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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	132.810	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	132.810
ED5: Assured Positioning, Navigation and Timing (PNT)	-	21.469	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21.469
EH8: DISMOUNTED	-	13.846	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	13.846
EH9: PSEUDOLITES	-	53.332	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	53.332
EJ2: MOUNTED	-	32.621	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	32.621
EJ3: ANTI-JAM ANTENNA	-	11.542	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.542

Note

Program Element (PE) 0604120A transitioned to PE 1206120A beginning in FY19.

A. Mission Description and Budget Item Justification

Network Enabling Functions (Assured PNT).

Assured Positioning, Navigation and Timing (PNT) will provide the Army's ground maneuver forces access to trusted PNT information under conditions where space-based PNT Global Positioning System (GPS) may be limited or denied. Joint Requirements Oversight Council Memo (JROCM) 049-10, dated 05 Apr 2010, approved the Positioning, Navigation and Timing Assurance Initial Capabilities Document and designated the Army as the Lead Component for Assured PNT. The Material Development Decision (MDD) was approved on 30 Jul 2013. The Assured PNT draft Capabilities Development Document was validated by the Army Requirements Oversight Council (AROC) on 28 Jul 2014. The Assured PNT Cross Functional Team is drafting individual Capability Development Documents for each product.

PNT is a critical enabler of many Army systems. The current GPS capability is a fixed frequency system vulnerable to current and emerging threats, and field conditions (e.g. urban, dense vegetation), which means Warfighter assured access and integrity to PNT is not guaranteed. This situation degrades mission performance to an unacceptable level. Therefore, current Army systems cannot operate at the required PNT Assurance Levels with GPS alone.

Assured PNT consists of one project (ED5) Assured PNT and four separate and interdependent PNT products; (EH8) Dismounted A-PNT System, (EH9) Pseudolite, (EJ2) Mounted A-PNT System (MAPS), and (EJ3) Anti-Jam Antenna System (AJAS). These interdependent PNT products assure access to and integrity of PNT information. Each product provides a degree of standalone capability that can be leveraged across the solutions and enterprise enablers to raise the capabilities in all environments and across all formations and warfighting functions. Project Manager (PM) PNT manages these four products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System (MAPS), and AJAS) constructed to develop, test, field, and sustain the A-PNT materiel solution.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army				Date: March 2019	
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)			
B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	164.967	0.000	0.000	-	0.000
Current President's Budget	132.810	0.000	0.000	-	0.000
Total Adjustments	-32.157	0.000	0.000	-	0.000
• Congressional General Reductions	-0.114	-			
• Congressional Directed Reductions	-25.000	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-5.479	-			
• Adjustments to Budget Years	-1.564	-	-	-	-
Change Summary Explanation					
FY 2018 congressional marks of \$23.679 million and \$1.321 million due to contract delays.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
ED5: Assured Positioning, Navigation and Timing (PNT)	-	21.469	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21.469
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

PE 644120ED5 Assured Positioning, Navigation and Timing (PNT) will be funded with a different PE - 146120FJ8 beginning in FY19.

A. Mission Description and Budget Item Justification

Network Enabling Functions (Assured PNT).

Resiliency and Software Assurance Measures (RSAM) provides resiliency and software assurance processes that mitigate risks in a Global Positioning System (GPS)-challenged environment until future Positioning, Navigation and Timing (PNT) solutions are fully implemented. RSAM will result in software security updates for Selective Availability Anti-Spoofing Module (SAASM)-based GPS receivers including the dismounted/mounted Defense Advanced GPS Receiver (DAGR) and the embedded Ground Based-GPS Receiver Applications Module (GB-GRAM)/MicroGRAM, RSAM will coordinate integrated software testing with host platforms and support client systems in synchronizing RSAM deployment to combat forces.

The Assured PNT Enterprise Enabler requirements will be refined by conducting technical demonstrations including Alternative Navigation (ALT NAV) and net-enabled GPS solutions that leverage commercial capabilities, existing contracts, industry, academia, and the warfighter in an iterative process.

