Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy											Date: April 2022	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303109N *I Satellite Communications (SPACE)*							
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	29.932	48.708	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	78.640
0728: *Navy Multiband Terminal (NMT)*	29.932	19.169	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	49.101
0729: *Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)*	0.000	20.851	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	20.851
9999: *Congressional Adds*	0.000	8.688	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.688
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 290												

Note

Funding for the following projects has been realigned out of PE 0303109N into PE0604280N as part of Program Element Consolidation starting in FY22: Project 0728 Navy Multiband Terminal (NMT) and 0729 Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT).

A. Mission Description and Budget Item Justification

(0728) The details of Program Element 0604280N, Project 0728 for NMT are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.

(0728) Navy Global Broadcast System (GBS) is a member of the larger Joint C4I program, providing high speed (up to 45 Mbps per transponder)/large volume information/data delivery to forces afloat, ashore, and Naval Special Warfare Command. Leveraging the NMT antenna, GBS provides a one-way broadcast to Naval maritime forces across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence in support of RC2. GBS Transmission Security (TRANSEC) is an operational requirement from the Joint GBS ORD and provides robust datalink protection of both uplink and downlink for the GBS broadcast. GBS is evaluating Protected Tactical Waveform (PTW) solutions to meet the TRANSEC mandate. The Air Force & Army Anti-Jam Modem (A3M) and the WAMS are PTW solutions that are under consideration. Navy GBS will require extensive development activities for the new PTW modem solution and must conduct a FOT&E with Joint Services. Overall program efforts include technology insertion studies required to support satellite communications.

(0729) Satellite Communications: The details of Program Element 0303109N, Project 0729 are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.

(9999) Congressional Add provides for the development, test and evaluation of enhanced capabilities for the Navy Multiband Terminal (NMT) by furthering Science & Technology (S&T) research and transition activities associated with resilient communications capabilities.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy	Date: April 2022
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303109N *I Satellite Communications (SPACE)*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	50.978	0.000	0.000	-	0.000
Current President's Budget	48.708	0.000	0.000	-	0.000
Total Adjustments	-2.270	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.643	0.000			
• SBIR/STTR Transfer	-1.627	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 9999: *Congressional Adds*		
Congressional Add: *Navy Multiband Terminal Program Interference Mitigation Technology Test*	8.688	0.000
Congressional Add Subtotals for Project: 9999	8.688	0.000
Congressional Add Totals for all Projects	8.688	0.000

Change Summary Explanation

Technical:
EHF SATCOM Terminals (Project 0728): No change

The details of program element 0303109N Project 0729 are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / *Satellite Communications (SPACE)*	Project (Number/Name) 0728 / *Navy Multiband Terminal (NMT)*	

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
0728: *Navy Multiband Terminal (NMT)*	29.932	19.169	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	49.101
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 290

Note

Funding has been realigned out of PE 0303109N Project 0728 into PE0604280N as part of Program Element Consolidation starting in FY22.

A. Mission Description and Budget Item Justification

(0728) The details of Program Element 0604280N, Project 0728 for NMT are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.

