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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Office of the Secretary Of Defense **Date:** May 2021

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>					PE 0604165D8Z I <i>Prompt Global Strike Capability Development</i>							
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	2,120.906	152.782	89.863	0.000	-	0.000	-	-	-	-	-	-
166: <i>Alternate Re-Entry System/ Warhead Engineering</i>	2,120.906	53.549	0.000	0.000	-	0.000	-	-	-	-	-	-
065: <i>Joint Hypersonics</i>	0.000	99.233	89.863	0.000	-	0.000	-	-	-	-	-	-

Note

Funding from Project Code 065, Joint Hypersonics, will transfer to Program Element 0603183D8Z, Joint Hypersonic Technology Development & Transition, Project Code 066, Joint Hypersonic Transition Office (JHTO) in FY 2022 to align the JHTO mission and budget activity to congressional intent.

A. Mission Description and Budget Item Justification

This Program Element (PE) was established to develop and demonstrate technologies and applications that advance Conventional Prompt Global Strike (CPGS) warfighting capabilities. The program uses a national team with participation from multiple Services, Agencies, national research laboratories, and industry partners selected on a competitive basis. Program emphasis is on demonstrating component and subsystem technology maturity with risk reduction initiatives highlighted by flight tests. The program funds the design, development, and experimentation of boosters, payload delivery vehicles (PDVs), non-nuclear warheads, thermal protection systems, guidance systems, test range modernization, and mission planning and enabling capabilities. To support these development activities, the program procures modeling and simulation capabilities, ground testing, command and control interfaces, test range support, and launch system infrastructure. Additionally, expert resources address strategic policy and treaty issues. Flight and ground test outcomes drive program timing and DoD hypersonic budget investments.

The Prompt Global Strike Capability Development Program Element supports the National Defense Strategy's focus on technological advancements that enhance deterrence and increase strategic flexibility, freedom of action, and Joint Force lethality.

B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	151.000	0.000	0.000	-	0.000
Current President's Budget	152.782	89.863	0.000	-	0.000
Total Adjustments	1.782	89.863	0.000	-	0.000
• Congressional General Reductions	-	-0.137			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	90.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.966	-			
• SBIR/STTR Transfer	-1.158	-			
• Program Adjustments	-0.026	-	52.000	-	52.000

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• Transfer to Program Element 0603183D8Z	-	-	-52.000	-	-52.000
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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 065: *Joint Hypersonics*

Congressional Add: *University Consortium for Applied Hypersonics*

Congressional Add: *University Science and Technology Research Grants*

Congressional Add: *HyFly2 Initial Risk Mitigation Program*

Congressional Add: *Navigation, Guidance and Controls (NGC) Science and Technology Development*

Congressional Add: *Propulsion Science and Technology Development*

Congressional Add: *Systems Engineering, Design and Analysis (SEDA) Science and Technology Development*

Congressional Add: *Materials, Structures and Manufacturing (MSM) Science and Technology Development*

Congressional Add: *Ordnance Science and Technology Development*

Congressional Add: *Mission Planning Science and Technology Development*

Congressional Add: *Aerodynamics and Aerothermodynamics Science and Technology Development*

Congressional Add: *JHTO Manpower, Support and Administration*

Congressional Add: *JHTO Systems Engineering Field Activity at NSWC Crane*

Congressional Add Subtotals for Project: 065

Congressional Add Totals for all Projects

	FY 2020	FY 2021
	10.683	8.571
	4.248	-
	34.621	9.229
	13.371	18.946
	11.523	17.081
	5.150	7.346
	2.500	7.146
	4.050	5.846
	3.750	3.346
	2.500	4.646
	2.152	3.021
	4.685	4.685
Congressional Add Subtotals for Project: 065	99.233	89.863
Congressional Add Totals for all Projects	99.233	89.863

Change Summary Explanation

FY 2020 \$0.026 million reduction is for other DoD priorities. FY 2021 \$0.137 million reduction is Undistributed Reduction - Excess to Need.

FY 2022 \$52.000 million will transfer to Program Element 0603183D8Z, Joint Hypersonic Technology Development & Transition, Project Code 066, Joint Hypersonic Transition Office (JHTO) to align the JHTO mission and budget activity to congressional intent.

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense **Date:** May 2021

Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Capability Development</i>				Project (Number/Name) 166 / <i>Alternate Re-Entry System/Warhead Engineering</i>			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
166: <i>Alternate Re-Entry System/Warhead Engineering</i>	2,120.906	53.549	0.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
In FY 2021, the Prompt Global Strike program transfers to the Services for execution.

