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Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Army											Date: March 2014	
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0604820A / RADAR DEVELOPMENT							
COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
Total Program Element	-	3.734	1.548	5.224	-	5.224	12.213	11.389	10.906	12.132	Continuing	Continuing
E10: Sentinel	-	3.734	1.548	5.224	-	5.224	12.213	11.389	10.906	12.132	Continuing	Continuing

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

This system is a supporting program of the overall Air and Missile Defense (AMD) architecture and will provide for an incrementally fielded Integrated Air and Missile Defense Fire Control System/capability for the composite Army Air and Missile Defense Brigades. The Sentinel system is used with the Forward Area Air Defense Command and Control (FAAD C2) element and is a key component to the Integrated Air and Missile Defense (IAMD) architecture via the Integrated Air and Missile Defense Battle Command System (IBCS) to provide critical air surveillance of the forward areas.

Sentinel (AN/MPQ-64A1) consists of a radar-based sensor with its prime mover/power, Identification Friend or Foe (IFF), and Forward Area Air Defense (FAAD) Command, Control and Intelligence (C2I) interfaces. The radar is deployed in both an air defense role and a force protection role for Counter-Rocket, Artillery, and Mortar (C-RAM) missions. The sensor is an advanced three-dimensional battlefield X-Band air defense phased-array radar with an instrumented range of 75 km. Sentinel is capable of operating day or night, in adverse weather conditions, in the battlefield environments of dust, smoke, aerosols and enemy countermeasures. It provides 360-degree azimuth coverage for acquisition tracking. Sentinel contributes to the digital battlefield by automatically detecting, classifying, identifying and reporting targets (cruise missiles, unmanned aerial systems, rotary wing and fixed wing aircraft). Sentinel acquires targets sufficiently forward of the battle area to allow weapons reaction time and engagement at optimum ranges. Sentinel's integrated IFF reduces the potential for fratricide of US and Coalition aircraft.

The Research and Development funding supports Sentinel modernization/upgrades, hardware/software issue resolution, resolution of obsolescence issues, engineering studies, and cost reduction initiatives. The funding for Fiscal Year (FY) 2013 through FY2019 development activities addresses the following Sentinel system capability gaps and obsolescence issues identified by the User: 1) Target Detection gap; 2) Target Tracking gap; 3) Net Readiness gap; 4) Electronic Counter Measures (ECM) gap; and 5) Unmanned Aerial Systems (UAS) Defense gap.

Battle Space Improvement addresses the Target Detection gap that currently exists with the Sentinel system. This development effort modifies the radar signal processor algorithms to reduce system processing losses. The modified algorithms will increase target acquisition and tracking range capability by a minimum of 12 percent against the threat set within the instrumented range band. This effort also develops modifications to the radar hardware by utilizing an upgraded common signal processing card to the radar signal processor to provide a common hardware and software processing configuration across the Sentinel radar fleet.

Stop, Stare and Track addresses the Target Tracking Gap. This development effort provides direct Fire Control Radar (FCR) support in an integrated air and missile defense architecture. In addition this provides significantly improved Non-Cooperative Target Recognition (NCTR) timeline and performance against all targets to include Unmanned Aerial Systems (UAS), Cruise Missiles, Rotary Wing and Fixed Wing aircraft. This upgrade also enables rapid classification of cued Rockets, Artillery and

