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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army **Date:** May 2021

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604037A / Tactical Intel Targeting Access Node (TITAN) Adv Dev
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	-	-	28.347	-	28.347	-	-	-	-	-	-
BY4: Tactical Intelligence Targeting Access Node	-	-	-	28.347	-	28.347	-	-	-	-	-	-

Note

TITAN Ground Station funding transitioned from PE 0305208A to PE 0604037A Tactical Intel Targeting Access Node (TITAN) Adv Dev in FY 2022. This is not a new start.

A. Mission Description and Budget Item Justification

TITAN is a scalable and expeditionary intelligence ground station that supports commanders across the entire Multi-Domain Operations (MDO)/Joint All Domain Operations (JADO) battlefield framework with capabilities tailored to echelon. TITAN leverages Space, High Altitude, Aerial and Terrestrial layer sensors to provide targetable data to fires networks as well as multi-discipline intelligence support to targeting and Situation Awareness/Situation Understanding (SA/SU) in support of mission command.

TITAN is the future Army Intelligence, Surveillance, and Reconnaissance (ISR) ground station that will consolidate the sensor processing capabilities in the current Distributed Common Ground System-Army (DCGS-A) Operational-Intelligence Ground Station (OGS), Tactical-Intelligence Ground Station (TGS), the Advanced Miniaturized Data Acquisition System Dissemination Vehicle (ADV) and the Remote Ground Terminal (RGT). Additionally, TITAN will have the access and sensor tasking or control capabilities of the future Tactical Space Layer assets, National assets, the Multi-Domain Sensing Systems (MDSS) as well as commercial overhead sensors. Consequently, the TITAN ground station will be able to conduct deep sensing operations with the abilities to Task, Collect, Process, Exploit, and Disseminate (TCPED) information from Space, High Altitude, Aerial, and Terrestrial Layer sensors in support of Long Range Precision Fires (LRPF) operations.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	28.347	-	28.347
Total Adjustments	0.000	0.000	28.347	-	28.347
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	28.347	-	28.347

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<u>Change Summary Explanation</u> TITAN Ground Station funding transitioned from PE 0305208A to PE 0604037A Tactical Intel Targeting Access Node (TITAN) Adv Dev in FY 2022.		

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Army										Date: May 2021		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604037A / <i>Tactical Intel Targeting Access Node (TITAN) Adv Dev</i>				Project (Number/Name) BY4 / <i>Tactical Intelligence Targeting Access Node</i>			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
BY4: <i>Tactical Intelligence Targeting Access Node</i>	-	-	-	28.347	-	28.347	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

TITAN Ground Station funding transitioned from PE 0305208A to PE 0604037A Tactical Intel Targeting Access Node (TITAN) Adv Dev in FY 2022. This is not a new start.

A. Mission Description and Budget Item Justification

TITAN directly addresses the U.S. Army Combined Arms Center's (USACAC) Multi-Domain Operations (MDO) Gap #1: Lack of echelons above corps (EAC) multi-domain deep sensing, analysis, and processing, exploitation and dissemination (PED) for indications & warning (I&W) and anti-access/area denial (A2/AD) targeting. Furthermore, TITAN indirectly addresses MDO Gap 2: No theater detect, decide, deliver, assess (D3A) and convergence of Long Range Precision Fires (LRPF) to disintegrate A2/AD and MDO Gap #3: Lack of EAC LRPF capacity to dis-integrate A2/AD and shape the deep fight. TITAN supports these MDO gaps by providing the sensor data receipt and control, analysis, exploitation, and dissemination functions needed to enable LRPF. The system is postured to provide the fighting force with improved capacity and capability to "stimulate, see, and strike the enemy."

The FY22 funds in the amount of \$28.698M will fund initial Prototyping and Advanced Development of TITAN critical technologies on a representative platform. Efforts will prototype high altitude, aerial and terrestrial sensor data feeds and processing. Funds will support technology maturation of critical TITAN technologies including: hyper-computing, Artificial Intelligence/Machine Learning (AI/ML), Multi-Link Antennas and CMOSS.