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

	FY 2018	FY 2019	FY 2020
Title: PNT System of System (SOSA) Testing and Resiliency and Software Assurance Modification (RSAM)	21.469	-	-
Description: The effort supports testing of PNT System of Systems Architecture (SOSA) of Army PNT capabilities and Resiliency and Software Assurance Modification (RSAM).			
Accomplishments/Planned Programs Subtotals	21.469	-	-

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

N/A

Remarks

D. Acquisition Strategy

The planned acquisition strategy for Positioning, Navigation and Timing (PNT) System of Systems Architecture (SOSA) testing and Resiliency and Software Assurance Measures (RSAM) implementation is to award sole source contracts to the original equipment manufacturers and leverage the Communications Electronics Research

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) ED5 / <i>Assured Positioning, Navigation and Timing (PNT)</i>
<p>Development Engineering Center (CERDEC) to develop and evaluate solutions to enhance the resiliency of Global Positioning System (GPS)-dependent systems operating in evolving contested environments. PNT SOSA testing and RSAM implementation will complete software development for Defense Advanced GPS Receiver (DAGR), Ground Based GPS Receiver Applications Module (GB-GRAM), and MicroGRAM to include engineering build testing and formal qualification testing, as well as integration and integration testing, for platforms utilizing DAGR, GB-GRAM and MicroGRAM engineering builds.</p> <p>The Assured PNT Enterprise Enabler requirements will be refined by conducting technical demonstrations including Alternative Navigation and net-enabled GPS solutions that leverage commercial capabilities, existing contracts, industry, academia, and the warfighter in an iterative process.</p> <p><u>E. Performance Metrics</u> N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Project Management Support	Allot	PM PNT : Various	1.134	1.559	Oct 2017	-		-		-		-	0.000	2.693	-
Subtotal			1.134	1.559		-		-		-		-	0.000	2.693	N/A
Remarks															
Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19.															
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
AM2P - DOTC GPS Receiver Prototypes	C/FFP	Rockwell Collins : Cedar Rapids, IA	0.630	-		-		-		-		-	0.000	0.630	-
AM2P - DOTC GPS Receiver Prototypes	C/CPFF	L-3 IEC : Anaheim, CA	0.600	-		-		-		-		-	0.000	0.600	-
AM2P - DOTC GPS Receiver Prototypes	C/CPFF	EOIR Technologies : Fredericksburg, VA	3.982	-		-		-		-		-	0.000	3.982	-
AM2P - DOTC GPS Receiver Prototypes	C/CPFF	SAVIT : Rockaway, NJ	0.286	-		-		-		-		-	0.000	0.286	-
AM2P - GPS/PGM Integration	MIPR	various : various	2.989	-		-		-		-		-	0.000	2.989	-
Develop Pseudolite Competitive Prototype Contractor 1	C/CPIF	Datapath - Rockwell Collins : Cedar Rapids, IA	3.615	-		-		-		-		-	0.000	3.615	-
Develop Pseudolite Competitive Prototype Contractor 2	C/CPIF	L-3 Communications : Anaheim, CA	3.237	-		-		-		-		-	0.000	3.237	-
RSAM - DAGR Software Development	SS/CPFF	Rockwell Collins : Cedar Rapids, IA	-	3.643	Mar 2018	-		-		-		-	0.000	3.643	-
RSAM - GB-GRAM Software Development	SS/CPFF	GCC Technologies : Oakland, MD	2.770	4.516	Jun 2018	-		-		-		-	0.000	7.286	-

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Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
RSAM - Develop RSAM Integration Modifications	Various	Various : Various	-	0.476	Mar 2018	-		-		-		-	0.000	0.476	-
Army Modernization Priorities	TBD	Various : Various	-	1.223	Feb 2019	-		-		-		-	0.000	1.223	-
Subtotal			18.109	9.858		-		-		-		-	0.000	27.967	N/A
Remarks Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19.															
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Engineering and Technical Contracting Services	C/FFP	Various : Various	6.186	3.259	Mar 2018	-		-		-		-	0.000	9.445	-
Engineering and Technical Government Services	MIPR	C4ISR : Various	1.852	0.205	Jan 2018	-		-		-		-	0.000	2.057	-
AM2P - Government Eng	MIPR	ARDEC : Picatinny, NJ	3.996	-		-		-		-		-	0.000	3.996	-
AM2P - Joint PGM SME	MIPR	Various : Various	3.441	-		-		-		-		-	0.000	3.441	-
Subtotal			15.475	3.464		-		-		-		-	0.000	18.939	N/A
Remarks Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19.															
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
AM2P - Bench Top Component Level Test	MIPR	Various : Various	0.112	-		-		-		-		-	0.000	0.112	-

