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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)
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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	-	9.927	34.169	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	44.096
FE1: Dscs-Dcs (Phase II)	-	4.074	4.260	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.334
FE2: MILSATCOM System Engineering	-	4.226	4.357	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.583
FE4: Enroute Mission Command	-	1.627	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.627
FI8: Protected Anti-JAM Tactical SATCOM	-	0.000	25.552	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	25.552

Note
 1203142A - SATCOM Ground Environment (SPACE) funding has been realigned to 0303142A SATCOM Ground Environment (SPACE) in FY 2021 and out.

A. Mission Description and Budget Item Justification

The SATCOM Ground Environment (SPACE) funding line supports the Army's Network Modernization Strategy Line Of Effort (LOE) 1: Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

FE1: Defense Satellite Communications System (DSCS)/Digital Communications System (DCS) (Phase II):
 This project develops Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems (MCNS) requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future Force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations.

FE2: Military Satellite Communications (MILSATCOM) System Engineering (SE):
 Military Satellite Communications (MILSATCOM) System Engineering (SE) assures that tactical Army Satellite Communications (SATCOM) and SATCOM On-The-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM SE shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM SE represents the Army's tactical interests within DoD, Commercial & International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts ensure that the Army continues to evaluate evolving technologies for the planning and designing of SATCOM solutions that reduce technical and programmatic impacts.

Program funding has been realigned to MILSATCOM System Engineering (0303142A/456) beginning in FY 2021.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203142A / <i>SATCOM Ground Environment (SPACE)</i>	
FE4 / Enroute Mission Command: Mission Description and Budget Item Justification: Enroute Mission Command (EMC) supports the Global Response Force (GRF) and other Army units with the requirement to conduct Airborne forced entry operations with the ability to conduct mission command, to include mission planning and rehearsal, while enroute on board US Air Force Air Mobility Command (AMC) aircraft. EMC provides a modernization to enroute communications to enable broadband reach-back data capability utilizing military or commercial networks with adequate bandwidth support required by Mission Command and Intelligence applications. EMC will provide commanders with the ability to obtain and share near real-time information regarding intelligence, situational awareness and command and control information while enroute to their objective. The ability to adjust plans and strategize utilizing the latest Intel data will give the GRF the information dominance needed to execute their mission once they arrive at their objective.		
Due to rephasing of FY 2017 OPA funding into FY 2018/2019, program was restructured in Dec 2015. MDA addressed schedule issues (Oct 2016) by authorizing to field a Ku FISA FOC (4QFY17) and complete a Modification Word Order (MWO), adding Ka FISA capability, post Ku FISA FOC.		
F18: Protected Anti-jam Tactical SATCOM (Protected SATCOM) will fill a critical protected communications gap for anti-jam SATCOM capability for mobile ground forces conducting expeditionary operations in electronically contested environments. It provides the ability for the tactical Army to be resilient in a contested environment and protect against potentially catastrophic loss of situational awareness and command and control during critical battle movement. It will offer the Tactical Army protection against interference that is either intentional or unintentional. The effort includes development of a critical Protected Tactical Waveform (PTW) modem which will be integrated into Army tactical SATCOM terminals to provide higher throughputs, protection (anti-jam) against Electronic Warfare (EW), and resiliency in a contested environment; development of a dual small form factor modem that can run the PTW and the current Network Centric Waveform (NCW) to Army Expeditionary Signal Battalions (ESBs) and eventually Army Corps, Division, and Brigade Combat Teams; and development, testing and certification of prototype Advanced Extremely High Frequency (AEHF) protected SATCOM terminals which will augment existing AEHF terminals. The PTW efforts are synchronized with the Air Force and DoD's plans for PTW on Wideband Global SATCOM (WGS) the Protected Tactical Satellite (PTS), and commercial SATCOM systems.		
In FY 2020, new start development of an Advanced Extremely High Frequency (AEHF) protected SATCOM terminal prototype will begin. The new terminal will augment the existing capability of the Secure, Mobile, Anti-Jam, Reliable, Tactical Terminal (SMART-T) AEHF terminal, with the intent to backfill decreasing SMART-T numbers post FY 2025. This ensures the Army's ability to meet increasing EW threat requirements. It will provide AEHF protected SATCOM capability in a modular, more transportable, vehicle agnostic form factor, providing greater flexibility on the battlefield. The terminal will be built with the intent to migrate from the AEHF constellation to the PTS constellation.		
Program funding has been realigned to MILSATCOM System Engineering (0303142A/456) beginning in FY 2021 to support Protected Anti-jam Tactical SATCOM development, engineering, test and evaluation.		

