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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	34.344	41.978	-	41.978	28.041	0.625	0.155	0.154	Continuing	Continuing
0728: <i>Navy Multiband Terminal (NMT)</i>	0.000	0.000	34.344	20.292	-	20.292	27.554	0.305	0.155	0.154	Continuing	Continuing
0729: <i>Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)</i>	0.000	0.000	0.000	21.686	-	21.686	0.487	0.320	0.000	0.000	0.000	22.493

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 290

Note

Navy Multiband Terminal (NMT) Program (Proj 0728) has been realigned from PE 1203109N to PE 0303109N starting in FY20.

A. Mission Description and Budget Item Justification

(0728)The Navy Multiband Terminal (NMT) Program is the required Navy component to the Advanced Extremely High Frequency (AEHF) program for enhancing protected and survivable satellite communications to Naval forces. The NMT system provides an increase in single service capability from 1.5 Megabits per second (Mbps) to 8 Mbps, increases the number of coverage areas and retains Anti-Jam/Low Probability of Intercept (AJ/LPI) protection characteristics. It is compatible with legacy Navy Low Data Rate/Medium Data Rate (LDR/MDR) terminals and will sustain the Military Satellite Communications (MILSATCOM) architecture by providing connectivity 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 Resilient Command and Control (RC2) initiatives. The NMT system replenishes and improves on Navy terminal capabilities of the Military Strategic, Tactical & Relay System (MILSTAR), Defense Satellite Communications System (DSCS), Wideband Global Satellite (WGS) and Global Broadcast Service (GBS). The new system equips warfighters with the assured, jam resistant, secure communications as described in the joint AEHF satellite communications system and WGS Operational Requirements Documents (ORD).

(0728) The Wideband Anti-Jam Modem System (WAMS) is a Navy technology upgrade that enhances communication capability of shipboard and submarine NMTs by providing wideband Anti-Jam (AJ) Satellite Communication throughput over Wideband Global SATCOM (WGS). WAMS is a major contributor in supporting the National Defense Strategy by investing in resilience to provide assured communications capabilities. WAMS enables space segment Anti Jam (AJ) diversity (EHF/AEHF and WGS), thus enabling NMT ships and submarines equipped with the modem to operate in wideband links closer to threat jammers. The United States USAF (USAF) Protected Tactical Enterprise Service (PTES) program will provide the ground hub component of the WAMS communication system. This PTES joint hub will serve as a DoD enterprise service ground solution for the use of the Protected Tactical Waveform (PTW) of SATCOM communications and introduces a Network Operations Without Shore (NOWS) capability. The NOWS capability will use the Direct Sequence Spread Spectrum (DSSS) waveform that provides uninterrupted communication in case of loss of shore hub connectivity. PTW is a Frequency Hopped Spread Spectrum (FHSS) waveform that provides high data rates in a benign environment and anti-jam protection to meet contested data rate requirements. High data rate anti-jam capability is enabled via the Protected Tactical Waveform (PTW) and low data rate

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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>
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anti-jam capability is provided via the Direct Sequence Spread Spectrum (DSSS) waveform. These two waveforms are designed to operate over the Wideband Global SATCOM system as well as other transponded satellites, and are also forward compatible with the on-board processing capabilities of the future Protected Tactical Satellites (PTS). WAMS enables the use of WGS X and Ka-band resources to assure access to mission critical communications to provide Resilient Command and Control (RC2) capabilities in contested/degraded environments, formerly known as Anti-Access/Area Denial (A2AD). The use of WAMS PTW on WGS will augment AEHF Extended Data Rate (XDR) services to provide the information throughput capacity necessary to support critical Command and Control capability.

(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.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	0.000	34.344	20.250	-	20.250
Current President's Budget	0.000	34.344	41.978	-	41.978
Total Adjustments	0.000	0.000	21.728	-	21.728
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	21.345	-	21.345
• Rate/Misc Adjustments	0.000	0.000	0.383	-	0.383

Change Summary Explanation

Cost:

The FY2021 funding request was increased by \$0.042 million in project 0728 for Navy Working Capital Rate Adjustments, and a decrease of \$0.833 million in project 0729 to account for the availability of prior year execution balances.

EHF SATCOM Terminals (Project 0728) - The FY21 funding request was increased by \$0.042M due to Navy Working Capital Rate Adjustments.