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Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
AM2P - Flight Tests	MIPR	Various : Yuma Proving Ground, AZ	0.780	-		-		-		-		-	0.000	0.780	-
SOSA Testing/RSAM - Government Eng Support	MIPR	Various : Various	0.942	1.885	Mar 2018	-		-		-		-	0.000	2.827	-
SOSA Testing/RSAM - Contractor Eng Support	Various	Various : Various	-	1.278	Mar 2018	-		-		-		-	0.000	1.278	-
Platform Integration Testing	Various	Various : Various	0.500	3.175	Apr 2018	-		-		-		-	0.000	3.675	-
SOSA Testing/RSAM Test Equipment	Various	Various : Various	-	0.250	Aug 2018	-		-		-		-	0.000	0.250	-
Subtotal			2.334	6.588		-		-		-		-	0.000	8.922	N/A
Remarks															
Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19.															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			37.052	21.469		0.000		-		-		-	0.000	58.521	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army

Date: March 2019

Appropriation/Budget Activity

2040 / 4

R-1 Program Element (Number/Name)

PE 0604120A / Assured Positioning,
Navigation and Timing (PNT)

Project (Number/Name)

ED5 / Assured Positioning, Navigation and Timing (PNT)

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) ED5 / <i>Assured Positioning, Navigation and Timing (PNT)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
PNT System of Systems Architecture (SOSA) Testing	1	2017	4	2019
RSAM - DAGR Software Development	1	2018	4	2019
RSAM - GB-GRAM Software Development	4	2017	4	2019
Platform Integration Testing	3	2018	4	2019

Note

Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>				Project (Number/Name) EH8 / <i>DISMOUNTED</i>			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EH8: <i>DISMOUNTED</i>	-	13.846	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	13.846
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
 Network Enabling Functions (Assured PNT).

The Dismounted Assured PNT (A-PNT) System acquires, protects, and distributes secure PNT to the Dismounted Soldier. Dismounted A-PNT System will be used in conjunction with the PEO Soldier Nett Warrior System. Dismounted A-PNT System is planned to be modular, scalable form-factor that paces the threats and includes development and integration of Global Positioning System (GPS) and non-GPS sensors. Dismounted A-PNT System includes receiver software capable of acquiring Pseudolite signals resulting in additional integrity for military GPS in denied environments and includes a Military-Code (M-Code) receiver solution with other future technologies.

<u>B. Accomplishments/Planned Programs (\$ in Millions)</u>	FY 2018	FY 2019	FY 2020
<i>Title:</i> Dismounted A-PNT System	13.846	-	-
<i>Description:</i> Risk Reduction efforts to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system.			
Accomplishments/Planned Programs Subtotals	13.846	-	-

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

Remarks

D. Acquisition Strategy

The goal of the Dismounted A-PNT program is to provide the Soldier conducting operations outside of vehicles unhindered access to trusted PNT under conditions where space based PNT may be limited or denied as well as a means to maintain accurate position, velocity, and time information in Global Positioning System (GPS) challenged or degraded/denied environments. The Dismounted A-PNT capability will provide improved performance and reliability, availability, and maintainability over the currently fielded Defense Advanced GPS Receiver.

