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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Army										Date: February 2015		
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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
Total Program Element	-	7.500	9.925	30.058	-	30.058	27.957	33.918	30.574	30.598	-	170.530
ED5: Assured Positioning, Navigation and Timing (PNT)	-	7.500	9.925	9.700	-	9.700	-	-	-	-	-	27.125
EH8: DISMOUNTED	-	-	-	-	-	-	-	13.700	0.400	0.800	-	14.900
EH9: PSEUDOLITES	-	-	-	20.358	-	20.358	27.957	20.218	7.774	0.598	-	76.905
EJ2: MOUNTED	-	-	-	-	-	-	-	-	15.700	1.000	-	16.700
EJ3: ANTI-JAM ANTENNA	-	-	-	-	-	-	-	-	6.700	28.200	-	34.900

Note

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

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 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 which can be impacted by current and emerging threats and field conditions, which means that PNT access and integrity to the Warfighter cannot be 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: (1) 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. (2) 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. (3) 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 wirelessly on the soldier; (4) The Anti-Jam 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 has transitioned into four (4) separate project lines for each Assured PNT subprogram. EH8 – Dismounted subprogram. EH9 – Pseudolites subprogram. EJ2 – Mounted subprogram. EJ3 Anti-jam Antenna subprogram.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Army				Date: February 2015		
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)				
FY 2016 Base funds in the amount of \$30.058 million are provided to continue the development of the Pseudolite sub-program; program planning and technical evaluation of the Assured PNT sub-system and architecture development; integration of M-Code in accordance with Public Law 111-383 Sec 913; participation in various Navigation Warfare (NAVWAR) test events and support to the Military GPS User Equipment (MGUE) Precision Guided Munitions.						
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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget		-	9.930	20.191	-	20.191
Current President's Budget		7.500	9.925	30.058	-	30.058
Total Adjustments		7.500	-0.005	9.867	-	9.867
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-	-			
• Adjustments to Budget Years		7.500	-0.005	9.867	-	9.867

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Army										Date: February 2015		
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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
ED5: Assured Positioning, Navigation and Timing (PNT)	-	7.500	9.925	9.700	-	9.700	-	-	-	-	-	27.125
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

0604120/ED5 funding has transitioned into four (4) separate project lines for each Assured PNT subprogram. EH8 – Dismounted Subprogram. EH9 – Pseudolites Subprogram. EJ2 – Mounted Subprogram. EJ3 Anti-jam Antenna subprogram

ED5 - Assured PNT FY 2015 funds in the amount of \$9.925 million are associated with EH9 – Pseudolites Subprogram. FY 2015 funds were provided as a new start for the Assured PNT Program to initiate the development of Pseudolites.

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 2016 – \$9.700 million is to support Military GPS User Equipment (MGUE) Precision Guided Munitions.

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

	FY 2014	FY 2015	FY 2016
Title: Assured PNT	7.500	9.925	9.700
Description: Efforts include initiation of development effort for Pseudolite subprogram, Dismounted sub program Risk reduction efforts, 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)			
FY 2014 Accomplishments: Development of Precision Guided Munitions prototype receivers.			
FY 2015 Plans: Efforts include initiation of development effort for Pseudolite subprogram, Dismounted sub program Risk reduction efforts, preparation of Milestone documentation for the Assured PNT program, and			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Army										Date: February 2015		
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 2014	FY 2015	FY 2016
associated Program Management Office (PMO) and support activities.												
FY 2016 Plans: FY 2016 Funds will further assess the Technology maturity assessment and Joint Comment 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.												
Accomplishments/Planned Programs Subtotals										7.500	9.925	9.700
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost	
• RDTE&A: PE: 0604115A	10.741	44.214	40.917	-	40.917	47.819	39.140	40.475	48.694	-	272.000	
• PE: 0604120A:	-	-	-	-	-	-	13.700	0.400	0.800	-	14.900	
<i>EH8: DISMOUNTED</i>												
• EH9: Pseudolites	-	-	20.358	-	20.358	27.957	20.218	7.774	0.598	-	76.905	
• EJ2: Mounted	-	-	-	-	-	-	-	15.700	1.000	-	16.700	
• EJ3: Anti-Jam Antenna	-	-	-	-	-	-	-	6.700	28.200	-	34.900	
Remarks												
PE 0604115A Title: Technology Maturation Initiatives												
ED5 - Assured PNT FY 2015 Base funds in the amount of \$9.925 million are associated with EH9 - Pseudolites Subprogram. FY 2015 funds were provided as a new start for the Assured PNT Program to initiate the development of Psuedolites.												
D. Acquisition Strategy												
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.												
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												