A. Mission Description and Budget Item Justification

This Program Element (PE) was established to develop and demonstrate technologies and applications that advance Prompt Global Strike warfighting capabilities. The program uses a national team with participation from the Services, Agencies, national research laboratories, and involvement of industry. Program emphasis is on demonstrating component and subsystem technology maturity with risk reduction initiatives highlighted by flight tests. The program funds the design, development, and experimentation of boosters, payload delivery vehicles (PDVs), non-nuclear warheads, thermal protection systems, guidance systems, test range modernization, and mission planning and enabling capabilities. To support these development activities, the program procures modeling and simulation capabilities, ground testing, command and control interfaces, test range support, and launch system infrastructure. Additionally, expert resources address strategic policy and treaty issues. Flight and ground test outcomes drive program timing and DoD hypersonic budget investments.

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

	FY 2020	FY 2021	FY 2022
Title: Munitions Program	53.549	-	-
Description: This is a classified munitions program, to be completed in FY 2020. Additional information available upon request.			
Accomplishments/Planned Programs Subtotals	53.549	-	-

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

N/A

Remarks

D. Acquisition Strategy

This is a classified munitions program, to be completed in FY 2020. Acquisition information available upon request.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Office of the Secretary Of Defense **Date:** May 2021

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Cap ability Development</i>	Project (Number/Name) 166 / <i>Alternate Re-Entry System/Warhead Engineering</i>
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Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
Munitions Program	MIPR	Various Performing Activities : Various	2,120.906	53.549		-		-		-		-	Continuing	Continuing	-
Subtotal			2,120.906	53.549		-		-		-		-	Continuing	Continuing	N/A

Remarks
NA

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2,120.906	53.549	0.000	-	-	-	Continuing	Continuing	N/A

Remarks
NA

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Office of the Secretary Of Defense			Date: May 2021		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Capability Development</i>		Project (Number/Name) 166 / <i>Alternate Re-Entry System/Warhead Engineering</i>	

FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
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

Munitions Program	
Program milestones are classified, additional details available upon request.	

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Capability Development</i>	Project (Number/Name) 166 / <i>Alternate Re-Entry System/Warhead Engineering</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Munitions Program</i>				
Program milestones are classified, additional details available upon request.	1	2020	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense **Date:** May 2021

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Capability Development</i>	Project (Number/Name) 065 / <i>Joint Hypersonics</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
065: <i>Joint Hypersonics</i>	0.000	99.233	89.863	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

The Joint Hypersonics project code was created in FY 2020 as a result of a Congressional add that highlighted the threats to national security posed by hypersonic weapons and called for the establishment of the Joint Hypersonics Transition Office (JHTO). This project will transfer to Program Element 0603183D8Z in FY 2022 to align the Joint Hypersonics Transition Office mission and budget activity to congressional intent.

A. Mission Description and Budget Item Justification

The Joint Hypersonics Transition Office (JHTO) within the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) was created to establish a university consortium for hypersonics research and support workforce development; expedite testing, evaluation, and acquisition of hypersonic technologies to meet the stated needs of the warfighter, including flight testing, ground-based-testing, and underwater launch testing; ensure that prototyping demonstration programs on hypersonic systems integrate advanced technologies to speed the maturation and deployment of future hypersonic systems; develop strategies and roadmaps for hypersonic technologies to enable the transition of such technologies to future operational capabilities for the warfighter; and develop and implement a strategy for enhancing the current and future hypersonics workforce.

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

	FY 2020	FY 2021
<i>Congressional Add:</i> University Consortium for Applied Hypersonics	10.683	8.571
<i>FY 2020 Accomplishments:</i> The JHTO established a University Consortium for Applied Hypersonics in 1 Q FY 2021 as a well-balanced, geographically diverse, multi-disciplinary, collaborative ecosystem of university facilities, staff, researchers, and students working across institutions and with the Government to address applied hypersonics problems. The Consortium will help create a strong pipeline of research and workforce development initiatives to meet the future needs of the Department. The JHTO solicited research projects through the Consortium that address priorities and gaps identified by the JHTO Hypersonics Science and Technology (S&T) Roadmap, focusing on workforce development, applied research and advanced technology development related to the hypersonics mission. The Consortium will be available to meet the needs of the Services and all U.S. Government Agencies having a hypersonics mission.		
<i>FY 2021 Plans:</i> The JHTO plans to solicit research projects through the Consortium that address priorities and gaps identified by the JHTO Hypersonics Science and Technology (S&T) Roadmap, focusing on workforce development, applied research and advanced technology development related to the hypersonics mission. To facilitate development of the next generation hypersonics workforce, the JHTO intends to leverage the		