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203142A / <i>SATCOM Ground Environment (SPACE)</i>
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B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	12.105	34.169	18.702	-	18.702
Current President's Budget	9.927	34.169	0.000	-	0.000
Total Adjustments	-2.178	0.000	-18.702	-	-18.702
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.178	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-18.702	-	-18.702

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)					Project (Number/Name) FE1 / Dscs-Dcs (Phase II)		
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
FE1: Dscs-Dcs (Phase II)	-	4.074	4.260	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.334
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

1203142A - SATCOM Ground Environment (SPACE) funding has been realigned to 0303142A / 253 SATCOM Ground Environment (SPACE) in FY 2021 and out.

A. Mission Description and Budget Item Justification

Project FE1, Defense Satellite Communications System - Digital Communications System (DSCS-DCS) supports the Army's Network Modernization Strategy Line Of Effort (LOE) 1 - Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

This project develops Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations in support of the President, JCS, combatant commanders, military departments, Department of State and other government departments and agencies.

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

	FY 2019	FY 2020	FY 2021
Title: SATCOM Terminal Digital Intermediate Frequency (IF) Implementation Analysis	2.852	2.517	-
Description: SATCOM Terminal Digital Intermediate Frequency (IF) implementation analysis aimed at improving bandwidth efficiency of gateway terminals while providing an additional layer of resiliency through terminal redundancy. These analyses include various evaluations for digital terminal components to replace current, less efficient, analog components. These analyses also include assessment of terrestrial connectivity among SATCOM terminals to enable Continuity Of Operations (COOP) and failover scenarios required for resiliency.			
FY 2020 Plans: Demonstrate SATCOM Gateway resiliency through path diversity; use SATCOM terminals at different geographical locations to support any SATCOM mission.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE1 / Dscs-Dcs (Phase II)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
1203142A - SATCOM Ground Environment (SPACE) funding has been moved to PE 0303142A / project 253 SATCOM Ground Environment (SPACE) in FY 2021 and out.			
<p>Title: Electromagnetic Interference Mitigation Analysis</p> <p>Description: Assess multiple interference mitigation/cancellation technologies for effectiveness in improving reliability/resiliency of strategic and tactical communications. Mature technology to software/firmware that will improve protected SATCOM modem/terminal performance in a electro-magnetic interference contested environment. Technology will also improve terminal performance against adversary and friendly satellite link jamming resources.</p> <p>FY 2020 Plans: Transition performance specifications to be implemented into next generation SATCOM modem. Mature and demonstrate gateway resiliency by using satellite links and terrestrial connectivity simultaneously to support SATCOM missions.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: 1203142A - SATCOM Ground Environment (SPACE) funding has been moved to PE 0303142A / project 253 SATCOM Ground Environment (SPACE) in FY 2021 and out.</p>	1.222	1.549	-
<p>Title: FY 2020 SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>	-	0.194	-
Accomplishments/Planned Programs Subtotals	4.074	4.260	-

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• BB8500: Defense Enterprise Wideband Satcom Systems	96.633	98.399	101.498	-	101.498	110.890	105.871	101.438	97.156	Continuing	Continuing
Remarks											

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE1 / Dscs-Dcs (Phase II)

