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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force **Date:** March 2023

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 0604033F / <i>Hypersonics Prototyping</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	308.089	114.981	150.340	0.000	150.340	0.000	0.000	0.000	0.000	0.000	573.410
643882: <i>Air-Launched Rapid Response Weapon (ARRW)</i>	-	308.089	114.981	150.340	0.000	150.340	0.000	0.000	0.000	0.000	0.000	573.410

Note

In FY 2022, PE 0101101F, Project ARRW00/AGM-183A Air-Launched Rapid Response Weapon, efforts were transferred to PE 0604033F, Hypersonics Prototyping, Project 643882, Air-Launched Rapid Response Weapon, in order to mitigate the testing shortfall.

In FY 2024, HACM funding under PE0604033F, Project 643883 Hypersonic Attack Cruise Missile, efforts were transferred to PE 0604183F, Project 644183 Hypersonic Attack Cruise Missile.

A. Mission Description and Budget Item Justification

The Hypersonics Prototyping program enables integration and demonstration of emerging hypersonic technologies in an operational or operational-like environment to capitalize on successful laboratory hypersonic research and development efforts with high warfighter priority. Integration and demonstration of hypersonic prototypes also allows leadership to make informed strategy and resource decisions for future programs based on the results of such hypersonic prototype demonstrations.

Hypersonic Prototyping enables a key linkage between research and development in the lab and fielding advanced technologies to the warfighter. Under this program, Air-Launched Rapid Response Weapon (ARRW) will accelerate the technology transfer of hypersonic technologies to enable a responsive, long range strike capability.

Throughout this program element will be future hypersonic development, which will incubate and mature new technologies, processes, and resources for the development and demonstration of hypersonic technology including, but not limited to, infrastructure advancements, digital engineering, open systems architecture, modeling and simulation, analytics, and high performance computing environments.

Investing in hypersonics development enables the collection of valuable data, builds capacity and capability, allows hypersonic programs to leverage and build upon each other, and projects the overall technology forward.

The total cost of the ARRW Rapid Prototyping Middle Tier of Acquisition effort is 1,649.19 million, including RDT&E. ARRW is fully funded across the Future Years Defense Program.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY 2022 3.729 million was expended for civilian pay expenses in this program element, in FY 2023 4.332 million is forecasted for civilian pay expenses.

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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 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	318.687	431.868	270.240	0.000	270.240
Current President's Budget	308.089	114.981	150.340	0.000	150.340
Total Adjustments	-10.598	-316.887	-119.900	0.000	-119.900
• 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	-316.887			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-10.598	0.000			
• Other Adjustments	0.000	0.000	-119.900	0.000	-119.900

Change Summary Explanation

In FY 2022, funding decreased \$10.598M for SIBR in PE 0604033, Project 643882 Air-Launched Rapid Response Weapon.

In FY 2023, \$316.887M from PE0604033F, Project 643883 Hypersonic Attack Cruise Missile, Congressional Direct transfer to PE 0604183F, Project 644183 Hypersonic Attack Cruise Missile.

In FY 2024, \$270.240M from PE0604033F, Project 643883 Hypersonic Attack Cruise Missile, transferred to PE 0604183F, Project 644183 Hypersonic Attack Cruise Missile and funding increased \$150.340M in Project 643882 Air-Launched Rapid Response Weapon to complete flight testing and rapid prototyping program.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force										Date: March 2023		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0604033F / <i>Hypersonics Prototyping</i>				Project (Number/Name) 643882 / <i>Air-Launched Rapid Response Weapon (ARRW)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
643882: <i>Air-Launched Rapid Response Weapon (ARRW)</i>	-	308.089	114.981	150.340	0.000	150.340	0.000	0.000	0.000	0.000	0.000	573.410
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air-Launched Rapid Response Weapon (ARRW) project integrates Air Force and DARPA enabled system technologies into a prototype that will demonstrate the viability of this concept to be fielded as a long range prompt strike capability. ARRW will design, develop, manufacture, and test, a number of prototype vehicles to inform decisions concerning ARRW acquisition and production.

Future hypersonics development will incubate and mature new technology, processes, and resources for the development and demonstration of hypersonic technology including, but not limited to, infrastructure advancements, digital engineering, open systems architecture, modeling and simulation, analytics, and high performance computing environments.

Investing in hypersonics development will enable the collection of valuable data, building of capacity and capability, allowing hypersonic programs to leverage and build upon each other, and project the overall technology forward.

