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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army **Date:** February 2016

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)
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	11.447	30.058	83.279	-	83.279	108.847	87.914	37.847	28.851	Continuing	Continuing
ED5: Assured Positioning, Navigation and Timing (PNT)	-	11.447	9.700	11.116	-	11.116	23.809	19.820	19.829	19.826	Continuing	Continuing
EH8: DISMOUNTED	-	0.000	0.000	3.200	-	3.200	13.700	0.400	0.000	0.000	0.000	17.300
EH9: PSEUDOLITES	-	0.000	20.358	57.411	-	57.411	30.130	7.774	0.000	0.000	0.000	115.673
EJ2: MOUNTED	-	0.000	0.000	11.552	-	11.552	41.208	53.220	15.028	9.025	Continuing	Continuing
EJ3: ANTI-JAM ANTENNA	-	0.000	0.000	0.000	-	0.000	0.000	6.700	2.990	0.000	0.000	9.690

Note

0604120/ED5 funding has transitioned into four (4) separate project lines for each Assured PNT subprogram.

A. Mission Description and Budget Item Justification

Assured Positioning, Navigation and Timing (PNT) will provide Army forces with unhindered 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 April 5th 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 July 30th 2013. The Assured PNT draft Capabilities Development Document was validated by the Army Requirements Oversight Council (AROC) on July 28th 2014.

PNT is a critical enabler of many Army systems. The current capability, GPS, is a fixed frequency system vulnerable to current and emerging threats and field conditions, 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 family of solutions which includes four subprograms: (EH9) The Pseudolites subprogram provides 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 PNT subprogram is the integration of multiple sensors and provides PNT platform distribution. The Mounted PNT subprogram incorporates a System of Systems architecture that acquires, protects and distributes secure PNT on stationary and vehicular platforms. (EH8) The Dismounted PNT subprogram is the integration of multiple sensors for platform distribution of PNT on the Soldier. The Dismounted PNT subprogram incorporates a System of Systems architecture that acquires, protects and distributes secure PNT on the soldier. (EJ3) The Anti-Jam Antenna subprogram provides GPS signal protection and PNT Assurance in challenged environments through anti-jam technologies. Anti-jam enables tactical capabilities through assured signal acquisition in challenged environments.

0604120/ED5 funding line continues as the Assured PNT parent funding line. However, four (4) separate project lines were created for the Assured PNT subprograms; EH8 – Dismounted PNT subprogram; EH9 – Pseudolite subprogram; EJ2 – Mounted PNT subprogram; EJ3 - Anti-Jam Antenna subprogram.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army	Date: February 2016
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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>
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FY 2017 Base funds in the total amount of \$83.279 million are provided to continue the development of the A-PNT program. The ED5 funding line accounts for \$11.116 million for PNT System of Systems Architecture (SOSA) Testing and enhancements of Army PNT capabilities against emerging threats. The EH8 funding line accounts for \$3.200 million for risk reduction activities and program documentation in preparation for Milestone B of the Dismounted PNT subprogram. The EH9 funding line accounts for \$57.411 million for the continuation of the TMRR competitive prototyping effort and program documentation in preparation for Milestone B for the Pseudolite subprogram. The EJ2 funding line accounts for \$11.552 million for Technology Maturation and Risk Reduction (TMRR) and program documentation in preparation for Milestone B of the Mounted PNT subprogram.

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	9.925	30.058	27.957	-	27.957
Current President's Budget	11.447	30.058	83.279	-	83.279
Total Adjustments	1.522	0.000	55.322	-	55.322
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.522	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	55.322	-	55.322

Change Summary Explanation

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

FY 2017 Base funds increased by \$55.322 million to support requirements contained in the Milestone A affordability assessment.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army										Date: February 2016		
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
ED5: Assured Positioning, Navigation and Timing (PNT)	-	11.447	9.700	11.116	-	11.116	23.809	19.820	19.829	19.826	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

0604120/ED5 funding line continues as the Assured PNT parent funding line. However, four (4) separate project lines were created for the Assured PNT subprograms: EH8 – Dismounted PNT subprogram; EH9 – Pseudolite subprogram; EJ2 – Mounted PNT subprogram; EJ3 - Anti-Jam Antenna subprogram.