Schedule:

EHF SATCOM Terminals (Project 0728) - No change

Technical:

EHF SATCOM Terminals (Project 0728): No change

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Appropriation/Budget Activity
1319: *Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development*

R-1 Program Element (Number/Name)
PE 0303109N / *Satellite Communications (SPACE)*

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

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy										Date: February 2020		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>				Project (Number/Name) 0728 / <i>Navy Multiband Terminal (NMT)</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
0728: <i>Navy Multiband Terminal (NMT)</i>	0.000	0.000	34.344	20.292	-	20.292	27.554	0.305	0.155	0.154	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 290												

Note

Navy Multiband Terminal (NMT) Program (Proj 0728) has been realigned from PE 1203109N to PE 0303109N starting in FY20.

A. Mission Description and Budget Item Justification

The Navy Multiband Terminal (NMT) Program is the required Navy component to the Advanced Extremely High Frequency (AEHF) Program for enhancing protected and survivable satellite communications to Naval forces. Although development of the NMT terminal is complete, software and hardware upgrade development is ongoing to provide enhanced capabilities to the fleet. The NMT system provides an increase in single service capability from 1.5 Megabits per second (Mbps) to 8 Mbps, increases the number of coverage areas, and retains Anti-Jam/Low Probability of Intercept (AJ/LPI) protection characteristics. It is compatible with legacy Navy Low Data Rate/Medium Data Rate (LDR/MDR) terminals and will sustain the Military Satellite Communications (MILSATCOM) architecture by providing connectivity across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic defense, theater missile defense, and space operations and intelligence. The NMT system replenishes and improves on Navy Military Strategic, Tactical & Relay System (MILSTAR), Defense Satellite Communications System (DSCS), Wideband Global Satellite (WGS), and Global Broadcast Service (GBS) terminal capabilities. The new system equips warfighters with assured, jam resistant, secure communications as described in both the joint AEHF Satellite Communications System and the WGS Operational Requirement Documents (ORD). Mission requirements specific to Navy operations, including threat levels and scenarios, are contained in the ORD. The NMT provides multiband Satellite Communications (SATCOM) capability for ship, submarine, and protected MILSATCOM for shore sites.

The Wideband Anti-Jam Modem System (WAMS) is a Navy technology upgrade that enhances communication capability of shipboard and submarine NMTs by providing wideband Anti-Jam (AJ) Satellite Communication throughput over Wideband Global SATCOM (WGS). WAMS is a major contributor in supporting the National Defense Strategy by investing in resilience to provide assured communications capabilities. WAMS enables space segment Anti Jam (AJ) diversity (EHF/AEHF and WGS), thus enabling NMT ships and submarines equipped with the modem to operate in wideband links closer to threat jammers. The United States USAF (USAF) Protected Tactical Enterprise Service (PTES) program will provide the ground hub component of the WAMS communication system. This PTES joint hub will serve as a DoD enterprise service ground solution for the use of the Protected Tactical Waveform (PTW) of SATCOM communications and introduces a Network Operations Without Shore (NOWS) capability. The NOWS capability will use the Direct Sequence Spread Spectrum (DSSS) waveform that provides uninterrupted communication in case of loss of shore hub connectivity. PTW is a Frequency Hopped Spread Spectrum (FHSS) waveform that provides high data rates in a benign environment and anti-jam protection to meet contested data rate requirements. High data rate anti-jam capability is enabled via the Protected Tactical Waveform (PTW) and low data rate anti-jam capability is provided via the Direct Sequence Spread Spectrum (DSSS) waveform. These two waveforms are designed to operate over the Wideband Global SATCOM system as well as other transponded satellites, and are also forward compatible with the on-board processing capabilities of the future Protected Tactical Satellites (PTS). WAMS enables the use of WGS X and Ka-band resources to assure access to mission critical communications to provide Resilient Command and

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>	Project (Number/Name) 0728 / <i>Navy Multiband Terminal (NMT)</i>
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Control (RC2) capabilities in contested/degraded environments, formerly known as Anti-Access/Area Denial (A2AD). The use of WAMS PTW on WGS will augment AEHF Extended Data Rate (XDR) services to provide the information throughput capacity necessary to support critical Command and Control capability.