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>		R-1 Program Element (Number/Name) PE 0604820A / <i>RADAR DEVELOPMENT</i>
Mortars (RAM), UAS, Rotary wing and fixed wing aircraft, as well as very accurate Point of Origin (POO) and Point of Impact (POI) of RAM targets and enables a robust kill assessment capability of engaged targets. Cross Domain Solution (CDS) Network Interface addresses net readiness and system security concerns. This effort develops a CDS interface to isolate the Sentinel radar from connected networks of lower classification levels. Electronic Attack/Electronic Protect (EA/EP) addresses the electronic countermeasures (ECM) gap. This effort conducts additional design and testing to verify initial EA/EP results and updates the database and associated software and hardware with more extensive EA/EP signatures to address evolving threats. Signal Data Processor (SDP)/North Finding Module (NFM) addresses the Target Detection, Target Tracking, and Electronic Countermeasures (ECM) capability gaps and funds the mitigation of the Signal Data Processor (SDP) and North Finding Module (NFM) obsolescence issues. Signal Data Processor (SDP) cards are estimated to go obsolete every four to six years. Medium Bandwidth Waveform upgrade will address latent tracking issues that currently exist with Sentinel in certain applications. This development effort modifies firmware as well as software in the Sentinel radar. This effort will provide better target resolution and more accurate tracking in the slant range coordinate. This improved target resolution and tracking accuracy will provide improved retention of target identification and more robust tracking that addresses the latent tracking issues. Mode S upgrade to existing Sentinel Identification Friend or Foe (IFF) will address Sentinel's objective requirement to interrogate IFF mode S which is currently not being met. Mode S transmissions are a key component of the Automatic Dependent Surveillance-Broadcast (ADS-B) surveillance technology being used by the Federal Aviation Administration for tracking aircraft as part of the Next Generation Air Transportation System (NextGen). In the United States, all aircraft required to have transponders (most aircraft) must transition to mode S capable units by 2020. Without the Mode S upgrade, Sentinel will have to rely on these aircraft transponders responding to the legacy mode 3/A interrogations. The data available in the mode S response will be valuable in identifying the aircraft and correlating Sentinel tracks with civil aviation tracks/data and other track data sources. The Active Electronic Steered Array (AESA) is the next generation of radar technology to replace the current phase and frequency scanned array used by Sentinel today. The AESA effort is to develop and test a new single face, rotating AESA Antenna for the Sentinel radar and will be executed as a modification to the existing platform. The single face AESA Antenna will provide increased capability including extended range for ground-based surveillance and situational awareness, faster and more accurate Non-Cooperative Target Recognition (NCTR) for clearing fires and preventing fratricide, improved Fire Control (FC) quality track accuracy, and management of larger track loads. The AESA will also provide improved operation in severe/urban clutter. The system will detect and track small targets, such as Unmanned Aerial Systems (UAS) and Cruise Missiles, in clutter and will detect and track slow targets, such as UAS and Rotary Wing (RW) aircraft, at low altitudes in clutter. The system will detect, track, and classify Rocket, Artillery, and Mortar (RAM) threats and will support Integrated Air and Missile Defense (IAMD) requirements. The AESA will support advanced Electronic Protect (EP) techniques to address the evolving Electronic Attack (EA) threat.		

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Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)		PE 0604820A / RADAR DEVELOPMENT			
B. Program Change Summary (\$ in Millions)	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total
Previous President's Budget	3.486	1.549	5.264	-	5.264
Current President's Budget	3.734	1.548	5.224	-	5.224
Total Adjustments	0.248	-0.001	-0.040	-	-0.040
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.622	-			
• SBIR/STTR Transfer	-0.094	-			
• Adjustments to Budget Years	-0.004	-0.001	-0.040	-	-0.040
• Other Adjustments 1	-0.276	-	-	-	-

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Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604820A / RADAR DEVELOPMENT				Project (Number/Name) E10 / Sentinel			
COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
E10: Sentinel	-	3.734	1.548	5.224	-	5.224	12.213	11.389	10.906	12.132	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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A. Mission Description and Budget Item Justification

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The Research and Development funding supports Sentinel modernization/upgrades, hardware/software issue resolution, resolution of obsolescence issues, engineering studies, and cost reduction initiatives. The funding for Fiscal Year (FY) 2013 through FY2019 development activities addresses the following Sentinel system capability gaps and obsolescence issues identified by the User: 1) Target Detection gap; 2) Target Tracking gap; 3) Net Readiness gap; 4) Electronic Counter Measures (ECM) gap; and 5) Unmanned Aerial Systems (UAS) Defense gap.

Battle Space Improvement addresses the Target Detection gap that currently exists with the Sentinel system. This development effort modifies the radar signal processor algorithms to reduce system processing losses. The modified algorithms will increase target acquisition and tracking range capability by a minimum of 12 percent against the threat set within the instrumented range band. This effort also develops modifications to the radar hardware by utilizing an upgraded common signal processing card to the radar signal processor to provide a common hardware and software processing configuration across the Sentinel radar fleet.

