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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

| Appropriation/Budget Activity | | | | | R-1 Program Element (Number/Name) | | | | | | | |
|--|--------------------|----------------|----------------|---------------------|---|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i> | | | | | PE 0603680F I <i>Manufacturing Technology Program</i> | | | | | | | |
| COST (\$ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
| Total Program Element | - | 51.467 | 46.344 | 46.450 | 0.000 | 46.450 | 42.953 | 43.441 | 44.751 | 46.588 | Continuing | Continuing |
| 635280: <i>Manufacturing Technologies</i> | - | 51.467 | 46.344 | 46.450 | 0.000 | 46.450 | 42.953 | 43.441 | 44.751 | 46.588 | 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 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

| B. Program Change Summary (\$ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget | 52.630 | 46.344 | 45.386 | 0.000 | 45.386 |
| Current President's Budget | 51.467 | 46.344 | 46.450 | 0.000 | 46.450 |
| Total Adjustments | -1.163 | 0.000 | 1.064 | 0.000 | 1.064 |
| • Congressional General Reductions | 0.000 | 0.000 | | | |
| • Congressional Directed Reductions | 0.000 | 0.000 | | | |
| • Congressional Rescissions | 0.000 | 0.000 | | | |
| • Congressional Adds | 0.000 | 0.000 | | | |
| • Congressional Directed Transfers | 0.000 | 0.000 | | | |
| • Reprogrammings | -0.048 | 0.000 | | | |
| • SBIR/STTR Transfer | -1.115 | 0.000 | | | |
| • Other Adjustments | 0.000 | 0.000 | 1.064 | 0.000 | 1.064 |

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

Project: 635280: *Manufacturing Technologies*

Congressional Add: *Additive Manufacturing*

| FY 2016 | FY 2017 |
|----------------|----------------|
| | |
| 10.000 | - |

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| Congressional Add Details (\$ in Millions, and Includes General Reductions) | | FY 2016 | FY 2017 |
| Congressional Add Subtotals for Project: 635280 | | 10.000 | - |
| Congressional Add Totals for all Projects | | 10.000 | - |
| Change Summary Explanation Funding realigned in FY 2018 to support higher Department of Defense priorities. | | | |
| C. Accomplishments/Planned Programs (\$ in Millions) | FY 2016 | FY 2017 | FY 2018 |
| Title: Sustainment Manufacturing Technologies | 12.440 | 12.873 | 13.006 |
| Description: Develop and transition pervasive affordability and producibility technologies for weapons systems and processes. | | | |
| FY 2016 Accomplishments: Validated and demonstrated laser bond inspection methodology. Developed cost effective conventional and special material production and repair technologies to enable affordable sustainment of aircraft systems. Continued manufacturing technology development for depot maintenance. | | | |
| FY 2017 Plans: Continue development of cost effective conventional production and special material repair technologies to enable affordable sustainment of aircraft systems. Continue agile sustainment manufacturing technology development for depot maintenance. | | | |
| FY 2018 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. | | | |
| Title: Advanced Manufacturing Technologies | 29.027 | 33.471 | 33.444 |
| Description: Develop and transition pervasive affordability and producibility technologies for weapons systems and processes. | | | |
| FY 2016 Accomplishments: Developed and demonstrated manufacturing capabilities for more affordable advanced turbine engine propulsion technologies, communications technologies, advanced active electronically scanned array (AESA) sensor applications, and mid-wave infrared (MWIR) optics producibility. Demonstrated integrated direct-write electronics and manufacturing technology for vertical cavity surface emitting lasers. Improved casting processes through advanced modeling and manufacturing processes. Continued | | | |

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| Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i> | | R-1 Program Element (Number/Name) PE 0603680F <i>I Manufacturing Technology Program</i> | |
| C. Accomplishments/Planned Programs (\$ in Millions) | | FY 2016 | FY 2017 |
| development of agile manufacturing applications and hot structures affordability and continued to mature advanced material development. | | | |
| FY 2017 Plans: Continue development and demonstration of agile manufacturing capabilities for more affordable advanced turbine engine propulsion technologies, intelligence, surveillance, and reconnaissance 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 mature advanced material manufacturing development and transition to the field. | | | |
| FY 2018 Plans: Continue development and demonstration of agile manufacturing capabilities for more affordable advanced turbine engine propulsion technologies, Intelligence, Surveillance, and 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, precision guided munitions, and hypersonics. | | | |
| Accomplishments/Planned Programs Subtotals | | 41.467 | 46.344 |
| | | | |
| | | FY 2016 | FY 2017 |
| Congressional Add: Additive Manufacturing | | 10.000 | - |
| FY 2016 Accomplishments: Conducted congressionally directed effort | | | |
| Congressional Adds Subtotals | | 10.000 | - |
| D. Other Program Funding Summary (\$ in Millions) | | | |
| N/A | | | |
| Remarks | | | |
| E. Acquisition Strategy | | | |
| N/A | | | |
| F. Performance Metrics | | | |
| Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission. | | | |