Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Defense Information Systems Agency	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0303153K: *Defense Spectrum Organization*

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
Total Program Element	18.579	20.991	29.154	-	29.154	24.037	17.809	17.915	17.874	Continuing	Continuing
JS1: *Joint Spectrum Center*	18.579	20.991	29.154	-	29.154	24.037	17.809	17.915	17.874	Continuing	Continuing

A. Mission Description and Budget Item Justification

Electromagnetic Spectrum Management enables information dominance through effective spectrum operations. In direct support of Combatant Commanders, Assistant Secretary of Defense for Networks and Information Integration (ASD/NII), Military Services, and Defense Agencies, the Defense Spectrum Organization (DSO), a component of DISA, provides a full array of electromagnetic spectrum services and capabilities, ranging from short notice on-the-ground operational support at the forward edge, to long range planning in pursuit of national strategic objectives. The DSO is the center of excellence for electromagnetic spectrum analysis and the development of integrated spectrum plans and strategies to address current and future needs for DoD spectrum access. In addition, DSO serves as DoD's spectrum advocate at national and international forums and conducts extensive outreach to both industry and government. DSO also implements enterprise spectrum management capabilities to enhance spectrum efficiency and agility to improve spectrum-dependent capabilities in support of United States and Coalition operations. This includes acquiring, implementing and sustaining the Global Electromagnetic Spectrum Information System (GEMSIS) which provides an integrated catalog of joint net-centric spectrum management tools and services. This effort supports the Spectrum portion of the DISA Campaign Plan.

This program element is under Budget Activity 07 because it supports operational systems development.

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	18.865	20.991	23.679	-	23.679
Current President's Budget	18.579	20.991	29.154	-	29.154
Total Adjustments	-0.286	-	5.475	-	5.475
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments	-0.286	-	5.475	-	5.475

Change Summary Explanation

The reduction in FY 2010 of -$0.286 is due to realized savings within the E3 program (-$0.74K) and the GEMSIS program (-$0.212K).

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The increase in FY 2012 funding of +$5.475 is the net result of an increase for GEMSIS of +$6.403 which will provide the technology research for a near real-time update capability and help avoid cases of spectrum "fratricide" where different operational users are interfering with each other's signals. And a decrease of -$0.928 offset the increase and is the result of general adjustments for Economic Assumtions and a shifting of priorities to meet new Departmental goals.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Information Systems Agency			DATE: February 2011
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COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
JS1: *Joint Spectrum Center*	18.579	20.991	29.154	-	29.154	24.037	17.809	17.915	17.874	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

The Defense Spectrum Organization's (DSO) Joint Spectrum Center (JSC) designs, develops, and maintains DoD automated spectrum management systems, evaluation tools, and databases. The JSC databases are the prime sources of information for DoD use of the Electromagnetic (EM) spectrum. The JSC provides technical measurement and analysis in support of DoD spectrum policy decisions to ensure the development, acquisition, and operational deployment of systems are compatible with other spectrum dependent systems operating within the same EM environment. Additional focus is centered on improving future warfighter EM spectrum utilization through technological innovation accomplished by researching, studying, and steering the direction of research and development (R&D) emerging technology efforts from a spectrum perspective.

DSO's Global Electromagnetic Spectrum Information System (GEMSIS) is a net centric capability that will provide commanders with an increased common picture of spectrum situational awareness of friendly and hostile forces while transparently deconflicting competing mission requirements for spectrum use. This capability will enable the transformation from the current preplanned and static assignment strategy into autonomous and adaptive spectrum operations.

The FY 2012 increase of $8.163 million is due to implementation of the Global Electromagnetic Spectrum Information System (GEMSIS)Increment 2 (+$6.4M). Increment 2 will provide for much more dynamic management of spectrum assets in operational theaters and enable Commanders at all levels to make better decision on the deployment of spectrum assets. The JSC Data and Date Software (JDADS) program increases in FY2012 (+$1.0M) to support deployment and software enhancement of Spectrum XXI On-line (SXXIO) which provides a set of enhanced frequency nomination and assignment algorithms that affords the opportunity to make more spectrally efficient frequency assignments. The Emerging Spectrum Technology (EST) program increases in FY2012 (+$0.8M) in support of the Department's increased need for dynamic spectrum access (DSA)capable systems. Exploiting DSA capable technologies will allow the DoD to expand spectrum sharing and to access under-utilized spectrum as recommended by the President's wireless broadband memorandum.