ED5 - Assured PNT FY 2015 funds in the amount of \$11.447 million are associated with EH9 – Pseudolites Subprogram. FY 2015 funds were provided to initiate the development of Pseudolites. FY 2016 funds of \$9.700 million support Military GPS User Equipment (MGUE) Precision Guided Munitions. FY 2017 funds of \$11.116 million support Positioning, Navigation and Timing (PNT) System of Systems Architecture (SOSA) Testing and enhancements of Army PNT capabilities against emerging threats.

A. Mission Description and Budget Item Justification

Assured Positioning, Navigation and Timing will provide Army forces with unhindered access to trusted Positioning, Navigation, and Timing (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 April 5th 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 July 30th 2013. The Assured PNT draft Capabilities Development Document was validated by Army Requirements Oversight Council (AROC) on July 28th 2014.

FY 2017 Base funds are to support PNT System of Systems Architecture (SOSA) Testing and Resiliency and Software Assurance Modification (RSAM). The U.S. Army is required to operate in an ever growing Electronic Warfare contested environment. The PNT System of Systems Architecture (SOSA) Testing will allow for Army systems to be tested against emerging GPS threats and enable actions to be taken to ensure full operation of Army Forces through RSAM field patches, M-CODE implementation, and Assured PNT.

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

Title: Assured PNT	FY 2015	FY 2016	FY 2017
Description: Efforts include initiation of development effort for Pseudolite subprogram, preparation of Milestone documentation for the Assured PNT program, and associated Program Management Office (PMO) and support activities. Efforts also include Acceleration of MGUE (Military GPS User Equipment) Increment 2 for Precision Guided Munitions (AM2P). In addition, the effort supports testing of Positioning, Navigation and Timing (PNT) System of Systems Architecture (SOSA) of Army PNT capabilities against emerging threats.	11.447	9.700	11.116

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017
<p><i>FY 2015 Accomplishments:</i> Efforts include initiation of development effort for Pseudolite subprogram, preparation of Milestone documentation for the Assured PNT program, and associated Program Management Office (PMO) and support activities.</p> <p><i>FY 2016 Plans:</i> FY 2016 Funds will further assess the technology maturity and Joint Common GPS Specification and Interface Control Document. These efforts include bench top component level testing of GPS receiver prototypes, integration of the GPS receivers into a Precision Guided Munition platform and live fire guide-to-hit (Technology Readiness Level 6) demonstration of the GPS receivers.</p> <p><i>FY 2017 Plans:</i> FY 2017 Funds will provide for Army GPS/Positioning, Navigation and Timing (PNT) test assets. These systems and assets will be utilized for System of Systems Architecture (SOSA) testing against emerging threats. The testing data will validate Resiliency and Software Assurance Modification (RSAM) and aid senior leadership in determining the most equitable path forward on PNT modernization.</p>			
Accomplishments/Planned Programs Subtotals	11.447	9.700	11.116

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• EH8: <i>EH8: Dismounted PNT</i>	-	-	3.200	-	3.200	13.700	0.400	-	-	0	17.300
• EH9: <i>EH9: Pseudolites</i>	-	20.358	57.411	-	57.411	30.130	7.774	-	-	0	115.673
• EJ2: <i>EJ2: Mounted PNT</i>	-	-	11.552	-	11.552	41.208	53.220	15.028	9.025	Continuing	Continuing
• EJ3: <i>EJ3: Anti-Jam Antenna</i>	-	-	-	-	-	-	6.700	2.990	-	0	9.690

Remarks
ED5 - Assured PNT FY 2015 Base funds in the amount of \$11.447 million are associated with EH9 - Pseudolites Subprogram. FY 2015 funds were provided the Assured PNT Program to initiate the development of Pseudolites. FY 2016 funds of \$9.700 million support Military GPS User Equipment (MGUE) Precision Guided Munitions. FY 2017 funds of \$11.116 million support Positioning, Navigation and Timing (PNT) System of Systems Architecture (SOSA) Testing and enhancements of Army PNT capabilities against emerging threats.

D. Acquisition Strategy
FY15: The Planned Acquisition Strategy for the Pseudolite subprogram includes: 1) Technology maturation of the Transmitter segment through the use of two competitive 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, specifically, the Electronic Warfare Planning and Management Tool (EWPMT); this will be a Government Off the Shelf (GOTS) product. 3) Receiver segment will make the use of multiple contracts through existing vehicles for Pseudolite Receiver SW Prototype Development.