D. Acquisition Strategy

This finances Project Manager, Defense Communications and Army Transmission Systems (PM DCATS) netcentric systems engineering, modem risk mitigation, and risk management framework support. Funding provides for SATCOM terminal upgrades, enhancement of baseband throughput capabilities, technology insertion and upgrades which improves SATCOM gateway resiliency while allowing for full utilization of Wideband Global SATCOM (WGS) capabilities. Both the Wideband SATCOM Operational Management System (WSOMS) and the Enterprise Wideband SATCOM Terminal System (EWSTS) Capability Production Documents (CPDs) contain Netcentric-Ready Key Performance Parameters (NR-KPPs) as required by CJCSI 6212.01C. Netcentric efforts are required to facilitate the migration from the current trunk-based communications systems to Internet Protocol (IP) based systems and to engineer, test and integrate IP based capabilities into WSOMS and EWSTS systems. Studies, risk mitigation, system integration and advanced demonstrations for Netcentric baseband and policy based control will accommodate technology insertion, data sharing, remote operations, architecture efforts and use of commercial technology, thus ensuring the life of the Defense Enterprise Wideband Satellite System (DEWSS) terminal family beyond 2025 and reducing lifecycle costs and enterprise requirements on the WGS and Defense Satellite Communication System (DSCS) satellites in the future. Contracting approach for new technology is through the use of Broad Agency Announcements (BAA) and Other Transaction Authority (OTA) contracts.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 7				PE 1203142A / SATCOM Ground Environment (SPACE)				FE1 / Dscs-Dcs (Phase II)							
Management Services (\$ 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
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.194		-		-		-	0.000	0.194	-
Subtotal			-	-		0.194		-		-		-	0.000	0.194	N/A
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
SATCOM Terminal Digital IF Implementation Analysis	MIPR	TBD : APG, MD	2.709	2.021	Jan 2019	1.770		-		-		-	Continuing	Continuing	Continuing
Electromagnetic Interference Mitigation Analysis	MIPR	TBD : APG, MD	2.167	1.035	Jan 2019	1.786		-		-		-	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	0.155		-		-		-		-	0.000	0.155	-
Subtotal			4.876	3.211		3.556		-		-		-	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
In-house Support	Allot	PdM WESS : Ft. Belvoir, VA	1.121	0.532		0.006		-		-		-	Continuing	Continuing	Continuing
Contractor Support	C/CPPF	ACC, MD : APG, MD	0.533	0.331	Jan 2019	0.504	Jan 2020	-		-		-	Continuing	Continuing	Continuing
Subtotal			1.654	0.863		0.510		-		-		-	Continuing	Continuing	N/A
Project Cost Totals			6.530	4.074		4.260		-		-		-	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE1 / Dscs-Dcs (Phase II)	

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
SATCOM Terminal Digital IF Implementation Analysis																												
Electromagnetic Interference Mitigation Analysis																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE1 / Dscs-Dcs (Phase II)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SATCOM Terminal Digital IF Implementation Analysis	1	2019	4	2025
Electromagnetic Interference Mitigation Analysis	1	2019	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)				Project (Number/Name) FE2 / MILSATCOM System Engineering			
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
FE2: MILSATCOM System Engineering	-	4.226	4.357	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.583
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program funding was realigned to 0303142A - SATCOM Ground Environment (SPACE) / 456 - MILSATCOM System Engineering beginning in FY 2021.

A. Mission Description and Budget Item Justification

This funding line supports the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network Cross-Functional Team capability set approach to achieve the network modernization strategy.

FE2: Military Satellite Communications (MILSATCOM) System Engineering (SE) assures that tactical Army Satellite Communications (SATCOM) and SATCOM On-The-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM SE shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM SE represents the Army's tactical interests within DoD, Commercial & International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts ensure that the Army continues to evaluate evolving technologies for the planning and designing of SATCOM solutions that reduce technical and programmatic impacts.

