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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</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	-	25.856	17.294	20.008	-	20.008	11.717	12.867	14.584	13.356	Continuing	Continuing
L86: <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>	-	4.036	4.913	5.375	-	5.375	2.764	3.427	4.553	4.844	Continuing	Continuing
L87: <i>Hypervelocity Armament System (HAS)</i>	-	16.373	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.373
L88: <i>Enhanced AN/TPQ 36</i>	-	5.447	12.381	14.633	-	14.633	8.953	9.440	10.031	8.512	Continuing	Continuing

A. Mission Description and Budget Item Justification

The RDT&E funds for the AN/TPQ-50 and AN/TPQ-53 programs fund the design, development and test of primary efforts. The programs directly support the prioritization, tracking and locating of targets, and dissemination of that information for simultaneous attack of multiple threats. They provide the Warfighter with continuous and responsive counterfire target acquisition systems for all types and phases of military operations. Project L86, Lightweight Counter Mortar Radar (LCMR), version AN/TPQ-50 provides 360 degrees of azimuth coverage from ranges of 500 meters to 10 kilometers. Project L88, AN/TPQ-53 is a highly mobile radar system that leverages the latest in technology design to accelerate modernization and increase range while improving false location rate, reducing obsolescence and increasing reliability. The AN/TPQ-53 provides a system with increased range and accuracy throughout a 90 degree search sector (stare mode) as well as 360 degree coverage (rotating) for locating mortar, artillery and rocket firing positions. The AN/TPQ-50 and AN/TPQ-53 radars are currently fielded to multiple Continental United States (CONUS) and Outside Continental United States (OCONUS) locations to include operational support to Operation Inherent Resolve (OIR) and Operation Freedom's Sentinel (OFS).

The Fiscal Year (FY) 2021 Base funding in the amount of \$20.008 million supports ongoing AN/TPQ-50 and AN/TPQ-53 test efforts, Army interoperability certifications (AICs), and the development and testing of modernization efforts to address extended range, electronic protection, and emerging threats in support of multi-domain operations against peer and near-peer threats. These efforts include the performance of technical assessments, engineering studies, risk reduction, and required documentation.

This program line also funds development of an integrated Hypervelocity Armament System (HAS), and associated technologies as they mature to support accelerated demonstration and transition of advanced gun weapon systems, command guided maneuverable projectiles, and tactical sensors. The development of HAS would include advancing artillery powder guns firing Hypervelocity Projectiles (HVPs), resulting in next-generation, common, low drag, guided cannon artillery projectiles capable of completing multiple missions with improved cost effectiveness across different gun systems. Integration with a fire control radar and sensor array will allow closed-loop targeting of moving and relocatable targets beyond the range of conventional artillery.

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</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	27.439	17.294	20.026	-	20.026
Current President's Budget	25.856	17.294	20.008	-	20.008
Total Adjustments	-1.583	0.000	-0.018	-	-0.018
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.583	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.018	-	-0.018

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>				Project (Number/Name) L86 / <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</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
L86: <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>	-	4.036	4.913	5.375	-	5.375	2.764	3.427	4.553	4.844	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AN/TPQ-50 Lightweight Counter Mortar Radar (LCMR) is a highly mobile radar that automatically detects, classifies, tracks, and locates the point of origin of projectiles fired from mortar, artillery, and rocket systems with sufficient accuracy for first round fire for effect. It mitigates close combat radar coverage gaps by providing 360 degrees of azimuth coverage from ranges of 500 meters to 10 kilometers and is capable of being deployed in two configurations, standalone or vehicle mounted. The AN/TPQ-50 system interoperates with mission command systems to provide the maneuver commander increased counterfire radar flexibility. The AN/TPQ-50 is deployed as part of the Counter-Rocket, Artillery, Mortar (C-RAM) system of systems. It provides data to the Forward Area Air Defense Command and Control (FAAD C2) node for the sense and warn force protection capability. The AN/TPQ-50 is currently fielded to multiple Continental United States (CONUS) and Outside Continental United States (OCONUS) locations to include support to Operation Inherent Resolve (OIR) and Operation Freedom's Sentinel (OFS).