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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>

FY16: The acquisition strategy includes the acceleration of Military GPS User Equipment (MGUE) Increment 2 for Precision Guided Munitions (AM2P). This will provide a technology maturity assessment of MGUE Increment 1 technology and increase supply chain competition for subsequent use by Joint Precision Guided Munitions (PGM) to avoid potential significant performance and operation risks. The Joint Common GPS Specification and Interface Control Document will be validated through live fire Technology Readiness Level 6 (TRL6) demonstration. The M-Code GPS enables essential PGM-based lethality capabilities in potential "M-Code Only" GPS combat scenarios and maintains combat overmatch enabled by Joint GPS-based PGMs.

FY17: The planned acquisition strategy for 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, utilize existing engineering support contracts, and leverage the Communications Electronics Research Development Engineering Center (CERDEC) to develop and evaluate solutions that will mitigate emerging threats.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				ED5 / Assured Positioning, Navigation and Timing (PNT)								
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	0.000	0.485	Mar 2015	-		0.517	Dec 2016	-		0.517	0	1.002	0	
Subtotal			0.000	0.485		-		0.517		-		0.517	0.000	1.002	0.000	
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	0.630	0	
AM2P – DOTC GPS Receiver Prototypes	C/CPFF	L-3 IEC : Anaheim, CA	0.600	-		-		-		-		-	0	0.600	0	
AM2P – DOTC GPS Receiver Prototypes	C/CPFF	EOIR Technologies : Fredericksburg, VA	3.982	-		-		-		-		-	0	3.982	0	
AM2P – DOTC GPS Receiver Prototypes	C/CPFF	SAVIT : Rockaway, NJ	0.286	-		-		-		-		-	0	0.286	0	
AM2P – GPS/PGM Integration	MIPR	various : various	0.000	-		3.430	Jan 2016	-		-		-	0	3.430	0	
Develop Pseudolite Competitive Prototype Contractor 1	C/CPIF	Datapath - Rockwell Collins : Various	0.000	3.615	Apr 2015	-		-		-		-	0	3.615	0	
Develop Pseudolite Competitive Prototype Contractor 2	C/CPIF	L-3 : Various	0.000	3.237	Apr 2015	-		-		-		-	0	3.237	0	
Subtotal			5.498	6.852		3.430		-		-		-	0.000	15.780	0.000	
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	
SETA Support	C/FFP	Various : Various	0.000	0.920	Mar 2015	-		-		-		-	0	0.920	0	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army **Date:** February 2016

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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Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
Matrix Support	MIPR	Various : Various	0.000	1.290	Mar 2015	-		-		-		-	0	1.290	0
AM2P – Government Eng	MIPR	ARDEC : Picatinny, NJ	0.702	1.174	Jul 2015	2.500	Jan 2016	-		-		-	0	4.376	0
AM2P- Joint PGM SME	MIPR	Various : Various	1.300	0.726	Aug 2015	2.740	Jan 2016	-		-		-	0	4.766	0
Subtotal			2.002	4.110		5.240		-		-		-	0.000	11.352	0.000

Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
AM2P – Bench Top Component Level Test	MIPR	Various : Various	0.000	-		0.190	Mar 2016	-		-		-	0	0.190	0
AM2P – Flight Tests	MIPR	Various : Yuma Proving Ground, AZ	0.000	-		0.840	Jun 2016	-		-		-	0	0.840	0
SOSA Testing/RSAM - Government Eng Support	MIPR	Various : Various	0.000	-		-		3.038	Dec 2016	-		3.038	0	3.038	0
SOSA Testing/RSAM - SETA Support	Various	Various : Various	0.000	-		-		3.800	Dec 2016	-		3.800	0	3.800	0
SOSA Testing/RSAM - Receiver acquisition	Various	Various : Various	0.000	-		-		1.211	Dec 2016	-		1.211	0	1.211	0
SOSA Testing/RSAM - Test PNT system modifications against emerging threats	Various	Various : Various	0.000	-		-		2.550	Dec 2016	-		2.550	0	2.550	0
Subtotal			0.000	-		1.030		10.599		-		10.599	0.000	11.629	0.000

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		7.500	11.447	9.700	11.116	-	11.116	0.000	39.763	0.000

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
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
AM2P Technology Maturation and Demonstration	1	2015	2	2017
AM2P Develop Receiver Prototypes	1	2015	4	2015
AM2P Platform Integration	1	2016	4	2016
AM2P Bench Top Component Testing	3	2016	4	2016
AM2P Flight Testing	4	2016	2	2017
PNT System of Systems Architecture (SOSA) Testing	1	2017	4	2021
Receiver: Resiliency and Software Assurance Modification (RSAM)	1	2017	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army										Date: February 2016		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) EH8 / DISMOUNTED			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
EH8: DISMOUNTED	-	0.000	0.000	3.200	-	3.200	13.700	0.400	0.000	0.000	0.000	17.300
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

ED5 funding has been transitioned into four (4) separate project lines for each Assured PNT subprogram: EH8 – Dismounted PNT subprogram; EH9 – Pseudolite subprogram; EJ2 – Mounted PNT subprogram; EJ3 - Anti-Jam Antenna subprogram.