The first iteration of capabilities will employ tailored processes to identify and close key technology gaps. Technologies available from Industry today will be evaluated for performance and operational suitability and equipped to select critical units to support the capability development document requirements. This will be implemented by utilizing a competitive Other Transaction Agreement (OTA) contract vehicle to obtain prototypes. The Government will conduct laboratory and performance

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH8 / <i>DISMOUNTED</i>
<p>testing. The findings from these test efforts will determine whether or not to proceed to test-fix-test events. Providing initial equipment to specified units will result in an assessment to determine production and fielding readiness of the capability.</p> <p><u>E. Performance Metrics</u></p> <p>N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) EH8 / DISMOUNTED					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Project Management Support - Government	Allot	PM PNT : APG, MD	0.425	0.096	May 2018	-		-		-		-	0.000	0.521	-
Project Management Support - Contractor	C/CPFF	Various : Various	0.180	0.248	May 2018	-		-		-		-	0.000	0.428	-
Subtotal			0.605	0.344		-		-		-		-	0.000	0.949	N/A
Remarks															
Program Element (PE) 0604120A project EH8 transitions to PE 1206120A project FJ9 beginning in FY19.															
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 of a Dismounted M-Code capable prototype	C/CPFF	L3, IEC : Anaheim, CA	0.524	8.484	Jun 2018	-		-		-		-	0.000	9.008	-
Development of a small SWAP-C multi sensor navigation prototype	MIPR	CERDEC Command Power and Integration Directorate : APG, MD	1.253	1.513	Apr 2018	-		-		-		-	0.000	2.766	-
Dismounted A- PNT Prototyping & Development	TBD	TBD : TBD	-	3.253	Feb 2019	-		-		-		-	0.000	3.253	-
Subtotal			1.777	13.250		-		-		-		-	0.000	15.027	N/A
Remarks															
Program Element (PE) 0604120A project EH8 transitions to PE 1206120A project FJ9 beginning in FY19.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>						Project (Number/Name) EH8 / <i>DISMOUNTED</i>			

Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	Award Date	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Technical Services - Government	Various	C5ISR : Various	0.425	0.252	Nov 2017	-		-		-		-		0.000	0.677	-
Engineering and Technical Services - Contractor	C/CPFF	Various : Various	0.269	-		-		-		-		-		0.000	0.269	-
Subtotal			0.694	0.252		-		-		-		-		0.000	0.946	N/A

Remarks
 Program Element (PE) 0604120A project EH8 transitions to PE 1206120A project FJ9 beginning in FY19.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.076	13.846		0.000		-		-		-	0.000	16.922	N/A

Remarks

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PE 0604120A: Assured Positioning, Navigation and Timi...
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Project (Number/Name)	EH8 / <i>DISMOUNTED</i>
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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH8 / <i>DISMOUNTED</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Dismounted A-PNT Risk Reduction Activities	4	2017	2	2019

Note

Program Element (PE) 0604120A project EH8 transitions to PE 1206120A project FJ9 beginning in FY19.

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Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>				Project (Number/Name) EH9 / <i>PSEUDOLITES</i>			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EH9: <i>PSEUDOLITES</i>	-	53.332	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	53.332
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
 Network Enabling Functions (Assured PNT).

Highly accurate Positioning, Navigation and Timing (PNT) data is a key enabler and a cross cutting capability for Army forces to execute their mission. The Army requires ground maneuver forces access to trusted PNT information under conditions where space-based PNT may be limited or denied to maintain its Global Positioning System (GPS) military advantage on the battlefield. The current GPS capability is a fixed frequency system which is vulnerable to current and emerging threats and field conditions.

Pseudolite (satellite-like transmitters) assure GPS access and integrity by providing PNT via terrestrial and airborne-based radio navigation GPS transmitters in electronically or physically challenged environments using a higher power signal. Area protection is provided through the deployment of Pseudolite transmitters supporting a Brigade Combat Team area of operations. Pseudolite supports continued operations of PNT-enabled systems such as Blue Force Tracker, Communications Networks and Precision Guided Munitions. Pseudolite consists of three segments:

1. Pseudolite Transmitter segment provides terrestrial and airborne radio navigation (GPS-like) service in electronically or physically challenged environments using a high power signal.
2. Command and Control (C2) segment to control the Pseudolite transmitters on the battlefield.
3. Receiver segment, which will develop software upgrades to current and future military GPS receivers to receive and process the Pseudolite signals.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Title: Pseudolites	53.332	-	-
Description: Pseudolite Technology Maturation and Risk Reduction to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system.			
Accomplishments/Planned Programs Subtotals	53.332	-	-