Navy Global Broadcast System (GBS) is a member of the larger Joint Command, Control, Communications, Computers, and Intelligence (C4I)program, providing high speed (up to 45 Mbps per transponder)/large volume information/data delivery to forces afloat, ashore, and Naval Special Warfare Command. Leveraging the NMT antenna, GBS provides a one-way broadcast to Naval maritime forces across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence in support of RC2. GBS Transmission Security (TRANSEC) is an operational requirement from the Joint GBS ORD and provides robust datalink protection of both uplink and downlink for the GBS broadcast. GBS is evaluating Protected Tactical Waveform (PTW) solutions to meet the TRANSEC mandate. The Air Force & Army Anti-Jam Modem (A3M) and the WAMS are PTW solutions that are under consideration. Navy GBS will require extensive development activities for the new PTW modem solution and must conduct a Follow-On Test & Evaluation (FOT&E) with Joint Services. Overall program efforts include technology insertion studies required to support satellite communications.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: NMT Resilient C2 Development	18.519	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: (0728) The details of Program Element 0604280N, Project 0728 for NMT are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.					
FY 2022 Plans: Funding has been realigned out of PE 0303109N Project 0728 into PE 0604280N as part of Program Element Consolidation starting in FY22.					
FY 2023 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (SPACE)*	**Project (Number/Name)** 0728 / *Navy Multiband Terminal (NMT)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Funding has been realigned out of PE 0303109N Project 0728 into PE 0604280N as part of Program Element Consolidation starting in FY22. ***FY 2023 OCO Plans:*** N/A					
Title: Technology Insertion ***Articles:*** ***Description:*** Overall program efforts include technology insertion studies required to support satellite communications. ***FY 2022 Plans:*** Funding has been realigned out of PE 0303109N Project 0728 into PE 0604280N as part of Program Element Consolidation starting in FY22. ***FY 2023 Base Plans:*** Funding has been realigned out of PE 0303109N Project 0728 into PE 0604280N as part of Program Element Consolidation starting in FY22. ***FY 2023 OCO Plans:*** N/A	0.150 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: Global Broadcast System (GBS) Transmission Security (TRANSEC) ***Articles:*** ***Description:*** Navy GBS is a member of the larger Joint C4I program, providing high speed (up to 45 Mbps per transponder)/large volume information/data delivery to forces afloat, ashore, and Naval Special Warfare Command. Leveraging the NMT antenna, GBS provides a one-way broadcast to Naval maritime forces across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence in support of RC3. GBS Transmission Security (TRANSEC) is an operational requirement from the Joint GBS ORD and provides robust datalink protection of both uplink and downlink for the GBS broadcast. GBS is evaluating Protected Tactical Waveform (PTW) solutions to meet the TRANSEC mandate. The Air Force & Army Anti-Jam Modem (A3M) and the WAMS are PTW solutions that are under consideration. Navy GBS will require extensive development activities for the new PTW modem solution and must conduct a FOT&E with Joint Services. Overall program efforts include technology insertion studies required to support satellite communications.	0.500 -	0.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (SPACE)*	**Project (Number/Name)** 0728 / *Navy Multiband Terminal (NMT)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
FY 2022 Plans: Funding has been realigned out of PE 0303109N Project 0728 into PE 0604280N as part of Program Element Consolidation starting in FY22. ***FY 2023 Base Plans:*** Funding has been realigned out of PE 0303109N Project 0728 into PE 0604280N as part of Program Element Consolidation starting in FY22. ***FY 2023 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	19.169	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• OPN/3216: *NAVY MULTIBAND TERMINAL (NMT)*	55.342	34.723	24.586	-	24.586	80.367	116.040	94.479	86.974	0.000	1,700.672

Remarks

The Other Appropriation represents remaining procurement and installation of NMT production units for Afloat and Shore requirements to reach Full Operational Capability. Funding also includes the procurement and installation of Assured Command and Control (AC2) modems as well as the installation of Advanced Time Division Multiple Access (TDMA) Interface Processors (ATIPs), X/KA Back-Fits, and Ashore Antennas.

D. Acquisition Strategy

(0728) The details of Program Element 0604280N, Project 0728 for NMT are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / *Satellite Communications (SPACE)*	Project (Number/Name) 0728 / *Navy Multiband Terminal (NMT)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified	Various	Not Specified : Not Specified	13.900	13.047	Jan 2021	0.000		0.000		-		0.000	0.000	26.947	-
		Subtotal	13.900	13.047		0.000		0.000		-		0.000	0.000	26.947	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified	Various	Not Specified : Not Specified	10.727	2.606	Nov 2020	0.000		0.000		-		0.000	0.000	13.333	-
GBS TRANSEC Engineering Support	WR	NIWC PAC : San Diego, CA	0.540	0.500	Jan 2021	0.000		0.000		-		0.000	0.000	1.040	-
		Subtotal	11.267	3.106		0.000		0.000		-		0.000	0.000	14.373	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified	Various	Not Specified : Not Specified	2.415	1.866	Jan 2021	0.000		0.000		-		0.000	0.000	4.281	-
		Subtotal	2.415	1.866		0.000		0.000		-		0.000	0.000	4.281	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified	Various	Not Specified : Not Specified	2.350	1.150	Nov 2020	0.000		0.000		-		0.000	0.000	3.500	-
		Subtotal	2.350	1.150		0.000		0.000		-		0.000	0.000	3.500	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / *Satellite Communications (SPACE)*	Project (Number/Name) 0728 / *Navy Multiband Terminal (NMT)*	