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Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604820A / RADAR DEVELOPMENT	Project (Number/Name) E10 / Sentinel		
Cross Domain Solution (CDS) Network Interface addresses net readiness and system security concerns. This effort develops a CDS interface to isolate the Sentinel radar from connected networks of lower classification levels. Electronic Attack/Electronic Protect (EA/EP) addresses the electronic countermeasures (ECM) gap. This effort conducts additional design and testing to verify initial EA/EP results and updates the database and associated software and hardware with more extensive EA/EP signatures to address evolving threats. Signal Data Processor (SDP)/North Finding Module (NFM) addresses the Target Detection, Target Tracking, and Electronic Countermeasures (ECM) capability gaps and funds the mitigation of the Signal Data Processor (SDP) and North Finding Module (NFM) obsolescence issues. Signal Data Processor (SDP) cards are estimated to go obsolete every four to six years. Medium Bandwidth Waveform upgrade will address latent tracking issues that currently exist with Sentinel in certain applications. This development effort modifies firmware as well as software in the Sentinel radar. This effort will provide better target resolution and more accurate tracking in the slant range coordinate. This improved target resolution and tracking accuracy will provide improved retention of target identification and more robust tracking that addresses the latent tracking issues. Mode S upgrade to existing Sentinel Identification Friend or Foe (IFF) will address Sentinel's objective requirement to interrogate IFF mode S which is currently not being met. Mode S transmissions are a key component of the Automatic Dependent Surveillance-Broadcast (ADS-B) surveillance technology being used by the Federal Aviation Administration for tracking aircraft as part of the Next Generation Air Transportation System (NextGen). In the United States, all aircraft required to have transponders (most aircraft) must transition to mode S capable units by 2020. Without the Mode S upgrade, Sentinel will have to rely on these aircraft transponders responding to the legacy mode 3/A interrogations. The data available in the mode S response will be valuable in identifying the aircraft and correlating Sentinel tracks with civil aviation tracks/data and other track data sources. The Active Electronic Steered Array (AESA) is the next generation of radar technology to replace the current phase and frequency scanned array used by Sentinel today. The AESA effort is to develop and test a new single face, rotating AESA Antenna for the Sentinel radar and will be executed as a modification to the existing platform. The single face AESA Antenna will provide increased capability including extended range for ground-based surveillance and situational awareness, faster and more accurate Non-Cooperative Target Recognition (NCTR) for clearing fires and preventing fratricide, improved Fire Control (FC) quality track accuracy, and management of larger track loads. The AESA will also provide improved operation in severe/urban clutter. The system will detect and track small targets, such as Unmanned Aerial Systems (UAS) and Cruise Missiles, in clutter and will detect and track slow targets, such as UAS and Rotary Wing (RW) aircraft, at low altitudes in clutter. The system will detect, track, and classify Rocket, Artillery, and Mortar (RAM) threats and will support Integrated Air and Missile Defense (IAMD) requirements. The AESA will support advanced Electronic Protect (EP) techniques to address the evolving Electronic Attack (EA) threat.					
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2013	FY 2014	FY 2015
Title: Product Development			2.541	-	3.561
Articles:			-	-	-
Description: Funding is provided for the following efforts:					

