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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army										Date: February 2018		
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	83.074	164.967	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	248.041
ED5: Assured Positioning, Navigation and Timing (PNT)	-	10.689	23.991	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	34.680
EH8: DISMOUNTED	-	3.076	14.423	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.499
EH9: PSEUDOLITES	-	55.202	79.230	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	134.432
EJ2: MOUNTED	-	14.107	35.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	49.407
EJ3: ANTI-JAM ANTENNA	-	0.000	12.023	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.023

Note

In accordance with Section 239 of Title 10, U.S.C., the FY 2018 President's Budget established new Program Elements (PE) to account for all of the Department's Space Major Force Program (MFP)-12 programs. To comply with this requirement, PE 0604120A transitions to PE 1206120A beginning in FY19.

Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19.
 Program Element (PE) 0604120A project EH8 transitions to PE 1206120A project FJ9 beginning in FY19.
 Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19.
 Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19.
 Program Element (PE) 0604120A project EJ3 transitions to PE 1206120A project FK3 beginning in FY19.

A. Mission Description and Budget Item Justification

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.

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 is a system of systems consisting 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, 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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0604120A I Assured Positioning, Navigation and Timing (PNT)				
capabilities in all environments and across all formations and warfighting functions. Program Manager (PM) PNT manages these four products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and AJAS) constructed to develop, test, field, and sustain the A-PNT materiel solution.						
The overall mission of PM PNT also includes experimentation and demonstration activities aligned with the Secretary of the Army and Chief Staff of the Army modernizations areas. The final acquisition and contracting strategy are under development.						
Assured PNT consists of:						
(ED5) - The Assured PNT funding line originally represented the entire program prior to breaking into four separate funding lines. The FY17-FY22 funding is for PNT System of Systems Architecture (SOSA) Testing and Resiliency and Software Assurance Modification (RSAM) to legacy GPS systems.						
(EH8) - The Dismounted Assured Positioning, Navigation and Timing (PNT) System is a Size, Weight, Power, and Cost (SWAP-C) optimized military Global Positioning System (GPS) and non-GPS sensor suite that acquires and distributes trusted PNT data to soldier-borne systems.						
(EH9) - The Pseudolite system provides area protection and PNT Assurance in GPS denied environments by providing terrestrial radio navigation (GPS-like) service in electronically or physically challenged environments using a higher power signal.						
(EJ2) - The Mounted Assured PNT System fuses military GPS with physics based sensors and timing technology to acquire and distribute secure trusted PNT data to tactical client systems on vehicular and watercraft platforms.						
(EJ3) - The Anti-Jam Antenna Systems (AJAS) provides GPS signal point protection and PNT Assurance in challenged environments through anti-jam technologies. AJAS enables tactical capabilities through assured signal acquisition in challenged environments.						
There are no FY 2019 Base funds. Program Element (PE) 0604120A transitions to PE 1206120A beginning in FY19.						
B. Program Change Summary (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget		83.279	164.967	138.323	-	138.323
Current President's Budget		83.074	164.967	0.000	-	0.000
Total Adjustments		-0.205	0.000	-138.323	-	-138.323
• Congressional General Reductions		-0.041	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-0.164	-			
• Adjustments to Budget Years		-	-	-138.323	-	-138.323

