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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 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0702207F / <i>Depot Maintenance (Non-IF)</i>
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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	-	1.880	1.890	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
673326: <i>Precision Measurement & Calibration</i>	-	1.880	1.890	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program develops, tests, and evaluates national and Air Force measurement standards (hardware) and calibration equipment in support of all Air Force programs and activities, including Precision Measurement Equipment Laboratories (PMELs) worldwide. Metrology research and development provides technology to support systems in all phases of development and acquisition, as well as Air Force R&D laboratories, test ranges, ground test facilities, and operational weapons systems support. Rapidly changing technology requires continuing research and development of measurement standards and calibration equipment to ensure modern weapon systems meet Air Force readiness objectives. This program addresses all metrology disciplines and includes the technology areas of laser, infrared, microwave, millimeter wave, optical, physical, mechanical, electrical, electronic, and ionizing radiation measurements. Metrology is a technical discipline devoted to the science of measurements and to the study and improvement of measurement technology. Measurements are the foundation of military system development, quality assurance, hardware conformance testing and system readiness tests. The integrity of these tests is assured through calibration and traceability assurance schemes. The capability to measure and calibrate must parallel the emergence of new technology, new ranges, and new capabilities of military systems. Lack of new measurement capability impedes or blocks the successful exploitation of new technologies, especially in the movement from development laboratory to production to deployment. R&D efforts are essential within the DoD to pace these requirements, otherwise, these same new systems will suffer time delays, excessive cost, and increased risk due to unreliable test results in all phases of development, production, deployment and operation.

This program element may include necessary civilian pay expenses required to manage, execute and deliver 0702207F. 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.

Program is managed by Air Force Materiel Command, Agile Combat Support Directorate, Air Force Metrology Division (WNM).

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
Previous President's Budget	1.897	1.890	1.974	0.000	1.974	
Current President's Budget	1.880	1.890	0.000	0.000	0.000	
Total Adjustments	-0.017	0.000	-1.974	0.000	-1.974	
• Congressional General Reductions	0.000	0.000				
• Congressional Directed Reductions	0.000	0.000				
• Congressional Rescissions	0.000	0.000				
• Congressional Adds	0.000	0.000				
• Congressional Directed Transfers	0.000	0.000				
• Reprogrammings	0.000	0.000				
• SBIR/STTR Transfer	0.000	0.000				
• Other Adjustments	-0.017	0.000	-1.974	0.000	-1.974	
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2019	FY 2020	FY 2021
Title: Weapons Systems Measurement Standards				0.568	0.298	0.000
Description: Develop national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment.						
FY 2020 Plans: Continue development of national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment.						
FY 2021 Plans: Continue development of national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment.						
FY 2020 to FY 2021 Increase/Decrease Statement: Increased cost based on estimated workload for the Weapons System Measurement standards area for FY21.						
Title: Electrical Measurements				0.000	0.368	0.000
Description: Develop standards for electrical measurements to support high accuracy electronic test equipment.						
FY 2020 Plans: Continue development of standards for electrical measurements to support high accuracy electronic test equipment.						
FY 2021 Plans:						

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Continue development of standards for electrical measurements to support high accuracy electronic test equipment. FY 2020 to FY 2021 Increase/Decrease Statement: Increased FY21 funding based on estimated cost for planned workload in the Electrical Measurement Area.				
Title: Radar Support/Communications Description: Develop standards for radar support, RF communication systems, and radar cross section range measurements. FY 2020 Plans: Continue development of standards for radar support, RF communication systems, and radar cross section range measurements. FY 2021 Plans: Continue development of standards for radar support, RF communication systems, and radar cross section range measurements. FY 2020 to FY 2021 Increase/Decrease Statement: Increased FY21 funding based on estimated cost for planned workload in the Radar/Support/Communications Measurement Area.		0.702	0.596	0.000
Title: Calibration Description: Develop improved calibration standards to support physical, mechanical, and electro-mechanical support equipment. FY 2020 Plans: Continue development of improved calibration standards to support physical, mechanical, and electro-mechanical support equipment. FY 2021 Plans: Continue development of improved calibration standards to support physical, mechanical, and electro-mechanical support equipment. FY 2020 to FY 2021 Increase/Decrease Statement: Increased FY21 funding based on estimated cost for planned workload in the Calibrations Area.		0.560	0.628	0.000
Title: Analytical Metrology Description: Develop standards, models, and procedures to support analytical metrology applications. FY 2020 Plans:		0.050	0.000	0.000

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Continue development of standards, models, and procedures to support analytical metrology applications.			
<i>FY 2021 Plans:</i> Continue development of standards, models, and procedures to support analytical metrology applications.			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Increased analytical costs.			
Accomplishments/Planned Programs Subtotals	1.880	1.890	0.000
Other Service Funding Adjustment	0.000	-	-
Air Force Subtotals	1.880	1.890	0.000

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

N/A

Remarks

E. Acquisition Strategy

Primarily accomplished through intergovernmental transfer between the Department of Defense and other Federal Departments.

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0702207F / <i>Depot Maintenance (Non-IF)</i>	Project (Number/Name) 673326 / <i>Precision Measurement & Calibration</i>

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

<i>Standards Development</i>	
Standards Development	

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

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Standards Development</i>				
Standards Development	1	2019	4	2025