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / RADAR DEVELOPMENT	Project (Number/Name) E10 / Sentinel	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2013	FY 2014
FY 2013 Accomplishments: Integrated firmware, software and hardware. Built prototype subsystems/components for testing. Completed software code coding and modification of the system search and track logic, clutter mapping, and waveforms. Characterized performance, design & replace firmware, software and hardware. Performed technical assessments, concept studies, cost reduction, risk reduction, threat analysis, and required documentation.			
FY 2015 Plans: Integrate firmware, software and hardware. Build prototype subsystems/components for testing. Complete software code coding and modification of the system search and track logic, clutter mapping, and waveforms. Characterize performance, design & replace firmware, software and hardware. Perform technical assessments, concept studies, cost reduction, risk reduction, threat analysis, and required documentation.			
Title: Test & Evaluation		0.888	1.408
Articles:		-	-
Description: Funding is provided for the following efforts:			
FY 2013 Accomplishments: Conducted software qualification test and hardware verification testing, field testing against representative targets. Prepared logistics products and required documentation for material release of software and hardware upgrades.			
FY 2014 Plans: Conduct system verification test and system qualification test on software upgrades.			
FY 2015 Plans: Conduct software qualification test and hardware verification testing, field testing against representative targets. Prepare logistics products and required documentation for material release of software and hardware upgrades.			
Title: Management Support		0.305	0.140
Articles:		-	-
Description: This funds Government and technical support.			
FY 2013 Accomplishments: Provided government management, technical and administrative support in FY 2013.			
FY 2014 Plans: Provides government management, technical and administrative support in FY 2014.			
FY 2015 Plans:			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)										FY 2013	FY 2014	FY 2015
Provides government management, technical and administrative support in FY 2015.												
Accomplishments/Planned Programs Subtotals										3.734	1.548	5.224
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost	
• PE 0604869A: Proj M06, Patriot/MEADS Combined Aggregate Program (CAP)	348.234	-	-	-	-	-	-	-	-	-	348.234	
• PE 0605456A: Proj PA3, PAC-3/MSE MISSILE	63.123	68.807	35.009	-	35.009	2.271	-	-	-	Continuing	Continuing	
• SSN C53101: MSE Missile	8.249	690.401	384.605	-	384.605	419.791	422.527	458.724	497.553	Continuing	Continuing	
• PE 0205456: Proj EF9, System Integration and Test	-	-	78.758	-	78.758	64.628	67.461	65.734	117.666	Continuing	Continuing	
• SSN C50016: Lower Tier Air and Missile Defense (AMD)	-	-	110.300	-	110.300	116.416	131.549	114.678	113.281	Continuing	Continuing	
• PE 0102419A: Proj E55, JLENS	142.508	83.406	54.076	-	54.076	50.167	39.590	2.566	0.003	Continuing	Continuing	
• PE 0604319A: Proj DU3, IFPC2 (FY12 PE0603305A IFPC II - Intercept)	25.710	79.190	96.177	-	96.177	156.523	90.980	58.214	27.663	Continuing	Continuing	
• PE 0605457A: Proj S40, Army Integrated Air and Missile Defense (AIAMD)	233.892	369.452	142.584	-	142.584	215.659	228.791	170.828	154.565	Continuing	Continuing	
• SSN BZ5075: IAMD Battle Command System	-	-	-	-	-	21.091	206.300	298.990	379.981	Continuing	Continuing	
• PE 0604741A: Proj 126, 146, 149; Air Defense C2I Eng Dev	42.876	18.284	15.906	-	15.906	20.248	19.632	19.878	20.165	Continuing	Continuing	
Remarks												
This program is an integral part of the Army Integrated Air and Missile Defense (IAMD) architecture.												
D. Acquisition Strategy												
Battle Space Improvement: The Sentinel Product Office will contract with Thales Raytheon Systems (TRS) to update and modify the radar signal processor algorithms. The updated software will be tested, documented and released for installation.												