In FY 2010, in response to urgent requests from USCENTCOM, DSO realigned resources within this program element to begin development of a SCOP prototype capability. The prototype will be evaluated by spectrum operational users in COCOMs and MILDEPs to refine requirements and to demonstrate the ability to display multiple sets of data, each organized by frequency.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: JSC Data and Data Software (formally called Spectrum Knowledge Resources)	6.828	6.953	7.952	-	7.952
Description: The JSC Data and Data Software (JDADS) program supports development of spectrum modeling and simulation capabilities, spectrum database development, and spectrum data transformation and					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
standardization. This program provides the Combatant Commands and Military Services with the spectrum management tools and associated databases to manage spectrum resources at the strategic and operational level. It also provides the DoD acquisition community with tools to conduct Electromagnetic Environmental Effects (E3) evaluations and spectrum supportability risk assessments. ***FY 2010 Accomplishments:*** FY 2010 software development initiatives eliminated the need for the majority of the current suite of data mapping tools. DSO developed enhanced tools that will enable analysts and engineers to conduct thorough, valid, and cost effective E3 evaluations and spectrum supportability risk assessments. The tools range from shared common services registered with Net-Centric Enterprise Services (NCES) and accessible by other authorized services (such as an electromagnetic propagation service subscribed to by communication planning services), to an orchestrated set of web services that provide capabilities to conduct E3 assessments for a specific platform or installation. The capabilities developed replace and enhance the existing Joint E3 Evaluation Tool (JEET), which was a stand alone tool distributed by CD-ROM. JDADS database was also expanded to include all known United States and coalition communications and electronic equipment in the Afghanistan theater. DSO provided SPECTRUM XXI software updates. SPECTRUM XXI provides the warfighter the capability to deconflict spectrum dependent devices, facilitates the spectrum management workflow and business process, and provides a common spectrum use database for the warfighter. ***FY 2011 Plans:*** In FY 2011, a version of Joint Data Access Web Server (JDAWS) will be developed and will improve data sharing with NATO. This effort also implements interface enhancements to accommodate evolving DoD and NATO spectrum data standard changes. FY 2011 efforts also include the development and initial deployment of the SPECTRUM XXI Online (SXXI-O) infrastructure to spectrum managers in the Military Departments (MILDEPs) and COCOMs. SXXI-O capabilities provide a set of enhanced frequency nomination and assignment algorithms and associated default data that affords the opportunity to make more spectrally efficient assignments while precluding co-channel and adjacent signal interference. ***FY 2012 Base Plans:*** JDADS FY 2012 resources will migrate capabilities to new hardware and operating environments and will implement the evolving DoD and NATO spectrum data standard in all aspects of the JDADS program. Additional background environment data sources will be developed and the program will implement enhanced monitoring transactions with Military Departments' (MILDEPs) systems. All developed capabilities will be					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
documented and tested by subject matter users before being hosted at a Defense Enterprise Computing Center(DECC) site. SXXI-O will continue to be enhanced and deployed to spectrum managers in MILDEPs and Combatant Commands (COCOMS).					
Title: DoD E3 Program	3.068	3.107	3.200	-	3.200
Description: The DoD Electromagnetic Environmental Effects (E3) Program supports the Joint Capabilities Integration and Development System (JCIDS) process and the DoD acquisition process to ensure that E3 control and Spectrum Supportability (SS) are incorporated into the development, testing, and procurement of information technology and National Security Systems. The E3 Program also supports the development of the Joint Ordnance E3 Risk Assessment Database (JOERAD) and Hazards of Electromagnetic Radiation to Ordnance (HERO) electromagnetic environmental effects (EME) surveys in support of the COCOMS and Joint Task Forces (JTF). JOERAD develops algorithms and provides analytical capabilities to perform real-time risk assessments to evaluate platform/system safety and identify equipment limitations in the operational EM environment. JOERAD enables operators to make critical decisions about the hazards associated with the use of ordnance within complex EM environments. ***FY 2010 Accomplishments:*** DSO continued to provide HERO Impact Assessments, forward deployed EME surveys, and JOERAD shipboard installations. DSO also delivered JOERAD version 9.5 and initiated conversion of JOERAD to a network-connected capability, JOERAD version 10.0. JOERAD 10.0 will provide an automated data update capability for users that are connected to the SIPRNET and data updates will be delivered in the DoD approved spectrum standard data format. Network certifications for JOERAD for Army and Air Force networks were completed. DSO completed over 400 critical research/analysis efforts supporting DoD acquisitions. ***FY 2011 Plans:*** FY 2011 resources continue the conversion of JOERAD to a network-connected capability, JOERAD 10.0, incorporating data improvements. Three shipboard installations, training and validation of CONUS based emitter complement for JOERAD will also be completed in FY 2011 along with HERO Impact Assessments and forward deployed EME surveys. DSO will continue development of approximately 400 critical research/analysis efforts supporting DoD acquisitions. ***FY 2012 Base Plans:*** FY 2012 resources will complete development of JOERAD 10.0 and complete development of an improved ordnance safety database. JOERAD 10.0 will undergo testing and begin deployment and training. DSO will					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
conduct CONUS base emitter surveys for ordnance safety database validation. DSO will develop enhanced Ordnance radio frequency (RF) safety requirements for DoD. DSO will continue development of approximately 400 critical research/analysis efforts supporting DoD acquisitions.					
Title: Emerging Spectrum Technologies (EST) ***Description:*** DSO has the responsibility to investigate emerging spectrum related technologies and evaluate their applicability to improve future warfighter EM spectrum utilization through technological innovation. The goal of the EST program is to identify the opportunities and risks associated with emerging spectrum-related technologies in the early stages of the technology development, influence and lead technology development in order to maximize DoD spectrum utilization, and ensure that spectrum policies incorporate optimal technology to meet DoD mission requirements. Within EST there has been an increased focus on Dynamic Spectrum Access (DSA). DSA is realized through wireless networking architectures and technologies that enable wireless devices to dynamically adapt their spectrum access according to criteria such as policy constraints, spectrum availability, propagation environment, and application performance requirements. ***FY 2010 Accomplishments:*** FY 2010 funds completed research in “hidden node” challenges associated with the spectrum sensing function of DSA and the scalability of ad-hoc DSA-enabled networks. DSA efforts also focused on research and development of a framework to support deployment of DSA-enabled systems. Research into a federated architecture for DSA radios was initiated. The Spectrum Scorecard was modified to address sensor and electronic warfare spectrum dependent systems. ***FY 2011 Plans:*** FY 2011 funds focus DSA research on spectrum sharing techniques and interference mitigation approaches in general, and specific to advanced radar systems. DSA research efforts initiated in FY 2010 will be completed. DSO will develop a framework and technical parameters to demonstrate the effective coexistence of DSA enabled radios with legacy systems. DSO will also develop extensions to evolving DoD and NATO spectrum data standards allowing for control of DSA capable systems. ***FY 2012 Base Plans:*** In FY 2012, DSO, in coordination and collaboration with the MILDEPs and the National Telecommunications and Information Administration (NTIA), will initiate development of the revised spectrum certification process	3.433	3.715	4.474	-	4.474

