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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force **Date:** February 2020

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	163.132	314.926	219.252	0.000	219.252	259.128	158.445	75.014	44.655	Continuing	Continuing
645350: <i>Experimentation</i>	-	84.179	186.798	81.522	0.000	81.522	83.244	84.735	75.014	44.655	Continuing	Continuing
645351: <i>Prototyping</i>	-	78.953	128.128	137.730	0.000	137.730	175.884	73.710	0.000	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 addition, this program element may include necessary civilian pay expenses required to manage, execute, and deliver future weapons system capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

The FY 2021 funding request was reduced by \$17.830 million to account for availability of prior year execution balances.

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	167.277	154.926	280.495	0.000	280.495
Current President's Budget	163.132	314.926	219.252	0.000	219.252
Total Adjustments	-4.145	160.000	-61.243	0.000	-61.243
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	160.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	1.500	0.000			
• SBIR/STTR Transfer	-5.645	0.000			
• Other Adjustments	0.000	0.000	-61.243	0.000	-61.243

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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 645350: *Experimentation*

Congressional Add: *Program Increase - Low Cost Attributable Aircraft Technology*

Congressional Add: *Program Increase - Directed Energy Experimentation*

Congressional Add Subtotals for Project: 645350

Project: 645351: *Prototyping*

Congressional Add: *Program Increase - Alternative Energy Research*

Congressional Add: *Program Increase - Laser Coating Removal Technology*

Congressional Add: *Program Increase - Health and Logistics Management Technology*

Congressional Add: *Program Increase - Competitively Awarded Technology Transition Initiatives*

Congressional Add: *Program Increase - Rapid Sustainment Office*

Congressional Add: *Program Increase - Reliable Power for Critical Infrastructure*

Congressional Add: *Program Increase - Logistics Technologies*

Congressional Add: *Program Increase - Small Satellite Manufacturing*

Congressional Add: *Program Increase - Advanced Repair and Qualification Processes*

Congressional Add: *Program Increase - Additive Manufacturing*

Congressional Add Subtotals for Project: 645351

Congressional Add Totals for all Projects

	FY 2019	FY 2020
	0.000	100.000
	0.000	5.000
Congressional Add Subtotals for Project: 645350	0.000	105.000
	4.832	0.000
	9.663	0.000
	4.832	0.000
	9.663	0.000
	0.000	20.000
	0.000	6.000
	0.000	5.000
	0.000	8.000
	0.000	6.000
	0.000	10.000
Congressional Add Subtotals for Project: 645351	28.990	55.000
Congressional Add Totals for all Projects	28.990	160.000

Change Summary Explanation

Increase in FY 2019 of \$1.500 million due to reprogramming for human resource software prototype.

Decrease in FY 2021 of \$61.243 million due to reduced emphasis in prototyping due to higher Department of Defense and Air Force priorities and to account for availability of prior year execution balances and Department of Defense inflationary factors.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
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>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
645350: <i>Experimentation</i>	-	84.179	186.798	81.522	0.000	81.522	83.244	84.735	75.014	44.655	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 2019	FY 2020	FY 2021
Title: Experimentation Campaigns	84.179	81.798	81.522
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 2020 Plans: 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 2021 Plans: 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			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force	Date: February 2020
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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>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
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.			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> FY 2021 decreased compared to FY 2020 by \$0.276 million due to inflation.			
Accomplishments/Planned Programs Subtotals	84.179	81.798	81.522

	FY 2019	FY 2020
<i>Congressional Add:</i> Program Increase - Low Cost Attributable Aircraft Technology	0.000	100.000
<i>FY 2019 Accomplishments:</i> Not Applicable		
<i>FY 2020 Plans:</i> Conduct Congressionally-directed efforts		
<i>Congressional Add:</i> Program Increase - Directed Energy Experimentation	0.000	5.000
<i>FY 2019 Accomplishments:</i> Not Applicable		
<i>FY 2020 Plans:</i> Conduct Congressionally-directed efforts		
Congressional Adds Subtotals	0.000	105.000