A. Mission Description and Budget Item Justification

The Dismounted Positioning, Navigation and Timing (PNT) subprogram:

- > Acquires, protects, and distributes wired and wirelessly secure PNT on Dismounted Platforms
- > Enabling capability for applications under development in the Mobile Hand Held Computing Environment, PEO Soldier and NETT Warrior
- > Development and integration of multiple sensors for non-GPS augmentation
- > Modular, Scalable Form-Factor that paces the threats
- > Migration Path to M-code & other future technologies
- > Receiver software can be upgraded to acquire Pseudolite signals to provide additional protection for military GPS in denied environments

FY 2017 Base funds in the amount of \$3.200 million are provided to continue risk reduction activities in support of the Dismounted PNT subprogram. These efforts include prototype development, technical evaluation of the Assured PNT sub-system architecture development, and preparation of the acquisition documents necessary to conduct a Milestone B review.

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

	FY 2015	FY 2016	FY 2017
Title: Dismounted PNT Technology Maturation	-	-	3.200
Description: Technology Risk Reduction associated with the Dismounted PNT subprogram to determine set of technologies to be integrated into the full system.			
FY 2017 Plans: FY 2017 funds will transition the Communications Electronics Research Development and Engineering Center (CERDEC) Technology Maturation Initiative (TMI) efforts and continue the risk reduction activities for the Dismounted PNT subprogram. Efforts will focus on implementation of wireless technology e.g. Intra-Soldier Wireless (ISW), analyzing non-GPS augmentation to optimize Assured PNT, and preparation of Milestone B documentation.			
Accomplishments/Planned Programs Subtotals	-	-	3.200

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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>

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

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• PE: 0604115A:: <i>PE: 0604115A</i> <i>Technology Maturation Initiative - Dismounted PNT</i>	6.500	5.500	-	-	-	-	-	-	-	0.000	12.000

Remarks

D. Acquisition Strategy

The Assured Positioning, Navigation and Timing (PNT) Acquisition Strategy is focused on the acquisition of a family of solutions required to achieve the Assured PNT capability. The materiel solutions are partitioned into subprograms (Pseudolites, Mounted PNT, Dismounted PNT, and Anti-jam Antenna) to allow for the optimization of solutions for various Army formations. EH8 is specifically for the acquisition of Dismounted PNT.

The Dismounted PNT acquisition strategy will begin at Milestone B in FY18. After a successful MS B approval the proposed strategy is to award a single Engineering and Manufacturing Development (EMD) contract through full and open competition with priced options for Low Rate Initial Production (LRIP) and for the procurement of all technical data relevant to the performance of this contract or life cycle of this program.

FY15-FY17:

The planned Dismounted subprogram acquisition strategy uses Small Business Innovation Research (SBIR) Science and Technology (S&T) funding and Budget Activity (BA) 4 funding for the technology maturation and risk reduction phase (SBIR Phase I and II). Phase I will reduce associated risks, overall development costs, and develop the technology to Technical Readiness Level (TRL) 6 prior to Milestone B and enables incremental development prototyping in support of transition to planned program of record. Phase II will provide funding for key features and functionality desired by PM PNT to significantly advance the design for a clear transition to Engineering Manufacturing Development.

FY18 and beyond:

During Engineering and Manufacturing Development, the chosen vendor will develop the Dismounted PNT system.