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
for dynamic spectrum access (DSA) capable systems, including procedures for demonstrating the ability to effectively coexist with legacy systems. DSO will expand the coordination between the various entities developing tools for spectrum and network management to ensure that capabilities needed to effectively manage DSA enabled systems are available within those tools. DSO will research utilizing advanced situational-aware technologies to enable expanded spectrum sharing with commercial systems to mitigate potential impacts from the national broadband expansion, and unlock under-utilized spectrum as recommended in the President's wireless broadband memo. DSO will continue to track emerging technologies and will publish two Technology Tracking Reports describing spectrum technology implications to DoD.					
Title: Spectrum Data Sharing Capability ***Description:*** FY 2011 funds will initiate an authoritative data source for the Department's spectrum management (SM) information and an automated spectrum data capture and quality control process. The spectrum data enhancement will develop the data sharing solution to US Central Command's (USCENTCOM) Joint Urgent Operational Need (JUON) 06-53745201-00, Radio Frequency Spectrum Management. This enhancement will: provide accurate data for automated Counter Radio Electronic Warfare (CREW) deconfliction and spectrum inventory calculation; enable automated data capture; automate data access capabilities; provide business process engines of oversight and quality control; and enable interoperability with NATO. ***FY 2010 Accomplishments:*** N/A. ***FY 2011 Plans:*** FY 2011 resources will enhance the Spectrum Data Capture tool, Stepstone, to include upgrade to the evolving DoD and NATO spectrum data standard and will establish a transactional data repository for equipment parameters. A statistical assessment capability will be prototyped for the Data Quality Assessments (DQA) capability. Development will begin on federation of E-Space data assets and federation of emerging Global Force Management with common query and service interface capabilities. An Attribute Based Access Control (ABAC) capability will also be acquired in FY 2011. ***FY 2012 Base Plans:*** FY 2012 funds will transition Stepstone version 3.0 to the capability to be hosted on the SIPRNET at a DECC site, and the Joint Spectrum Data Repository (JSDR) Service Interface (SI) will be updated to import data directly from Stepstone to the JSDR. Business process management work flow will be integrated to manage and track Stepstone records. Under the DQA effort, the FY 2011 prototype statistical assessment capability will be	-	4.500	5.500	-	5.500