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Exhibit R-2A, RDT&E Project Justification: PB 2015 Army		Date: March 2014
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / <i>RADAR DEVELOPMENT</i>	Project (Number/Name) E10 / <i>Sentinel</i>
Stop, Stare and Track: The Sentinel Product Office will contract with Thales Raytheon Systems (TRS) to develop new and/or modify existing Sentinel software. The updated software will be tested, documented and released for installation. Cross Domain Solution Interface: The Sentinel Product Office will contract with Thales Raytheon Systems (TRS) to develop an interface solution to isolate Sentinel transmission from connected networks of lower classifications. The updated software will be tested, documented and released for installation in the field. Electronic Attack/Electronic Protect (EA/EP): The Sentinel Product Office will contract with Thales Raytheon Systems (TRS) to verify the initial EA/EP Database and update the database, software and hardware with more extensive EA/EP signatures to address evolving threats. The updated database will be tested, documented and released for installation. Signal Data Processor (SDP)/North Finding Module (NFM) Obsolescence: The Sentinel Product Office will contract with Thales Raytheon Systems (TRS) to upgrade and mitigate the Signal Data Processor and North Finding Module issues. The updated SDP and NFM hardware will be tested, documented and released for installation in the field. Medium Bandwidth Waveform: The Sentinel Product Office will contract with Thales Raytheon Systems (TRS) to address latent tracking issues that currently exist with Sentinel in certain applications. The effort modifies firmware as well as software in the Sentinel radar. The updated medium bandwidth waveform software and firmware will be tested, documented and released for installation in the field. Mode S: The Sentinel Product Office will contract with Thales Raytheon Systems (TRS) to address Sentinel's objective requirement to interrogate Identification Friend or Foe (IFF) mode S on board commercial aircraft. The updated software will be tested, documented and released for installation in the field. Active Electronic Steered Array (AESA): The Sentinel Product Office will issue an RFI for solutions to an AESA single face rotating radar for the Sentinel. The updated software and hardware will be tested, documented and released for installation in the field. <u>E. Performance Metrics</u> N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2015 Army												Date: March 2014			
Appropriation/Budget Activity 2040 / 5						R-1 Program Element (Number/Name) PE 0604820A / RADAR DEVELOPMENT				Project (Number/Name) E10 / Sentinel					
Management Services (\$ in Millions)				FY 2013		FY 2014		FY 2015 Base		FY 2015 OCO		FY 2015 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
Improved Sentinel Development	Various	Cruise Missile Defense Systems Project Office : Huntsville, AL	11.398	-		-		-		-		-	-	11.398	-
System of Systems Mod Development & Integration	Various	Cruise Missile Defense Systems Project Office : Huntsville, AL	1.169	-		-		-		-		-	-	1.169	-
Battle Space Improvement	Various	Cruise Missile Defense Systems Project Office : Huntsville, AL	0.139	0.031		0.049		0.050		-		0.050	-	0.269	-
Stop, Stare and Track	Various	Cruise Missile Defense Systems Project Office : Huntsville, AL	0.118	0.255		0.091		0.050		-		0.050	-	0.514	-
Electronic Attack/ Electronic Protect	Various	Cruise Missile Defense Systems Project Office : Huntsville, AL	0.000	-		-		0.313		-		0.313	Continuing	Continuing	-
Cross Domain Solution Network Interface	Various	Cruise Missile Defense Systems Project Office : Huntsville, AL	0.000	-		-		0.031		-		0.031	Continuing	Continuing	-
Signal Data Processor North Finding Module	Various	Cruise Missile Defense Systems Project Office : Huntsville, AL	0.000	-		-		0.118		-		0.118	Continuing	Continuing	-
Subtotal			12.824	0.286		0.140		0.562		-		0.562	-	-	-

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Appropriation/Budget Activity 2040 / 5						R-1 Program Element (Number/Name) PE 0604820A / RADAR DEVELOPMENT				Project (Number/Name) E10 / Sentinel					
Product Development (\$ in Millions)				FY 2013		FY 2014		FY 2015 Base		FY 2015 OCO		FY 2015 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
Improved Sentinel Development	SS/CPFF	Thales Raytheon Systems : Fullerton, CA	102.729	-		-		-		-		-	-	102.729	-
System of Systems Mod Development & Integration	SS/CPFF	Thales Raytheon Systems : Fullerton, CA	20.820	-		-		-		-		-	-	20.820	-
Battle Space Improvement	Various	Thales Raytheon Systems & Various : Fullerton,CA / Various	1.463	0.138		-		-		-		-	-	1.601	-
Stop, Stare, and Track	Various	Thales Raytheon Systems & Various : Fullerton, CA / Various	1.201	2.403		-		-		-		-	-	3.604	-
Electronic Attack/ Electronic Protect	Various	Thales Raytheon Systems & Various : Fullerton, CA / Various	0.000	-		-		2.046		-		2.046	Continuing	Continuing	-
Cross Domain Solution Network Interface	Various	Thales Raytheon Systems & Various : Fullerton, CA / Various	0.000	-		-		0.219		-		0.219	Continuing	Continuing	-
Signal Data Processor/ North Finding Module	Various	Thales Raytheon Systems & Various : Fullerton, CA / Various	0.000	-		-		1.296		-		1.296	Continuing	Continuing	-
Subtotal			126.213	2.541		-		3.561		-		3.561	-	-	-
Support (\$ in Millions)				FY 2013		FY 2014		FY 2015 Base		FY 2015 OCO		FY 2015 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
Improved Sentinel Development	SS/CPFF	Thales Raytheon Systems : Fullerton, CA	16.930	-		-		-		-		-	-	16.930	-

