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

<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0208053A / <i>Joint Tactical Ground System</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	-	9.510	13.379	-	13.379	-	-	-	-	-	-
635: <i>Joint Tact Grd Station-P3I</i>	-	-	9.510	13.379	-	13.379	-	-	-	-	-	-

**A. Mission Description and Budget Item Justification**

The Joint Tactical Ground Station (JTAGS) is a post-production, Acquisition Category (ACAT) III program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units, which are deployed in three theaters (United States Pacific Command (PACOM), United States Central Command (CENTCOM), United States European Command (EUCOM)), constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is used as an institutional trainer, but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor-to-shooter connectivity. On 14 January 2016, the Army Acquisition Executive designated the JTAGS Pre-Planned Product Improvement (JTAGS P3I) program as a separate ACAT III modification program.

The JTAGS Program Element (PE) supports development and testing of the JTAGS Block II Preplanned Product Improvements (P3I) program based on the JTAGS Operational Requirements Document (ORD), additive Joint Requirements Oversight Council - Memorandum (JROC-M) requirements, and the formal JTAGS Block II Capability Development Document (CDD) thresholds. P3I upgraded JTAGS to a Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and improved warning tactical parameters and timeliness. The JTAGS Block II P3I program based on the 2009 JTAGS ORD is on contract as a two phase development effort. JTAGS Block II P3I Phase 1 is complete. The final developmental efforts of JTAGS Block II P3I Phase 2 to achieve 2009 ORD requirements will be complete in FY2021 with Follow-on Test and Evaluation (FOTE) and Materiel Release efforts to be conducted in FY2022. JTAGS Block II Phase 2 fielding is planned for FY 2023. The JTAGS Block II CDD addresses evolving User-driven needs such as emerging threats and interface efforts that were not known at the time the JTAGS ORD was validated. Developmental efforts to achieve JTAGS Block II CDD threshold requirements and implementation of M-Code GPS (IAW PL 111-383) continue through FY27.

Fiscal Year 2022 (FY22) requested funding of \$13.379 million allows for the continued development of cyber compliance, defense against emerging threats, system materiel release, Assure Positioning Navigation and Timing (A-PNT) and M-code GPS compliance, addresses obsolescence mitigation with Commercial Off The Shelf (COTS) hardware/software upgrades, and NextGen Polar Geosynchronous satellite interface efforts.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2022 Army	<b>Date:</b> May 2021
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<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0208053A / <i>Joint Tactical Ground System</i>
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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022 Base</b>	<b>FY 2022 OCO</b>	<b>FY 2022 Total</b>
Previous President's Budget	0.000	9.510	9.665	-	9.665
Current President's Budget	0.000	9.510	13.379	-	13.379
Total Adjustments	0.000	0.000	3.714	-	3.714
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	3.714	-	3.714

**Change Summary Explanation**

Fiscal Year 2022 (FY22) increase of \$3.714 million is the result of a realignment from Program Element (PE) 1208053A - allows Joint Tactical Ground System (JTGS) continue development of cyber compliance, defense against emerging threats, system materiel release, Assure Positioning Navigation and Timing (A-PNT) and M-code GPS compliance, address obsolescence mitigation with Commercial Off The Shelf (COTS) hardware/software upgrades, and NextGen Polar Geosynchronous satellite interface efforts.

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

<b>Appropriation/Budget Activity</b> 2040 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0208053A / Joint Tactical Ground System	<b>Project (Number/Name)</b> 635 / Joint Tact Grd Station-P3I
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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
635: Joint Tact Grd Station-P3I	-	-	9.510	13.379	-	13.379	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

**A. Mission Description and Budget Item Justification**

The Joint Tactical Ground Station (JTAGS) is a post-production, Acquisition Category (ACAT) III program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units, which are deployed in three theaters (United States Pacific Command (PACOM), United States Central Command (CENTCOM), United States European Command (EUCOM)), constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is used as an institutional trainer, but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor-to-shooter connectivity. On 14 January 2016, the Army Acquisition Executive designated the JTAGS Pre-Planned Product Improvement (JTAGS P3I) program as a separate ACAT III modification program.