E. Performance Metrics

N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

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>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021							
	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 PNT Prototype Testing																																
(1) Dismounted PNT Risk Reduction Activities Decision																																
(2) Dismounted PNT Development RFP Release Decision																																
(3) Dismounted PNT Milestone B Decision																																
(4) Dismounted PNT EMD Contract Award																																
Dismounted PNT Developmental Testing																																
(5) Dismounted PNT Milestone C Decision																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
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 PNT Prototype Testing	4	2016	4	2016
Dismounted PNT Risk Reduction Activities Decision	2	2017	2	2017
Dismounted PNT Development RFP Release Decision	2	2017	2	2017
Dismounted PNT Milestone B Decision	1	2018	1	2018
Dismounted PNT EMD Contract Award	2	2018	2	2018
Dismounted PNT Developmental Testing	3	2019	4	2019
Dismounted PNT Milestone C Decision	1	2020	1	2020

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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) EH9 / PSEUDOLITES
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
EH9: PSEUDOLITES	-	0.000	20.358	57.411	-	57.411	30.130	7.774	0.000	0.000	0.000	115.673
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

0604120/ED5 funding line continues as the Assured PNT parent funding line. However, four (4) separate project lines were created for the Assured PNT subprograms: EH8 – Dismounted PNT subprogram; EH9 – Pseudolite subprogram; EJ2 – Mounted PNT subprogram; EJ3 - Anti-Jam Antenna subprogram.

EH9 - Pseudolites subprogram funds prior to FY16 are associated with ED5 – Assured PNT. FY 2016-2019 funds are to continue the development of Pseudolites.

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. Army Forces require unhindered access to trusted PNT information under conditions where space based PNT may be limited or denied to maintain its Global Positioning System military advantage on the battlefield. The current capability, Global Positioning System (GPS), is a fixed frequency system which is vulnerable to current and emerging threats and field condition.

Pseudolites (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. The Pseudolites subprogram enables continued operations of PNT-enabled systems such as Blue Force Tracker, Communications Networks and Precision Guided Munitions. The PNT Pseudolite subprogram will consist 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 Pseudolites 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.

FY 2017 Base funds in the amount of \$57.411 million are provided for the continuation of the Pseudolite subprogram. These efforts include the laboratory and field testing of Pseudolite prototypes; platform integration development; integration of M-Code in accordance with Public Law 111-383 Sec 913; participation in various Navigation Warfare (NAVWAR) test events; and documentation preparation to support the Development RFP Release Decision.

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

	FY 2015	FY 2016	FY 2017
Title: Pseudolites Technology Maturation and Risk Reduction	-	20.358	57.411
Description: Technology Maturation and Risk Reduction associated with the Pseudolite subprogram, to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system.			

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army **Date:** February 2016

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>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017
<p><i>FY 2016 Plans:</i> FY16 Funds will continue the Technology Maturation and Risk Reduction phase of the Pseudolite subprogram. These efforts include Pseudolite Transmitter competitive prototyping, with two (2) contractors; and prototype software for legacy GPS receiver(s). Additionally, funds will be used for Assured PNT system architecture development to include: design trades and requirements trades analysis; mature and validate requirements; and performance of Cost Benefit analysis.</p> <p><i>FY 2017 Plans:</i> FY17 Funds will continue the Technology Maturation and Risk Reduction competitive prototyping and testing effort for the Pseudolite transmitter. Develop prototype software code for the remote Command and Control of Pseudolites over a tactical network. Continue the software upgrades to legacy receivers (e.g. DAGR) and develop software for Precision Guided Munitions to communicate with the Pseudolite transmitter. Efforts will focus on laboratory and field testing of Pseudolite prototypes; integration efforts with Pseudolite host platforms; finalization of design and requirements trades analysis; finalization of Cost Benefit analysis; and documentation preparation to support the Development RFP Release Decision.</p>			
Accomplishments/Planned Programs Subtotals	-	20.358	57.411

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

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• ED5: <i>ED5: Assured PNT</i>	11.447	9.700	-	-	-	-	-	-	-	0.000	21.147
• PE: 0604115A: <i>PE: 0604115A Technology Maturation Initiative - Pseudolites</i>	4.300	-	-	-	-	-	-	-	-	0	4.300

Remarks
EH9 - Pseudolites Sub-program funds prior to FY16 are associated with ED5 – Assured PNT. FY 2017 funds are to continue the development of Pseudolites.

D. Acquisition Strategy
The Assured Positioning, Navigation and Timing (PNT) Acquisition Strategy is focused on the acquisition of a family of solutions required to achieve the Assured PNT capability. The materiel solutions are partitioned into subprograms (Pseudolites, Mounted PNT, Dismounted PNT, and Anti-jam Antenna) to allow for the optimization of solutions for various Army formations. EH9 is specifically for the acquisition of Pseudolites.