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>
<p><u>Change Summary Explanation</u></p> <p>FY 2017 reduction of \$.205 million reflects FFRDC and SBIR/STTR Transfer.</p> <p>RDT&E funding decreased from \$164.967 million in FY2018 to \$0.0 million in FY2019. In accordance with Section 239 of Title 10, U.S.C., the FY 2018 President's Budget established new Program Elements (PE) to account for all of the Department's Space Major Force Program (MFP)-12 programs. To comply with this requirement, PE 0604120A transitions to PE 1206120A beginning in FY19.</p> <p>Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19. Program Element (PE) 0604120A project EH8 transitions to PE 1206120A project FJ9 beginning in FY19. Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19. Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19. Program Element (PE) 0604120A project EJ3 transitions to PE 1206120A project FK3 beginning in FY19.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ED5: Assured Positioning, Navigation and Timing (PNT)	-	10.689	23.991	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	34.680
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19.												
A. Mission Description and Budget Item Justification Assured 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 5 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 Army Requirements Oversight Council (AROC) on 28 Jul 2014. There are no FY 2019 Base funds. Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: PNT System of System (SOSA) Testing and Resiliency and Software Assurance Modification (RSAM)									10.689	23.991	-	
Description: The effort supports testing of PNT SOSA of Army PNT capabilities and RSAM.												
FY 2018 Plans: FY18 Base funds will support Systems of Systems testing of Army PNT capabilities. This testing will inform the Resiliency and Software Assurance Modification (RSAM) and Assured PNT requirements and will validate RSAM implementation. RSAM will include software modifications to Army legacy receivers and GPS systems. RSAM will receive Defense Advanced GPS Receiver (DAGR) and Ground Based GPS Receiver Applications Module (GB-GRAM) engineering builds. DAGR and other receivers analysis will be completed.												
FY 2018 to FY 2019 Increase/Decrease Statement: RDT&E funding decreased from \$23.991 million in FY2018 to \$0.0 million in FY2019. The decrease was a result of Program Element (PE) 0604120A project ED5 transitioning to PE 1206120A project FJ8 beginning in FY19.												
Accomplishments/Planned Programs Subtotals									10.689	23.991	-	
C. Other Program Funding Summary (\$ in Millions) N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
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>
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
<p>The planned acquisition strategy for Positioning, Navigation and Timing (PNT) System of Systems Architecture (SOSA) testing and Resiliency and Software Assurance Modification (RSAM) implementation is to award sole source contracts to the original equipment manufacturers and leverage the Communications Electronics Research 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) and Ground Based GPS Receiver Applications Module (GB-GRAM), to include engineering build testing and formal qualification testing, as well as integration and integration testing, for platforms utilizing DAGR and GB-GRAM engineering builds.</p> <p>Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19.</p>		
E. Performance Metrics		
N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	0.485	0.649	Oct 2016	0.693	Oct 2017	-		-		-	0.000	1.827	-
Subtotal			0.485	0.649		0.693		-		-		-	0.000	1.827	N/A
Remarks															
Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19.															
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	-	-		3.035	Feb 2018	-		-		-	0.000	3.035	-
RSAM - GB-GRAM Software Development	SS/CPFF	GCC Technologies : Oakland, MD	-	2.770	Aug 2017	5.892	Jan 2018	-		-		-	0.000	8.662	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	-	-		1.890	Dec 2017	-		-		-	0.000	1.890	-
Subtotal			15.339	2.770		10.817		-		-		-	0.000	28.926	N/A

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

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	0.920	5.266	Jan 2017	4.262	Dec 2017	-		-		-	0.000	10.448	-
Engineering and Technical Government Services	MIPR	C4ISR : Various	1.290	0.562	Jan 2017	1.296	Nov 2017	-		-		-	0.000	3.148	-
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			9.647	5.828		5.558		-		-		-	0.000	21.033	N/A

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

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	-
AM2P - Flight Tests	MIPR	Various : Yuma Proving Ground, AZ	0.780	-		-		-		-		-	0.000	0.780	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
SOSA Testing/RSAM - Government Eng Support	MIPR	Various : Various	-	0.942	Jan 2017	3.660	Nov 2017	-		-		-	0.000	4.602	-
SOSA Testing/RSAM - Contractor Eng Support	Various	Various : Various	-	-		1.998	Dec 2017	-		-		-	0.000	1.998	-
Platform Integration Testing	Various	Various : Various	-	0.500	Aug 2017	-		-		-		-	0.000	0.500	-
SOSA Testing/RSAM Test Equipment	Various	Various : Various	-	-		1.265	Jan 2018	-		-		-	0.000	1.265	-
Subtotal			0.892	1.442		6.923		-		-		-	0.000	9.257	N/A

Remarks Program Element (PE) 0604120A project ED5 transitions to PE 1206120A project FJ8 beginning in FY19.															
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	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	26.363	10.689		23.991		-		-		-	0.000	61.043	N/A

