Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Information Systems Agency	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303153K / *Defense Spectrum Organization*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	184.265	8.377	7.457	21.698	-	21.698	9.836	9.251	8.292	8.446	Continuing	Continuing
JS1: *Joint Spectrum Center*	184.265	8.377	7.457	21.698	-	21.698	9.836	9.251	8.292	8.446	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Defense Spectrum Organization (DSO) 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. These services/capabilities are in direct support of Combatant Commanders, the Department of Defense (DoD) Chief Information Officer, Military Services, and Defense Agencies. The DSO is the focal point 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. Electromagnetic Spectrum Management enables information dominance through effective spectrum operations.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	8.750	7.570	9.698	-	9.698
Current President's Budget	8.377	7.457	21.698	-	21.698
Total Adjustments	-0.373	-0.113	12.000	-	12.000
• Congressional General Reductions	-0.044	-0.113			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.259	-			
• Adjustment	-0.070	-	12.000	-	12.000

Change Summary Explanation

The decrease of -$0.373 in FY 2018 reflects a transfer of funding to Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs (-$0.259), a congressional general reduction for the Federally Funded Research and Development Centers (FFRDC) of -$0.044, and decrease of -$0.070 that will result in fewer Hazards of Electromagnetic Radiation to Ordnance (HERO) electromagnetic environmental effects surveys conducted.

The decrease of -$0.113 in FY 2019 is due to a congressional general reduction (FFRDC).

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Information Systems Agency	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303153K *I Defense Spectrum Organization*

The increase of +$12.000 in FY 2020 is to begin foundational efforts in support of electromagnetic (EM) battle management (EMBM) to enable effective joint electromagnetic spectrum (EMS) operations. The funds support the integration of data feeds and analytics with the Joint Spectrum Data Repository (JSDR) to provide holistic spectrum situational awareness and are critical to understanding the EM operating environment and to inform military decision-makers. Spectrum maneuverability will be critical to future military operations engaging near-peer adversaries and will be dependent on a clear understanding of the spectrum operational environment.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Information Systems Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0303153K / *Defense Spectrum Organization*	Project (Number/Name) JS1 / *Joint Spectrum Center*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
JS1: *Joint Spectrum Center*	184.265	8.377	7.457	21.698	-	21.698	9.836	9.251	8.292	8.446	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Spectrum Center (JSC), which is a division of Defense Spectrum Organization (DSO), designs, develops, and maintains Department of Defense (DoD) automated spectrum management systems, evaluation tools, and databases. The 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 (EME). Additional efforts focus on improving future warfighter EM spectrum utilization through technological innovation, and influencing research and development emerging technology efforts.