In FY 2022, PE 0101101F, Project ARRW00/AGM-183A Air-Launched Rapid Response Weapon, efforts were transferred to PE 0604033F, Hypersonics Prototyping, Project 643882, Air-Launched Rapid Response Weapon, in order to mitigate the testing shortfall.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY 2022 \$3.729 million was expended for civilian pay expenses in this program element, FY 2023 \$4.332 million is forecasted for civilian pay expenses in this program element.

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

	FY 2022	FY 2023	FY 2024
Title: Air Launched Rapid Response Weapon (ARRW)	308.089	114.981	150.340
Description: Integrates Air Force and DARPA enabled system technologies into a prototype that will demonstrate the viability of this concept to be fielded as a long range prompt strike capability. ARRW will design, develop, manufacture, and test, a number of prototype vehicles to inform decisions concerning ARRW acquisition, production, and leave behind capability.			
FY 2023 Plans:			

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Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604033F / <i>Hypersonics Prototyping</i>	Project (Number/Name) 643882 / <i>Air-Launched Rapid Response Weapon (ARRW)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Continued flight test of AUR test missiles, Production Readiness Reviews (PRRs), and Early Operational Capability (EOC) activities.			
<i>FY 2024 Plans:</i> Complete the rapid prototyping program and flight testing. The testing will enable ARRW to collect valuable data, build capacity and capability, allow hypersonics programs to leverage and build upon each other, and project the overall technology forward. Additionally, ARRW will complete contract closeout, finalize documentation and analysis, and activities to support the leave behind capability.			
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Funding increased to complete the rapid prototyping program and flight testing.			
Accomplishments/Planned Programs Subtotals	308.089	114.981	150.340

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• MPAF 02 0101101F: N/A	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	-	0.000	0.000

Remarks

D. Acquisition Strategy
Acquisition Decision Memorandum (signed 3 May 2018) designated Air-Launched Rapid Response Weapon (ARRW) as Section 804 Rapid Prototyping Program.

The Air Force awarded in August 2018 an undefinitized contract in order to complete a critical design review and procure all long lead parts and materials. The ARRW Program definitized this contract December 2019 to include the entire RDT&E effort (through the end of flight test). The cost type contract includes schedule incentives. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Armament Directorate, Eglin AFB, FL.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force **Date:** March 2023

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604033F / <i>Hypersonics Prototyping</i>	Project (Number/Name) 643882 / <i>Air-Launched Rapid Response Weapon (ARRW)</i>
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
ARRW - Contract	C/CPFF	LMCO: Various : Various	-	217.703	Feb 2022	43.076	Dec 2022	91.318	Dec 2023	-		91.318	0.000	352.097	-
ARRW - Mission Planning	C/CPFF	Boeing: Tapestry : TBD	-	0.944	Mar 2022	0.856	Dec 2022	0.800	Dec 2023	-		0.800	0.000	2.600	-
ARRW - Aircraft Integration	Various	Various : Various	-	10.572	Jan 2022	0.640	Dec 2022	-		-		-	0.000	11.212	-
Subtotal			-	229.219		44.572		92.118		-		92.118	0.000	365.909	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Direct Cite Authority Civilian Pay	Allot	Not specified. : TBD	-	3.729	Oct 2021	4.332	Oct 2022	4.967	Oct 2023	-		4.967	0.000	13.028	-
Subtotal			-	3.729		4.332		4.967		-		4.967	0.000	13.028	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
ARRW - Government Test	Various	Various : TBD	-	66.978	May 2022	56.200	Dec 2022	45.340	Dec 2023	-		45.340	0.000	168.518	-
Subtotal			-	66.978		56.200		45.340		-		45.340	0.000	168.518	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
ARRW - Program Management Administration	Various	Multiple : TBD	-	8.163	Sep 2022	9.877	Oct 2022	7.915	Oct 2023	-		7.915	0.000	25.955	-
Subtotal			-	8.163		9.877		7.915		-		7.915	0.000	25.955	N/A

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Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
Includes A&AS support requirements plus TDY, and office supplies.

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	308.089	114.981	150.340	-	150.340	0.000	573.410	N/A

Remarks
Additional details on Hypersonics prototyping concepts can be provided in the appropriate forum.

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604033F / <i>Hypersonics Prototyping</i>	Project (Number/Name) 643882 / <i>Air-Launched Rapid Response Weapon (ARRW)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Air Launched Rapid Response Weapon (ARRW)</i>				
ARRW- Contract	1	2022	1	2025
Flight Tests	1	2022	3	2024

Note
Further schedule details can be provided in the appropriate forum.