The FY21 request will provide for continued development of Wideband Anti Jam Modem System (WAMS) to include integration of anti-jam capabilities and RC2 over WGS.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>Title: NMT Resilient C2 Development</p> <p align="right">Articles:</p> <p>Description: Navy Multiband Terminal (NMT) software and hardware upgrade development is ongoing to provide Resilient Command and Control (RC2) capabilities to pace the evolving threats to the warfighter in contested/degraded environments. The Wideband Anti-Jam Modem System (WAMS) will provide an anti-jamming capability that will counter various adversary threats. Adaptive Coding (AC) autonomously maximizes throughput in degraded or benign conditions over the Advanced Extremely High Frequency (AEHF) satellites, providing significantly more throughput than is available today in the baseline NMT. The Time of Day (TOD) capability promotes communications reliability and resiliency. When the channel is degraded due to inclement weather or adversarial action, TOD enables the system to automatically transition to a more robust, lower code rate resulting in ability to maintain satellite link thereby allowing the fleet to preserve communications. Technology Insertion, studies and implementation is necessary for military satellite communications systems development to support emerging technologies.</p> <p>FY 2020 Plans: Award a full and open competitive contract for the design and development of the Navy Wideband Anti Jam Modem System (WAMS) configuration. The contract will include Navy unique requirements such as antenna handover that provides the means to shift communications from one antenna to another to avoid shipboard super structure blockage. This will also include the Direct Sequence Spread Spectrum (DSSS) waveform that provides uninterrupted communication in case of loss of shore hub connectivity as well as interface to the Automatic Digital Network System (ADNS), and shipboard and submarine environmental qualification testing. The vendor will design and implement the changes required to the technical baseline to support the integration of Wideband Anti Jam Modem System (WAMS) with the NMT. The vendor will conduct a System Requirements Review (SRR), System Design Review (SDR) and a Preliminary Design Review (PDR) of the WAMS to work with both the Protected Tactical Waveform (PTW) and the Direct Sequence Spread Spectrum (DSSS) waveform to enable anti-jam communications and Network Operations Without Shore (NOWS).</p>	0.000	22.194	20.292	0.000	20.292
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>	Project (Number/Name) 0728 / <i>Navy Multiband Terminal (NMT)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>This will include development of the Embedded Crypto Unit (ECU) that provides protection for both waveforms. The ECU development as part of the contract will require National Security Agency (NSA) coordination and certification. NSA certification will require full engineering support to evaluate the security posture of the vendor's implementation of the ECU into the WAMS. MIT Lincoln Labs will support the requirement to meet the gold standard for WAMS development to be interoperable with the Protected Tactical Enterprise Service (PTES) Hub.</p> <p>Continue Automatic Digital Network System (ADNS) development of the dynamic network interface that enables data rate to change based on modem link condition and will be included in the ADNS Service Pack 5 software build. Start to develop all required training documentation and required Shipmain documentation to install the Engineering Design Model (EDM) modems on identified surface, subsurface and shore facilities to support a Multiservice Operational Test & Evaluation (MOT&E) event in FY22.</p> <p>FY 2021 Base Plans: Continue the WAMS development efforts for the design and integration of anti-jam capabilities and Resilient Command and Control (RC2) over Wideband Global Satellite (WGS). The development efforts will configure both the Protected Tactical Waveform (PTW) and Direct Sequence Spread Spectrum (DSSS) waveform capabilities in the modem and allow for seamless transition from benign to contested environments. The DSSS waveform enables anti-jam communications via Network Operations Without Shore (NOWS). Continue development efforts to include requirements such as antenna handover and Automatic Digital Network System (ADNS) capabilities. Develop the required training documentation during the design phase as well as the required Shipmain documentation.</p> <p>The WAMS vendor will complete critical design reviews including: System Requirements Review (SRR), System Design Review (SDR), Preliminary Design Review (PDR), and Critical Design Review (CDR) to ensure the development efforts are meeting the requirements of the contract. This phase will continue work on the design of the ECU as well as continued support of NSA on the certification of the crypto. The vendor will also conduct a Test Readiness Review (TRR) prior to factory level testing. Testing events conducted in FY21 include Design Verification Testing (DVT) and Regression Testing. A MIT Lincoln Labs gold standard hub will be provided to the vendor as Government-Furnished Equipment (GFE) to complete the testing requirements to be interoperable with the Protected Tactical Enterprise Service (PTES) Hub. FY21 efforts will result in WAMS Engineering Design Models (EDM).</p> <p>FY 2021 OCO Plans:</p>					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: The FY21 decrease of (\$1.902M) from FY20 is due to the completion of Time of Day (ToD) causing a program shift to focus on WAMS development as part of the NMT RC2 effort.					
Title: Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)					
Articles:					
Description: The details of Program Element 0303109N, Project 0728 (MAT) is classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books					
FY 2020 Plans: The details of Program Element 0303109N, Project 0728 (MAT) are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books. \$12.0M is erroneously reflected in PU0728					
FY 2021 Base Plans: The details of Program Element 0303109N, Project 0728 (MAT) is classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: The details of Program Element 0303109N, Project 0728 (MAT) are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.					
Title: Technology Insertion					
Articles:					
Description: Overall program efforts include technology insertion studies required to support satellite communications.					
FY 2020 Plans: To maintain alignment with the Navy's Resilient Command and Control (RC2) strategy and approach, Commercial Broadband Satellite Program (CBSP) will transition from exercising an initial RC2 modem capability to utilizing the Wideband Anti-Jam Modem System (WAMS), which provides protected wideband Satellite					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>	Project (Number/Name) 0728 / <i>Navy Multiband Terminal (NMT)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Communication (SATCOM) capability to the Fleet. Funds required to perform studies on how to integrate WAMS into the CBSP architecture. FY 2021 Base Plans: N/A FY 2021 OCO Plans: N/A FY 2020 to FY 2021 Increase/Decrease Statement: The FY21 decrease (\$0.150M) from FY20 is attributed to completion of studies on CBSP integration with WAMS capability.					
Accomplishments/Planned Programs Subtotals	0.000	34.344	20.292	0.000	20.292