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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>
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.		
E. Performance Metrics N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army												Date: February 2015			
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 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	PD PNT : Various	0.000	-		0.485	Mar 2015	-		-		-	-	0.485	-
Subtotal			0.000	-		0.485		-		-		-	-	0.485	-
Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	0.000	0.630	Nov 2014	-		-		-		-	-	0.630	-
AM2P – DOTC GPS Receiver Prototypes	C/CPFF	L-3 IEC : Anaheim, CA	0.000	0.600	Jan 2015	-		-		-		-	-	0.600	-
AM2P – DOTC GPS Receiver Prototypes	C/CPFF	EOIR Technologies : Fredericksburg, VA	0.000	3.982	Nov 2014	-		-		-		-	-	3.982	-
AM2P – DOTC GPS Receiver Prototypes	C/CPFF	SAVIT : Rockaway, NJ	0.000	0.286	Jan 2015	-		-		-		-	-	0.286	-
AM2P – GPS/PGM Integration	MIPR	various : various	0.000	-		-		2.735	Dec 2015	-		2.735	-	2.735	-
AM2P – DOTC PGM Platform Integration	C/CPFF	SAVIT : Rockaway, NJ	0.000	-		-		0.695	Dec 2015	-		0.695	-	0.695	-
AM2P – Government Engineering	MIPR	ARDEC : Picatinny, NJ	0.000	0.702	Nov 2014	-		2.500	Dec 2015	-		2.500	-	3.202	-
AM2P – Joint PGM SME	MIPR	Various : Various	0.000	1.300	Dec 2014	-		2.740	Dec 2015	-		2.740	-	4.040	-
Develop Pseudolite Competitive Prototype Contractor 1	C/CPIF	Various : Various	0.000	-		3.615	Apr 2015	-		-		-	-	3.615	-
Develop Pseudolite Competitive Prototype Contractor 2	C/CPIF	Various : Various	0.000	-		3.615	Apr 2015	-		-		-	-	3.615	-
Dismounted Technical Risk Reduction and Integration	MIPR	Various : Various	0.000	-		0.440	Apr 2015	-		-		-	-	0.440	-