FY 2019-2020 funds the systems engineering required to support technology maturation, systems analysis, and planning associated with joint SATCOM development efforts including complying with the implementation of the recommendations from the Protected SATCOM Communications Systems (PSCS) Analysis of Alternatives (AoA). This line continues to fund the systems architecture and analysis for current and future SATCOM efforts in both wideband and protected satellite communications. This effort includes collaborative work with the Air Force on the prototype Protected Tactical Service Field Demo (PTSFD) development and associated modem testing.

In addition, FY 2019-2020 funding covers the Narrowband Mobile User Objective System (MUOS) follow-on study efforts, Network Centric Waveform Tool (NCWT) Development and Testing and other efforts that have impact on tactical Army use of military and commercial satellite constellations. These efforts have a direct impact in reducing technical and programmatic risk for the acquisition efforts for tactical Army SATCOM systems using these constellations.

FY 2021 funding was realigned to 0303142A - SATCOM Ground Environment (SPACE) / 456 - MILSATCOM System Engineering.

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

	FY 2019	FY 2020	FY 2021
Title: Protected Communications System Engineering and WGS Communications	1.140	1.110	-
Description: Systems engineering support relating to the technology maturation, development and planning associated with joint SATCOM development efforts including Network Centric Waveform Tool (NCWT), Protected Tactical Service Field Demo			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE2 / MILSATCOM System Engineering		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>(PTSFD) and the implementation of the recommendations from the Protected SATCOM Communications Systems (PSCS) Analysis of Alternatives (AoA).</p> <p>FY 2020 Plans: Will continue systems engineering and analysis for the Protected Communications and WGS Communications as well as development and technology maturation on the NCW Tool.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Decrease in FY 2021 realigned program funding from MILSATCOM System Engineering (1203142A/FE2) to MILSATCOM System Engineering (0303142A/456) beginning in FY 2021.</p>				
<p>Title: Systems Architecture and Analysis Support</p> <p>Description: Systems engineering support relating to the architecture and analysis of the Network Centric Waveform Tool (NCWT) and the collaborative SATCOM development Protected Tactical Service Field Demo (PTSFD) effort as well as other efforts, such as Analysis of Alternatives, that have impact on tactical Army use of military and commercial satellite constellations. These efforts have a direct impact in reducing technical and programmatic risk for the acquisition efforts for tactical Army SATCOM systems using the WGS and Protected constellations.</p> <p>FY 2020 Plans: Will continue in house Engineering Support, Contractor Support and System Architecture & Analysis.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Decrease in FY 2021 realigned program funding from MILSATCOM System Engineering (1203142A/FE2) to MILSATCOM System Engineering (0303142A/456) beginning in FY 2021.</p>		2.544	2.557	-
<p>Title: Testing and certification of critical SATCOM and Satellite-On-The-Move (SOTM) communication and network technologies</p> <p>Description: Testing and certification of the prototype Protected Tactical Service Field Demo modem.</p> <p>FY 2020 Plans: Will continue testing and certification of critical SATCOM and SOTM communication and network technologies.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Decrease in FY 2021 realigned program funding from MILSATCOM System Engineering (1203142A/FE2) to MILSATCOM System Engineering (0303142A/456) beginning in FY 2021.</p>		0.542	0.492	-
<p>Title: FY 2020 SBIR/STTR Transfer</p>		-	0.198	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE2 / MILSATCOM System Engineering

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Description: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	4.226	4.357	-

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

N/A

Remarks

FY 2017 and prior funding was aligned to 0303142A/456.

FY 2021 and future funding is realigned to 0303142A/456.

D. Acquisition Strategy

This project funds advanced systems engineering, research, development, test and evaluation of new and emerging technologies to optimize terminal performance and communications control. Once the technologies are mature and deemed feasible, funding and management responsibility for implementation of the technology will transition to PM Tactical Network and related programs of record.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE2 / MILSATCOM System Engineering
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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			
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.198		-		-		-	0.000	0.198	-
Subtotal			-	-		0.198		-		-		-	0.000	0.198	N/A

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			
Protected Communications and WGS Communications SE	TBD	Various : APG, MD	0.662	1.140	Feb 2019	1.148	Jan 2020	-		-		-	Continuing	Continuing	Continuing
Subtotal			0.662	1.140		1.148		-		-		-	Continuing	Continuing	N/A

Remarks
FY 2019 funding was reduced by \$161K to support FY 2019 SBIR/STTR funds transfers.