The acquisition strategy was approved by the Milestone Decision Authority and Milestone A was successfully completed in May 2015. The Pseudolite subprogram is currently in the Technology Maturation and Risk Reduction Phase of the acquisition life-cycle.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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>The TMRR Acquisition Strategy for the Pseudolite subprogram includes: 1) Technology maturation of the Transmitter segment through the use of two competitive 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, specifically, the Electronic Warfare Planning and Management Tool (EWPMT); 3) Receiver segment will make the use of multiple contracts through existing vehicles for Pseudolite Receiver SW Prototype Development.</p> <p>Pseudolite Milestone B is planned for FY 2018. After a successful MS B approval, the proposed strategy is to award a single Engineering and Manufacturing Development (EMD) contract with priced options for Low Rate Initial Production (LRIP) and for the procurement of all technical data relevant to the performance of this contract or life cycle of this program.</p> <p>E. Performance Metrics N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EH9 / PSEUDOLITES
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Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	Various	PM PNT : APG, MD	0.000	-		0.800	Dec 2015	0.670	Dec 2016	-		0.670	0	1.470	0
FFRDC	SS/CR	Various : Various	0.000	-		0.700	Jan 2016	0.586	Dec 2016	-		0.586	0	1.286	0
Contractor Support	C/CPFF	Various : Various	0.000	-		0.228	Jan 2016	0.191	Dec 2016	-		0.191	0	0.419	0
Subtotal			0.000	-		1.728		1.447		-		1.447	0.000	3.175	0.000

Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
Develop Pseudolite Competitive Prototype - Transmitter Contractor 1 (incremental funding)	C/CPFF	Datapath - Rockwell Collins : Various	0.000	-		5.663	Feb 2016	6.285	Jan 2017	-		6.285	0	11.948	0
Develop Pseudolite Competitive Prototype - Transmitter Contractor 2 (incremental funding)	C/CPFF	L-3 Communications : Various	0.000	-		5.663	Feb 2016	6.285	Jan 2017	-		6.285	0	11.948	0
Develop Pseudolite Receiver Contractor (incremental funding)	C/CPFF	Various : Various	0.000	-		1.200	Mar 2016	4.784	Jan 2017	-		4.784	0	5.984	0
Develop Pseudolite Command & Control	C/CPFF	Various : Various	0.000	-		-		3.200	Jan 2017	-		3.200	0	3.200	0
OEM Platform Integration Development for Air Platform	SS/CPFF	Various : Various	0.000	-		-		14.543	Jan 2017	-		14.543	0	14.543	0
OEM Platform Integration Development for Ground Platform 1, Platform 2, and Platform 3	SS/CPFF	Various : Various	0.000	-		-		11.654	Jan 2017	-		11.654	0	11.654	0
PM Platform Integration Development	MIPR	Various : Various	0.000	-		-		2.000	Dec 2016	-		2.000	0	2.000	0

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EH9 / PSEUDOLITES
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Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
Subtotal			0.000	-		12.526		48.751		-		48.751	0.000	61.277	0.000

Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
Engineering and Technical Services	Various	C4ISR : Various	0.000	-		2.653	Jan 2016	2.222	Dec 2016	-		2.222	0	4.875	0
Engineering and Technical Contracting Services	C/CPFF	Various : Various	0.000	-		3.451	Jan 2016	2.891	Dec 2016	-		2.891	0	6.342	0
Subtotal			0.000	-		6.104		5.113		-		5.113	0.000	11.217	0.000

Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
Pseudolite Prototype Lab and Field Testing	MIPR	Various : Various	0.000	-		-		2.100	Jan 2017	-		2.100	0	2.100	0
Subtotal			0.000	-		-		2.100		-		2.100	0.000	2.100	0.000

			Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	-	20.358	57.411	-	57.411	0.000	77.769	0.000

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EH9 / PSEUDOLITES
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
(1) Milestone A Decision (Project started under ED5)	<div style="position: absolute; top: 50px; left: 50px; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;"> ▲ Milestone A Decision </div>																											
Pseudolite (PL) Prototype Development Contractor 1 (Project started under ED5)									PL Prototype Dev Ctr 1																			
Pseudolite (PL) Prototype Development Contractor 2 (Project started under ED5)									PL Prototype Dev Ctr 2																			
Pseudolite (PL) Command and Control Development (Project started under ED5)									PL Command and Control Dev																			
Pseudolite (PL) Receiver Development (Project started under ED5)									PL Receiver Development																			
(2) Pseudolite (PL) Preliminary Design Review (PDR)					<div style="position: absolute; top: 50px; left: 50px; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;"> ▲ PDR </div>																							
Pseudolite (PL) Prototype Testing									Prototype Testing																			
(3) Pseudolite (PL) Technical Readiness Review									<div style="position: absolute; top: 50px; left: 50px; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;"> ▲ Technical Readiness Review </div>																			
(4) Pseudolite (PL) Development RFP Release Decision													<div style="position: absolute; top: 50px; left: 50px; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;"> ▲ Development RFP Release Decision </div>															
(5) Pseudolite (PL) Milestone B Decision													<div style="position: absolute; top: 50px; left: 50px; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;"> ▲ Milestone B Decision </div>															
(6) Pseudolite (PL) EMD Contract Award																	<div style="position: absolute; top: 50px; left: 50px; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;"> ▲ EMD Contract Award </div>											
Pseudolite (PL) Developmental Testing																	Developmental Testing											
(7) Pseudolite (PL) Milestone C Decision																					<div style="position: absolute; top: 50px; left: 50px; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;"> ▲ Milestone C Decision </div>							