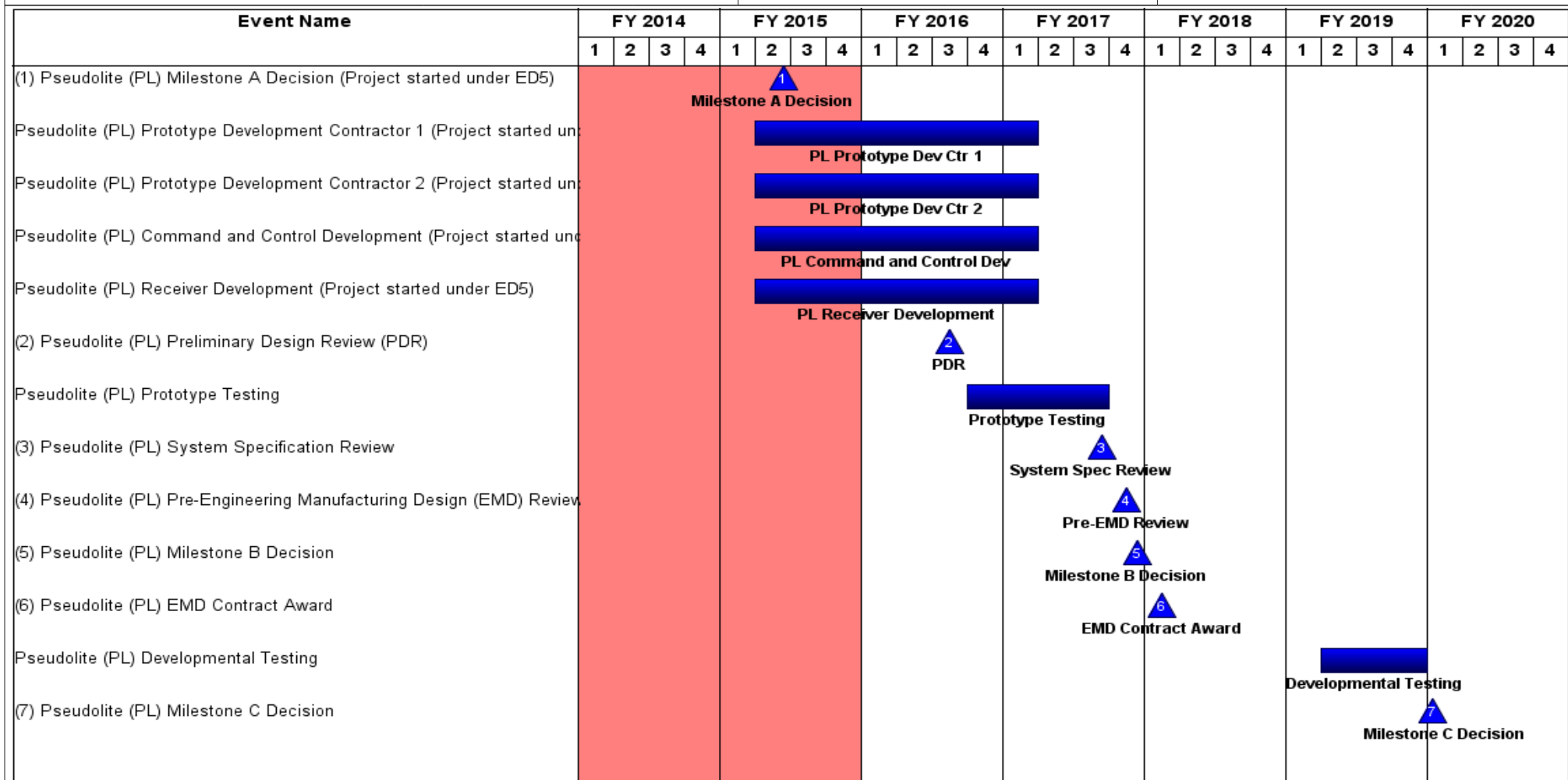
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army													Date: February 2015		
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)					
Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			0.000	7.500		7.670		8.670		-		8.670	-	23.840	-
Support (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	-		-		-	-	0.920	-
Matrix Support	MIPR	Various : Various	0.000	-		0.850	Mar 2015	-		-		-	-	0.850	-
Subtotal			0.000	-		1.770		-		-		-	-	1.770	-
Test and Evaluation (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	0.000	-		-		0.190	Dec 2015	-		0.190	-	0.190	-
AM2P – Flight Tests	MIPR	Various : Yuma Proving Ground, AZ	0.000	-		-		0.840	Aug 2016	-		0.840	-	0.840	-
Subtotal			0.000	-		-		1.030		-		1.030	-	1.030	-
			Prior Years	FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	7.500		9.925		9.700		-		9.700	-	27.125	-
Remarks															








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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army **Date:** February 2015