	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	29.932	19.169		0.000		0.000		-		0.000	0.000	49.101	N/A

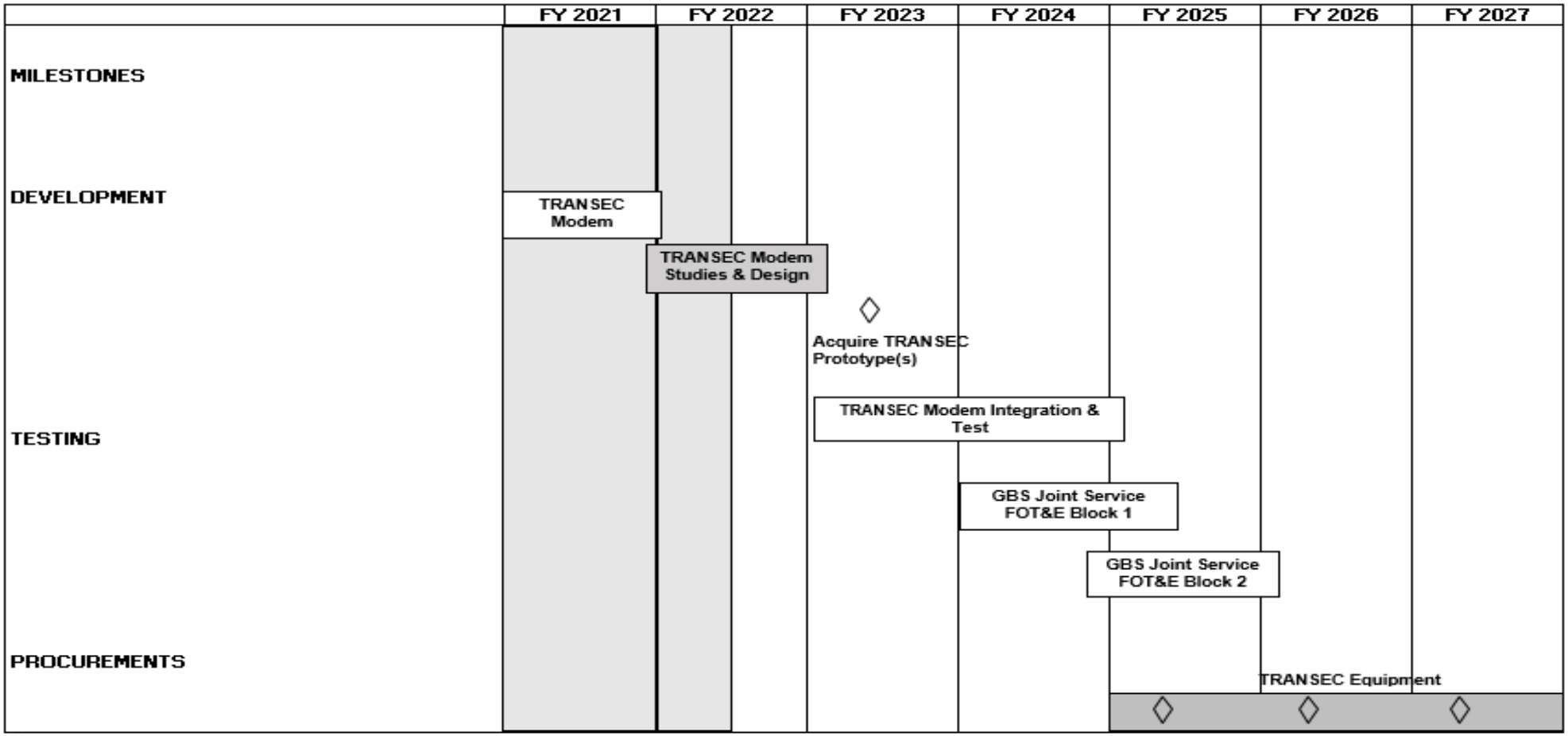
Remarks

PY Funding under PE 1203109N.

Funding has been realigned out of PE 0303109N Project 0728 into PE 0604280N as part of Program Element Consolidation starting in FY22.