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
expanded and a prototype assessment capability will be developed along with supporting Service Interface for Stepstone. A data default Service Interface will be developed for SXXI-O. Under the ABAC effort, a prototype implementation of the spectrum ABAC will be developed and applied to Stepstone and JSDR to augment the current AKO Single Sign On (SSO) method and provide role based access. A prototype ABAC attribute database and maintenance capabilities will be developed. All developed capabilities will be tested by subject matter users before being hosted at a DECC site.					
Title: Global Electromagnetic Spectrum Information System (GEMSIS) ***FY 2010 Accomplishments:*** In FY 2010, GEMSIS achieved Milestone C and Fielding Decision for the Coalition Joint Spectrum Management Planning Tool (CJSMPT) Joint Capability Technology Demonstration (JCTD) approved capabilities and began transition of CJMSPT into GEMSIS Increment 1. DSO began design and development of an on-line training program structure for GEMSIS Increments. DSO developed, tested, and deployed Host Nation Spectrum Worldwide Database Online (HNSWDO) version 3.1.3, which improved system effectiveness and usability by resolving latency issues. The GEMSIS Catalog of Services architecture design was finalized and the initial catalog piloted and demonstrated to the user community. ***FY 2011 Plans:*** In FY 2011, DSO finalizes the GEMSIS Catalog of Services architecture and infrastructure standards and will prepare for Milestone B or C for GEMSIS Increment 2. DSO will develop, test, and deploy HNSWDO version 3.1.5 which will allow transition of HNSWDO to a DECC. DSO will develop, test, and deploy CJSMPT version 2.1.2, which expands the software capabilities for broader COCOM applicability. ***FY 2012 Base Plans:*** In FY 2012, Defense Spectrum Organization will implement Increment 2 to transition, modify, integrate, test and then field a much more real-time spectrum management tool to DoD operational users. Increment 2 will provide for much more dynamic management of spectrum assets in operational theaters and enable Commanders at all levels to make better decision on the deployment of spectrum assets.	4.250	1.716	7.528	-	7.528
Title: Spectrum Common Operating Picture (SCOP) ***Description:*** Spectrum Common Operating Picture (SCOP) will provide an automated end-to-end capability to pull together all of the spectrum and other related data sets currently used to support spectrum planning and operations, and layer this data to provide a clear visualization of the spectrum environment, similar to	1.000	1.000	0.500	-	0.500