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

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH9 / <i>PSEUDOLITES</i>
<p><u>D. Acquisition Strategy</u></p> <p>The Pseudolite Technology Maturation and Risk Reduction (TMRR) acquisition strategy was approved by the Milestone Decision Authority and Milestone A was successfully completed in May 2015. The Pseudolite product is finalizing the TMRR Phase of the acquisition life-cycle.</p> <p>The first iteration of capabilities will employ tailored processes to identify and close key technology gaps. Technologies available from Industry today will be evaluated for performance and operational suitability and equipped to select critical units to support the capability development document requirements. This will be implemented by utilizing an Other Transaction Agreement (OTA) competitive contract vehicle to obtain prototypes. The Government will conduct laboratory and performance testing. The findings from these test efforts will determine whether or not to proceed to test-fix-test events. Providing initial equipment to specified units will result in an assessment to determine production and fielding readiness of the capability.</p> <p><u>E. Performance Metrics</u></p> <p>N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) EH9 / PSEUDOLITES					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Project Management Support - Government	Allot	PM PNT : APG, MD	1.942	0.326	Feb 2018	-		-		-		-	0.000	2.268	-
Project Management Support - Contractor	C/CPFF	Various : Various	2.238	5.112	Dec 2017	-		-		-		-	0.000	7.350	-
FFRDC	SS/CR	MITRE : Various	0.700	1.200	Mar 2018	-		-		-		-	0.000	1.900	-
Subtotal			4.880	6.638		-		-		-		-	0.000	11.518	N/A
Remarks															
Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19.															
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Pseudolite Prototype - Transmitter Contractor 1	C/CPFF	Datapath - Rockwell Collins : Cedar Rapids IA	12.585	-		-		-		-		-	0.000	12.585	-
Pseudolite Prototype - Transmitter Contractor 2	C/CPFF	L-3 Communications : Anaheim, CA	14.027	9.679	Mar 2018	-		-		-		-	0.000	23.706	-
Engineering and Technical Product Support	MIPR	C4ISR : Various	9.042	3.496	Dec 2017	-		-		-		-	0.000	12.538	-
Pseudolite GPS Receiver Upgrade (DAGR & PGK)	SS/CPFF	Various : Various	8.949	5.204	Aug 2018	-		-		-		-	0.000	14.153	-
Pseudolite Command & Control	C/Various	Various : Various	4.231	5.145	May 2018	-		-		-		-	0.000	9.376	-
OEM Platform Integration Development for Air Platform	SS/CPFF	PEO Aviation : Various	2.776	-		-		-		-		-	0.000	2.776	-
PM Platform Integration Development	MIPR	Various : Various	0.200	-		-		-		-		-	0.000	0.200	-
APNT Enterprise Enablers	MIPR	Various : Various	-	15.148	Sep 2018	-		-		-		-	0.000	15.148	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) EH9 / PSEUDOLITES					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Subtotal			51.810	38.672		-		-		-		-	0.000	90.482	N/A
Remarks Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19.															
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Engineering and Technical Services - Government	Various	C4ISR : Various	6.294	1.984	Dec 2017	-		-		-		-	0.000	8.278	-
Engineering and Technical Services - Contractor	C/CPFF	Various : Various	9.639	5.239	Dec 2017	-		-		-		-	0.000	14.878	-
Subtotal			15.933	7.223		-		-		-		-	0.000	23.156	N/A
Remarks Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19.															
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Pseudolite Prototype Lab and Field Testing	MIPR	Various : Various	2.130	0.799	Feb 2018	-		-		-		-	0.000	2.929	-
Subtotal			2.130	0.799		-		-		-		-	0.000	2.929	N/A
Remarks Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19.															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			74.753	53.332		0.000		-		-		-	0.000	128.085	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army							Date: March 2019			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)			Project (Number/Name) EH9 / PSEUDOLITES				
	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army																Date: March 2019												
Appropriation/Budget Activity 2040 / 4									R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)								Project (Number/Name) EH9 / PSEUDOLITES											
Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
Pseudolite (PL) Prototype Development Contractor 1	PL Prototype Dev Ctr 1				PL Prototype Dev Ctr 2																							
Pseudolite (PL) Prototype Development Contractor 2																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH9 / <i>PSEUDOLITES</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Pseudolite (PL) Prototype Development Contractor 1	3	2015	4	2019
Pseudolite (PL) Prototype Development Contractor 2	3	2015	3	2018