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

	FY 2020	FY 2021	FY 2022
Title: Development and Prototyping of Critical RF Technologies	-	-	15.721
Description: Fund initial Prototyping and Advanced Development of TITAN critical technologies on a representative platform. Development and prototyping of critical RF technologies and technology which currently does not exist or needs significant enhancements to meet TITAN requirements. Fund technology maturation and prototyping of critical TITAN RF technologies including Multi-Link Antennas and CMOSS implementations. Multi-link RF systems will support the simultaneous ingest of multiple sensor data streams in a tactical configuration/footprint Prototype high altitude, aerial and terrestrial sensor data feeds.			
FY 2022 Plans:			

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604037A / <i>Tactical Intel Targeting Access Node (TITAN) Adv Dev</i>	Project (Number/Name) BY4 / <i>Tactical Intelligence Targeting Access Node</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>Fund initial Prototyping and Advanced Development of TITAN critical RF technologies on a representative platform. Prototype high altitude, aerial and terrestrial sensor data feeds and processing. Fund technology maturation of critical TITAN technologies to include Multi-Link Antennas and CMOSS.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: TITAN Ground Station funding transitioned from PE 0305208A to PE 0604037A Tactical Intel Targeting Access Node (TITAN) Adv Dev in FY 2022.</p>			
<p>Title: Development and Prototyping of Critical Automated Processing Technologies</p> <p>Description: Fund technology maturation of critical TITAN processing technologies including hyper-computing solutions, AI/ML algorithms to enhance targeting automation, stimulation capabilities and the generation of ML training data. Fund maturation of existing technology that needs minor enhancements to meet Army needs. This includes AI/ML algorithms that will transition to TITAN from various programs across the DoD and IC and need to be tuned for Army use cases. Fund the generation of new training data to aid in automated targeting. Funding will be used to integrate other technology transitioned from the research and development centers across the army to increase the accuracy and precision of TITAN. Existing modeling and simulation tools will be enhanced to account for the additional sensor modalities (EO/IR/SAR/FMV) that TITAN needs to process, which will allow the PM to automate more of the testing at the same time allowing units to run their own training exercises to maintain proficiency.</p> <p>FY 2022 Plans: Fund initial Prototyping and Advanced Development of TITAN critical technologies on a representative platform. Prototype high altitude, aerial and terrestrial sensor data feeds and processing. Fund technology maturation of critical TITAN technologies including hyper-computing and AI/ML algorithms.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: TITAN Ground Station funding transitioned from PE 0305208A to PE 0604037A Tactical Intel Targeting Access Node (TITAN) Adv Dev in FY 2022.</p>	-	-	12.626
Accomplishments/Planned Programs Subtotals	-	-	28.347

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u> <u>Base</u>	<u>FY 2022</u> <u>OCO</u>	<u>FY 2022</u> <u>Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• BY5: <i>Tactical Intelligence Targeting Access Node EMD</i>	-	-	54.972	-	54.972	-	-	-	-	-	-
Remarks	PE 0305208A is being leveraged for FY20 (\$715K) and FY21 Ground Station Modernization activities (\$18,000K).										

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

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u> <u>Base</u>	<u>FY 2022</u> <u>OCO</u>	<u>FY 2022</u> <u>Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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FY22 funds realign from PE 0305208A to PE 0604037A Tactical Intel Targeting Access Node (TITAN) Adv Dev in FY 2022.

D. Acquisition Strategy

The TITAN program acquisition strategy is to leverage Section 804 Middle-Tier Acquisition (MTA) policy for rapid prototyping program (RPP). This RPP rapidly develops and fields a capability that address multi-domain operations gap that can be demonstrated in an operational environment informing a decision point to transition to Rapid Fielding effort or tailored Milestone C for production. TITAN ground station fielding will be accelerated with this approach while providing increased intelligence capabilities, additional sensor data and processing throughput over time. The MTA approval will be based on an Abbreviated CDD (A-CDD) with an AROC anticipated in third of FY21, followed by the MTA decision in fourth quarter FY21.