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)
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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army																Date: February 2015																
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)																	
Event Name					FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
					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
AM2P Technology Maturation and Demonstration																																
									AM2P Tech Maturation and Demo																							
AM2P Develop Receiver Prototypes																																
									AM2P Prototype Dev																							
AM2P Platform Integration																																
									AM2P Platform Integration																							
AM2P Bench Top Component Testing																																
					AM2P Bench Testing																											
AM2P Flight Testing																																
									AM2P Flight Testing																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Army			Date: February 2015
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
Pseudolite (PL) Milestone A Decision (Project started under ED5)	2	2015	2	2015
Pseudolite (PL) Prototype Development Contractor 1 (Project started under ED5)	2	2015	1	2017
Pseudolite (PL) Prototype Development Contractor 2 (Project started under ED5)	2	2015	1	2017
Pseudolite (PL) Command and Control Development (Project started under ED5)	2	2015	1	2017
Pseudolite (PL) Receiver Development (Project started under ED5)	2	2015	1	2017
Pseudolite (PL) Preliminary Design Review (PDR)	3	2016	3	2016
Pseudolite (PL) Prototype Testing	4	2016	3	2017
Pseudolite (PL) System Specification Review	3	2017	3	2017
Pseudolite (PL) Pre-Engineering Manufacturing Design (EMD) Review	4	2017	4	2017
Pseudolite (PL) Milestone B Decision	4	2017	4	2017
Pseudolite (PL) EMD Contract Award	1	2018	1	2018
Pseudolite (PL) Developmental Testing	2	2019	4	2019
Pseudolite (PL) Milestone C Decision	1	2020	1	2020
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	1	2016	2	2016
AM2P Flight Testing	4	2016	2	2017

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Army										Date: February 2015		
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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
EH8: DISMOUNTED	-	-	-	-	-	-	-	13.700	0.400	0.800	-	14.900
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
ED5 funding has been transitioned into four (4) separate project lines for each Assured PNT subprogram. EH8 – Dismounted subprogram. EH9 – Pseudolites subprogram. EJ2 – Mounted 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

There are no FY 2016 Base funds for EH8 - Dismounted.

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

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

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army												Date: February 2015			
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>			

Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	
x	Various	x : x	0.000	-		-		-		-		-	0.001	0.001	-	
Subtotal			0.000	-		-		-		-		-	0.001	0.001	-	

			Prior Years	FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	-		-		-		-		-	0.001	0.001	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army																Date: February 2015																			
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 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
								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
x																																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EH8 / DISMOUNTED

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
x	2	2015	2	2015

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Army										Date: February 2015		
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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
EH9: PSEUDOLITES	-	-	-	20.358	-	20.358	27.957	20.218	7.774	0.598	-	76.905
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note												
ED5 funding has been transitioned into four (4) separate project lines for each Assured PNT subprogram. EH8 – Dismounted subprogram. EH9 – Pseudolites subprogram. EJ2 – Mounted subprogram. EJ3 Anti-jam Antenna subprogram.												
EH9 - Pseudolites Subprogram FY 2016 Base funds in the amount of \$20.358 million are associated with ED5 – Assured PNT. FY 2016 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 provide GPS protection by providing PNT data using terrestrial and airborne based radio navigation GPS satellite-like transmitters in electronically or physically challenged environments using a higher power signal. Area protection can be 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 sub-program 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 2016 Base funds in the amount of \$20.358 million are provided to continue the development of the Pseudolite sub-program; program planning and technical evaluation of the Assured PNT sub-system and architecture development; integration of M-Code in accordance with Public Law 111-383 Sec 913; participation in various Navigation Warfare (NAVWAR) test events.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2014	FY 2015	FY 2016	
Title: Pseudolites Technology Maturation and Risk Reduction									-	-	20.358	

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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					
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2014	FY 2015	FY 2016		
Description: Technology Maturation and Risk Reduction of the Pseudolite sub-program, to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system.											
FY 2016 Plans: FY16 Funds will continue the Technology Maturation and Risk Reduction phase of the Pseudolite sub-program. These efforts include Pseudolite Transmitter competitive prototyping, with two (2) contractors; Prototyping of the Command and Control Software; 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.											
Accomplishments/Planned Programs Subtotals							-	-	20.358		
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• ED5: Assured PNT	7.500	9.925	9.700	-	9.700	-	-	-	-	-	27.125
• EH8: Dismounted	-	-	-	-	-	-	13.700	0.400	0.800	-	14.900
• EJ2: Mounted	-	-	-	-	-	-	-	15.700	1.000	-	16.700
• EJ3: Anti-Jam Antenna	-	-	-	-	-	-	-	6.700	28.200	-	34.900
Remarks											
EH9 - Pseudolites Subprogram FY 2016 Base funds in the amount of \$20.358 million are associated with ED5 – Assured PNT. FY 2016 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 systems required to achieve the Assured PNT capability. The materiel solutions are partitioned into subprograms (Pseudolites, Mounted PNT, Dismounted PNT, and Anti-jam) to allow for the optimization of solutions for various Army formations. EH9 is specifically for the acquisition of Pseudolites.											
The acquisition strategy is pending approval by the Milestone Decision Authority, Milestone A is scheduled for 2QFY15.											
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.											