Remarks															
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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army	Date: February 2018
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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) ED5 / <i>Assured Positioning, Navigation and Timing (PNT)</i>
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
PNT System of Systems Architecture (SOSA) Testing																												
RSAM - DAGR Software Development																												
RSAM - GB-GRAM Software Development																												
Platform Integration Testing																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
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 2019 Army										Date: February 2018		
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EH8: <i>DISMOUNTED</i>	-	3.076	14.423	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.499
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

A. Mission Description and Budget Item Justification
The Dismounted Assured PNT System acquires, protects, and distributes secure PNT on dismounted platforms. Dismounted A-PNT System is a stand-alone system and 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 GPS and non-GPS sensors. Dismounted A-PNT System includes receiver software capable of acquiring Pseudolite signals resulting in additional protection for military GPS in denied environments and includes a migration path to Military-Code (M-Code) and other future technologies.

There are no FY 2019 Base funds. Program Element (PE) 0604120A project EH8 transitions to PE 1206120A project FJ9 beginning in FY19.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Title: Dismounted A-PNT System Description: Risk Reduction efforts to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system. FY 2018 Plans: FY2018 Base funds will support risk reduction/prototyping efforts required to mature critical technologies and development of the Acquisition Requirements Package and other documentation to support the Developmental Request for Proposal Release Decision Point milestone. FY 2018 to FY 2019 Increase/Decrease Statement: RDT&E funding decreased from \$14.423 million in FY2018 to \$0.0 million in FY2019. The decrease was a result of Program Element (PE) 0604120A project EH8 transitioning to PE 1206120A project FJ9 beginning in FY19.	3.076	14.423	-
Accomplishments/Planned Programs Subtotals	3.076	14.423	-

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

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
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><u>D. Acquisition Strategy</u></p> <p>Assured Positioning, Navigation and Timing (PNT) is a system comprised of products including Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and Anti-Jam Antenna System (AJAS), to 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. Program Manager (PM) PNT manages these products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and AJAS) constructed to develop, test, field, and sustain the A-PNT materiel solution.</p> <p>The final acquisition and contracting strategy are under development.</p> <p>The Dismounted A-PNT System acquisition strategy will conduct development, integration and testing of the Dismounted A-PNT System.</p> <p>Program Element (PE) 0604120A project EH8 transitions to PE 1206120A project FJ9 beginning in FY19.</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 2019 Army												Date: February 2018			
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	Jul 2017	0.558	Oct 2017	-		-		-	0.000	0.983	-
Project Management Support - Contractor	C/CPFF	Various : Various	-	0.180	Jul 2017	0.186	Dec 2017	-		-		-	0.000	0.366	-
Subtotal			-	0.605		0.744		-		-		-	0.000	1.349	N/A
Remarks Program Element (PE) 0604120A project EH8 transitions to PE 1206120A project FJ9 beginning in FY19.															
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	Sep 2017	5.200	Dec 2017	-		-		-	0.000	5.724	-
Development of a small SWAP-C multi sensor navigation prototype	MIPR	CERDEC Command Power and Integration Directorate : APG, MD	-	1.253	Jul 2017	4.694	Dec 2017	-		-		-	0.000	5.947	-
Development of sensor fusion algorithm	MIPR	CERDEC Command Power and Integration Directorate : APG, MD	-	-		0.789	Dec 2017	-		-		-	0.000	0.789	-
Engineering and Technical Product Support	MIPR	C4ISR : Various	-	-		0.412	Dec 2017	-		-		-	0.000	0.412	-
Subtotal			-	1.777		11.095		-		-		-	0.000	12.872	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 2019 Army													Date: February 2018		
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) EH8 / DISMOUNTED					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	-	0.425	Jul 2017	0.904	Nov 2017	-		-		-	0.000	1.329	-
Engineering and Technical Services - Contractor	C/CPFF	Various : Various	-	0.269	Sep 2017	1.444	Dec 2017	-		-		-	0.000	1.713	-
Subtotal			-	0.694		2.348		-		-		-	0.000	3.042	N/A
Remarks Program Element (PE) 0604120A project EH8 transitions to PE 1206120A project FJ9 beginning in FY19.															
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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/Various	Various : Various	-	-		0.236	Dec 2017	-		-		-	0.000	0.236	-
Subtotal			-	-		0.236		-		-		-	0.000	0.236	N/A
Remarks Program Element (PE) 0604120A project EH8 transitions to PE 1206120A project FJ9 beginning in FY19.															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	3.076		14.423		-		-		-	0.000	17.499	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018																
Appropriation/Budget Activity 2040 / 4										R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)								Project (Number/Name) EH8 / DISMOUNTED														
Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	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				
Dismounted A-PNT Risk Reduction Activities																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
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	3	2019

Note

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

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) EH9 / PSEUDOLITES			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EH9: PSEUDOLITES	-	55.202	79.230	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	134.432
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

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

A. Mission Description and Budget Item Justification

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.