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Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Cap ability Development</i>	Project (Number/Name) 065 / <i>Joint Hypersonics</i>
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021
Consortium to award scholarships to graduate students who are focusing on key hypersonic development areas. Additionally, the Consortium will host Consortium Industry Days, Project Industry Days, and participate in career/ internship fairs to cross-level information and enhance workforce development.		
Congressional Add: University Science and Technology Research Grants FY 2020 Accomplishments: The JHTO awarded eight University Grants through Naval Surface Warfare Center (NSWC) Crane, with the intent of providing rapid support to help sustain the university hypersonics community during the Covid-19 crisis while furthering hypersonics science and technology efforts across critical lines of inquiry. These grants, of approximately \$0.500 million each, have been awarded to the following Universities: the University of Dayton Research Institute; Texas A&M University; the University of Texas at Austin; the University of Minnesota; the North Carolina State University; the University of Florida; the University of Michigan; and the University of Tennessee Space Institute. Solicitations for these Grants were based on priorities highlighted in the Hypersonics S&T Roadmap.	4.248	-
Congressional Add: HyFly2 Initial Risk Mitigation Program FY 2020 Accomplishments: This project continued research necessary to develop and field a hypersonic cruise missile. The project provided a series of weapon systems options and a program plan for a hypersonic cruise missile employable at stand-off range from naval vessels and aircraft. The HyFly2 Risk Mitigation Program builds on the successful Phase 1 Trade Study effort conducted from May 2019 to November 2019. During the Phase 1 effort, Boeing and Aerojet Rocketdyne (AR) conducted system trade studies that resulted in an updated HyFly2 weapon system configuration, a demonstration program plan, and the identification of major technical risks. FY 2021 Plans: Continue and complete the work initiated with FY 2020 funds, paving the way for a viable hypersonic cruise missile. Additional details regarding this project are sensitive and/or classified and will be provided upon request.	34.621	9.229
Congressional Add: Navigation, Guidance and Controls (NGC) Science and Technology Development FY 2020 Accomplishments: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funded six NGC science and technology projects to improve the operational capabilities of both offensive and defensive hypersonic systems. These projects focus on navigation in contested environments, on-vehicle	13.371	18.946

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021
trajectory generation, communications risk reduction, guidance electronics, and conformal antenna development. Additional details regarding these projects are sensitive and/or classified and will be provided upon request. FY 2021 Plans: Continue activities initiated with FY 2020 funds. Additional details regarding FY 2021 NGC projects are sensitive and/or classified and will be provided upon request.		
Congressional Add: Propulsion Science and Technology Development FY 2020 Accomplishments: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funded four propulsion science and technology projects designed to enhance propulsion capabilities for both offensive and defensive hypersonic systems. These efforts close critical gaps in the development of hypersonic cruise missiles and enhance range and/or payload capacity of boost-glide systems. Focus areas for these projects included solid rocket motor component technologies, expanding the operating envelope of Dual-Mode Ramjet/Scramjet propulsion systems, developing new actuator technologies for axial thrusters, and establishing a proof-of-principle for an improved endothermic fuel for hypersonic applications. Additional details regarding these projects are sensitive and/or classified and will be provided upon request. FY 2021 Plans: Continue activities initiated with FY 2020 funds. Additional details regarding FY 2021 propulsion projects are sensitive and/or classified and will be provided upon request.	11.523	17.081
Congressional Add: Systems Engineering, Design and Analysis (SEDA) Science and Technology Development FY 2020 Accomplishments: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funded five SEDA science and technology projects designed to: (1) improve the modeling and prediction of hypersonic vehicle plumes, wakes, and signatures, and (2) provide performance baselines for offensive and defensive systems. Additional details are sensitive and/or classified and will be provided upon request. FY 2021 Plans: Continue activities initiated with FY 2020 funds. Additional details regarding FY 2021 SEDA projects are sensitive and/or classified and will be provided upon request.	5.150	7.346
Congressional Add: Materials, Structures and Manufacturing (MSM) Science and Technology Development FY 2020 Accomplishments: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funded four MSM science and technology projects essential to develop new high-temperature materials for hypersonic applications and to design more efficient and effective manufacturing methods for hypersonic structural components. Specific projects seek to characterize alternative ceramic matrix composites for hypersonics, improve the ability to produce multiphase monolithic ceramic dielectric materials, test and	2.500	7.146

