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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 3: Advanced Technology Development (ATD)					R-1 Program Element (Number/Name) PE 0603680F I Manufacturing Technology Program							
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	-	63.224	65.760	43.116	0.000	43.116	44.416	45.943	47.002	48.051	Continuing	Continuing
635280: Manufacturing Technologies	-	63.224	65.760	43.116	0.000	43.116	44.416	45.943	47.002	48.051	Continuing	Continuing

## A. Mission Description and Budget Item Justification

This program executes technical programs to maintain and develop an affordable and reliable industrial base and manufacturing capability that will be responsive to warfighter needs. The program develops and improves manufacturing technologies and processes to enable cost reduction, improve component and system quality, and enhance industrial capability. Value stream modifications and manufacturing throughput improvements are effected to shorten cycle times of weapon systems during design, development, production and sustainment. Manufacturing Technologies objectives are conducted through industrial partnerships which enable the demonstration of manufacturing technologies for existing weapon system upgrades and/or for new warfighter systems. Efforts in the program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver science & technology capabilities. The use of program funds in this PE would be in addition to the civilian pay expenses budgeted in program elements 0601102F, 0602102F, 0602201F, 0602202F, 0602203F, 0602204F, 0602602F, 0602605F, 0602788F, 1206601F, and 0602298F.

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 program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.

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B. Program Change Summary (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget		46.450	42.025	43.116	0.000	43.116
Current President's Budget		63.224	65.760	43.116	0.000	43.116
Total Adjustments		16.774	23.735	0.000	0.000	0.000
• Congressional General Reductions		-0.040	-0.065			
• Congressional Directed Reductions		0.000	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		18.600	23.800			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		-1.786	0.000			
• Other Adjustments		0.000	0.000	0.000	0.000	0.000
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 635280: Manufacturing Technologies						
Congressional Add: Program Increase						
Congressional Add: Program increase - F-35 Battery Technology						
Congressional Add: Program increase - Materials Development Research						
Congressional Add: Program Increase - Modeling Technology for Small Turbine Engines						
Congressional Add Subtotals for Project: 635280						
Congressional Add Totals for all Projects						
C. Accomplishments/Planned Programs (\$ in Millions)						
Title: Sustainment Manufacturing Technologies						
Description: Develop and transition pervasive affordability and producibility technologies for the sustainment of weapons systems and processes.						
FY 2019 Plans:						
Continue development of cost effective conventional production and special material repair technologies to enable affordable sustainment of aircraft systems. Continue agile sustainment and automation manufacturing technology development for depot maintenance.						
FY 2020 Plans:						

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>
Advance high demand specialized manufacturing technologies to develop cost effective conventional production and special material repair technologies to enable affordable sustainment of aircraft systems. Align distributed advanced manufacturing techniques and concepts for agile sustainment and automation technology development for depot maintenance and flight line repair efficiency.				
<b>FY 2019 to FY 2020 Increase/Decrease Statement:</b> FY 2020 increased compared to FY 2019 by \$0.323 million. Justification for the increase is described in the plans above.				
<b>Title:</b> Advanced Manufacturing Technologies <b>Description:</b> Develop and transition affordable advanced manufacturing technologies for weapons systems.  <b>FY 2019 Plans:</b> Continue development and demonstration of agile manufacturing capabilities for more affordable advanced turbine engine propulsion technologies, Intelligence, Surveillance, Reconnaissance (ISR) and communications technologies, transparent ceramics producibility, and the producibility of air armaments. Continue development of agile manufacturing applications and structures affordability with a focus on low cost attritable aircrafts and open pod architecture. Continue to develop manufacturing capabilities for producibility and affordability of aerospace structures, and hypersonics.  <b>FY 2020 Plans:</b> Continue to refine the development and demonstrate advanced agile manufacturing and repair capabilities for more affordable and increased availability of advanced turbine engine propulsion technologies, ISR and communications technologies, transparent ceramics producibility, and the producibility of air armaments. Continue and refine development of high demand distributed agile manufacturing applications and structures affordability with a focus on low cost attritable aircrafts and open pod architecture. Transition successful technologies. Continue the development and demonstrate manufacturing capabilities for producibility and affordability of aerospace structures, and hypersonics.  <b>FY 2019 to FY 2020 Increase/Decrease Statement:</b> FY 2020 increased compared to FY 2019 by \$0.833 million. Justification for the increase is described in plan above.		33.129	30.211	31.044
<b>Accomplishments/Planned Programs Subtotals</b>		45.135	41.960	43.116
		<b>FY 2018</b>	<b>FY 2019</b>	
<b>Congressional Add:</b> Program Increase		9.725	0.000	

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		<b>FY 2018</b>	<b>FY 2019</b>
<b>FY 2018 Accomplishments:</b> Conducted Congressionally directed efforts. <b>FY 2019 Plans:</b> Not Applicable			
<b>Congressional Add:</b> Program increase - F-35 Battery Technology <b>FY 2018 Accomplishments:</b> Conducted Congressionally directed efforts. <b>FY 2019 Plans:</b> Conduct Congressionally directed efforts.		8.364	9.800
<b>Congressional Add:</b> Program increase - Materials Development Research <b>FY 2018 Accomplishments:</b> Not Applicable <b>FY 2019 Plans:</b> Conduct Congressionally directed efforts.		0.000	10.000
<b>Congressional Add:</b> Program Increase - Modeling Technology for Small Turbine Engines <b>FY 2018 Accomplishments:</b> Not Applicable <b>FY 2019 Plans:</b> Conduct Congressionally directed efforts.		0.000	4.000
<b>Congressional Adds Subtotals</b>		18.089	23.800
<b><u>D. Other Program Funding Summary (\$ in Millions)</u></b> N/A <b><u>Remarks</u></b>  <b><u>E. Acquisition Strategy</u></b> N/A  <b><u>F. Performance Metrics</u></b> 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.			