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 (SDPE) Office located at Wright-Patterson Air Force Base, Ohio manages and executes each experimentation campaign. Contracting strategies vary based on the activities of each campaign.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / Tech Transition Program	Project (Number/Name) 645350 / Experimentation
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Experimentation Campaigns	C/Variou	Various : Various	-	10.398	Mar 2019	14.000	Mar 2020	69.141	Mar 2021	-		69.141	Continuing	Continuing	-
Experimentation Campaign: Commercial Space Internet/Global Lightning	C/CPFF	Various : Various	-	11.623	Mar 2019	-		-		-		-	0.000	11.623	-
Experimentation Campaign: Hawkeye Contract 1	C/CPFF	L3 : Salt Lake City, UT	-	2.080	Apr 2019	8.453	Feb 2020	-		-		-	Continuing	Continuing	-
Experimentation Campaign: Hawkeye Contract 2	C/CPFF	Lockheed : Forth Worth, TX	-	0.900	Apr 2019	2.673	Jan 2020	-		-		-	Continuing	Continuing	-
Experimentation Campaign: Hawkeye Contract 3	C/CPFF	Northrup Grumman : San Diego, CA	-	1.499	May 2019	4.500	Mar 2020	-		-		-	Continuing	Continuing	-
Experimentation Campaign: Directed Energy	C/Variou	Various : Various	-	15.456	May 2019	12.300	Feb 2020	-		-		-	Continuing	Continuing	-
Experimentation: Campaign: Hawkeye Contract 4	C/CPFF	Space X : Hawthorne, CA	-	14.214	May 2019	1.865	Feb 2020	-		-		-	Continuing	Continuing	-
Experimentation Campaign: Advanced Attributable Aircraft	Various	Various : Various	-	9.556	Jul 2019	25.000	Jun 2020	-		-		-	Continuing	Continuing	-
Experimentation Campaign: Hawkeye Contract 5	C/Variou	Various : Various	-	-		2.600	Feb 2020	-		-		-	Continuing	Continuing	-
Congressional Add - Directed Energy Experimentation	Various	Various : Various	-	-		5.000	Apr 2020	-		-		-	0.000	5.000	-
Congressional Add - Low Cost Attributable Aircraft Technology	Various	Various : Various	-	-		100.000	Jul 2020	-		-		-	0.000	100.000	-
Subtotal			-	65.726		176.391		69.141		-		69.141	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / Tech Transition Program	Project (Number/Name) 645350 / Experimentation
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
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 budget details can be provided in the appropriate forum.

Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Experimentation Campaign Support	Various	Various : Various	-	0.000	Jul 2019	0.800	Jan 2020	1.520	Dec 2020	-		1.520	Continuing	Continuing	-
Experimentation Campaign: Directed Energy Modeling and Simulation Support, Data Analysis and Vignette Support	MIPR	AFRL : WPAFB, OH	-	5.858	Mar 2019	3.700	Mar 2020	-		-		-	0.000	9.558	-
Hawkeye Experimentation Campaign Support	MIPR	Various : Various	-	0.308	Mar 2019	-		-		-		-	Continuing	Continuing	-
Subtotal			-	6.166		4.500		1.520		-		1.520	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Experimentation Campaign Test and Evaluation	MIPR	Various : Various	-	-		1.000	Feb 2020	5.000	Mar 2021	-		5.000	Continuing	Continuing	-
Directed Energy Experimentation Government Modeling and Test Planning Support	MIPR	AFRL : Kirtland, NM	-	2.801	Feb 2019	-		-		-		-	0.000	2.801	-
Hawkeye Test and Evaluation Support	MIPR	Various : Various	-	0.800	Mar 2019	1.000	Feb 2020	-		-		-	0.000	1.800	-
Commercial Space Internet Government Test	MIPR	Various : Various	-	0.377	Feb 2019	-		-		-		-	0.000	0.377	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force **Date:** February 2020

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>
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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																												
Directed Energy Experimentation Campaign																												
Directed Energy Campaign																												
Commercial Space Internet																												
Commercial Space Internet Experimentation																												
Advanced Attributable Aircraft																												
Advanced Attributable Aircraft Experimentation																												
Hawkeye																												
Hawkeye Experimentation																												
Congressional Add Directed Energy																												
Directed Energy Experimentation																												
Congressional Add Low Cost Attributable Aircraft Technology																												
Low Cost Attributable Aircraft Technology																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force **Date:** February 2020