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021
characterize the performance of leading edge coatings, and improve manufacturing processes to build cruiser fins. Additional details regarding these projects are sensitive and/or classified and will be provided upon request. FY 2021 Plans: Continue activities initiated with FY 2020 funds. Additional details regarding FY 2021 MSM projects are sensitive and/or classified and will be provided upon request.		
Congressional Add: Ordnance Science and Technology Development FY 2020 Accomplishments: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funded three ordnance science and technology projects to better understand hypersonic ordnance effects and improve those effects across a broad range of target sets. Projects develop and demonstrate a survivable fuze system designed to function under extreme hypersonic terminal conditions, model shock loads associated with a multi-mission warhead, and conduct high-fidelity modeling to analyze and optimize the effects of hypersonic munitions. Additional details regarding these projects are sensitive and/or classified and will be provided upon request. FY 2021 Plans: Continue activities initiated with FY 2020 funds. Additional details regarding FY 2021 Ordnance projects are sensitive and/or classified and will be provided upon request.	4.050	5.846
Congressional Add: Mission Planning Science and Technology Development FY 2020 Accomplishments: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funded four mission planning science and technology projects to support rapid mission planning of hypersonic systems when employed in a variety of operational conditions. Projects focus on flight-trajectory survivability analysis, the development of prototype tools to facilitate rapid mission planning, and the assessment of weather impacts during different segments of hypersonic flight. Additional details regarding these projects are sensitive and/or classified and will be provided upon request. FY 2021 Plans: Continue activities initiated with FY 2020 funds. Additional details regarding FY 2021 Mission Planning projects are sensitive and/or classified and will be provided upon request.	3.750	3.346
Congressional Add: Aerodynamics and Aerothermodynamics Science and Technology Development FY 2020 Accomplishments: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funded a aerodynamics and aerothermal science and technology project to enhance aero optics modeling and simulation testing. This project seeks to increase the fidelity of infrared aero optics modeling and simulation data	2.500	4.646

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense	Date: May 2021
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Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Cap ability Development</i>	Project (Number/Name) 065 / <i>Joint Hypersonics</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021
while driving down man-hours through creation/validation of a more useful and collaborative collection format. Additional details are sensitive and/or classified and will be provided upon request. FY 2021 Plans: Continue activities initiated with FY 2020 funds. Additional details regarding FY 2021 Aerodynamics and Aerothermodynamics projects are sensitive and/or classified and will be provided upon request.		
Congressional Add: JHTO Manpower, Support and Administration FY 2020 Accomplishments: Supports all JHTO activities to include financial oversight, Hypersonic S&T Roadmap Development; competitive award of the University Consortium for Applied Hypersonics, competitive award of University Grants; administrative efforts associated with all S&T project funding, and general administrative support for conferences and reporting. Planned and obligated funding covers support contracts and support provided through the Johns Hopkins University Applied Physics Laboratory. FY 2021 Plans: Continue to support all JHTO activities, to include financial oversight, Hypersonic S&T Roadmap Development; oversight of the University Consortium for Applied Hypersonics, oversight of University Grants; administrative efforts associated with all S&T project funding, and general administrative support for conferences and reporting.	2.152	3.021
Congressional Add: JHTO Systems Engineering Field Activity at NSWC Crane FY 2020 Accomplishments: Supports systems engineering and integration for hypersonics development to generate efficiencies and facilitate technology transition. Support includes coordinating with systems engineering teams across the Services and programs; negotiating more modular Government Reference Architectures to support individual programs; define and execute system on-ramping plans, primarily; and guide accelerated development plans. Additionally, the activity represents JHTO as a technical execution area co-lead for workforce development. FY 2021 Plans: Continue to support cross-service systems engineering, technology transition, and workforce development.	4.685	4.685
Congressional Adds Subtotals	99.233	89.863

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

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Office of the Secretary Of Defense		Date: May 2021
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D. Acquisition Strategy
NA

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Office of the Secretary Of Defense **Date:** May 2021