Support (\$ 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			
Engineering (In House)	MIPR	PM WIN-T : APG, MD	0.679	1.169	Sep 2019	1.175	Sep 2020	-		-		-	Continuing	Continuing	-
Engineering Contractors Support	C/CPFF	PM WIN-T : APG, MD	0.671	1.155	Sep 2019	1.161	Mar 2020	-		-		-	Continuing	Continuing	-
System Architecture & Analysis	Various	CERDEC : APG, MD	0.128	0.220	Apr 2019	0.200	Apr 2020	-		-		-	Continuing	Continuing	-
Subtotal			1.478	2.544		2.536		-		-		-	Continuing	Continuing	N/A

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE2 / MILSATCOM System Engineering
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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			
Terminal Testing and Evaluation System Engineering	FFRDC	PEO C3T : TBD	0.112	0.192	Jan 2019	0.170	Dec 2019	-		-		-	0.000	0.474	-
Test Support	MIPR	Matrix : APG, MD	0.091	0.157	Apr 2019	0.134	Apr 2020	-		-		-	0.000	0.382	-
Testing, Certification	MIPR	TBD : APG, MD	0.112	0.193	Jul 2019	0.171	Jul 2020	-		-		-	0.000	0.476	-
Subtotal			0.315	0.542		0.475		-		-		-	0.000	1.332	N/A
Project Cost Totals			2.455	4.226		4.357		-		-		-	Continuing	Continuing	N/A

Remarks
FY 2019 funding was reduced by \$161K to support FY 2019 SBIR/STTR funds transfers.

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE2 / MILSATCOM System Engineering

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Protected Tactical Service Field Demo Modem Testing	[Redacted]				[Redacted]																							
	PTSFD Modem Testing																											
Narrowband (MUOS) Follow-on Studies					[Redacted]				[Redacted]																			
					Narrowband (MUOS) Follow-on Studies																							
Protected Tactical Service Field Demo	[Redacted]				[Redacted]																							
	PTSFD																											
NCW Tool Development and Testing	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
	NCW Tool Dev and Testing																											
SATCOM Systems Architecture & Analysis	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
	SATCOM Systems Architecture and Analysis																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE2 / MILSATCOM System Engineering

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Wideband AoA	4	2016	2	2018
Protected Tactical Service Field Demo Modem Testing	1	2018	4	2020
Narrowband (MUOS) Follow-on Studies	3	2019	4	2021
Protected Tactical Service Field Demo	4	2015	2	2021
NCW Tool Development and Testing	1	2015	4	2025
SATCOM Systems Architecture & Analysis	1	2018	4	2025

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

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE4 / Enroute Mission Command
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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
FE4: <i>Enroute Mission Command</i>	-	1.627	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.627
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Enroute Mission Command (EMC) supports the Global Response Force (GRF) and other Army units with the requirement to conduct Airborne forced entry operations with the ability to conduct mission command, to include mission planning and rehearsal, while enroute on board US Air Force Air Mobility Command (AMC) aircraft. EMC provides a modernization to enroute communications to enable broadband reach-back data capability utilizing military or commercial networks with adequate bandwidth support required by Mission Command and Intelligence applications. EMC will provide commanders with the ability to obtain and share near real-time information regarding intelligence, situational awareness and command and control information while enroute to their objective. The ability to adjust plans and strategize utilizing the latest Intel data will give the GRF the information dominance needed to execute their mission once they arrive at their objective.

Ku FOC was achieved in September 2017 as directed by MDA due to rephasing of FY 2017 OPA funding into FY 2018/2019 and program was restructure in December 2015. A Modification Work Order (MWO), adding Ka Fixed Installed Satellite Antenna (FISA) capability began in FY 2018.