Note

Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>				Project (Number/Name) EJ2 / <i>MOUNTED</i>			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EJ2: <i>MOUNTED</i>	-	32.621	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	32.621
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
 Network Enabling Functions (Assured PNT).

The Mounted Assured Positioning, Navigation and Timing System (MAPS) provides positioning, navigation and timing (PNT) data and is a key enabler and a cross cutting capability for Army ground maneuver forces to execute their mission in support of the Network Enabling Function. Army ground maneuver Forces require access to trusted PNT information under conditions where space-based PNT may be limited or denied to maintain its Global Positioning System (GPS) military advantage on the battlefield. The current GPS capability is a fixed frequency system which is vulnerable to current and emerging threats and field condition.

The MAPS is a scalable, upgradable system mounted on Army ground force platforms. It fuses GPS with complimentary navigation and timing technologies to provide trusted PNT to client systems and platforms. The MAPS distributes PNT data to multiple systems directly and via the network, reducing the dependency on multiple GPS receiver devices on a single platform. In order to achieve performance requirements in the highest threat level conditions, an Anti-Jam Antenna will be integrated with the MAPS. These two products each provide a degree of A-PNT protection. Integrated together, however, these two products will close the capability gap and achieve the desired performance.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Title: Mounted A-PNT System	32.621	-	-
Description: Risk Reduction efforts to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system. Also, the entrance into an Other Transaction Agreement (OTA) competitive contract vehicle to obtain prototypes for testing, platform integration, and client system integration.			
Accomplishments/Planned Programs Subtotals	32.621	-	-

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

Remarks

D. Acquisition Strategy
 The goal of the Mounted A-PNT program is to deliver distributed A-PNT capabilities to mounted platforms over time in an iterative, affordable manner. The first iteration of capabilities will employ tailored processes to identify and close key technology gaps. Technologies available from Industry today will be evaluated for performance