Improved spectrum support includes the Global Electromagnetic Spectrum Information System (GEMSIS), 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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Advanced Spectrum Tools	0.883	0.883	0.883
Description: The Joint Spectrum Data Repository and Tools program supports development of spectrum management tools, spectrum modeling and simulation capabilities, spectrum database development, and spectrum data transformation and standardization. This program provides the Combatant Commands (COCOMs) 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 analytical tools to conduct Electromagnetic Environmental Effects (E3) analyses and Spectrum Supportability Risk Assessments (SSRA).			
FY 2019 Plans: Will continue to make enhancements to Spectrum Technology and Testbed Initiative in support of Spectrum Engineering Analysis and Relocation efforts. Supports evaluation of future and existing spectrum analysis tools.			
FY 2020 Plans: Will continue to make enhancements to Spectrum Technology and Testbed Initiative in support of Spectrum Engineering Analysis and Relocation efforts. Supports evaluation of future and existing spectrum analysis tools.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Information Systems Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0303153K / *Defense Spectrum Organization*	**Project (Number/Name)** JS1 / *Joint Spectrum Center*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
No change statement required.			
Title: DoD Electromagnetic Environmental Effects (E3) Program	3.315	3.315	4.203
Description: The DoD 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 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 surveys in support of the COCOMs and Joint Task Forces. 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. A SSRA is performed by program managers and materiel developers on all programs that are acquiring or incorporating spectrum-dependent systems or equipment per DoDI 4650.1. These assessments encompassed regulatory, technical, and operational spectrum and E3 issues and associated risks. ***FY 2019 Plans:*** Will continue to conduct Joint Ordnance Commanders Group (JOCG) HERO Subgroup meetings, support the JOCG Executive Steering Committee and develop and maintain the Services' HERO susceptibility data records. Will conduct forward deployed base HERO surveys for the COCOMs/Services, and CONUS based equipment which emits radio frequencies (emitter) surveys for ordnance safety database validation and update the DoD ordnance Radio Frequency (RF) safety requirements. Will update MIL-HDBK-235, "Electromagnetic Environment (EME) Profiles" and develop EME (profiles to address blue force jammer and electronic warfare environments. Will conduct monthly DoD E3 Integrated Product Team (IPT) Meetings. Will provide technical support to DoD CIO, the Joint Staff, and other DoD Components on E3, spectrum, hazards of EM radiation matters. Will review JCIDS and Information Support Plan (ISP) acquisition documents assigned by the Joint Staff and DoD CIO and update guidance instructions as necessary. Will provide E3 and SS training to the DoD Components and develop/maintain training curricula at the Defense Acquisition University. ***FY 2020 Plans:*** Will continue to conduct JOCG HERO Subgroup meetings, support the JOCG Executive Steering Committee and develop and maintain the Services' HERO susceptibility data records. Will conduct forward deployed base HERO surveys for the COCOMs/Services, and CONUS based emitter surveys for ordnance safety database validation and update the DoD ordnance RF safety requirements. Will update MIL-HDBK-235, "EME Profiles" and develop EME profiles to address blue force jammer and electronic warfare environments. Will conduct monthly DoD E3 Integrated Product Team (IPT) Meetings. Will provide technical support to DoD CIO, the Joint Staff, and other DoD Components on E3, spectrum, hazards of EM radiation matters. Will review JCIDS and			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Information Systems Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0303153K / *Defense Spectrum Organization*	**Project (Number/Name)** JS1 / *Joint Spectrum Center*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
ISP acquisition documents assigned by the Joint Staff and DoD CIO and update guidance instructions as necessary. Will provide E3 and SS training to the DoD Components and develop/maintain training curricula at the Defense Acquisition University. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The increase of +$0.888 from FY 2019 to FY 2020 is attributed to additional forward deployed base HERO surveys for COCOMs/ Services and any CONUS based emitter surveys for ordnance safety database validation. This will also allow for an increase in the number of E3 and SS training events delivered to DoD Components.			
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 is 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 2019 Plans:*** Will continue collaboration efforts with the Science and Technology community (including Assistant Secretary of Defense fore Research and Engineering (ASDR&E), Service Labs and Defense Advance Research Projects Agency (DARPA)) to develop and execute the technology roadmaps and integration strategies that result in system flexibility and operational agility. Revisions will be made to the current spectrum management architecture to reflect transforming spectrum operations through application of EST in accordance with the new DoD EMS Spectrum Strategy. Prototype capabilities that provide increased operational agility will be developed and demonstrated. Continue to develop initiatives that include the roadmap, standards, architecture, and business processes to exploit and/or minimize the impact of emerging technologies on DoD spectrum operations. ***FY 2020 Plans:*** Will continue collaboration efforts with the Science and Technology community (including ASDR&E, Service Labs and DARPA) to develop and execute the technology roadmaps and integration strategies that result in system flexibility and operational agility. Revisions will be made to the current spectrum management architecture to reflect transforming spectrum operations through application of EST in accordance with the new DoD EMS Spectrum Strategy. Prototype capabilities that provide increased operational agility will be developed and demonstrated. Will continue to develop initiatives including the roadmap,	3.342	2.453	3.800