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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
University Consortium for Applied Hypersonics	C/FFP	Texas A&M Engineering Experiment Station : College Station, TX	-	10.683	Oct 2020	8.571		-		-		-	Continuing	Continuing	-
University Science and Technology Research Grants	Grant	Multiple : Multiple	-	4.248	Sep 2020	-		-		-		-	Continuing	Continuing	-
HyFly2 Initial Risk Mitigation Program	MIPR	Boeing Defense and Aerospace : St. Charles, MO	-	34.621	Aug 2020	9.229		-		-		-	Continuing	Continuing	-
Navigation, Guidance and Controls Science and Technology Development	MIPR	Sandia Natl. Labs; Johns Hopkins University Applied Research Lab; MITRE; DARPA : Albuquerque, NM; Laurel, MD; McClean/Arlington, VA	-	13.371		18.946		-		-		-	Continuing	Continuing	-
Propulsion Science and Technology Development	MIPR	Air Force Research Labs; DARPA; MDA; Lockheed Martin; Aerojet Rocketdyne : Edwards, CA; Dayton, OH; Baytown, TX; Tucson, AZ	-	11.523		17.081		-		-		-	Continuing	Continuing	-
Systems Engineering, Design and Analysis Science and Technology Development	MIPR	U.S. Army Aviation & Missile Center : Huntsville, AL	-	5.150		7.346		-		-		-	Continuing	Continuing	-
Materials, Structures and Manufacturing Science and Technology Development	MIPR	NSWC Carderock; NASA; Air Force Research Labs : Bethesda, MD;	-	2.500		7.146		-		-		-	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Office of the Secretary Of Defense **Date:** May 2021

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Capability Development</i>	Project (Number/Name) 065 / <i>Joint Hypersonics</i>
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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
		Hampton, VA; Dayton, OH													
Ordnance Science and Technology Development	MIPR	Air Force Research Labs; NSWC Carderock; NSWC Indian Head : Eglin AFB, FL; Bethesda, MD, Indian Head, MD	-	4.050		5.846		-		-		-	Continuing	Continuing	-
Mission Planning Science and Technology Development	MIPR	Sandia National Labs; Army Aviation & Missile Center; Johns Hopkins University Applied Research Lab; Air Force Research Labs : Albuquerque, NM; Huntsville, AL; Laurel, MD	-	3.750		3.346		-		-		-	Continuing	Continuing	-
Aerodynamics and Aerothermodynamics Science and Technology Development	MIPR	MDA : Huntsville, AL	-	2.500		4.646		-		-		-	Continuing	Continuing	-
JHTO Systems Engineering Field Activity at NSWC Crane	MIPR	Naval Surface Warfare Center Crane Division : Crane, IN	-	4.685	Sep 2020	4.685		-		-		-	Continuing	Continuing	-
JHTO Manpower, Support, and Administration	Various	Frontier Technology, Inc., Johns Hopkins University Applied Physics Laboratory, Pending : Washington, DC.; Laurel MD, TBD	-	2.152		3.021		-		-		-	Continuing	Continuing	-
Tactical High-speed Offensive Ramjet for	MIPR	U.S. Navy Naval Air Warfare Center,	-	-		-		-		-		-	Continuing	Continuing	-

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Office of the Secretary Of Defense **Date:** May 2021

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Capability Development</i>	Project (Number/Name) 065 / <i>Joint Hypersonics</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>University Consortium for Applied Hypersonics</i>				
Award Consortium Contract and Begin Consortium Activities	1	2021	4	2025
<i>University Science and Technology Research Grants</i>				
Eight University Grants Research Conducted/Completed, Technical Reports Received by JHTO.	4	2020	4	2021
<i>Hy Fly2 Initial Risk Mitigation Program</i>				
Inlet Risk Reduction, Dual Mod RamJet/Scramjet Risk Reduction, Final Project Review	4	2020	4	2023
<i>Navigation, Guidance and Controls Science and Technology Development</i>				
Project Funding, Initiation, Review and Completion	4	2020	3	2023
<i>Propulsion Science and Technology Development</i>				
Project Funding, Initiation, Review and Completion	4	2020	4	2022
<i>Systems Engineering, Design and Analysis Science and Technology Development</i>				
Project Funding, Initiation, Review and Completion	4	2020	3	2023
<i>Materials, Structure and Manufacturing Science and Technology Development</i>				
Project Funding, Initiation, Review and Completion	4	2020	4	2022
<i>Ordnance Science and Technology Development</i>				
Project Funding, Initiation, Review and Completion	4	2020	4	2023
<i>Mission Planning Science and Technology Development</i>				
Project Funding, Initiation, Review and Completion	4	2020	4	2021
<i>Aerodynamics and Aerothermodynamics Science and Technology Development</i>				
Project Funding, Initiation, Review and Completion	4	2020	4	2021
<i>JHTO Systems Engineering Field Activity at NSWC Crane</i>				

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Office of the Secretary Of Defense **Date:** May 2021

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Capability Development</i>	Project (Number/Name) 065 / <i>Joint Hypersonics</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Systems Engineering, Integration and Workforce Development	4	2020	4	2023
<i>JHTO Manning, Administration, and Contract Support</i>				
Establish Manpower, Develop Workplan, Initiate and Continue JHTO Operations	2	2020	4	2023