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EJ2 / <i>MOUNTED</i>
<p>and operational suitability and equipped to select critical units to support the stand-alone requirements of Requirements Definition Package (RDP) 1. This will be implemented by utilizing an Other Transaction Agreement (OTA) competitive contract vehicle to obtain prototypes. The Government will conduct Electromagnetic Interference and Environmental Testing as well as performance testing in the System Integration Lab (SIL) and anechoic chamber testing. The findings from these test efforts will determine whether or not to proceed to test fix test events and begin platform integration. Providing initial equipment to specified units will result in an assessment to determine production and fielding readiness of the capability.</p> <p><u>E. Performance Metrics</u> N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) EJ2 / MOUNTED					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Project Management Support - Government	Allot	PM PNT : APG, MD	0.383	1.116	Nov 2017	-		-		-		-	0.000	1.499	-
Project Management Support - Contractor	C/CPFF	Various : Various	0.238	0.170	Dec 2017	-		-		-		-	0.000	0.408	-
FFRDC	SS/CR	MITRE : Various	1.450	0.300	Sep 2018	-		-		-		-	0.000	1.750	-
Subtotal			2.071	1.586		-		-		-		-	0.000	3.657	N/A
Remarks															
Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19.															
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Prototype Development Contractor 1	C/CPFF	Rockwell Collins : Cedar Rapids, IA	0.555	2.720	Dec 2017	-		-		-		-	0.000	3.275	-
Prototype Development Contractor 2	C/CPFF	Northrup Grumman : San Diego, CA	-	0.438	Dec 2017	-		-		-		-	0.000	0.438	-
Prototype Development Contractor 3	C/CPFF	GPS Source : Pueblo, CO	1.234	-		-		-		-		-	0.000	1.234	-
Engineering and Technical Product Support	MIPR	C4ISR : Various	1.805	2.293	Nov 2017	-		-		-		-	0.000	4.098	-
Development of the Systems Engineering and Integration Lab	MIPR	CERDEC Command Power and Integration Directorate : APG, MD	0.965	7.060	Dec 2017	-		-		-		-	0.000	8.025	-
Stryker Integration	C/CPFF	General Dynamics Land Systems : Sterling Heights MI	2.214	5.746	Aug 2018	-		-		-		-	0.000	7.960	-
Mounted and AJAS Prototype Development	C/Various	TBD : TBD	-	7.400	Dec 2018	-		-		-		-	0.000	7.400	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) EJ2 / MOUNTED					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Subtotal			6.773	25.657		-		-		-		-	0.000	32.430	N/A
Remarks															
Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19. On schedule for competitive award of the Mounted and Anti-Jam Antenna System (AJAS) prototype development contract.															
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Engineering and Technical Services - Government	Various	C5ISR : various	1.267	0.497	Nov 2017	-		-		-		-	0.000	1.764	-
Engineering and Technical Services - Contractor	C/CPFF	Various : Various	3.210	2.196	Dec 2017	-		-		-		-	0.000	5.406	-
Subtotal			4.477	2.693		-		-		-		-	0.000	7.170	N/A
Remarks															
Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19.															
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 - Contractor	C/CPFF	Various : Various	0.786	0.164	Dec 2017	-		-		-		-	0.000	0.950	-
ED3 Operational Needs Statement (ONS) Testing	TBD	ATEC : MD, AZ	-	2.331	Jun 2018	-		-		-		-	0.000	2.331	-
ALT NAV Performance Testing	TBD	Dept of Energy (DOE) and CERDEC : MD, SC	-	0.190	Jun 2018	-		-		-		-	0.000	0.190	-
Subtotal			0.786	2.685		-		-		-		-	0.000	3.471	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019		
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>				Project (Number/Name) EJ2 / <i>MOUNTED</i>				

Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Remarks Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19.															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			14.107	32.621		0.000		-		-		-	0.000	46.728	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army																Date: March 2019																
Appropriation/Budget Activity 2040 / 4								R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)								Project (Number/Name) EJ2 / MOUNTED																
Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024							
	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				
Mounted A-PNT Risk Reduction Activities																																
ED3 ONS Testing																																
ALT NAV Performance Testing																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EJ2 / <i>MOUNTED</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Mounted A-PNT Risk Reduction Activities	4	2017	1	2019
ED3 ONS Testing	3	2018	4	2018
ALT NAV Performance Testing	3	2018	4	2018

Note

Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>				Project (Number/Name) EJ3 / <i>ANTI-JAM ANTENNA</i>			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EJ3: <i>ANTI-JAM ANTENNA</i>	-	11.542	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.542
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Network Enabling Functions (Assured PNT).

The Anti-Jam Antenna System (AJAS) provides point protection by steering electronic nulls at interference sources or beams at valid signal sources. This enables continuous Global Positioning System (GPS) signal acquisition and tracking in a navigation warfare (jamming) environment. The AJAS is deployed as a scalable component accessory to the Mounted Assured Positioning, Navigation and Timing System (MAPS).

The MAPS is a scalable, upgradable system mounted on Army ground force platforms. It fuses GPS with complimentary navigation and timing technologies to provide trusted PNT to client systems and platforms. The MAPS distributes Positioning, Navigation and Timing (PNT) data to multiple systems directly and via the network, reducing the dependency on multiple GPS receiver devices on a single platform. In order to achieve performance requirements in the highest threat level conditions, an Anti-Jam Antenna will be integrated with the MAPS. These two products each provide a degree of Assured-Positioning, Navigation and Timing (A-PNT) protection. Integrated together, however, these two products will close the capability gap and achieve the desired performance.