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
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
Milestone A Decision (Project started under ED5)	3	2015	3	2015
Pseudolite (PL) Prototype Development Contractor 1 (Project started under ED5)	3	2015	2	2018
Pseudolite (PL) Prototype Development Contractor 2 (Project started under ED5)	3	2015	2	2018
Pseudolite (PL) Command and Control Development (Project started under ED5)	3	2015	4	2019
Pseudolite (PL) Receiver Development (Project started under ED5)	3	2015	4	2019
Pseudolite (PL) Preliminary Design Review (PDR)	3	2016	3	2016
Pseudolite (PL) Prototype Testing	2	2017	4	2017
Pseudolite (PL) Technical Readiness Review	3	2017	3	2017
Pseudolite (PL) Development RFP Release Decision	4	2017	4	2017
Pseudolite (PL) Milestone B Decision	1	2018	1	2018
Pseudolite (PL) EMD Contract Award	2	2018	2	2018
Pseudolite (PL) Developmental Testing	3	2019	4	2019
Pseudolite (PL) Milestone C Decision	1	2020	1	2020

Note

*Note: Program started under project ED5 in FY 15.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army										Date: February 2016		
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
EJ2: <i>MOUNTED</i>	-	0.000	0.000	11.552	-	11.552	41.208	53.220	15.028	9.025	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

0604120/ED5 funding line continues as the Assured PNT parent funding line. However, four (4) separate project lines were created for the Assured PNT subprograms: EH8 – Dismounted PNT subprogram; EH9 – Pseudolite subprogram; EJ2 – Mounted PNT subprogram; EJ3 - Anti-Jam Antenna subprogram.

A. Mission Description and Budget Item Justification

The Mounted Positioning, Navigation and Timing (PNT) subprogram:

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

The Mounted A-PNT System is a scalable form-factor that distributes PNT data to multiple devices (client systems) via the PNT System of Systems Architecture (SOSA) in a mounted environment by using GPS signals coupled with non-GPS augmentation while minimizing the redundant costs for Anti-Jam Antennas in GPS degraded or denied environments. The Mounted A-PNT System is the integration of multiple sensors for platform distribution of PNT, which allows the Soldier to operate in a GPS denied environment. The Mounted A-PNT System implements a SOSA that acquires, protects and distributes secure PNT on stationary and/or mobile platforms. The mounted materiel solution paces the threats and is a migration path to future technologies, including M-Code.

FY 2017 Base funds in the amount of \$11.552 million is for the initiation of the Technology Maturation and Risk Reduction (TMRR) phase to support the Mounted PNT subprogram. These efforts include the development, testing and integration activities to demonstrate sufficient technical maturity to support the entrance into the EMD phase. It will also include the integration of M-Code in accordance with Public Law 111-383 Sec 913 and documentation preparation to support the Milestone A Decision.

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

	FY 2015	FY 2016	FY 2017
Title: Mounted PNT Technology Maturation and Risk Reduction	-	-	11.552
Description: Technology Maturation and Risk Reduction associated with the Mounted PNT subprogram, to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system.			
FY 2017 Plans: FY 2017 funds will transition the Communications Electronics Research Development and Engineering Center (CERDEC) Technology Maturation Initiative (TMI) efforts to the Mounted PNT subprogram. In addition, after a successful Milestone A			

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army **Date:** February 2016

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>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017
decision, the Technology Maturation and Risk Reduction phase of the Mounted PNT subprogram will proceed. Efforts will focus on sensor fusion and PNT distribution architecture. It will also include finalization of design and requirement trades analysis and integration efforts on host platforms; finalization of Cost Benefit analysis; and documentation preparation to support the Milestone A Decision.			
Accomplishments/Planned Programs Subtotals	-	-	11.552