There are no FY 2019 Base funds. Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19.

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

	FY 2017	FY 2018	FY 2019
Title: Pseudolite	55.202	79.230	-
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.			
FY 2018 Plans: FY18 Base funds will continue the Technology Maturation and Risk Reduction prototyping and testing effort for the Pseudolite transmitter. In addition, efforts will continue the development of prototype software code for the remote C2 of Pseudolites over a tactical network. Other efforts include: software upgrades to legacy receivers and completion of software development for Precision Guided Munitions to communicate with the Pseudolite transmitter; Security Certification requirements and initial			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018	
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>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018
activities toward achievement; implementation of modifications and upgrades to prototypes based on testing results; integration development efforts with Pseudolite Ground and Air host platforms; support to Milestone B activities and documentation preparation/approval; and development of the Acquisition Requirements Package and other documentation to support the Developmental Request for Proposal Release Decision Point milestone.			
FY 2018 to FY 2019 Increase/Decrease Statement: RDT&E funding decreased from \$79.230 million in FY2018 to \$0.0 million in FY2019. The decrease was a result of Program Element (PE) 0604120A project EH9 transitioning to PE 1206120A project FK1 beginning in FY19.			
Accomplishments/Planned Programs Subtotals		55.202	79.230
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy Assured Positioning, Navigation and Timing (PNT) is a system comprised of products including Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and Anti-Jam Antenna System (AJAS), to 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. Program Manager (PM) PNT manages these products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and AJAS) constructed to develop, test, field, and sustain the A-PNT materiel solution. The final acquisition and contracting strategy are under development. 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 currently in the TMRR Phase of the acquisition life-cycle. The TMRR Acquisition Strategy for Pseudolites includes: 1) Technology maturation of the Transmitter segment through the use of two prototyping, cost-plus fixed fee (CPFF) contracts; 2) Command and Control (C2) segment will leverage the development by other DoD agencies to the greatest extent possible; 3) Receiver segment will make the use of multiple contracts through existing vehicles for Pseudolite Receiver software prototype development. After successful acquisition decision, development, integration and testing of the Pseudolite solution will begin. 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 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EH9 / PSEUDOLITES
E. Performance Metrics N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	0.800	1.142	Oct 2016	4.713	Oct 2017	-		-		-	0.000	6.655	-
Project Management Support - Contractor	C/CPFF	Various : Various	0.228	2.010	Nov 2016	1.571	Dec 2017	-		-		-	0.000	3.809	-
FFRDC	SS/CR	MITRE : Various	0.700	-		1.200	Dec 2017	-		-		-	0.000	1.900	-
Subtotal			1.728	3.152		7.484		-		-		-	0.000	12.364	N/A
Remarks															
Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19.															
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	5.663	6.922	Nov 2016	5.806	Dec 2017	-		-		-	0.000	18.391	-
Pseudolite Prototype - Transmitter Contractor 2	C/CPFF	L-3 Communications : Anaheim, CA	5.663	8.364	Oct 2016	6.398	Dec 2017	-		-		-	0.000	20.425	-
Engineering and Technical Product Support	MIPR	C4ISR : Various	-	9.042	Jun 2017	3.560	Nov 2017	-		-		-	0.000	12.602	-
Pseudolite GPS Receiver Upgrade (DAGR & PGK)	SS/CPFF	Rockwell Collins & L-3 Communications : Cedar Rapids, IA & Anaheim, CA	0.393	8.556	Dec 2016	11.407	Dec 2017	-		-		-	0.000	20.356	-
Pseudolite GPS Receiver Upgrade (GB-GRAM & Excalibur)	SS/CPFF	Rockwell Collins & L-3 Communications : Cedar Rapids, IA & Anaheim, CA	-	-		9.532	Dec 2017	-		-		-	0.000	9.532	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Command & Control	C/Various	PEO Ammo & PM EW : Various	-	4.231	Dec 2016	10.177	Nov 2017	-		-		-	0.000	14.408	-
OEM Platform Integration Development for Air Platform	SS/CPFF	PEO Aviation : Various	-	2.776	Aug 2017	11.952	Dec 2017	-		-		-	0.000	14.728	-
OEM Platform Integration Development for Ground Platform 1, Platform 2, and Platform 3	SS/CPFF	Various : Various	-	-		1.000	Dec 2017	-		-		-	0.000	1.000	-
PM Platform Integration Development	MIPR	Various : Various	-	0.200	Jun 2017	0.616	Dec 2017	-		-		-	0.000	0.816	-
Subtotal			11.719	40.091		60.448		-		-		-	0.000	112.258	N/A
Remarks															
Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19.															
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	2.653	3.641	Nov 2016	5.591	Nov 2017	-		-		-	0.000	11.885	-
Engineering and Technical Services - Contractor	C/CPFF	Various : Various	3.451	6.188	Dec 2016	5.307	Dec 2017	-		-		-	0.000	14.946	-
Subtotal			6.104	9.829		10.898		-		-		-	0.000	26.831	N/A
Remarks															
Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
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>				