The fiscal year (FY) 2021 funds of \$5.375 million continue development required to address electronic protection against cyber electromagnetic activity (CEMA) and threats identified in the Validated Online Lifecycle Threat (VOLT) report. This funding enables the program to develop and integrate sensor protect capabilities into the software baseline, develop advanced protection techniques which take advantage of hardware upgrades, and develop documentation for hardware and software capability improvements in support of multi-domain operations against peer and near-peer threats. Funding supports associated test costs and program support.

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

	FY 2019	FY 2020	FY 2021
Title: Modernization & Emerging Threats	4.036	4.690	5.375
Description: Funding supports software updates required to address electronic protection and mitigate the effects of electromagnetic interference (EMI) and combat cyber electromagnetic activity (CEMA). These capabilities address vulnerabilities identified in the bi-annual release of the Validated Online Lifecycle Threat (VOLT) and changes on the battlefield due to new tactics, techniques, and procedures (TTPs) and/or areas of operation.			
FY 2020 Plans: Funding enables the continuation of work required to enhance the AN/TPQ-50's capability to address electronic protection against cyber electromagnetic activity (CEMA) and other known, new, emerging and evolving threats identified in the Validated Online Lifecycle Threat (VOLT) report. In addition, it integrates developed capabilities into the baseline, develops documentation for hardware and software capability improvements, and includes operational assessments for capability improvements. Funding supports all associated testing costs and program support. These efforts are executed by the LCMR program.			
FY 2021 Plans:			

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L86 / <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Funding increases the scope of work required to enhance the AN/TPQ-50's ability to address electronic protection against CEMA and new threats identified in the VOLT report as well as associated test efforts and program support. These efforts are executed by the LCMR program. FY 2020 to FY 2021 Increase/Decrease Statement: Increase in funding reflects required development efforts to address threats identified in the VOLT report.			
Title: FY 2020 SBIR/STTR Transfer 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	-	0.223	-
Accomplishments/Planned Programs Subtotals	4.036	4.913	5.375

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>
• B05201: <i>Lightweight Counter Mortar Radar</i>	6.107	5.400	5.332	-	5.332	6.520	5.762	9.888	12.788	Continuing	Continuing

Remarks

D. Acquisition Strategy

The AN/TPQ-50 Lightweight Counter Mortar Radar was developed in 2009 to meet Training and Doctrine Command (TRADOC) Capabilities Production Document (CPD) requirements. The program achieved a full rate production (FRP) decision on 21 June 2013. The AAO increased from 400 to 452 systems in January 2019; 400 systems procured to date. The AN/TPQ-50 program transitioned into the sustainment phase on 1 October 2019.

Research, Development, Test and Evaluation (RDT&E) funding supports modernization development task orders under the national maintenance contract (NMC). The efforts extend through the current Program Objective Memorandum (POM) period.

The fiscal year (FY) 2021 funds of \$4.303 million continue development required to address electronic protection against cyber electromagnetic activity (CEMA) and threats identified in the Validated Online Lifecycle Threat (VOLT) report. This funding enables the program to develop and integrate sensor protect capabilities into

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L86 / <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>

the software baseline, develop advanced protection techniques which take advantage of hardware upgrades, and develop documentation for hardware and software capability improvements in support of multi-domain operations to address peer and near-peer threats. Funding supports associated test costs and program support.

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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 / 5				PE 0604823A / Firefinder				L86 / LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)								
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	
Program Management (Government Support)	Various	Various : Activities	1.582	0.532	Nov 2018	0.495	Nov 2019	0.573	Oct 2020	-		0.573	Continuing	Continuing	Continuing	
Program Management (Contractor Support)	C/CPFF	Various : APG, MD	0.927	0.052	Mar 2019	-		-		-		-	Continuing	Continuing	Continuing	
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.223		-		-		-	0.000	0.223	-	
Subtotal			2.509	0.584		0.718		0.573		-		0.573	Continuing	Continuing	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	
Modernization & New and Emerging Threats	SS/CPFF	Various : Various	3.848	2.636	Oct 2018	2.744	Nov 2019	3.687	Nov 2020	-		3.687	Continuing	Continuing	Continuing	
Subtotal			3.848	2.636		2.744		3.687		-		3.687	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	
Test Support (Government)	Various	Various : Activities	5.184	0.816	Nov 2018	1.451	Nov 2019	1.115	Nov 2020	-		1.115	Continuing	Continuing	Continuing	
Subtotal			5.184	0.816		1.451		1.115		-		1.115	Continuing	Continuing	N/A	
Project Cost Totals			11.541	4.036		4.913		5.375		-		5.375	Continuing	Continuing	N/A	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L86 / <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>