An Other Transaction Authority (OTA) contract will be pursued under the 10 U.S.C. 2371b and the 2016 National Defense Authorization Act (NDAA), Section 815, for TITAN Rapid Prototype and Production. This innovative approach will enable acceleration of the TITAN Ground Station capabilities to the Warfighter.

The TITAN OTA approach is a multi-phased contract vehicle designed to scope each phase separately based on maturing requirements and informed by risk reduction efforts in prior phases.

Phase I, Ground Station Modernization, is a competitive effort in FY21 between two vendors to build system-level designs and mature a SW baseline. At the conclusion of Phase I, a Tech Demo and Critical Design Review (CDR) will inform up-select to one vendor for Phase 2. Phase 2 will be executed starting in FY22 and encompass efforts such as prototyping and development of TITAN critical technologies identified during Phase I, and inform the later Phase 3 (additional Echelon build and integration) and 4 (enhancements and scalability builds) activities. The OTA allows the flexibility for each phase to be executed either in parallel or sequentially.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army												Date: May 2021			
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development and Prototyping of Critical RF Technologies	C/FP	Contractor (Pending Selection) : PEO IEW&S (APG) and Contractor Facility (TBD)	-	-		-		15.721	Nov 2021	-		15.721	Continuing	Continuing	Continuing
Subtotal			-	-		-		15.721		-		15.721	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development and Prototyping of Critical Automated Processing Technologies	C/FP	Contractor (Pending Selection) : Various: APG, Ft. Bragg, JBLM, YPG, CTR FAC (TBD)	-	-		-		12.626	Nov 2021	-		12.626	Continuing	Continuing	Continuing
Subtotal			-	-		-		12.626		-		12.626	Continuing	Continuing	N/A
Project Cost Totals			-	-		0.000		28.347		-		28.347	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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Event Name	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MDD		▲ 1																										
Analysis of Alternatives			■																									
AoA SAG						▲ 2																						
AROC							▲ 3																					
MTA								▲ 4																				
OTA Phase 1: Ground Station Modernization						■																						
Phase 1 Technology Demonstrations/Design Reviews						■																						
CDR										▲ 5																		
OTA Phase 2: Prototyping and Critical Technology Development										■																		
Phase 2 Testing (Multiple DT Events/OA)										■																		
OT Complete															▲ 6													
OTA Phase 3: Tailoring by Echelon															■													
Phase 3 Testing (Multiple DT Events/OA)															■													

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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Event Name	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026																			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4																
OTA Phase 4: Joint Sensor Integration, Continuous Integration and Updates																																												
Production Decision																																	7											
Production Contract																																												
Follow-on OTA Contract																																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MDD	2	2020	2	2020
Analysis of Alternatives	3	2020	1	2021
AoA SAG	1	2021	1	2021
AROC	3	2021	3	2021
MTA	4	2021	4	2021
OTA Phase 1: Ground Station Modernization	1	2021	1	2022
Phase 1 Technology Demonstrations/Design Reviews	1	2021	1	2022
CDR	1	2022	1	2022
OTA Phase 2: Prototyping and Critical Technology Development	1	2022	2	2023
Phase 2 Testing (Multiple DT Events/OA)	1	2022	2	2023
OT Complete	3	2023	3	2023
OTA Phase 3: Tailoring by Echelon	4	2022	2	2024
Phase 3 Testing (Multiple DT Events/OA)	4	2022	2	2024
OTA Phase 4: Joint Sensor Integration, Continuous Integration and Updates	1	2024	4	2025
Production Decision	4	2023	4	2023
Production Contract	1	2024	1	2025
Follow-on OTA Contract	1	2025	4	2026

Note

Schedule Detail notes.