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>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Experimentation</i>				
Experimentation Campaigns	1	2019	4	2025
<i>Directed Energy Experimentation Campaign</i>				
Directed Energy Campaign	1	2019	4	2020
<i>Commercial Space Internet</i>				
Commercial Space Internet Experimentation	1	2019	4	2021
<i>Advanced Attributable Aircraft</i>				
Advanced Attributable Aircraft Experimentation	1	2020	4	2020
<i>Hawkeye</i>				
Hawkeye Experimentation	1	2020	4	2020
<i>Congressional Add Directed Energy</i>				
Directed Energy Experimentation	1	2020	4	2020
<i>Congressional Add Low Cost Attributable Aircraft Technology</i>				
Low Cost Attributable Aircraft Technology	1	2020	4	2020

Note

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

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force **Date:** February 2020

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
645351: Prototyping	-	78.953	128.128	137.730	0.000	137.730	175.884	73.710	0.000	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.

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

	FY 2019	FY 2020	FY 2021
Title: Lifecycle Prototyping	49.963	73.128	137.730
Description: Lifecycle prototyping, product support and sustainment technologies.			
FY 2020 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 2021 Plans: Continue space internet prototyping effort to enable broad connectivity across multiple platforms. Conduct game-changing technology prototyping efforts to enable collaborative weapons and platforms capabilities for the future force. Additional prototyping activities for emerging technologies may be conducted in support of the strategic capabilities identified in the Air Force Science and Technology Strategy: global persistent awareness; resilient information sharing; rapid, effective decision-making; complexity, unpredictability, and mass; and speed and reach of disruption and lethality.			
FY 2020 to FY 2021 Increase/Decrease Statement: FY 2021 increased compared to FY 2020 by \$64.602 million. Funding increased due to the addition of game changing technology prototyping efforts.			
Accomplishments/Planned Programs Subtotals	49.963	73.128	137.730
	FY 2019	FY 2020	
Congressional Add: Program Increase - Alternative Energy Research	4.832	0.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
3600 / 4	PE 0604858F / Tech Transition Program	645351 / Prototyping	
		FY 2019	FY 2020
FY 2019 Accomplishments: Conducted Congressionally-directed efforts			
FY 2020 Plans: Not Applicable			
Congressional Add: Program Increase - Laser Coating Removal Technology		9.663	0.000
FY 2019 Accomplishments: Conducted Congressionally-directed efforts			
FY 2020 Plans: Not Applicable			
Congressional Add: Program Increase - Health and Logistics Management Technology		4.832	0.000
FY 2019 Accomplishments: Conducted Congressionally-directed efforts			
FY 2020 Plans: Not Applicable			
Congressional Add: Program Increase - Competitively Awarded Technology Transition Initiatives		9.663	0.000
FY 2019 Accomplishments: Conducted Congressionally-directed efforts			
FY 2020 Plans: Not Applicable			
Congressional Add: Program Increase - Rapid Sustainment Office		0.000	20.000
FY 2019 Accomplishments: Not Applicable			
FY 2020 Plans: Conduct Congressionally-directed efforts			
Congressional Add: Program Increase - Reliable Power for Critical Infrastructure		0.000	6.000
FY 2019 Accomplishments: Not Applicable			
FY 2020 Plans: Conduct Congressionally-directed efforts			
Congressional Add: Program Increase - Logistics Technologies		0.000	5.000
FY 2019 Accomplishments: Not Applicable			
FY 2020 Plans: Conduct Congressionally-directed efforts			
Congressional Add: Program Increase - Small Satellite Manufacturing		0.000	8.000
FY 2019 Accomplishments: Not Applicable			
FY 2020 Plans: Conduct Congressionally-directed efforts			
Congressional Add: Program Increase - Advanced Repair and Qualification Processes		0.000	6.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force	Date: February 2020
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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>
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	FY 2019	FY 2020
FY 2019 Accomplishments: Not Applicable		
FY 2020 Plans: Conduct Congressionally-directed efforts		
Congressional Add: Program Increase - Additive Manufacturing	0.000	10.000
FY 2019 Accomplishments: Not Applicable		
FY 2020 Plans: Conduct Congressionally-directed efforts		
Congressional Adds Subtotals	28.990	55.000

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

N/A

Remarks

D. Acquisition Strategy

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.