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	Dec 2016	0.400	Dec 2017	-		-		-	0.000	2.530	-
Subtotal			-	2.130		0.400		-		-		-	0.000	2.530	N/A

Remarks Program Element (PE) 0604120A project EH9 transitions to PE 1206120A project FK1 beginning in FY19.															
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	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	19.551	55.202		79.230		-		-		-	0.000	153.983	N/A

Remarks													
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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
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>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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																												
Pseudolite (PL) Prototype Development Contractor 2																												
PL Prototype Dev Ctr 2																												
Pseudolite (PL) Command and Control Development & Test																												
PL Command and Control Dev & Test																												
Pseudolite (PL) Receiver Development & Test																												
PL Receiver Development & Test																												
Pseudolite (PL) Technical Readiness Review																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
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	2	2019
Pseudolite (PL) Prototype Development Contractor 2	3	2015	2	2019
Pseudolite (PL) Command and Control Development & Test	3	2015	4	2019
Pseudolite (PL) Receiver Development & Test	3	2015	4	2019
Pseudolite (PL) Technical Readiness Review	3	2017	3	2017

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 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) EJ2 / MOUNTED			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EJ2: MOUNTED	-	14.107	35.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	49.407
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

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

A. Mission Description and Budget Item Justification

The Mounted Assured Positioning, Navigation and Timing (PNT) System provides PNT data and is a key enabler and a cross cutting capability for Army ground maneuver forces to execute their mission. 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.

Mounted A-PNT is a scalable form-factor that distributes PNT data to multiple devices (client systems) on mounted platforms. The system fuses military GPS with physics-based sensors and timing technology to provide trusted PNT data, which allows the Soldier to operate in GPS degraded or denied environments. Mounted A-PNT System includes receiver software capable of acquiring Pseudolite signals resulting in additional protection for military GPS in denied environments and paces the threat by including a migration path to Military Code (M-Code) and other future technologies.

There are no FY 2019 Base funds. Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19.