<u>B. Accomplishments/Planned Programs (\$ in Millions)</u>	FY 2018	FY 2019	FY 2020
<i>Title:</i> Anti-Jam Antenna System	11.542	-	-
<i>Description:</i> Risk reduction activities associated with the AJAS prototypes is to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system. The initiation of Other Transaction Agreement (OTA) competitive contract vehicle to obtain prototypes for test, user assessment and platform integration.			
Accomplishments/Planned Programs Subtotals	11.542	-	-

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

N/A

Remarks

D. Acquisition Strategy

The goal of the Anti-Jam Antenna System (AJAS) program is to deliver distributed A-PNT capabilities to mounted platforms over time in an iterative, affordable manner. The first iteration of capabilities will employ tailored processes to identify and close key technology gaps. Technologies available from Industry today will be evaluated for performance and operational suitability and equipped to select critical units to support the stand-alone requirements of Requirements Definition Package (RDP) 1.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EJ3 / <i>ANTI-JAM ANTENNA</i>
<p>This will be implemented by utilizing an Other Transaction Agreement (OTA) competitive contract vehicle to obtain prototypes. The Government will conduct partial Electromagnetic Interference and Environmental Testing as well as performance testing in the System Integration Lab (SIL) and anechoic chamber testing. The findings from these test efforts will determine whether or not to proceed to test-fix-test events and begin platform integration. Providing initial equipment to specified units will result in an assessment to determine production and fielding readiness of the capability.</p> <p>E. Performance Metrics N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) EJ3 / ANTI-JAM ANTENNA					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Project Management Support - Government	Allot	PM PNT : APG, MD	-	0.015	Nov 2017	-		-		-		-	0.000	0.015	-
Project Management Support - Contractor	C/CPFF	Various : Various	-	0.921	Dec 2017	-		-		-		-	0.000	0.921	-
FFRDC	SS/CR	MITRE : Various	-	0.862	May 2018	-		-		-		-	0.000	0.862	-
Subtotal			-	1.798		-		-		-		-	0.000	1.798	N/A
Remarks															
Program Element (PE) 0604120A project EJ3 transitions to PE 1206120A project FK3 beginning in FY19.															
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Engineering and Technical Product Suport	MIPR	C5ISR : Various	-	1.292	Dec 2017	-		-		-		-	0.000	1.292	-
Mounted and AJAS Prototype Development	C/Various	TBD : TBD	-	5.320	Dec 2018	-		-		-		-	0.000	5.320	-
ALT NAV Enterprise Enablers	MIPR	CERDEC CP&I : APG, MD	-	2.802	Sep 2018	-		-		-		-	0.000	2.802	-
Subtotal			-	9.414		-		-		-		-	0.000	9.414	N/A
Remarks															
Program Element (PE) 0604120A project EJ3 transitions to PE 1206120A project FK3 beginning in FY19. On schedule for competitive award of the Mounted and Anti-Jam Antenna System (AJAS) prototype contract.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>						Project (Number/Name) EJ3 / <i>ANTI-JAM ANTENNA</i>			

Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Anti-Jam Antenna Live Sky Demo and Anechoic Chamber Test	MIPR	CERDEC - Command Power and Integration Directorate : APG, MD	-	0.330	Jul 2018	-		-		-		-	0.000	0.330	-
Subtotal			-	0.330		-		-		-		-	0.000	0.330	N/A

Remarks Program Element (PE) 0604120A project EJ3 transitions to PE 1206120A project FK3 beginning in FY19.															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	11.542		0.000		-		-		-	0.000	11.542	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army																Date: March 2019												
Appropriation/Budget Activity 2040 / 4										R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)								Project (Number/Name) EJ3 / ANTI-JAM ANTENNA										
Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
Anti-Jam Antenna Risk Reduction Activities																												
Risk Reduction Activities																												
ALT NAV Enterprise Enablers																												
ALT NAV Enterprise Enablers																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EJ3 / <i>ANTI-JAM ANTENNA</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Anti-Jam Antenna Risk Reduction Activities	1	2018	1	2019
ALT NAV Enterprise Enablers	1	2018	4	2018

Note

Program Element (PE) 0604120 project EJ3 transitions to PE 1206120A project FK3 beginning in FY19.