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Support (\$ in Millions)				FY 2013		FY 2014		FY 2015 Base		FY 2015 OCO		FY 2015 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
System of Systems Mod Development & Integration	SS/CPFF	Thales Raytheon Systems : Fullerton, CA	0.352	-		-		-		-		-	-	0.352	-
Subtotal			17.282	-		-		-		-		-	-	17.282	-
Test and Evaluation (\$ in Millions)				FY 2013		FY 2014		FY 2015 Base		FY 2015 OCO		FY 2015 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
Improved Sentinel Mod Development	SS/CPFF	Thales Raytheon Systems : Fullerton, CA	34.599	-		-		-		-		-	-	34.599	-
System of Systems Mod Development & Integration	SS/CPFF	Thales Raytheon Systems : Fullerton, CA	2.331	-		-		-		-		-	-	2.331	-
Battle Space Improvement	Various	Thales Raytheon Systems & Various : Fullerton, CA / Various	0.086	0.335		0.447		0.450		-		0.450	-	1.318	-
Stop, Stare and Track	Various	Thales Raytheon Systems & Various : Fullerton, CA / Various	0.086	0.572		0.961		0.450		-		0.450	-	2.069	-
Electronic Attack/ Electronic Protect	Various	Thales Raytheon Systems & Various : Fullerton, CA / Various	0.000	-		-		0.201		-		0.201	Continuing	Continuing	-
Cross Domain Solution Network Interface	Various	Thales Raytheon Systems & Various : Fullerton, CA / Various	0.000	-		-		-		-		-	Continuing	Continuing	-
Signal Data Processor North Finding Module	Various	Thales Raytheon Systems & Various : Fullerton, CA / Various	0.000	-		-		-		-		-	Continuing	Continuing	-

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Appropriation/Budget Activity 2040 / 5						R-1 Program Element (Number/Name) PE 0604820A / <i>RADAR DEVELOPMENT</i>				Project (Number/Name) E10 / <i>Sentinel</i>					

Test and Evaluation (\$ in Millions)				FY 2013		FY 2014		FY 2015 Base		FY 2015 OCO		FY 2015 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			37.102	0.907		1.408		1.101		-		1.101	-	-	-

	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	193.421	3.734	1.548	5.224	-	5.224	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2015 Army	Date: March 2014
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / <i>RADAR DEVELOPMENT</i>	Project (Number/Name) E10 / <i>Sentinel</i>
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	FY 2013				FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019			
	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
Battle Space Improvement																												
Stop, Stare and Track (SS&T)																												
Cross Domain Solution (CDS) Network Interface																												
Signal Data Processor (SDP) / North Finding Module (NFM)																												
Electronic Attack/Electronic Protect (EA/EP)																												
Medium Bandwidth																												
Mode S																												
Active Electronic Steered Array (AESAs)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2015 Army			Date: March 2014
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / <i>RADAR DEVELOPMENT</i>	Project (Number/Name) E10 / <i>Sentinel</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Battle Space Improvement	4	2012	4	2015
Stop, Stare and Track (SS&T)	4	2012	4	2015
Cross Domain Solution (CDS) Network Interface	2	2015	4	2017
Signal Data Processor (SDP) / North Finding Module (NFM)	2	2015	2	2018
Electronic Attack/Electronic Protect (EA/EP)	2	2015	4	2019
Medium Bandwidth	2	2016	4	2018
Mode S	2	2018	1	2021
Active Electronic Steered Array (AESA)	2	2019	1	2024