The JTAGS Program Element (PE) supports development and testing of the JTAGS Block II Preplanned Product Improvements (P3I) program based on the JTAGS Operational Requirements Document (ORD), additive Joint Requirements Oversight Council - Memorandum (JROC-M) requirements, and the formal JTAGS Block II Capability Development Document (CDD) thresholds. P3I upgraded JTAGS to a Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and improved warning tactical parameters and timeliness. The JTAGS Block II P3I program based on the 2009 JTAGS ORD is on contract as a two phase development effort. JTAGS Block II P3I Phase 1 is complete. The final developmental efforts of JTAGS Block II P3I Phase 2 to achieve 2009 ORD requirements will be complete in FY2021 with Follow-on Test and Evaluation (FOTE) and Materiel Release efforts to be conducted in FY2022. JTAGS Block II Phase 2 fielding is planned for FY 2023. The JTAGS Block II CDD addresses evolving User-driven needs such as emerging threats and interface efforts that were not known at the time the JTAGS ORD was validated. Developmental efforts to achieve JTAGS Block II CDD threshold requirements and implementation of M-Code GPS (IAW PL 111-383) continue through FY27.

Fiscal Year 2022 (FY22) requested funding of \$13.379 million allows for the continued development of cyber compliance, defense against emerging threats, system materiel release, Assure Positioning Navigation and Timing (A-PNT) and M-code GPS compliance, addresses obsolescence mitigation with Commercial Off The Shelf (COTS) hardware/software upgrades, and NextGen Polar Geosynchronous satellite interface efforts.

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

	FY 2020	FY 2021	FY 2022
<b>Title:</b> JTAGS P3I Block II Phase 2	-	6.785	0.861

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Army		<b>Date:</b> May 2021		
<b>Appropriation/Budget Activity</b> 2040 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0208053A / <i>Joint Tactical Ground System</i>	<b>Project (Number/Name)</b> 635 / <i>Joint Tact Grd Station-P3I</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
<p><b>Description:</b> JTAGS Block II P3I Phase 2 activities seek to develop and test capabilities identified in the 2009 JTAGS Operational Requirements Document (ORD). Joint Requirements Oversight Council (JROC) Memos 197-12, 113-13, and 042-19 and PL 111-383 (Ike Skelton National Defense Authorization Act for Fiscal Year 2011) support the requirement to develop and field JTAGS Block II capabilities as soon as possible.</p> <p><b>FY 2021 Plans:</b> Allows for the development and integration on evolving cyber hardening advances and emerging threats</p> <p><b>FY 2022 Plans:</b> Funding required for efforts includes work on materiel release package for JTAGS Block II P3I system full materiel release</p> <p><b>FY 2021 to FY 2022 Increase/Decrease Statement:</b> FY 2022 decreased from FY 2021 as Block II development efforts against the JTAGS Block II Operational Requirements Document (ORD) requirements were completed. Reduced funding completes materiel release for JTAGS Block II under this planned program.</p>				
<p><b>Title:</b> Development and Test of Block II CDD requirements</p> <p><b>Description:</b> JTAGS Block II program continues to focus on development/integration of evolving cyber hardening advances, defense against emerging threats, M-code GPS, and JTAGS Capability Development Document (CDD) threshold requirements. JROC-Memos 197-12, 113-13, and 042-19 and PL 111-383 (Ike Skelton National Defense Authorization Act for Fiscal Year 2011) require fielding of these capabilities as soon as possible.</p> <p><b>FY 2022 Plans:</b> Funding required for efforts including continued development of cyber security tools to be achieve compliance with cyber requirements; continues development of new capabilities detailed in the JTAGS Block II Capability Development Document (CDD) defense against emerging threats, system materiel release, Assure Positioning Navigation and Timing (A-PNT) and M-code GPS compliance; addresses obsolescence mitigation with Commercial Off The Shelf (COTS) hardware/software upgrades; and addresses NextGen Polar Geosynchronous satellite interface efforts.</p> <p><b>FY 2021 to FY 2022 Increase/Decrease Statement:</b> FY 2022 increased from FY 2021 as development is focused on delivering capabilities detailed in the JTAGS Block II Capability Development Document (CDD), and M-Code GPS IAW Public Law 111-383 (Ike Shelton National Defense Authorization Act for Fiscal Year 2011) to achieve DoD Assured-Position, Navigation, and Timing objectives.</p>		-	-	9.148
<p><b>Title:</b> JTAGS Test and Evaluation Support</p>		-	2.725	3.370

