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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602890F / <i>High Energy Laser Research</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	26.886	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
625096: <i>High Energy Laser Research</i>	-	26.886	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program funded Department of Defense Directed Energy applied research through the Joint Directed Energy Transition Office. This program was part of an overall Department of Defense Directed Energy Science and Technology program. Directed Energy weapon systems have many potential advantages including speed of-light delivery, low collateral damage, significant magazine depth, low incremental cost per kill. Directed Energy Weapon Systems have the potential to perform a wide variety of military missions including high value asset and base protection, precision strike and platform self-protection versus a wide variety of missile, rocket, artillery, mortar and air platforms. Efforts under this program were generally chosen for their potential to have an impact on multiple Directed Energy Weapon systems and multiple Service missions while complementing Service/Agency efforts that are directed at specific Service needs. A broad range of technologies were addressed in key areas such as laser sources, microwave sources, laser beam control, antennas, waveguides, modeling and simulation, and lethality mechanisms. This program provided the enabling technology necessary to demonstrate advanced concepts for high power microwave sources, antennas and waveguides for mission areas not considered to date. The high power microwave lethality, hardware and software improvements and modeling and simulation advances provided by this program are essential to expand and build upon current architectures. This program supported the Senior Official as required. Efforts in this program were coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

For FY 2022 this devolved PE was transferred back to OSD under BA2 Program 62890D8Z. This move was at the request of OSD so that they may better integrate with current OSD Directed Energy efforts and participate in OSD budget processes.

This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.

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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	29.155	0.000	0.000	0.000	0.000
Current President's Budget	26.886	0.000	0.000	0.000	0.000
Total Adjustments	-2.269	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-4.920	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	4.920	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-2.269	0.000	0.000	0.000	0.000

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

Project: 625096: *High Energy Laser Research*

Congressional Add: *Program increase - Directed energy fiber lasers*

Congressional Add Subtotals for Project: 625096

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	2.651	0.000
Congressional Add Subtotals for Project: 625096	2.651	0.000
Congressional Add Totals for all Projects	2.651	0.000

Change Summary Explanation

Not Applicable

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

	FY 2021	FY 2022	FY 2023
Title: Directed Energy Technologies	4.242	0.000	0.000
Description: Mature technologies that will provide system level performance commensurate with fieldable directed energy devices.			
FY 2022 Plans: For FY 2022 this effort is moving to OSD PE 62890D8Z			
FY 2023 Plans: Not Applicable			
FY 2022 to FY 2023 Increase/Decrease Statement:			

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Not Applicable				
<p>Title: Advanced Directed Energy Technologies</p> <p>Description: Investigate new technologies that have revolutionary potential for high energy lasers and high power microwaves.</p> <p>FY 2022 Plans: For FY 22 this effort is moving to OSD PE 62890D8Z</p> <p>Not applicable.</p> <p>FY 2023 Plans: Not Applicable</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Not Applicable</p>		3.451	0.000	0.000
<p>Title: Directed Energy Propagation Technologies</p> <p>Description: Develop technology to support high performance beam control systems and integrated demonstrations.</p> <p>FY 2022 Plans: For FY 22 this effort is moving to OSD PE 62890D8Z</p> <p>FY 2023 Plans: Not Applicable</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Not Applicable</p>		12.011	0.000	0.000
<p>Title: Directed Energy Lethality Research</p> <p>Description: Conduct directed energy vulnerability experiments on materials, components, and targets. Develop a lethality database, and integrate into a systems-level architecture plan and lethality models.</p> <p>FY 2022 Plans: For FY 22 this effort is moving to OSD PE 62890D8Z</p> <p>FY 2023 Plans:</p>		2.282	0.000	0.000

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Not Applicable				
FY 2022 to FY 2023 Increase/Decrease Statement: Not Applicable				
Title: Directed Energy Modeling		2.249	0.000	0.000
Description: Maintain and evaluate high-fidelity engineering models for high energy laser and high power microwave system scenario evaluation and incorporation into the directed energy toolkit. Provide atmospheric propagation and directed energy system modeling for mission-level war-gaming activities.				
FY 2022 Plans: For FY 22 this effort is moving to OSD PE 62890D8Z				
FY 2023 Plans: Not Applicable				
FY 2022 to FY 2023 Increase/Decrease Statement: Not Applicable				
Accomplishments/Planned Programs Subtotals		24.235	0.000	0.000
		FY 2021	FY 2022	
Congressional Add: Program increase - Directed energy fiber lasers		2.651	0.000	
FY 2021 Accomplishments: Conduct Congressional directed efforts.				
FY 2022 Plans: Not applicable				
Congressional Adds Subtotals		2.651	0.000	
D. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
E. Acquisition Strategy				
Not Applicable				