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OPN/3216: NAVY <i>MULTIBAND TERMINAL (NMT)</i>	108.985	76.715	64.552	-	64.552	30.522	17.413	21.033	21.444	73.062	1,563.389
• RDTEN/1203109N/0728: <i>EHF SATCOM Terminals</i>	16.307	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	38.137

Remarks
Funding for Prior Year through FY19 NMT OPN in PE 1203109N.

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
The Navy Multiband Terminal (NMT) Follow-On Full Deployment (FOFD) contract will continue NMT production for Afloat platforms and Shore locations, in support of the Chief of Naval Operations and the Department of the Navy (DON), and will allow the NMT Program to complete Full Operational Capability (FOC). The competitive contract awarded to Comtech supports the development of Advanced Time Division Multiple Access (TDMA) Interface Processor (ATIP) and Assured Command and Control (AC2) modem enhancements such as Adaptive Coding. A new competitive contract will be awarded to support development and procurement of the Wideband Anti-Jam Modem System (WAMS).

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications</i> (SPACE)	Project (Number/Name) 0728 / <i>Navy Multiband Terminal (NMT)</i>

(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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 7				PE 0303109N / Satellite Communications (SPACE)				0728 / Navy Multiband Terminal (NMT)							
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Software Development Engineering	C/CPFF	NUWC : Newport, RI	0.000	0.000		3.067	Jan 2020	2.770	Jan 2021	-		2.770	Continuing	Continuing	Continuing
Software Development Engineering	WR	NIWC PAC : San Diego, CA	0.000	0.000		0.515	Jan 2020	0.464	Jan 2021	-		0.464	Continuing	Continuing	Continuing
WAMS Design Development	C/CPIF	TBD : TBD	0.000	0.000		9.970	Jun 2020	9.077	Feb 2021	-		9.077	Continuing	Continuing	Continuing
Classified	TBD	TBD : TBD	0.000	0.000		12.000	Feb 2020	0.000		-		0.000	0.000	12.000	-
Subtotal			0.000	0.000		25.552		12.311		-		12.311	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Software Integration/ Government Oversight	WR	NUWC : Newport, RI	0.000	0.000		1.394	Nov 2019	1.415	Nov 2020	-		1.415	Continuing	Continuing	Continuing
Software Integration Support	WR	NIWC PAC : San Diego, CA	0.000	0.000		0.745	Nov 2019	0.756	Nov 2020	-		0.756	Continuing	Continuing	Continuing
Software Engineering Support	C/CPFF	SYSTECH : San Diego, CA	0.000	0.000		2.163	Nov 2019	2.195	Nov 2020	-		2.195	Continuing	Continuing	Continuing
WAMS Studies and Design	FFRDC	MIT/LL : Lexington, MA	0.000	0.000		0.250	Jan 2020	0.250	Jan 2021	-		0.250	Continuing	Continuing	Continuing
WAMS Cybersecurity Engineering	WR	NSA : Fort Meade, MD	0.000	0.000		0.275	Jan 2020	0.250	Jan 2021	-		0.250	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		4.827		4.866		-		4.866	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Technology Insertion	WR	COTF : Norfolk, VA	0.000	0.000		0.150	Jan 2020	0.000		-		0.000	0.000	0.150	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>	Project (Number/Name) 0728 / <i>Navy Multiband Terminal (NMT)</i>
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Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
WAMS Development Test and Evaluation	WR	NIWC PAC : San Diego, CA	0.000	0.000		2.265	Nov 2019	1.925	Nov 2020	-		1.925	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		2.415		1.925		-		1.925	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Contract Management	C/CPFF	BAH : San Diego, CA	0.000	0.000		0.200	Nov 2019	0.182	Nov 2020	-		0.182	Continuing	Continuing	Continuing
Program Management	C/CPFF	BAH : San Diego, CA	0.000	0.000		1.300	Nov 2019	0.958	Nov 2020	-		0.958	Continuing	Continuing	Continuing
Travel	Various	NAVWAR : Various	0.000	0.000		0.050	Nov 2019	0.050	Nov 2020	-		0.050	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		1.550		1.190		-		1.190	Continuing	Continuing	N/A