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Army		<b>Date:</b> May 2021
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
<p><b>Description:</b> Test and evaluation support for the JTAGS program.</p> <p><b>FY 2021 Plans:</b> Provides test planning support of the JTAGS P3I Block II development program; plan an operational test for JTAGS P3I Block II.</p> <p><b>FY 2022 Plans:</b> Conducts test planning/support for interoperability, cyber compliance confirmation, and new capabilities for the JTAGS Block II program as detailed in the JTAGS Block II Capability Development Document (CDD). Conducts a Follow-on Operational Test and Evaluation (FOTE) for JTAGS Block II P3I.</p> <p><b>FY 2021 to FY 2022 Increase/Decrease Statement:</b> FY 2022 increased from FY 2021 to conduct JTAGS Block II FOTE; testing of new capabilities detailed in the JTAGS Block II CDD, and continued confirmation of compliance with interoperability and cyber requirements.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	-	9.510	13.379

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022 Base</b>	<b>FY 2022 OCO</b>	<b>FY 2022 Total</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• BZ8420: JOINT TACTICAL GROUND STATION MODS (JTAGS)	-	-	8.088	-	8.088	-	-	-	-	-	-
• FE7: Joint Tact Grd Station-P3I	7.676	-	-	-	-	-	-	-	-	-	-

**Remarks**  
Beginning in FY21 Joint Tactical Ground System (JTAGS) requested funding has been realigned from PE 1208053A to PE 0208053A.

**D. Acquisition Strategy**  
This program element develops critical software intensive improvements, while continuing to make maximum use of Non-Developmental Items (NDI)/Commercial Off-The-Shelf (COTS) components and Government Furnished Equipment (GFE). After design and integration, the system will be subject to thorough developmental and validation/verification testing to verify performance, operational effectiveness and suitability. The JTAGS Block II Pre-planned Product Improvement (P3I) program was initiated based on a 2009 JTAGS Operational Requirements Document (ORD) and upgrades JTAGS to a Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, improving warning tactical parameters and timeliness. The JTAGS Block II P3I contract was a full and open competition, but only the incumbent JTAGS contractor submitted a proposal, resulting in a sole-source contract on 26 Aug 2012. The contract's development options are Cost Plus Incentive Fee; its production options are Firm Fixed Price, and its Sustainment options are Cost Plus Fixed Fee. The JTAGS Block II contract's period of performance is from 1 October 2012 through 30 September 2021. As threats continue to evolve and change as well as new satellite sensors become available, the

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Army		<b>Date:</b> May 2021
<b>Appropriation/Budget Activity</b> 2040 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0208053A / <i>Joint Tactical Ground System</i>	<b>Project (Number/Name)</b> 635 / <i>Joint Tact Grd Station-P3I</i>
<p>JTAGS Users in conjunction with the Army Capabilities Manager have developed a JTAGS Block II Capability Development Document (CDD), requiring JTAGS to address new/changing threats that were not addressed in the 2009 JTAGS ORD. The acquisition of the continued JTAGS Block II efforts based on the JTAGS Block II CDD will be performed under a sole source follow-on contract to be awarded 4QFY21 to the current JTAGS contractor.</p>		

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army** **Date:** May 2021

<b>Appropriation/Budget Activity</b> 2040 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0208053A / Joint Tactical Ground System	<b>Project (Number/Name)</b> 635 / Joint Tact Grd Station-P3I
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<b>Management Services (\$ in Millions)</b>				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Program Management	Allot	Various (AMC, AMCOM, CCDC) : Redstone Arsenal, AL	-	-		1.184	Oct 2020	1.143	Oct 2021	-		1.143	0.000	2.327	Continuing
<b>Subtotal</b>			-	-		1.184		1.143		-		1.143	0.000	2.327	N/A

