000	Feb 2019	-		-		-	0.000	5.000	-
Congressional Add Competitively Awarded Technology Transition Initiatives	Various	Various : Varoius	-	-		10.000	Jul 2019	-		-		-	0.000	10.000	-
Mobile Counter-UAS Airborne Payload Suite	C/CPAF	TBD : TBD	-	-		-		0.000		7.800		7.800	0.000	7.800	-
Integrated Expeditionary Counter-Unmanned Aerial System	C/CPAF	TBD : TBD	-	-		-		0.000		2.000		2.000	0.000	2.000	-
Persistent Overhead Surveillance/ Reconnaissance for Special Operations	TBD	TBD : TBD	-	-		-		0.000		10.300		10.300	0.000	10.300	-
Overhead Surveillance/ Reconnaissance for Special Operations	TBD	TBD : TBD	-	-		-		0.000		5.600		5.600	0.000	5.600	-
Instant Fuel Leak Repair	TBD	TBD : TBD	-	-		-		0.000		0.750		0.750	0.000	0.750	-
Subtotal			-	821.863		80.457		46.678		26.450		73.128	Continuing	Continuing	N/A
Remarks															
In FY 2019 and beyond, Adaptive Engine Transition Program is reported in PE 0604004F, Advanced Engine Development.															
In FY 2019 and beyond, Hypersonics Prototyping is reported in PE 0604033F, Hypersonics Prototyping.															

UNCLASSIFIED

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 0604858F / <i>Tech Transition Program</i>	Project (Number/Name) 645351 / <i>Prototyping</i>
--	--	---

Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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

In FY 2019 and beyond, Directed Energy Prototyping is reported in PE 0604032F, Directed Energy Prototyping.

Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Hypersonics Prototyping - ARRW Aircraft Integration	Various	Various : TBD	-	3.332	Jan 2018	-		-		-		-	0.000	3.332	-
Hypersonics Prototyping - ARRW Logistics Support and Analysis	Various	Various : TBD	-	1.318	Oct 2017	-		-		-		-	0.000	1.318	-
Hypersonic Prototyping - HCSW Development and Prototyping Support	Various	Various : TBD	-	13.054	Sep 2018	-		-		-		-	0.000	13.054	-
Hypersonic Prototyping - HCSW Long Lead Items	Various	Various : TBD	-	5.178	Jan 2019	-		-		-		-	0.000	5.178	-
Congressional Add - Directed Energy Prototyping Support	Various	Various : TBD	-	1.820	Jul 2018	-		-		-		-	0.000	1.820	-
Subtotal			-	24.702		-		-		-		-	0.000	24.702	N/A

Remarks

In FY 2019 and beyond, Hypersonics Prototyping is reported in PE 0604033F, Hypersonics Prototyping.

In FY 2019 and beyond, Directed Energy Prototyping is reported in PE 0604032F, Directed Energy Prototyping.

Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Hypersonics Prototyping - ARRW Government Test	C/Various	Multiple : TBD	-	9.142	Dec 2018	-		-		-		-	0.000	9.142	-
Hypersonics Prototyping - HCSW Government	Various	96 TW : Eglin AFB, FL	-	7.859	Feb 2019	-		-		-		-	0.000	7.859	-

UNCLASSIFIED

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 0604858F / <i>Tech Transition Program</i>	Project (Number/Name) 645351 / <i>Prototyping</i>
--	--	---

Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
test support . Includes flight test equipment, targets, 96 Test Wing and range support, and aircraft integration test.															
Congressional Add Directed Energy Prototyping Test	MIPR	WSMR : White Sands, NM	-	1.000	Aug 2018	-		-		-		-	0.000	1.000	-
Subtotal			-	18.001		-		-		-		-	0.000	18.001	N/A

Remarks

In FY 2019 and beyond, Hypersonics Prototyping is reported in PE 0604033F, Hypersonics Prototyping.

In FY 2019 and beyond, Directed Energy Prototyping is reported in PE 0604032F, Directed Energy Prototyping.

Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Adaptive Engine Transition Program Program Management Support	Various	Various : TBD	-	3.254	Oct 2017	-		-		-		-	0.000	3.254	-
Hypersonics Prototyping - ARRW Program Management Administration	C/Various	Not specified. : TBD	-	2.239	Nov 2018	-		-		-		-	0.000	2.239	-
Hypersonics Prototyping - HCSW Program Management Administration	Various	Various : TBD	-	3.800	Aug 2018	-		-		-		-	0.000	3.800	-
Congressional Add - Directed Energy Prototyping Management Administration	Various	Various : TBD	-	3.180	Jan 2019	-		-		-		-	0.000	3.180	-
Subtotal			-	12.473		-		-		-		-	0.000	12.473	N/A

UNCLASSIFIED

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 0604858F / <i>Tech Transition Program</i>				Project (Number/Name) 645351 / <i>Prototyping</i>				

Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Remarks Hypersonics Prototyping - Includes A&AS support requirements plus TDY, office and office supplies. FY 2018 is not full support staff. FY 2019 is full staffing. In FY 2019 and beyond, Adaptive Engine Transition Program is reported in PE 0604004F, Advanced Engine Development. In FY 2019 and beyond, Hypersonics Prototyping is reported in PE 0604033F, Hypersonics Prototyping. In FY 2019 and beyond, Directed Energy Prototyping is reported in PE 0604032F, Directed Energy Prototyping.															
			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			-	877.039		80.457		46.678		26.450		73.128	Continuing	Continuing	N/A
Remarks Additional details, including Adaptive Engine, Spectral Halo, low-cost attritable aircraft technology, space internet prototyping, Hypersonics, Directed Energy, and other emerging prototyping efforts, can be provided in the appropriate forum.															