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
how a Geographic Information System (GIS) layers geospatial and related data. There is no comprehensive automated tool or service available today that allows decision makers to set priorities with the benefit of a common display of timely and relevant spectrum information. The proposed capability would provide operational and tactical planners and commanders in the field with a comprehensive layered picture of spectrum use through a Service Oriented Architecture-based web service tied to a GIS driven by robust, accurate information. Current manual and time intensive data gathering, correlation and visualization methods are not responsive to operational requirements and place undue risk to warfighters and mission accomplishment. SCOP will substantially reduce analysis and presentation time, from weeks/days to minutes/seconds. That situational awareness will enable real time decisions based on the area of operation and mission planning factors, resulting in more effective mission planning for the spectrum management community as well as for operations planners, electronic warfare planners, and intelligence collection. ***FY 2010 Accomplishments:*** In FY 2010, in response to urgent requests from USCENTCOM, DSO realigned resources within this program element to begin development of a SCOP prototype capability. The prototype will be evaluated by spectrum operational users in COCOMs and MILDEPs to refine requirements and to demonstrate the ability to display multiple sets of data, each organized by frequency. ***FY 2011 Plans:*** FY 2011 resources will complete software development efforts that will enhance the SCOP prototype into an operational capability and complete development of the visualization engine and web application. Funds will also support testing and initial training. ***FY 2012 Base Plans:*** In 2012, DSO will deploy the Initial Operational Capability (IOC) version of SCOP to DoD's spectrum operational community. Additional software development will begin enhancements required to achieve the Full Operational Capability (FOC) version of SCOP.					
Accomplishments/Planned Programs Subtotals	18.579	20.991	29.154	-	29.154

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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• O&M, DW/PE 0303153K: *O&M, DW*	28.273	32.404	41.379	0.200	41.579	42.879	44.457	45.299	45.859	Continuing	Continuing
• Procurement, DW/PE 0303153K: *Procurement, DW*	0.490	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.490	0.490

D. Acquisition Strategy

Engineering support services for DSO are provided by the use of a contract. No in-house government capability exists, nor is it practical to develop one that can provide the expertise necessary to fulfill the mission and responsibilities of DSO. Full and open competition was used for the acquisition of the current contract with ITT Industries, Inc. GEMSIS' acquisition approach is to obtain capabilities by adopting existing capabilities, buying commercial products, or developing new capabilities by delivering incrementally within the context of a streamlined and adaptive acquisition approach.

E. Performance Metrics

1. Formal Earned Value Measurement System (EVMS) measures will be applied to large software development efforts
2. On-time software version releases
3. Software development PCRs closed on schedule
4. On-time deployments to users
5. Number of spectrum data sources added
6. Percent quality improvement of spectrum data
7. Percent increase of user access to spectrum data via web services

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Defense Information Systems Agency		DATE: February 2011
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Engineering Services 1	C/CPIF	ITT Industries, Inc:ITT Industries, Inc	60.232	19.836	Oct 2010	27.848	Oct 2011	-		27.848	Continuing	Continuing	Continuing
Technical Engineering Services 2	MIPR	Various:Various	2.171	0.334		0.345		-		0.345	Continuing	Continuing	Continuing
		Subtotal	62.403	20.170		28.193		-		28.193			

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	MIPR	JTIC:Ft. Huachuca	1.052	0.160		0.300		-		0.300	Continuing	Continuing	Continuing
		Subtotal	1.052	0.160		0.300		-		0.300			

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	FFRDC	MITRE:MITRE	4.829	0.661	Nov 2010	0.661	Nov 2011	-		0.661	Continuing	Continuing	Continuing
		Subtotal	4.829	0.661		0.661		-		0.661			

	Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	68.284	20.991		29.154		-		29.154			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Defense Information Systems Agency		DATE: February 2011
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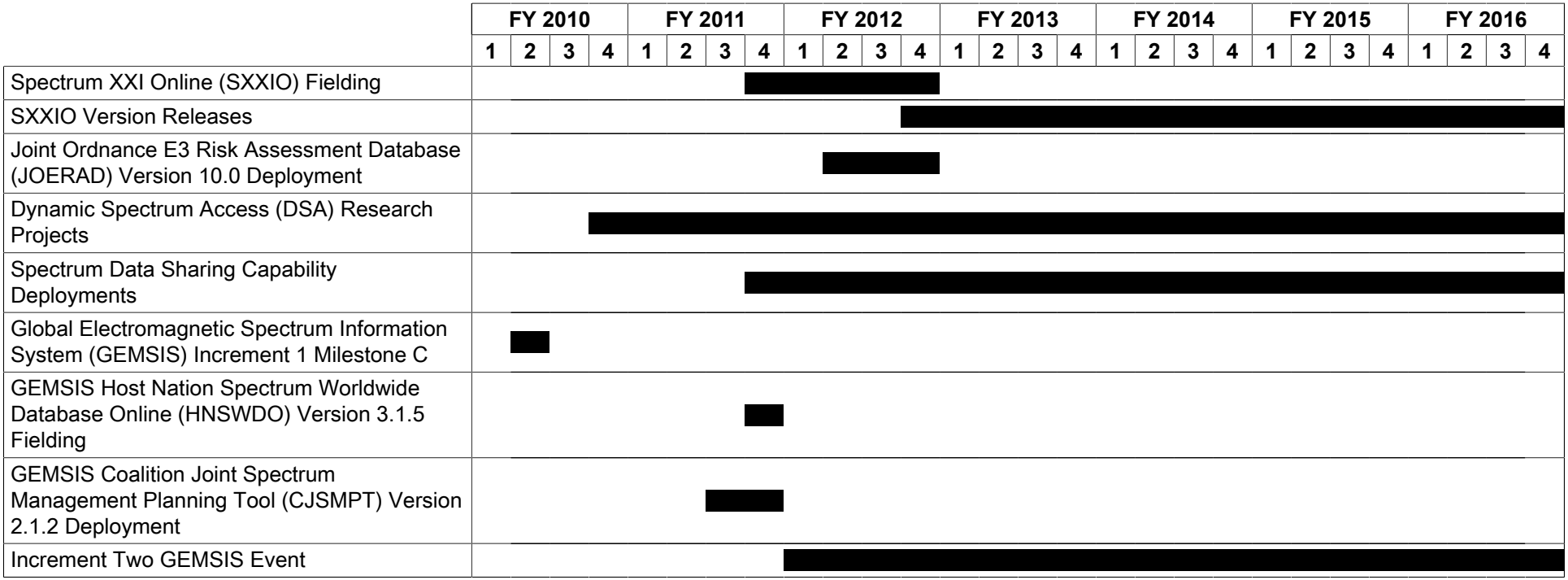

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Defense Information Systems Agency		DATE: February 2011
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Spectrum XXI Online (SXXIO) Fielding	4	2011	4	2012
SXXIO Version Releases	4	2012	4	2016
Joint Ordnance E3 Risk Assessment Database (JOERAD) Version 10.0 Deployment	2	2012	4	2012
Dynamic Spectrum Access (DSA) Research Projects	4	2010	4	2016
Spectrum Data Sharing Capability Deployments	4	2011	4	2016
Global Electromagnetic Spectrum Information System (GEMSIS) Increment 1 Milestone C	2	2010	2	2010
GEMSIS Host Nation Spectrum Worldwide Database Online (HNSWDO) Version 3.1.5 Fielding	4	2011	4	2011
GEMSIS Coalition Joint Spectrum Management Planning Tool (CJSMPT) Version 2.1.2 Deployment	3	2011	4	2011
Increment Two GEMSIS Event	1	2012	4	2016