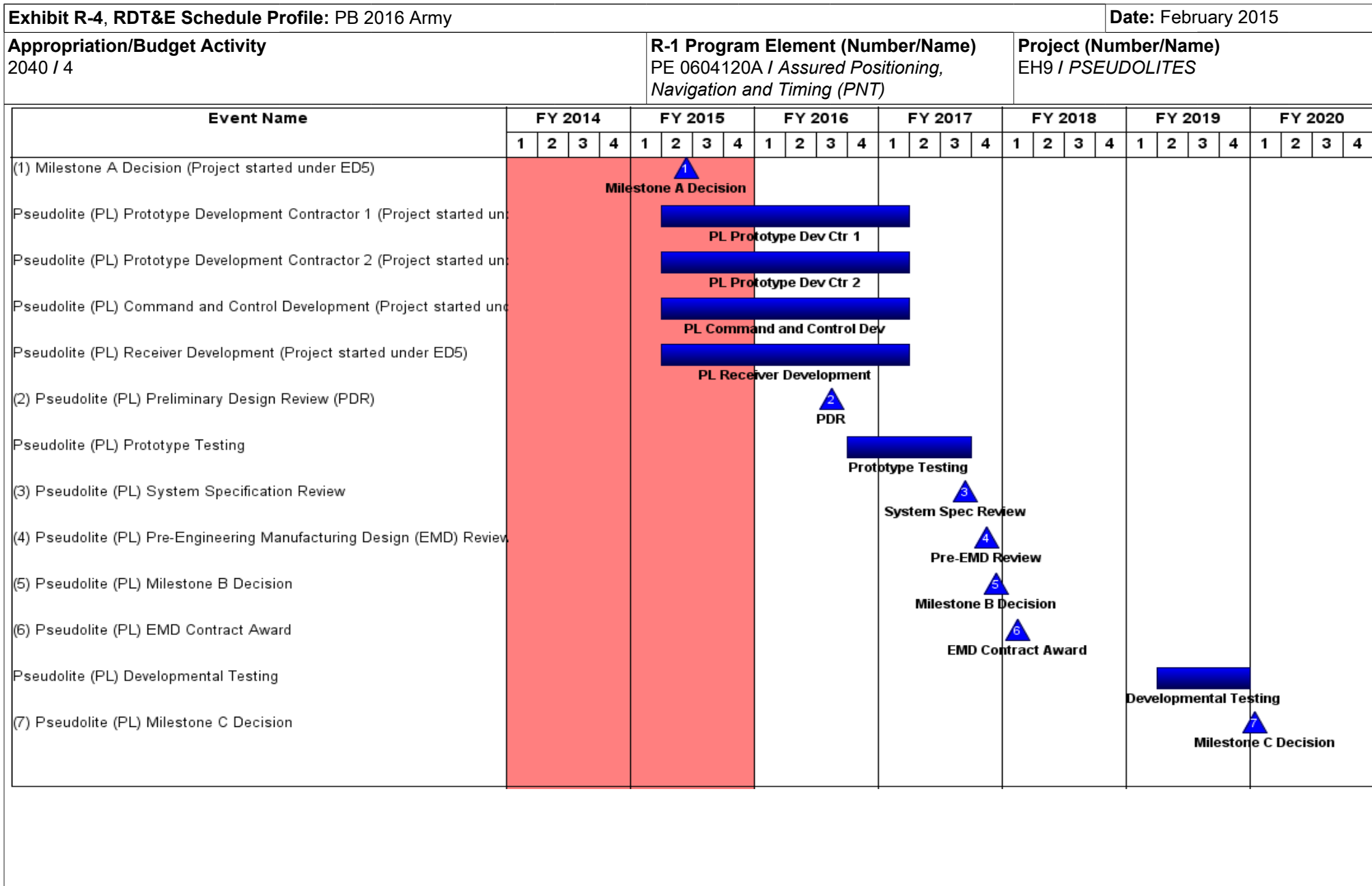
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Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH9 / <i>PSEUDOLITES</i>
<p>The 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.</p> <p>E. Performance Metrics N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army												Date: February 2015			
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 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	PD PNT : Various	0.000	-		-		0.800	Dec 2015	-		0.800	-	0.800	-
FFRDC	SS/CR	Various : Various	0.000	-		-		0.700	Dec 2015	-		0.700	-	0.700	-
Contractor Support	C/CPFF	Various : Various	0.000	-		-		0.228	Dec 2015	-		0.228	-	0.228	-
Subtotal			0.000	-		-		1.728		-		1.728	-	1.728	-
Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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
Develop Pseudolite Competitive Prototype - Transmitter Contractor 1 (incremental funding)	C/CPFF	Various : Various	0.000	-		-		5.663	Jan 2016	-		5.663	-	5.663	-
Develop Pseudolite Competitive Prototype - Transmitter Contractor 2 (incremental funding)	C/CPFF	Various : Various	0.000	-		-		5.663	Jan 2016	-		5.663	-	5.663	-
Develop Pseudolite Receiver Contractor (incremental funding)	C/CPFF	Various : Various	0.000	-		-		1.200	Jan 2016	-		1.200	-	1.200	-
Engineering and Technical Services	MIPR	CERDEC, SEC, LRC : Various	0.000	-		-		2.653	Dec 2015	-		2.653	-	2.653	-
Engineering and Technical contracting Services	C/CPFF	Various : Various	0.000	-		-		3.451	Dec 2015	-		3.451	-	3.451	-
Subtotal			0.000	-		-		18.630		-		18.630	-	18.630	-
			Prior Years	FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	-		-		20.358		-		20.358	-	20.358	-
Remarks															