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

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• PE: 0604115A:: <i>PE: 0604115A Technology Maturation Initiative - Mounted PNT</i>	2.000	7.200	6.700	-	6.700	-	-	-	-	0.000	15.900

Remarks

D. Acquisition Strategy
The Assured Positioning, Navigation and Timing (PNT) Acquisition Strategy is focused on the acquisition of a family of solutions required to achieve the Assured PNT capability. The materiel solutions are partitioned into subprograms (Pseudolites, Mounted PNT, Dismounted PNT, and Anti-jam Antenna) to allow for the optimization of solutions for various Army formations. EJ2 is specifically for the acquisition of Mounted PNT.

Based upon a successful Milestone A Decision, the program funding will be used to continue the Technology Maturation and Risk Reduction phase utilizing two contractors developing prototype-construct alternatives; demonstrate and assess the functionality of integrated Anti-Jam Antenna Systems.

Milestone B is planned for FY 2018. After a successful MS B approval the proposed strategy is to award a single Engineering and Manufacturing Development (EMD) contract through full and open competition with priced options for Low Rate Initial Production (LRIP) and for the procurement of all technical data relevant to the performance of this contract or life cycle of this program.

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				EJ2 / MOUNTED								
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	
FFRDC	SS/CR	Various : Various	0.000	-		-		0.339	Dec 2016	-		0.339	0	0.339	0	
Project Management Support	Various	PM PNT : APG, MD	0.000	-		-		0.386	Dec 2016	-		0.386	0	0.386	0	
Contractor Support	C/CPFF	Various : Various	0.000	-		-		0.110	Dec 2016	-		0.110	0	0.110	0	
Subtotal			0.000	-		-		0.835		-		0.835	0.000	0.835	0.000	
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	
Mounted PNT Prototype Development Contractor 1	C/CPFF	Various : Various	0.000	-		-		3.885	Nov 2016	-		3.885	0	3.885	0	
Mounted PNT Prototype Development Contractor 2	C/CPFF	Various : Various	0.000	-		-		3.885	Nov 2016	-		3.885	0	3.885	0	
Subtotal			0.000	-		-		7.770		-		7.770	0.000	7.770	0.000	
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	Various	C4ISR : various	0.000	-		-		1.281	Dec 2016	-		1.281	0	1.281	0	
Engineering and Technical Contracting Services	C/CPFF	Various : Various	0.000	-		-		1.666	Dec 2016	-		1.666	0	1.666	0	
Subtotal			0.000	-		-		2.947		-		2.947	0.000	2.947	0.000	
Project Cost Totals			0.000	-		0.000		11.552		-		11.552	0.000	11.552	0.000	

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

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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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
(1) Mounted PNT Milestone A Decision									▲ Milestone A Decision																			
Mounted PNT Prototype Development Contractor 1																	■ Mounted PNT Ctr 1											
Mounted PNT Prototype Development Contractor 2									■ Mounted PNT Ctr 2																			
(2) Mounted PNT Preliminary Design Review (PDR)									▲ PDR																			
(3) Mounted PNT Development RFP Release Decision									▲ Development RFP Release Decision																			
(4) Mounted PNT Milestone B Decision									▲ Milestone B Decision																			
(5) Mounted PNT Milestone C Decision																	▲ Milestone C Decision											

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
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 PNT Milestone A Decision	1	2017	1	2017
Mounted PNT Prototype Development Contractor 1	1	2017	3	2018
Mounted PNT Prototype Development Contractor 2	1	2017	3	2018
Mounted PNT Preliminary Design Review (PDR)	1	2018	1	2018
Mounted PNT Development RFP Release Decision	1	2018	1	2018
Mounted PNT Milestone B Decision	4	2018	4	2018
Mounted PNT Milestone C Decision	4	2020	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army **Date:** February 2016

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>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
EJ3: <i>ANTI-JAM ANTENNA</i>	-	0.000	0.000	0.000	-	0.000	0.000	6.700	2.990	0.000	0.000	9.690
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Anti-Jam Antenna subprogram:

- > Enables continuous GPS signal acquisition and tracking in a navigation warfare (jamming) environment
- > Deployed as a scalable component accessory to Positioning, Navigation and Timing User Equipment

There are no FY 2017 Base funds for EJ3 - Anti-Jam Antenna.