No FY 2020 or FY 2021 RDT&E funding.

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

	FY 2019	FY 2020	FY 2021
Title: Fuselage Mount Antenna (FMA) Training Cart	0.881	-	-
Title: EMI/EMC Testing	0.746	-	-
Accomplishments/Planned Programs Subtotals	1.627	-	-

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
• B00015: <i>Enroute Mission Command (EMC)</i>	37.401	8.609	0.000	-	0.000	-	-	-	-	0.000	46.010

Remarks

B08400: OPA funding line for EMC

D. Acquisition Strategy

The continued procurement of the EMC full operational capability follows DoDI 5000.02, Enclosure 12, 31 Aug 18 update (formerly DoDI 5000.02, 7 Jan 2015, Enclosure 13, Rapid Fielding of Capabilities). The Milestone Decision Authority (MDA) and project manager will tailor and streamline program strategy based on the required

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE4 / Enroute Mission Command
<p>timelines to meet urgent need capability requirements. The Army Executive Agent signed an Acquisition Decision Memorandum (ADM) on 27 April 2015 delegating MDA to PEO C3T. The MDA signed an ADM on 11 May 2015 selecting the KuKa Antenna and Radome for the Full Operational Capability (FOC). An ADM was signed on 20 May 2015 granting approval to enter into production and deployment phase.</p> <p>Ku FOC was achieved in September 2017 as directed by MDA due to rephasing of FY 2017 OPA funding into FY 2018/2019 and program was restructured in Dec 2015. A Modification Work Order (MWO), adding Ka Fixed Installed Satellite Antenna (FISA) capability began in FY18.</p> <p>Initial Operational Capability met in May 2015 with modification of five C-17s with satellite antennae and installation kits, and roll-on/roll-off, battalion level, Key Leader Node (KEN). FOC is 35 C-17s, eight Key Leader Enroute Node (KEN), and 24 company level Dependent Airborne Nodes (DAN), and a Command and Staff Palletized Airborne Node (CASPAN).</p>		

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE4 / Enroute Mission Command

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Fuselage Mount Antenna (FMA) Training Cart																												
NRE for Baseband Redesign																												
EM/EMC Testing																												
Disposition Decision																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) FE4 / Enroute Mission Command

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MDA Decision	3	2015	3	2015
ONS IOC	3	2015	3	2015
EMI/EMC Test	4	2016	1	2017
Triband Radome Certification Flight Test	1	2017	2	2017
CASPAN Safe to Fly Test	4	2017	4	2017
Fuselage Mount Antenna (FMA) Training Cart	2	2019	4	2019
Ku Full Operational Capability (FOC)	4	2017	4	2017
NRE for Baseband Redesign	3	2018	1	2019
EMI/EMC Testing	4	2019	4	2019
Disposition Decision	1	2021	1	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)					Project (Number/Name) F18 / Protected Anti-JAM Tactical SATCOM		
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
F18: Protected Anti-JAM Tactical SATCOM	-	0.000	25.552	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	25.552
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program funding was realigned to 0303142A - SATCOM Ground Environment (SPACE) / 456 MILSATCOM System Engineering beginning in FY 2021 to support Protected Anti-jam Tactical SATCOM development, engineering, test and evaluation.

A. Mission Description and Budget Item Justification

This funding line supports the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network Cross-Functional Team capability set approach to achieve the network modernization strategy.

F18: Protected Anti-jam Tactical SATCOM (Protected SATCOM) will fill a critical protected communications gap for anti-jam SATCOM capability for mobile ground forces conducting expeditionary operations in electronically contested environments. It provides the ability for the tactical Army to be resilient in a contested environment and protect against potentially catastrophic loss of situational awareness and command and control during critical battle movement. It will offer the Tactical Army protection against interference that is either intentional or unintentional. The effort includes development of a critical Protected Tactical Waveform (PTW) modem which will be integrated into Army tactical SATCOM terminals to provide higher throughputs, protection (anti-jam) against Electronic Warfare (EW), and resiliency in a contested environment; development of a dual small form factor modem that can run the PTW and the current Network Centric Waveform (NCW) to Army Expeditionary Signal Battalions (ESBs) and eventually Army Corps, Division, and Brigade Combat Teams. The PTW efforts are synchronized with the Air Force and DoD's plans for PTW on Wideband Global SATCOM (WGS), the Protected Tactical Satellite (PTS), and commercial SATCOM systems.