The details of Program Element 0604280N, Project 0728 for NMT are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (SPACE)*	**Project (Number/Name)** 0728 / *Navy Multiband Terminal (NMT)*



Notes:
PU 0728 realigned from PE0303109N to PE 0604280N in FY22
Transec Modem Integration and Test starts in Q3 FY22

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (SPACE)*	**Project (Number/Name)** 0728 / *Navy Multiband Terminal (NMT)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0728				
Classified (Place Holder)	1	2021	4	2027
Global Broadcast System(GBS) TRANSEC: Transec Modem Solution Assessment	1	2021	1	2022
Global Broadcast System(GBS) TRANSEC: Transec Modem Studies & Design	4	2021	1	2023
Global Broadcast System(GBS) TRANSEC: Transec Prototype	2	2023	2	2023
Global Broadcast System(GBS) TRANSEC: Transec Integration & Test	1	2023	1	2025
Global Broadcast System(GBS) TRANSEC: GBS Joint Service FOT&E Block 1	1	2024	2	2025
Global Broadcast System(GBS) TRANSEC: GBS Joint Service FOT&E Block 2	4	2024	1	2026
Global Broadcast System(GBS) TRANSEC: TRANSEC Procurement	1	2025	4	2027
Global Broadcast System(GBS) TRANSEC: TRANSEC Delivery FY25	2	2025	2	2025
Global Broadcast System(GBS) TRANSEC: TRANSEC Delivery FY26	2	2026	2	2026
Global Broadcast System(GBS) TRANSEC: TRANSEC Delivery FY27	2	2027	2	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy											Date: April 2022	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0303109N / *Satellite Communications (SPACE)*				Project (Number/Name) 0729 / *Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)*			
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**
0729: *Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)*	0.000	20.851	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	20.851
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 290

Note

Funding has been realigned out of PE 0303109N Project 0729 into PE0604280N as part of Program Element Consolidation starting in FY22.

A. Mission Description and Budget Item Justification

The details of Program Element 0303109N, Project 0729 are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)	20.851	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2022 Plans: Funding has been realigned out of PE 0303109N Project 0729 into PE 0604280N as part of Program Element Consolidation starting in FY22. The details of Program Element 0303109N, Project 0729 are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.					
FY 2023 Base Plans: N/A					
FY 2023 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	20.851	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (SPACE)*	**Project (Number/Name)** 0729 / *Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

The details of Program Element 0303109N, Project 0729 are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (SPACE)*	**Project (Number/Name)** 0729 / *Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified	TBD	Not Specified : Not Specified	0.000	20.851	Feb 2021	0.000		0.000		-		0.000	0.000	20.851	-
		Subtotal	0.000	20.851		0.000		0.000		-		0.000	0.000	20.851	N/A

	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	0.000	20.851		0.000		0.000		-		0.000	0.000	20.851	N/A

Remarks

- Funding has been realigned out of PE 0303109N Project 0729 into PE 0604280N as part of Program Element Consolidation starting in FY22.

- The details of Program Element 0303109N, Project 0729 are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (SPACE)*	**Project (Number/Name)** 0729 / *Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)*