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Information Systems Agency		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
standards, architecture, and business processes to exploit and/or minimize the impact of emerging technologies on DoD spectrum operations. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The increase of +$1.347 from FY 2019 to FY 2020 is due to an increase in the number of prototype assessments that will be accomplished during FY 2020.			
Title: Global Electromagnetic Spectrum Information System (GEMSIS) ***Description:*** The GEMSIS is a net centric capability that will provide operational 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. ***FY 2019 Plans:*** Will continue SPECTRUM XXI (SXXI) Legacy, End-to-End Supportability System (E2ESS), and Joint Spectrum Data Repository (JSDR) maintenance and version releases. ***FY 2020 Plans:*** Will continue SXXI Legacy, E2ESS, and JSDR maintenance and version releases. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The increase of +$12.006 in FY 2019 to 2020 is due to adjustments in contract requirements to support software version releases and to begin foundational electromagnetic (EM) battle management (EMBM) efforts to enable effective joint electromagnetic spectrum (EMS) operations.	0.837	0.806	12.812
Accomplishments/Planned Programs Subtotals	8.377	7.457	21.698

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• O&M, DW/PE 0303153K: *O&M, DW*	34.392	34.409	34.270	-	34.270	34.902	35.743	36.408	36.930	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Information Systems Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0303153K / *Defense Spectrum Organization*	**Project (Number/Name)** JS1 / *Joint Spectrum Center*

D. Acquisition Strategy

Engineering support services 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 current contract with EXELIS, 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. Provide engineering support to DoD Components to ensure E3 and spectrum supportability requirements are addressed during the acquisition life-cycle meeting at least 90% of program suspenses.
2. Execute effective emerging spectrum technologies evaluation process that generates timely and relevant products evaluating at least 3 technologies per quarter.
3. Provide technical E3 and spectrum engineering support upon request from the Combatant Commands, their components and the Military Services with a minimum 98% response rate.
4. Develop an operational Joint spectrum management system that delivers at least 90% of products on schedule in accordance with objective scheduled events and deliverables as approved in the Acquisition Program Baseline- Schedule Status of systems.

All metric results are classified.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Information Systems Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0303153K / *Defense Spectrum Organization*	Project (Number/Name) JS1 / *Joint Spectrum Center*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Engineering Services 1	C/FFP	Multi : Various	167.451	8.051	Oct 2017	7.127	Oct 2018	9.368	Nov 2019	-		9.368	Continuing	Continuing	Continuing
Technical Engineering Services 2	MIPR	Various : Various	5.443	0.326	Oct 2017	0.330	Oct 2018	12.000	Oct 2019	-		12.000	Continuing	Continuing	Continuing
		Subtotal	172.894	8.377		7.457		21.368		-		21.368	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	MIPR	JITC : Ft. Huachuca	2.312	-		-		-		-		-	0.000	2.312	-
		Subtotal	2.312	-		-		-		-		-	0.000	2.312	N/A