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

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Army										Date: February 2015		
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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
EJ2: <i>MOUNTED</i>	-	-	-	-	-	-	-	-	15.700	1.000	-	16.700
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

A. Mission Description and Budget Item Justification
The Mounted Positioning, Navigation and Timing (PNT) subprogram:
 > Acquires, protects, and distributes secure PNT on mounted platforms
 > Development and integration of multiple sensors for non-GPS augmentation
 > Modular, scalable form-Factor that paces the threats
 > Enables PNT on the Vehicle Integration for C4ISR/EW Interoperability (VICTORY) and Future Airborne Capability Environment (FACE) Architecture
 > Migration path to M-code & other future technologies

There are no FY 2016 Base funds for EJ2 - Mounted PNT.

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

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

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army												Date: February 2015			
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 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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
x	Various	x : x	0.000	-		-		-		-		-	0.001	0.001	-
Subtotal			0.000	-		-		-		-		-	0.001	0.001	-

	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-	-	-	-	-	0.001	0.001	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army																Date: February 2015																			
Appropriation/Budget Activity 2040 / 4								R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)								Project (Number/Name) EJ2 / MOUNTED																			
Event Name								FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
								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
x																																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Army		Date: February 2015
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
x	2	2015	2	2015

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Army										Date: February 2015		
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			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
EJ3: ANTI-JAM ANTENNA	-	-	-	-	-	-	-	-	6.700	28.200	-	34.900
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

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

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 2016 Base funds for EJ3 - Anti-Jam Antenna.

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

N/A

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army												Date: February 2015			
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>			

Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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
x	Various	x : x	0.000	-		-		-		-		-	0.001	0.001	-
Subtotal			0.000	-		-		-		-		-	0.001	0.001	-

			Prior Years	FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	-		-		-		-		-	0.001	0.001	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army																Date: February 2015																			
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 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
								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
x																																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Army			Date: February 2015
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
x	2	2015	2	2015