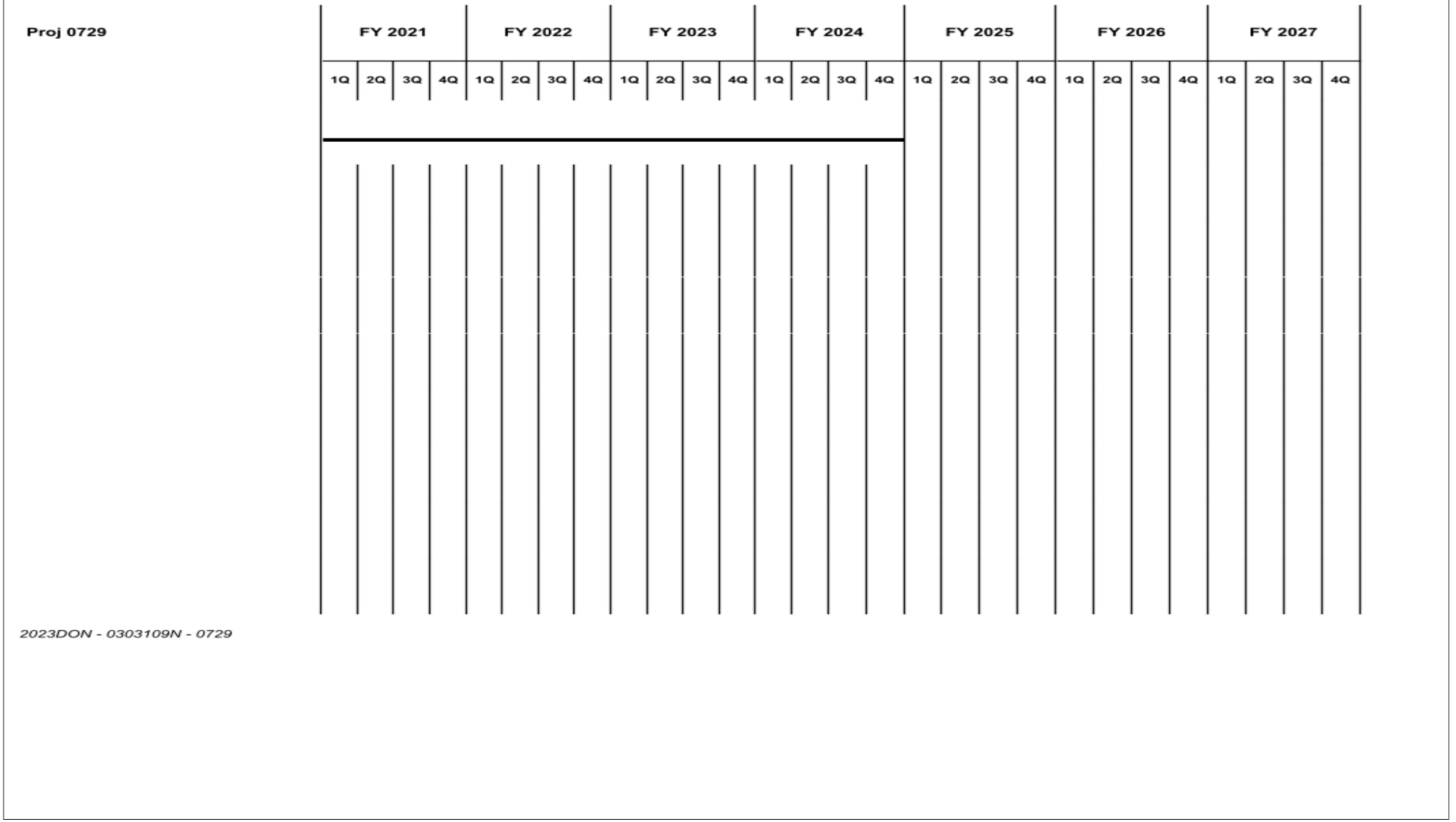


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (SPACE)*	**Project (Number/Name)** 0729 / *Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0729				
Classified (Place Holder)	1	2021	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / *Satellite Communications (SPACE)*	Project (Number/Name) 9999 / *Congressional Adds*	

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
9999: *Congressional Adds*	0.000	8.688	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.688
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Add provides for the development, test and evaluation of enhanced capabilities for the Navy Multiband Terminal (NMT) by furthering Science & Technology (S&T) research and transition activities associated with resilient communications capabilities. Specifically, this funding will provide for technology testing, evaluation, demonstration and validation for an interference canceller for Wideband Satellite Communications (SATCOM), modular hardware open platform for wideband SATCOM interface mitigation, an all-digital Multiple Access Waveform (MAW) modem, and study neuromorphic signal processing as the means to support the modernized NMT program, NMT-X.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
Congressional Add: Navy Multiband Terminal Program Interference Mitigation Technology Test	8.688	0.000
FY 2021 Accomplishments: The Congressional additions to the NMT program funded the Science & Technology (S&T) projects for NMT-X, which was broken in to the following 4 tasks: Contractor further enhanced the previously developed Modem Hardware Open Platform (MHOP) system by performing the following subtasks: develop ANSI VITA 46 compliant system for MHOP; integrate Radio Frequency System on Chip (RFSoC) into the VPX chassis to host the Digital Conversion System (DCS) and Wideband Signal Processor (WSP) functionality; and implement digital intermediate frequency interface per "VITA 49.2 Digital IF ICD v2.0" data plane standard. Contractor productized Envistacom's Multiple Access Waveform (MAW) Direct Sequence Spread Spectrum (DSSS) waveforms for All Digital Modem (ADM). The contractor shall optimize the performance of the synchronization loops (carrier, chip & symbol), minimize acquisition times, and achieve BER vs C/N performance prescribed in the DVB-S2X standard. The contractor shall add Adaptive Uplink Power Control (AUPC) to the DSSS Productization, by developing a closed loop power control algorithm, developing overhead channel or in-band signaling for conveying AUPC messages and developing "real-time" or close to real-time power control through Monitoring & Control (M&C) Host Application. The contractor shall demonstrate the MAW DSSS Productization.		