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
Modernization and Emerging Threats - Fiscal Year (FY) 2019 VOLT	████████████████																											
Modernization Testing - FY 2019 VOLT					████████████████																							
Modernization and Emerging Threats - FY 2021 VOLT									████████████████																			
Modernization Testing - FY 2021 VOLT													████████████████															
Modernization and Emerging Threats - FY 2023 VOLT																	████████████████											
Modernization Testing - FY 2023 VOLT																					████████████████							
Modernization and Emerging Threats - FY 2025 VOLT																									████████████████			

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L86 / <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Modernization and Emerging Threats - Fiscal Year (FY) 2019 VOLT	1	2019	1	2021
Modernization Testing - FY 2019 VOLT	1	2020	1	2022
Modernization and Emerging Threats - FY 2021 VOLT	1	2021	1	2023
Modernization Testing - FY 2021 VOLT	1	2022	1	2024
Modernization and Emerging Threats - FY 2023 VOLT	1	2023	1	2025
Modernization Testing - FY 2023 VOLT	1	2024	1	2026
Modernization and Emerging Threats - FY 2025 VOLT	1	2025	1	2027

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Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>				Project (Number/Name) L87 / <i>Hypervelocity Armament System (HAS)</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
L87: <i>Hypervelocity Armament System (HAS)</i>	-	16.373	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.373
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project L87 The Hypervelocity Armament System (HAS) and associated technologies are composed of advanced gun weapon systems, command guided maneuverable projectiles, and tactical sensors. The development of HAS would include advancing artillery powder guns firing Hypervelocity Projectiles (HVPs), resulting in a next generation, common, low drag, guided cannon artillery projectiles capable of completing multiple missions with improved cost effectiveness. Integration with a fire control radar and sensor array will allow closed-loop targeting of moving and relocatable targets beyond the range of conventional artillery.

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

	FY 2019	FY 2020	FY 2021
Title: Development	11.200	-	-
Description: Funding is provided for all development efforts on Hypervelocity Armament System (HAS) technology transitions.			
Title: Program Management	5.173	-	-
Description: Funding is provided for all program management efforts on Hypervelocity Armament System (HAS).			
Accomplishments/Planned Programs Subtotals	16.373	-	-

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

N/A

Remarks

D. Acquisition Strategy

The Army will leverage Strategic Capabilities Office (SCO) prototypes and technologies to continue transition from the FY 2018 program into programs of record.

The Army is transitioning prototype articles from the SCO demonstration to develop advanced gun systems, command guided maneuverable projectiles, and fire control sensors capable of engaging tactical range targets. Emerging requirements include communication suite changes, munitions updates, and introduction of new munitions require software and/or hardware updates to ensure full compatibility and maintain operational viability.

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L87 / <i>Hypervelocity Armament System (HAS)</i>