FY 2020 funds will continue collaborative development, testing and certification with the US Air Force and Navy of a PTW modem and a Protected Tactical Satellite (PTS). The prototype of a protected modem and protected satellite were previously funded under the FE2 MILSATCOM Systems Engineering during the Protected Tactical Service Field Demo (PTSFD). The PTW modem and the accompanying satellite constellation continue the spiral development of critical protected communications capabilities. The funding on F18 Protected SATCOM incorporates the Army specific requirements to be included in these efforts.

FY 2020 funds will start efforts to test commercial Advanced Extremely High Frequency (AEHF) protected SATCOM terminal prototypes to meet recently identified critical capability gaps for anti-jam SATCOM. The new terminal will augment the existing capability of the Secure, Mobile, Anti-jam, Reliable, Tactical Terminal (SMART-T) AEHF terminal, with the intent to backfill decreasing SMART-T numbers due to obsolescence. This ensures the Army's ability to meet increasing EW threat requirements.

FY 2021 funding was realigned to 0303142A - SATCOM Ground Environment (SPACE) / 456 - MILSATCOM System Engineering to support Protected Anti-jam Tactical SATCOM development, engineering, test and evaluation.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) F18 / Protected Anti-JAM Tactical SATCOM		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>Title: Protected Tactical Waveform Modem Development</p> <p>Description: Development of Protected Tactical Waveform modem incorporating tactical Army specific requirements.</p> <p>FY 2020 Plans: Development and engineering of Army specific requirements for the Protected Tactical Waveform Modem that will be utilized for protected communications.</p> <p>Activities are part of joint effort with the US Air Force and Navy.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Decrease in FY 2021 realigns program funding from Protected Anti-jam Tactical SATCOM (1203142A/F18) to MILSATCOM System Engineering (0303142A/456) beginning in FY 2021 to support Protected Anti-jam Tactical SATCOM development, engineering, test and evaluation.</p>		-	10.613	-
<p>Title: Protected Tactical Satellite Development</p> <p>Description: Tactical Army requirement inserted during development of future Protected Tactical SATCOM satellite.</p> <p>Activities are part of joint effort with Air Force and Navy.</p> <p>FY 2020 Plans: Research, development and engineering for the Protected Tactical Satellite incorporating Army specific requirements to be included on the satellite.</p> <p>Activities are part of joint effort led by the Air Force, to include Army and Navy.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Decrease in FY 2021 realigns program funding from Protected Anti-jam Tactical SATCOM (1203142A/F18) to MILSATCOM System Engineering (0303142A/456) beginning in FY 2021 to support Protected Anti-jam Tactical SATCOM development, engineering, test and evaluation.</p>		-	3.565	-
<p>Title: AEHF Protected SATCOM Terminal Prototype Development</p> <p>Description: Research, development and testing of prototype AEHF Protected SATCOM terminals.</p> <p>FY 2020 Plans:</p>		-	10.213	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020		
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) F18 / Protected Anti-JAM Tactical SATCOM		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Initial research, development and testing of prototype AEHF Protected SATCOM terminals.				
FY 2020 to FY 2021 Increase/Decrease Statement: Decrease in FY 2021 realigns program funding from Protected Anti-jam Tactical SATCOM (1203142A/F18) to MILSATCOM System Engineering (0303142A/456) beginning in FY 2021 to support Protected Anti-jam Tactical SATCOM development, engineering, test and evaluation.				
Title: FY 2020 SBIR/STTR Transfer		-	1.161	-
Description: Funding transferred in accordance with Title 15 USC ?638				
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638				
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638				
Accomplishments/Planned Programs Subtotals		-	25.552	-
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
This project funds advanced systems engineering, research, development, test and evaluation of emerging protected Satellite Communications technologies to provide resilience and anti-jam protection against Electronic Warfare (EW). The program will leverage contracts established by the Air Force for the development of Protected Tactical Waveform (PTW) modems, including development of a dual small form factor modem capable of running the PTW and Network Centric Waveform - Resilient (NCW-R), beginning in FY2020. Production and Fielding of the PTW modems will begin in FY2023 under the Protected Anti-JAM Tactical SATCOM procurement line (B34002).				
This project also funds the research, development and testing of an Advanced Extremely High Frequency (AEHF) protected SATCOM terminal prototype to aid in filling the identified critical gap in protected communications. This terminal is a direct follow-on effort to the Secure, Mobile, Anti-jam, Resilient, Tactical Terminal (SMART-T). The Program Office is working closely with the US Air Force on scheduling insertion of the terminal into the satellite Mission Planner as well as working with NSA to develop a timely path to certification. The terminal research and development effort will be awarded in FY2020; a development test combined with robust Military utility user assessment will inform an FY2022 decision point on the path forward to the terminal.				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) F18 / Protected Anti-JAM Tactical SATCOM