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (SPACE)*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
Contractor acquired, Verified, and Performed Initial Integration of IES in to WAM. The contractor evaluated iDirect's CSIR, BAE Systems' Wideband SATCOM Interference Cancellation (WSIC), L3Harris' Gatekeeper, and digital segment of MagiQ's Agile Interference Mitigation System (AIMS). The contractor investigated the efficacy and maturity of utilizing RF photonics and neuromorphic computing for advanced signal processing and analysis. At a minimum, the contractor shall determine the means of applying biological neuromorphology to advance the state of the art for Machine Learning (ML) with specific emphasis on photonics based artificial neural networks. ***FY 2022 Plans:*** N/A		
Congressional Adds Subtotals	8.688	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / *Satellite Communications (SPACE)*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Various	TBD : TBD	0.000	8.088	Jun 2021	0.000		0.000		-		0.000	0.000	8.088	-
		Subtotal	0.000	8.088		0.000		0.000		-		0.000	0.000	8.088	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support Services	WR	NIWC PAC : San Diego, CA	0.000	0.300	Mar 2021	0.000		0.000		-		0.000	0.000	0.300	-
		Subtotal	0.000	0.300		0.000		0.000		-		0.000	0.000	0.300	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing	WR	NIWC PAC : San Diego, CA	0.000	0.300	Mar 2021	0.000		0.000		-		0.000	0.000	0.300	-
		Subtotal	0.000	0.300		0.000		0.000		-		0.000	0.000	0.300	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	8.688		0.000		0.000		-		0.000	0.000	8.688	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (SPACE)*	**Project (Number/Name)** 9999 / *Congressional Adds*

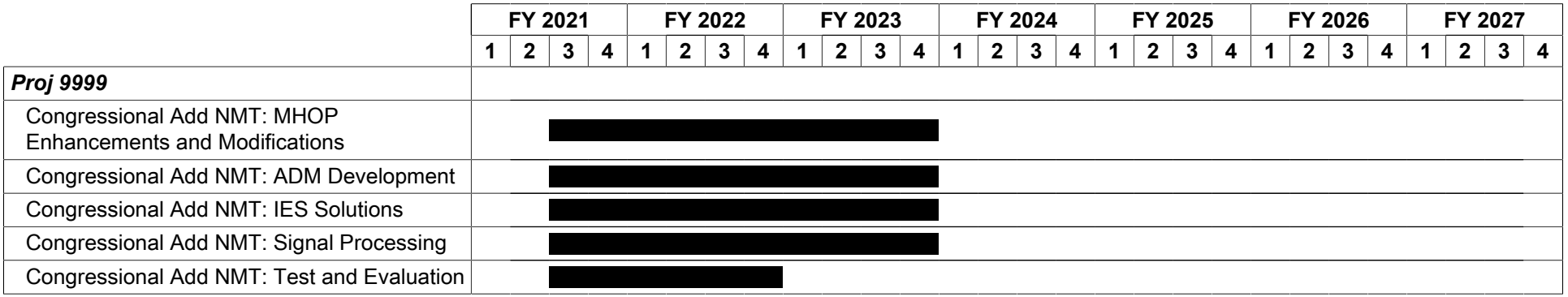


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (SPACE)*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Congressional Add NMT: MHOP Enhancements and Modifications	3	2021	4	2023
Congressional Add NMT: ADM Development	3	2021	4	2023
Congressional Add NMT: IES Solutions	3	2021	4	2023
Congressional Add NMT: Signal Processing	3	2021	4	2023
Congressional Add NMT: Test and Evaluation	3	2021	4	2022