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
Hypervelocity Armament System Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L87 / <i>Hypervelocity Armament System (HAS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Hypervelocity Armament System Development	1	2018	4	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>				Project (Number/Name) L88 / <i>Enhanced AN/TPQ 36</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
L88: <i>Enhanced AN/TPQ 36</i>	-	5.447	12.381	14.633	-	14.633	8.953	9.440	10.031	8.512	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced AN/TPQ-36 (AN/TPQ-53) Counterfire Target Acquisition Radar System is a highly mobile radar set that automatically detects, classifies, tracks, and locates the point of origin of projectiles fired from mortar, artillery, and rocket systems with sufficient accuracy for first round fire for effect. It mitigates close combat radar coverage gaps by providing a 90 degree search sector (stare mode) as well as 360 degree coverage (rotating) and replaces the current AN/TPQ-36 and AN/TPQ-37 Firefinder Radars. The AN/TPQ-53 system interoperates with mission command systems to provide the maneuver commander increased counterfire radar flexibility. The AN/TPQ-53 is deployed as part of the Counter-Rocket, Artillery, Mortar (C-RAM) system of systems. It provides data to the Forward Area Air Defense Command and Control (FAAD C2) node for the sense and warn force protection capability. The AN/TPQ-53 currently supports contingency operations to include Operation Inherent Resolve (OIR) and is fielded to Brigade Combat Teams (BCTs), Field Artillery Brigades (FABs) and Division Artilleries (DIVARTYs).

The FY 2021 funds of \$14.633 million supports ongoing test efforts, Army interoperability certifications (AICs), and the development and testing of modernization efforts to address extended range, electronic protection, and emerging threats in support of multi-domain operations against peer and near-peer threats. These efforts include the performance of technical assessments, engineering studies, risk reduction and required documentation.

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

	FY 2019	FY 2020	FY 2021
Title: Test support	1.111	4.062	10.346
Description: Funding supports testing efforts and associated Program Management Office (PMO) requirements.			
FY 2020 Plans: Conduct engineering and customer testing, Army interoperability certification (AIC) testing, a network vulnerability and penetration assessment, and electronic protection testing. Funds include associated PMO and test support costs. Funds will be executed by the Enhanced AN/TPQ-36 program.			
FY 2021 Plans: Conduct engineering testing and an independently evaluated, limited operational test in support of extended range efforts, Army interoperability certification (AIC) testing, a cooperative vulnerability and penetration assessment (CVPA), and electronic protection testing. Funds include associated PMO and test support costs. The Enhanced AN/TPQ-36 program will execute the funds.			
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 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L88 / <i>Enhanced AN/TPQ 36</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Increase in FY 2021 cost due to operational test to demonstrate extended range capability using soldiers and further refinement of the software as required.				
<p>Title: Electronic Protection and Emerging Threats</p> <p>Description: This effort improves spectrum management and mitigates electromagnetic interference (EMI) from commercial and military bands. This effort also develops and improves radar electronic protection (EP) algorithms which counter electronic threats. Lastly, this effort funds the development of capabilities to address emerging threats identified in the biennial release of the Validated Online Lifecycle Threat (VOLT) report and changes on the battlefield due to new adversarial tactics, techniques, and procedures (TTPs) and/or areas of operation.</p> <p>FY 2020 Plans: Develop additional electronic protection techniques to mitigate cyber electromagnetic activity (CEMA). Continue development of capabilities to address emerging threats identified in the biannual release of the VOLT, changes in the battlefield and areas of operations. Implement tools and TTPs to allow the radar to operate more efficiently in the presence of electromagnetic interference (EMI). Funding supports associated developmental testing and program support. Funds will be executed by the Enhanced AN/TPQ-36 program.</p> <p>FY 2021 Plans: Continue development and testing of additional electronic protection techniques to mitigate cyber electromagnetic activity (CEMA) in peer and near peer threat environments. Continue development of capabilities to address emerging threats identified in the biennial release of the VOLT and conflict areas of operation. Implement tools and TTPs to allow the radar to operate more efficiently in the presence of electromagnetic interference (EMI). Funding supports associated developmental testing and program support. The Enhanced AN/TPQ-36 program will execute the funds.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Increase from FY 2020 to FY 2021 to support additional electronic protection development efforts associated with an updated distributed digital receiver exciter (DDREX).</p>		0.157	2.081	4.287
<p>Title: Extended Range</p> <p>Description: This effort extends the radar's detection and identification range through associated development, integration, and testing in support of the Army's number one modernization priority of long range precision fires (LRPF).</p> <p>FY 2020 Plans: Will conduct regression and live fire testing of the extended range capability. Implement design and software changes based on results from testing performed in an operationally representative environment. Integrate a proven extended range capability into</p>		4.179	5.675	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
the program's software baseline and conduct initial integration testing. These funds will be executed by the Enhanced AN/TPQ-36 program.			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Decrease in FY 2021 cost due to a reduction in scope of the extended range software development effort.			
<i>Title:</i> FY 2020 SBIR/STTR Transfer	-	0.563	-
<i>Description:</i> Funding transferred in accordance with Title 15 USC ?638			
<i>FY 2020 Plans:</i> Funding transferred in accordance with Title 15 USC ?638			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	5.447	12.381	14.633