UNCLASSIFIED

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 0604858F / Tech Transition Program

Project (Number/Name)

645351 / Prototyping

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
Lifecycle Prototyping																												
Spectral Halo Pod																												
Low-Cost Attributable Aircraft Technology (LCAAT)																												
Space Internet																												
Congressional Add - Directed Energy Prototyping																												
Congressional Add - Alternative Energy Research																												
Congressional Add - Assured PNT																												
Congressional Add - Competitively Awarded Technology Transition																												
Congressional Add - Logistics Technologies																												
Congressional Add - Laser Coating Removal Technology																												
Congressional Add - Health and Logistics Management Technology																												
Congressional Add - Competitively Awarded Technology Transition Initiatives																												
OCO - Mobile Counter-UAS Airborne Payload Suite																												
OCO - Integrated Expeditionary Counter Unmanned Aerial System																												
OCO - Persistent Overhead Surveillance/ Reconnaissance for Special Operations																												
OCO - Overhead Surveillance/ Reconnaissance for Special Operations																												

UNCLASSIFIED

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 0604858F / Tech Transition Program										Project (Number/Name) 645351 / Prototyping									
	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				
	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	
OCO - Instant Curing Fuel Leak Repair Technology	<div></div>																												
Emerging Prototypes as directed	<div></div>																												
Hypersonics Prototyping	<div></div>																												
ARRW - DARPA OTA Option 1	<div></div>																												
ARRW - AF UCA Lockheed Martin	<div></div>																												
HCSW - Mission Planning/Program Office Support	<div></div>																												
HCSW - Preliminary Design Review	<div></div>																												
Adaptive Engine Transition Program	<div></div>																												
Detailed Design, Engine Fabrication, Engine Assessment	<div></div>																												

UNCLASSIFIED

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 0604858F / Tech Transition Program

Project (Number/Name)

645351 / Prototyping

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Lifecycle Prototyping</i>				
Spectral Halo Pod	1	2018	4	2020
Low-Cost Attritable Aircraft Technology (LCAAT)	1	2018	4	2019
Space Internet	1	2019	4	2023
Congressional Add - Directed Energy Prototyping	2	2018	4	2018
Congressional Add - Alternative Energy Research	2	2018	4	2019
Congressional Add - Assured PNT	2	2018	4	2018
Congressional Add - Competitively Awarded Technology Transition	2	2018	4	2018
Congressional Add - Logistics Technologies	2	2018	4	2018
Congressional Add - Laser Coating Removal Technology	1	2019	4	2019
Congressional Add - Health and Logistics Management Technology	1	2019	4	2019
Congressional Add - Competitively Awarded Technology Transition Initiatives	1	2019	4	2019
OCO - Mobile Counter-UAS Airborne Payload Suite	1	2020	4	2020
OCO - Integrated Expeditionary Counter Unmanned Aerial System	1	2020	4	2020
OCO - Persistent Overhead Surveillance/Reconnaissance for Special Operations	1	2020	4	2020
OCO - Overhead Surveillance/Reconnaissance for Special Operations	1	2020	4	2020
OCO - Instant Curing Fuel Leak Repair Technology	1	2020	4	2020
Emerging Prototypes as directed	1	2018	4	2024
<i>Hypersonics Prototyping</i>				
ARRW - DARPA OTA Option 1	1	2018	4	2018
ARRW - AF UCA Lockheed Martin	4	2018	4	2018
HCSW - Mission Planning/Program Office Support	1	2018	4	2018
HCSW - Preliminary Design Review	2	2018	4	2018

UNCLASSIFIED

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 0604858F / <i>Tech Transition Program</i>	Project (Number/Name) 645351 / <i>Prototyping</i>	

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Adaptive Engine Transition Program</i>				
Detailed Design, Engine Fabrication, Engine Assessment	1	2018	4	2018

Note

In FY 2019 and beyond, Adaptive Engine Transition Program is reported in PE 0604004F, Advanced Engine Development.

In FY 2019 and beyond, Hypersonics Prototyping is reported in PE 0604033F, Hypersonics Prototyping.

In FY 2019 and beyond, Directed Energy Prototyping is reported in PE 0604032F, Directed Energy Prototyping.

The Adaptive Engine Transition Program consists of three phases: detailed design, engine fabrication, and engine assessments. Program deliverables include: military adaptive engine detailed design parameters and models, multiple engine sets of hardware (plus spare parts), matured technologies, major rig assessment data (controls, combustor, etc.), program reviews, and technology, affordability and sustainability studies.

Additional details, including Adaptive Engine, Spectral Halo, low-cost attritable aircraft technology, space internet prototyping, Hypersonics, Directed Energy, OCO, and other emerging prototyping efforts, can be provided in the appropriate forum.