**Remarks**  
Provides Other Government Agency (OGA) support to the JTAGS acquisition program

<b>Product Development (\$ in Millions)</b>				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JTAGS P3I Block II Phase 2 Development	SS/CPIF	Northrop-Grumman : Colorado Springs, Co	-	-		4.401	Oct 2020	-		-		-	0.000	4.401	34.100
Development and Test Block II CDD requirements	SS/TBD	Northrop-Grumman : Colorado Springs, Co	-	-		-		7.407	Oct 2021	-		7.407	0.000	7.407	-
System Engineering Support	C/CPFF	COLSA : Huntsville, AL	-	-		0.450	Nov 2020	0.558	Jan 2022	-		0.558	0.000	1.008	Continuing
<b>Subtotal</b>			-	-		4.851		7.965		-		7.965	0.000	12.816	N/A

**Remarks**  
Continues development of the JTAGS Block II capabilities based on the JTAGS Block II Capability Development Document (CDD)

<b>Support (\$ in Millions)</b>				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Engineering Technical Assistance	C/CPFF	COLSA : Huntsville, AL	-	-		0.750	Nov 2020	0.739	Jan 2022	-		0.739	0.000	1.489	Continuing

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army** **Date:** May 2021

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Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
<b>Subtotal</b>			-	-		0.750		0.739		-		0.739	0.000	1.489	N/A

**Remarks**  
Provides technical assistance in implementing the JTAGS Block II CDD

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JTAGS Test Support (ATEC/AIC/JITC)	Allot	Various (ATEC, AIC, JITC) : Various locations	-	-		2.725	Oct 2020	3.532	Oct 2021	-		3.532	0.000	6.257	Continuing
<b>Subtotal</b>			-	-		2.725		3.532		-		3.532	0.000	6.257	N/A




**Remarks**  
Conducts a JTAGS Block II Follow-on Test and Evaluation (FOTE) and supports testing of JTAGS Block II development efforts based on the JTAGS Block II CDD.

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	-	-	9.510	13.379	-	13.379	0.000	22.889	N/A

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2022 Army</b>		<b>Date: May 2021</b>
<b>Appropriation/Budget Activity</b> 2040 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0208053A / Joint Tactical Ground System	<b>Project (Number/Name)</b> 635 / Joint Tact Grd Station-P3I

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
JTAGS P3I Block II Phase 2					JTAGS P3I Block II Phase 2																							
JTAGS P3I Block II operational test planning									JTAGS P3I Block II Operational Test Planning																			
JTAGS Follow-on Operational Test and Evaluation													Block II FOT&E															
JTAGS Block II Phase 2 Fielding (OPA Funded)																	Block II Fielding											
JTAGS Block II CDD driven emerging threats and cyber hardening													JTAGS Block II CDD Emerging Threats Development															
JTAGS Block III Capability Development Document																	 JTAGS Block III CDD											
Limited User Test of Block II CDD Emerging Threat Capabilities																	 Limited User Test											
Continued Block II CDD Emerging Threats and Future Sensor Integration																	Block II CDD Emerging Threats and Next Generation GEO Development											
Limited User Test of of Block II CDD Emerging Threat Capabilities																					 Limited User Test							
JTAGS Block III Development Effort																					JTAGS Block III							

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2022 Army</b>		<b>Date:</b> May 2021
<b>Appropriation/Budget Activity</b> 2040 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0208053A / <i>Joint Tactical Ground System</i>	<b>Project (Number/Name)</b> 635 / <i>Joint Tact Grd Station-P3I</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
JTAGS P3I Block II Phase 2	1	2021	4	2021
JTAGS P3I Block II operational test planning	2	2021	4	2021
JTAGS Follow-on Operational Test and Evaluation	2	2022	3	2022
JTAGS Block II Phase 2 Fielding (OPA Funded)	4	2022	3	2023
JTAGS Block II CDD driven emerging threats and cyber hardening	1	2022	2	2023
JTAGS Block III Capability Development Document	3	2023	3	2023
Limited User Test of Block II CDD Emerging Threat Capabilities	3	2023	3	2023
Continued Block II CDD Emerging Threats and Future Sensor Integration	4	2023	1	2025
Limited User Test of of Block II CDD Emerging Threat Capabilities	2	2025	2	2025
JTAGS Block III Development Effort	3	2024	4	2026