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

	FY 2017	FY 2018	FY 2019
Title: Mounted A-PNT System	14.107	35.300	-
Description: Risk Reduction efforts to reduce technology risk and to determine the appropriate set of technologies to be integrated into the system.			
FY 2018 Plans: FY2018 Base funds will support regulatory/statutory activities required for a Milestone B decision in FY19 to include documentation preparation/approval, critical technology risk reduction through focused prototyping with industry and Federally Funded Research & Development Center partners, standup of the Systems Integration Lab to begin early integration with over 40 client systems, and development of the Acquisition Requirements Package and other documentation to support the Developmental Request for Proposal Release Decision Point milestone.			
FY 2018 to FY 2019 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018	
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>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018
RDT&E funding decreased from \$35.300 million in FY2018 to \$0.0 million in FY2019. The decrease was a result of Program Element (PE) 0604120A project EJ2 transitioning to PE 1206120A project FK2 beginning in FY19.			
Accomplishments/Planned Programs Subtotals		14.107	35.300
			-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Assured Positioning, Navigation and Timing (PNT) is a system comprised of products including Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and Anti-Jam Antenna System (AJAS), to 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. Program Manager (PM) PNT manages these products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and AJAS) constructed to develop, test, field, and sustain the A-PNT materiel solution.			
The final acquisition and contracting strategy are under development.			
The Mounted A-PNT System acquisition strategy will conduct development, integration and testing of the Mounted A-PNT System.			
Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19.			
E. Performance Metrics			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EJ2 / MOUNTED
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Project Management Support - Government	Allot	PM PNT : APG, MD	-	0.383	Jul 2017	0.813	Nov 2017	-		-		-	0.000	1.196	-
Project Management Support - Contractor	C/CPFF	Various : Various	-	0.238	Jul 2017	0.271	Dec 2017	-		-		-	0.000	0.509	-
FFRDC	SS/CR	MITRE : Various	-	1.450	Sep 2017	1.200	Dec 2017	-		-		-	0.000	2.650	-
Subtotal			-	2.071		2.284		-		-		-	0.000	4.355	N/A

Remarks

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

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Prototype Development Contractor 1	C/CPFF	Rockwell Collins : Cedar Rapids, IA	-	0.555	Dec 2017	2.983	Dec 2017	-		-		-	0.000	3.538	-
Prototype Development Contractor 2	C/CPFF	Northrup Grumman : San Diego, CA	-	-		2.583	Dec 2017	-		-		-	0.000	2.583	-
Prototype Development Contractor 3	C/CPFF	GPS Source : Pueblo, CO	-	1.234	Sep 2017	-		-		-		-	0.000	1.234	-
Engineering and Technical Product Support	MIPR	C4ISR : Various	-	1.805	Jul 2017	2.300	Nov 2017	-		-		-	0.000	4.105	-
Early Platform Integration and Evaluation	MIPR	Various : Various	-	-		6.603	Dec 2017	-		-		-	0.000	6.603	-
Development of the Systems Engineering and Integration Lab	MIPR	CERDEC Command Power and Integration Directorate : APG, MD	-	0.965	Sep 2017	8.092	Dec 2017	-		-		-	0.000	9.057	-
M-Code Small-Chip Development and Prototype to meet Army Requirements	MIPR	Air Force : Various	-	-		5.500	Jan 2018	-		-		-	0.000	5.500	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
Stryker Integration	C/CPFF	General Dynamics Land Systems : Sterling Heights MI	-	2.214	Dec 2017	-		-		-		-	0.000	2.214	-
Subtotal			-	6.773		28.061		-		-		-	0.000	34.834	N/A
Remarks Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19.															
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	-	1.267	Jul 2017	1.239	Nov 2017	-		-		-	0.000	2.506	-
Engineering and Technical Services - Contractor	C/CPFF	Various : Various	-	3.210	Jul 2017	3.243	Dec 2017	-		-		-	0.000	6.453	-
Subtotal			-	4.477		4.482		-		-		-	0.000	8.959	N/A
Remarks Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19.															
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	Aug 2017	0.473	Dec 2017	-		-		-	0.000	1.259	-
Subtotal			-	0.786		0.473		-		-		-	0.000	1.259	N/A
Remarks Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army										Date: February 2018			
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>			
	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	14.107		35.300		-		-		-	0.000	49.407	N/A
Remarks													

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																				Date: February 2018			
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>			

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
<div style="display: flex; justify-content: space-between;"> Mounted A-PNT Risk Reduction Activities <div style="background-color: blue; width: 200px; height: 15px;"></div> </div> <div style="background-color: #e06699; width: 100%; height: 100%;"></div>																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EJ2 / MOUNTED	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Mounted A-PNT Risk Reduction Activities	4	2017	3	2019