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>
• B05310: <i>AN/TPQ-53 Counterfire Target Acquisition Radar</i>	324.150	16.416	72.421	-	72.421	11.829	29.868	41.921	53.408	Continuing	Continuing

Remarks

D. Acquisition Strategy
 The AN/TPQ-53 leverages technology developed in the multi-mission radar advanced technology objective (ATO) program. The system replaces all of the AN/TPQ-36 and AN/TPQ-37 systems in the fleet. The program obtained a Full Rate Production (FRP) decision in December 2015 and awarded an FRP contract in March 2017. The program will retrofit all initial production systems to the FRP configuration. The Army Acquisition Objective (AAO) increased from 174 to 189 systems in May 2017. Following the approval of a new acquisition category (ACAT) IC acquisition program baseline (APB) in April 2019, the program procured the last 15 FRP systems on contract in the same month. The program will complete all FRP system deliveries in FY 2021.

RDT&E funding supports modernization development and extended range software development task orders under the existing FRP contract. The efforts extend through the current Program Objective Memorandum (POM) period.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020				
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604823A / Firefinder				Project (Number/Name) L88 / Enhanced AN/TPQ 36								
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	
Program Management (Government)	Various	Various : Various	2.153	0.397	Nov 2018	1.023	Oct 2019	1.114	Nov 2020	-		1.114	Continuing	Continuing	Continuing	
Program Management (Contractor)	Various	Various : APG, MD	4.374	0.096	May 2019	0.035	May 2020	0.133	May 2021	-		0.133	Continuing	Continuing	Continuing	
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.563		-		-		-	0.000	0.563	-	
Subtotal			6.527	0.493		1.621		1.247		-		1.247	Continuing	Continuing	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	
Electronic Protection and Emerging Threats	SS/FPIF	Lockheed Martin : Syracuse, NY	6.740	0.157	Dec 2018	2.175	Oct 2019	4.287	Oct 2020	-		4.287	Continuing	Continuing	Continuing	
Extended Range	SS/FPIF	Lockheed Martin : Syracuse, NY	3.675	4.179	Jan 2019	5.769	Oct 2019	-		-		-	Continuing	Continuing	Continuing	
Subtotal			10.415	4.336		7.944		4.287		-		4.287	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	
Program Support	SS/CPFF	Georgia Tech Research Institute (GTRI) : Atlanta, GA	1.361	0.300	Mar 2019	0.206	Mar 2020	0.336	Dec 2020	-		0.336	Continuing	Continuing	Continuing	
Subtotal			1.361	0.300		0.206		0.336		-		0.336	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	
Test Support	Various	Various : Activities	53.884	0.318	Jan 2019	2.610	Oct 2019	8.763	Nov 2020	-		8.763	Continuing	Continuing	Continuing	

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army **Date:** February 2020

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L88 / <i>Enhanced AN/TPQ 36</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Extended Range (ER)	4	2018	4	2021
ER Testing	4	2019	2	2022
ER Limited Operational Test	3	2021	3	2021
Ongoing Tests - Electronic Protection (EP) and Emerging Threats	1	2016	2	2019
EP and Emerging Threats - Fiscal Year (FY) 2019 VOLT	2	2019	1	2021
Modernization Testing - FY 2019 VOLT	2	2020	1	2022
EP and Emerging Threats - FY 2021 VOLT	2	2021	1	2023
Modernization Testing - FY 2021 VOLT	2	2022	1	2024
EP and Emerging Threats - FY 2023 VOLT	2	2023	1	2025
Modernization Testing - FY 2023 VOLT	2	2024	1	2026
EP and Emerging Threats - FY 2025 VOLT	2	2025	1	2027