Remarks
Naval Information Warfare Systems Command (NAVWAR) formerly known as Space and Naval Warfare Systems Command (SPAWAR).

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	34.344	20.292	-	20.292	Continuing	Continuing	N/A

Remarks
FY19 and Prior NMT cost data is provided under PE 1203109N, Project 0728.

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>	Project (Number/Name) 0728 / <i>Navy Multiband Terminal (NMT)</i>
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	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
SATELLITE LAUNCHES AEHF Launches	SV-5	SV-6					
MILESTONES					WAMS IOC FY23	NMT FOC FY23	
DEVELOPMENT	AC / TOD Development						
	Wideband AJ Modem System (WAMS) Development						
TESTING				WAMS Integration & Test			
PROCUREMENTS	PY9	PY10			WAMS Equipment		
NMT DELIVERIES	PY8	PY9	PY10				
INSTALLATIONS	NMT Terminal Installations						

Notes: FY19 NMT funding is provided under PE 1203109N Project 0728.

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>	Project (Number/Name) 0728 / <i>Navy Multiband Terminal (NMT)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0728				
AEHF Launch SV-5	4	2019	4	2019
AEHF Launch SV-6	2	2020	2	2020
WAMS IOC	3	2023	3	2023
NMT FOC	4	2023	4	2023
A2AD Adaptive Coding/Time Of Day Development	1	2019	4	2019
Wideband Anti-Jam Modem System (WAMS) Development	1	2019	4	2022
WAMS Integration & Testing	2	2021	4	2022
NMT Procurement Year (PY9)	2	2019	2	2019
NMT Procurement Year (PY10)	2	2020	2	2020
FY23 WAMS Procurement	4	2023	4	2023
FY24 WAMS Procurement	2	2024	2	2024
NMT FRP PY8 Delivery	3	2019	3	2019
NMT FRP PY9 Delivery	3	2020	3	2020
NMT FRP PY10 Delivery	3	2021	3	2021
NMT Terminal Installations	1	2019	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>	Project (Number/Name) 0729 / <i>Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
0729: <i>Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)</i>	0.000	0.000	0.000	21.686	-	21.686	0.487	0.320	0.000	0.000	0.000	22.493
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 290

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)	0.000	0.000	21.686	0.000	21.686
Articles:	-	-	-	-	-
FY 2020 Plans: N/A					
FY 2021 Base Plans: The details of Program Element 0303109N, Project 0729 are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: The details of Program Element 0303109N, Project 0729 are classified SECRET//NOFORN and are submitted to Congress in the classified budget justification books.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	21.686	0.000	21.686

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>	Project (Number/Name) 0729 / <i>Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)</i>

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>	Project (Number/Name) 0729 / <i>Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)</i>
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Classified	TBD	Not Specified : Not Specified	0.000	0.000		0.000		21.686	Feb 2021	-		21.686	0.000	21.686	-
Subtotal			0.000	0.000		0.000		21.686		-		21.686	0.000	21.686	N/A

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

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	21.686	-	21.686	0.000	21.686	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>	Project (Number/Name) 0729 / <i>Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)</i>

Proj 0729	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / <i>Satellite Communications (SPACE)</i>	Project (Number/Name) 0729 / <i>Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0729				
Classified (Place Holder)	1	2021	4	2023