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.

Acquisition strategies for other prototypes from Congressional adds and OCO funding vary based on the activities of each prototype.

Miscellaneous emerging prototyping will be based on guidance from Department leadership.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

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>
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Spectral Halo Pod: Rapid Prototype of Aircraft Stores	C/CPFF	Various : Various	-	25.953	Apr 2019	12.500	Mar 2020	-		-		-	0.000	38.453	-
Spectral Halo Pod: Rapid Prototyping of UAV Payloads	C/CPFF	Various : Various	-	-		4.000	Oct 2019	-		-		-	0.000	4.000	-
Low-Cost Attributable Aircraft Technology Prototyping	Various	Various : Various	-	11.872	Jan 2019	-		-		-		-	0.000	11.872	-
Commercial Space Internet Prototyping: Global Lightning Contract 1	C/FFP	SpaceX : Hawthorne, CA	-	12.138	Jan 2019	-		-		-		-	0.000	12.138	-
Commercial Space Internet Prototyping: Global Lightning Contract 2	C/CPFF	Space X : Hawthorne, CA	-	-		10.611	Mar 2020	-		-		-	0.000	10.611	-
Commercial Space Internet Prototyping: Global Lightning Contract 3	C/CPFF	Various : Various	-	-		-		37.317	Feb 2021	-		37.317	Continuing	Continuing	-
Commercial Space Internet Prototyping: Global Lightning Contract 4	C/CPFF	Northrup Grumman : San Diego, CA	-	-		5.500	Mar 2020	-		-		-	0.000	5.500	-
Commercial Space Internet Prototyping: Global Lightning Contract 5	C/CPFF	L3 : Salt Lake City, UT	-	-		2.272	Jul 2020	-		-		-	0.000	2.272	-
Congressional Add - Alternate Energy Reserach	Various	Various : Various	-	4.832	Sep 2019	-		-		-		-	0.000	4.832	-
Congressional Add Laser Coating Removal Technology	Various	Various : Various	-	9.663	Feb 2019	-		-		-		-	0.000	9.663	-
Congressional Add Health and Logistics Management Technology	Various	Various : Various	-	4.832	Feb 2019	-		-		-		-	0.000	4.832	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

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>
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Congressional Add Competitively Awarded Technology Transition Initiatives	Various	Various : Various	-	9.663	Jul 2019	-		-		-		-	0.000	9.663	-
Game Changing Technologies	TBD	TBD : TBD	-	-		-		100.413	Mar 2021	-		100.413	Continuing	Continuing	-
Congressional Add Rapid Sustainment Office	Various	Various : Various	-	-		20.000	Jul 2020	-		-		-	0.000	20.000	-
Congressional Add Reliable Power for Critical Infrastructure	Various	Various : Various	-	-		6.000	Jun 2020	-		-		-	0.000	6.000	-
Congressional Add Logistics Technologies	Various	Various : Various	-	-		5.000	Jun 2020	-		-		-	0.000	5.000	-
Congressional Add Small Satellite Manufacturing	Various	Various : Various	-	-		8.000	Jun 2020	-		-		-	0.000	8.000	-
Congressional Add Advanced Repair and Qualification Process	Various	Various : Various	-	-		6.000	Jul 2020	-		-		-	0.000	6.000	-
Congressional Add Additive Manufacturing	Various	Various : Various	-	-		10.000	May 2020	-		-		-	0.000	10.000	-
Mobile Counter-UAS Airborne Payload Suite OCO	C/TBD	TBD : TBD	-	0.000		7.800	Jun 2020	0.000		-		0.000	0.000	7.800	-
Integrated Expeditionary Counter-Unmanned Aerial System OCO	C/TBD	TBD : TBD	-	0.000		2.000	Jun 2020	0.000		-		0.000	0.000	2.000	-
Persistent Overhead Surveillance/ Reconnaissance for Special Operations OCO	C/TBD	TBD : TBD	-	0.000		10.300	Jun 2020	0.000		-		0.000	0.000	10.300	-
Overhead Surveillance/ Reconnaissance for Special Operations OCO	C/TBD	TBD : TBD	-	0.000		5.600	Jun 2020	0.000		-		0.000	0.000	5.600	-
Instant Fuel Leak Repair OCO	C/TBD	TBD : TBD	-	0.000		0.750	Jun 2020	0.000		-		0.000	0.000	0.750	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / Tech Transition Program	Project (Number/Name) 645351 / Prototyping
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	78.953		116.333		137.730		-		137.730	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Spectral Halo Pod: Rapid Prototyping of Aircraft Stores Support	MIPR	AFRL : Bedford, MA	-	-		1.200	Feb 2020	-		-		-	0.000	1.200	-
Spectral Halo Pod: Rapid Prototyping of UAV Payloads Support	C/Various	AFRL : Rome, NY	-	-		2.500	Feb 2020	-		-		-	0.000	2.500	-
Global Lightning/ Commercial Space Support	MIPR	RAND : Santa Monica, CA	-	-		0.700	Feb 2020	-		-		-	0.000	0.700	-
Subtotal			-	-		4.400		-		-		-	0.000	4.400	N/A

Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Spectral Halo Pod: Rapid Prototyping of Aircraft Stores Support	MIPR	AFRL : Patuxent River, MD	-	-		0.200	Feb 2020	-		-		-	0.000	0.200	-
Spectral Halo Pod: Rapid Prototyping of UAF Payloads Support	C/Various	Various : Various	-	-		5.000	Mar 2020	-		-		-	0.000	5.000	-
Global Lightning/ Commercial Space Internet	MIPR	Various : Various	-	-		1.876	Mar 2020	-		-		-	0.000	1.876	-
Subtotal			-	-		7.076		-		-		-	0.000	7.076	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

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>
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Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Spectral Halo Pod: Rapid Prototyping of Aircraft Stores Support	MIPR	AFRL : Arlington, VA	-	-		0.100	Oct 2019	-		-		-	0.000	0.100	-
Spectral Halo Pod: Rapid Prototyping of UAV Payloads Support	MIPR	AFRL : Arlington, VA	-	-		0.100	Feb 2020	-		-		-	0.000	0.100	-
Global Lightning/ Commercial Space Internet	Various	Various : Various	-	-		0.119	Mar 2020	-		-		-	0.000	0.119	-
Subtotal			-	-		0.319		-		-		-	0.000	0.319	N/A
Project Cost Totals			-	78.953		128.128		137.730		-		137.730	Continuing	Continuing	N/A

Remarks
Additional details, including Spectral Halo, low-cost attritable aircraft technology, space internet prototyping, and other emerging prototyping efforts, can be provided in the appropriate forum.

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force **Date:** February 2020

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>
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Congressional Add - Reliable Power for Critical Infrastructure																												
Congressional Add - Logistics Technologies																												
Congressional Add - Small Satellite Manufacturing																												
Congressional Add - Advanced Repair and Qualification Processes																												
Congressional Add - Additive Manufacturing																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force **Date:** February 2020

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>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Lifecycle Prototyping</i>				
Spectral Halo Pod	1	2019	4	2020
Low-Cost Attritable Aircraft Technology (LCAAT)	1	2019	4	2019
Commercial Space Internet	1	2019	4	2022
Congressional Add - Alternative Energy Research	2	2019	4	2019
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
Game Changing Technologies	1	2021	4	2023
Emerging Prototypes as directed	1	2019	4	2023
OCO - Mobile Counter-UAS Airborne Payload Suite	1	2020	4	2020
OCO - Integrated Expeditionary Counter Unmanned Aerial Systems	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
Congressional Add - Rapid Sustainment Office	1	2020	4	2020
Congressional Add - Reliable Power for Critical Infrastructure	1	2020	4	2020
Congressional Add - Logistics Technologies	1	2020	4	2020
Congressional Add - Small Satellite Manufacturing	1	2020	4	2020
Congressional Add - Advanced Repair and Qualification Processes	1	2020	4	2020
Congressional Add - Additive Manufacturing	1	2020	4	2020