Program funding was realigned to MILSATCOM System Engineering (0303142A/456) beginning in FY2021 to support Protected Anti-jam Tactical SATCOM development, engineering, test and evaluation.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020				
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)					Project (Number/Name) F18 / Protected Anti-JAM Tactical SATCOM							
Management Services (\$ 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	
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		1.161		-		-		-	0.000	1.161	-	
Subtotal			-	-		1.161		-		-		-	0.000	1.161	N/A	
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	
Protected Tactical Waveform Modem Development	TBD	To Be Determined : To Be Determined	-	-		10.613	Jan 2020	-		-		-	0.000	10.613	Continuing	
Protected Tactical Satellite Development	TBD	To Be Determined : To Be Determined	-	-		3.565	Jan 2020	-		-		-	0.000	3.565	Continuing	
AEHF Protected SATCOM Terminal Prototype Development	TBD	To Be Determined : To Be Determined	-	-		10.213	Apr 2020	-		-		-	0.000	10.213	Continuing	
Subtotal			-	-		24.391		-		-		-	0.000	24.391	N/A	
Project Cost Totals			-	-		25.552		-		-		-	0.000	25.552	N/A	
Remarks																
Program funding was realigned to 0303142A - SATCOM Ground Environment (SPACE) / 456 - MILSATCOM System Engineering to support Protected Anti-jam Tactical SATCOM development, engineering, test and evaluation beginning in FY2021.																

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) F18 / Protected Anti-JAM Tactical SATCOM

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Protected Tactical Waveform (PTW) Development					PTW Modem Development																							
Protected Tactical Waveform (PTW) Modem Testing																	PTW Modem Testing											
Army Dual Waveform Development																					Army Dual Waveform Development							
Protected Tactical Satellite (PTS) Development									PTS Development																			
AEHF Protected SATCOM Terminal Prototype Development									AEHF Terminal Prototype Development																			
Decision Point: AEHF Protected SATCOM Terminal Production																	Decision Point: AEHF Terminal Production											

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 1203142A / SATCOM Ground Environment (SPACE)	Project (Number/Name) F18 / Protected Anti-JAM Tactical SATCOM

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Protected Tactical Waveform (PTW) Development	2	2020	4	2022
Protected Tactical Waveform (PTW) Modem Testing	1	2023	4	2025
Army Dual Waveform Development	1	2024	4	2025
Protected Tactical Satellite (PTS) Development	2	2020	4	2025
AEHF Protected SATCOM Terminal Prototype Development	2	2020	4	2022
Decision Point: AEHF Protected SATCOM Terminal Production	4	2022	4	2022