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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 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604183F / <i>Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)</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	-	0.000	190.116	144.891	0.000	144.891	117.282	33.226	0.000	90.540	0.000	576.055
644183: <i>Hypersonic Attack Cruise Missile (HACM)</i>	-	0.000	190.116	144.891	0.000	144.891	117.282	33.226	0.000	90.540	0.000	576.055
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Hypersonic Attack Cruise Missile (HACM) integrates advanced technologies and mature designs into an All-Up Round (AUR) prototype and will demonstrate a fieldable long range prompt strike capability. HACM will design, develop, manufacture, and test a number of prototype vehicles to inform future HACM acquisition decisions.

HACM will mature hypersonic technologies, processes, and resources to include: subsystem integration, infrastructure and testing advancements, digital engineering, open systems architecture, modeling and simulation, analytics, and high performance computing environments.

This PE is not a new start. HACM is currently listed under both 64033F/BPAC 643883 and PE 64183F/BPAC 644183 and will be consolidated to this PE (64183F/BPAC 644183) during the next budget update.

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 2021 \$0.000 million was expended for civilian pay expenses in this program element, and in FY 2022 \$2.360 million is forecasted for civilian pay expenses in this program element.

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.

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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	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	190.116	144.891	0.000	144.891
Total Adjustments	0.000	190.116	144.891	0.000	144.891
• 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	0.000	190.116	144.891	0.000	144.891

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: HACM Development	-	168.040	106.891	-	106.891
Description: Three industry performers purchasing hardware and developing a preliminary design. Followed by a single performer purchasing hardware and completing a critical design, and initial long-lead flight test asset hardware, to include aircraft integration assets.					
FY 2022 Plans: This effort consists of HACM requirements development, hardware purchases, trade studies, completion of preliminary design and start of critical design maturation using a model-based Digital Engineering (DE) ecosystem. The effort also includes the incorporation of Air Force enabled technologies into the design, evaluation of system performance, applying a Weapon Open System Architecture (WOSA) standard and program planning.					
FY 2023 Base Plans: Effort will utilize a single industry performer to build upon preliminary design activities and mature HACM to critical design. The effort will continue model-based engineering activities and the DE ecosystem to complete					

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C. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
critical design analysis, design verification testing, systems integration, lab development, initial qualification testing, initial flight test hardware orders, aircraft integration assets, and WOSA compliance evaluation. FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 funding decreased compared to FY 2022 by \$61.149 million due to the completion of PDR in FY 2022, advancement to CDR in FY 2023, and initial hardware orders.						
Title: Integration, Qualification, and Test Description: This effort includes the government costs associated to assembly, integration and test of subsystems for qualification testing as well as prototype systems for system qualification, ground test and flight testing. The effort includes the planning, execution and analysis to complete the defined HACM test strategy. FY 2022 Plans: Effort begins the planning, execution and analysis to assist in the completion of a defined HACM test strategy. FY 2023 Base Plans: Effort continues the assembly, integration and test of subsystems for qualification testing as well as prototype systems for system qualification, ground test and flight testing. FY 2022 to FY 2023 Increase/Decrease Statement: FY2023 funding increased compared to FY 2022 by \$32.877 million due to the ramp up of efforts to develop the HACM missile.		-	5.123	38.000	-	38.000
Title: Program Support Description: Provides associated direct cite authority civilian pay and contractor support for HACM requirements. FY 2022 Plans: Efforts include Digital Engineering (DE), WOSA development/support, DE Infrastructure, mission planning and direct cite authority civilian pay. FY 2023 Base Plans: Efforts include Digital Engineering (DE), WOSA development/support, DE Infrastructure, mission planning, container design, tech orders and direct cite authority civilian pay. FY 2023 OCO Plans:		-	16.953	0.000	0.000	0.000

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Funding decreased due to DE infrastructure.					
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2023 funding decreased compared to FY 2022 by \$16.953 million.					
Accomplishments/Planned Programs Subtotals	-	190.116	144.891	0.000	144.891

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

Remarks

E. Acquisition Strategy

Project integrates Air Force & Defense Advanced Research Projects Agency (DARPA) enabled systems technologies into a prototype that will demonstrate a multi-mission weapon concept to be fielded as a long range prompt strike capability. Includes scope to develop/test/demonstrate prototype weapon through Digital Model-Based System Engineering (MBSE) process, implementing WOSA and Agile Software Development. The HACM program will prioritize integration on the F-15E platform to enable quick entry into flight test.

The Air Force will award a Cost Plus Fixed Fee (CPFF) contract to procure all long lead parts, materials and labor for HACM Critical Design Review Development.

Acquisition Strategy approved Dec 2021 which designated HACM as a Section 804 Middle Tier of Acquisition (MTA) Pathway (Rapid Prototyping). Engaging OSD MTA Panel for pathway concurrence 2nd quarter of FY 2022.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3600 / 4				PE 0604183F / Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)				644183 / Hypersonic Attack Cruise Missile (HACM)							
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
HACM prime contractor support, analysis, technical risk reduction, and development	C/CPFF	Multiple: TBD: Various : TBD	-	-		168.040	Jun 2022	144.891	Mar 2023	-		144.891	Continuing	Continuing	-
Subtotal			-	-		168.040		144.891		-		144.891	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development & Prototyping	C/CPFF	Multiple: TBD: Various : TBD	-	-		5.675	Apr 2022	-		-		-	Continuing	Continuing	-
Direct Cite Authority Civilian Pay	Allot	Not specified: TBD : TBD	-	-		2.360	May 2022	-		-		-	Continuing	Continuing	-
Subtotal			-	-		8.035		-		-		-	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	C/TBD	Multiple: TBD: Various : TBD	-	-		5.123	Jun 2022	-		-		-	Continuing	Continuing	-
Subtotal			-	-		5.123		-		-		-	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/TBD	Multiple: TBD: Various : TBD	-	-		8.918	Apr 2022	-		-		-	Continuing	Continuing	-
Subtotal			-	-		8.918		-		-		-	Continuing	Continuing	N/A

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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	190.116	144.891	-	144.891	Continuing	Continuing	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604183F / <i>Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)</i>	Project (Number/Name) 644183 / <i>Hypersonic Attack Cruise Missile (HACM)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Hypersonic Attack Cruise Missile (HACM)</i>				
HACM Development	2	2022	2	2027
Integration, Qualification, and Test	2	2022	2	2027
Preliminary Design	2	2022	4	2022
Critical Design	4	2022	4	2023