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 2019 Army										Date: February 2018		
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EJ3: <i>ANTI-JAM ANTENNA</i>	-	0.000	12.023	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.023
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note Program Element (PE) 0604120A project EJ2 transitions to PE 1206120A project FK2 beginning in FY19.												
A. Mission Description and Budget Item Justification 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 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 (PNT) System. There are no FY 2019 Base funds. Program Element (PE) 0604120A project EJ3 transitions to PE 1206120A project FK3 beginning in FY19.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: Anti-Jam Antenna System Description: Risk reduction activities associated with the AJAS is to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system. FY 2018 Plans: FY2018 Base funds will provide support to Milestone B documentation preparation/approval, risk reduction activities to include: development of a Systems Integration Lab used for evaluation of system interoperability, platform integration, and evaluation of commercial AJAS using modeling and simulation; development/modification of commercial AJAS; Anechoic Chamber testing; live-sky testing and the development of the Acquisition Requirements Package to support the Developmental Request for Proposal Release Decision Point milestone. FY 2018 to FY 2019 Increase/Decrease Statement: RDT&E funding decreased from \$12.023 million in FY2018 to \$0.0 million in FY2019. The decrease was a result of Program Element (PE) 0604120A project EJ3 transitioning to PE 1206120A project FK3 beginning in FY19.									-	12.023	-	
Accomplishments/Planned Programs Subtotals									-	12.023	-	
C. Other Program Funding Summary (\$ in Millions) N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
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>
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
<p>Assured Positioning, Navigation and Timing (PNT) is a system comprised of products including Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and Anti-Jam Antenna System (AJAS), to 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. Program Manager (PM) PNT manages these products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and AJAS) constructed to develop, test, field, and sustain the A-PNT materiel solution.</p> <p>The final acquisition and contracting strategy are under development.</p> <p>The AJAS acquisition strategy will conduct development, integration and testing of the AJAS.</p> <p>Program Element (PE) 0604120A project EJ3 transitions to PE 1206120A project FK3 beginning in FY19.</p>		
E. Performance Metrics		
N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	-	-		0.400	Nov 2017	-		-		-	0.000	0.400	-
Project Management Support - Contractor	C/CPFF	Various : Various	-	-		0.112	Dec 2017	-		-		-	0.000	0.112	-
FFRDC	SS/CR	MITRE : Various	-	-		0.600	Dec 2017	-		-		-	0.000	0.600	-
Subtotal			-	-		1.112		-		-		-	0.000	1.112	N/A

Remarks Program Element (PE) 0604120A project EJ3 transitions to PE 1206120A project FK3 beginning in FY19.															
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 the Systems Engineering and Integration Lab	MIPR	CERDEC Command Power and Integration Lab : APG, MD	-	-		2.235	Dec 2017	-		-		-	0.000	2.235	-
Anti-Jam Antenna Hardware Simulation and Evaluation	MIPR	CERDEC - Command and Integration Directorate : APG, MD	-	-		3.717	Apr 2018	-		-		-	0.000	3.717	-
Early Platform Integration and Evaluation	MIPR	Various : Various	-	-		0.975	Dec 2017	-		-		-	0.000	0.975	-
Engineering and Technical Product Support	MIPR	C4ISR : Various	-	-		0.412	Dec 2017	-		-		-	0.000	0.412	-
Subtotal			-	-		7.339		-		-		-	0.000	7.339	N/A

Remarks Program Element (PE) 0604120A project EJ3 transitions to PE 1206120A project FK3 beginning in FY19.															
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
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					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	-	-		1.286	Nov 2017	-		-		-	0.000	1.286	-
Engineering and Technical Services - Contractor	C/CPFF	Various : Various	-	-		0.429	Dec 2017	-		-		-	0.000	0.429	-
Subtotal			-	-		1.715		-		-		-	0.000	1.715	N/A
Remarks Program Element (PE) 0604120A project EJ3 transitions to PE 1206120A project FK3 beginning in FY19.															
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	-	-		1.857	Dec 2017	-		-		-	0.000	1.857	-
Subtotal			-	-		1.857		-		-		-	0.000	1.857	N/A
Remarks Program Element (PE) 0604120A project EJ3 transitions to PE 1206120A project FK3 beginning in FY19.															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		12.023		-		-		-	0.000	12.023	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army																Date: February 2018												
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 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
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	3	2019

Note

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