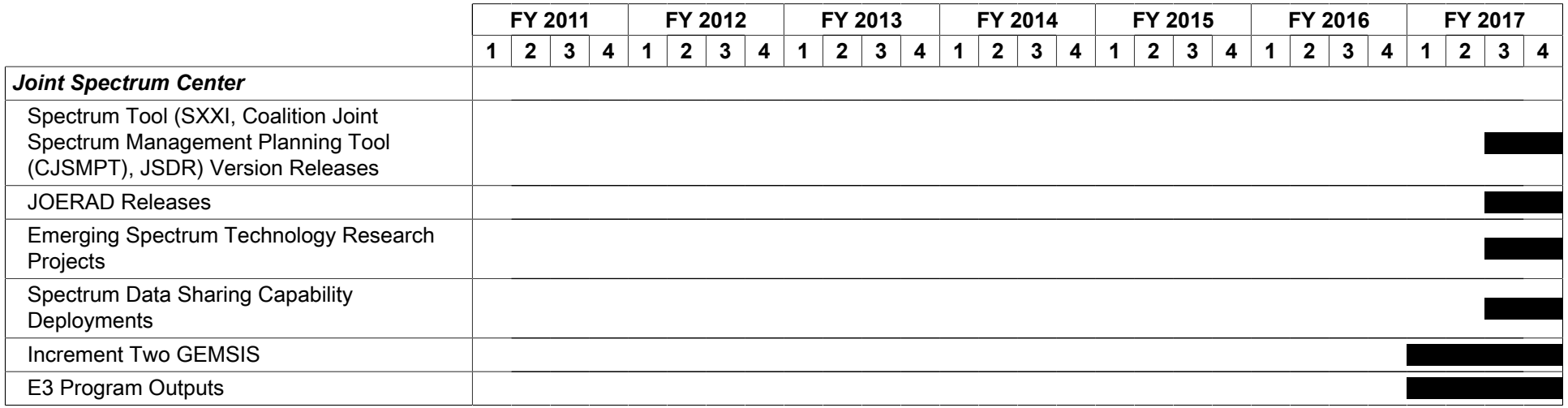
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	FFRDC	MITRE : Ft. Monmouth, NJ	9.059	-		-		0.330	Nov 2019	-		0.330	Continuing	Continuing	Continuing
		Subtotal	9.059	-		-		0.330		-		0.330	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	184.265	8.377		7.457		21.698		-		21.698	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Information Systems Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0303153K / *Defense Spectrum Organization*	**Project (Number/Name)** JS1 / *Joint Spectrum Center*



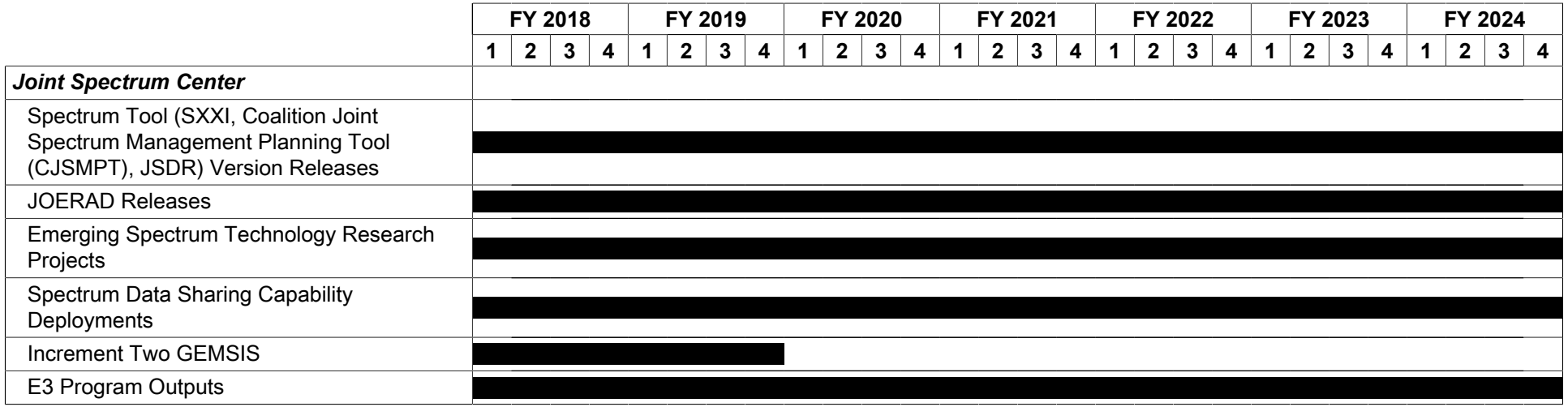


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Defense Information Systems Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0303153K / *Defense Spectrum Organization*	**Project (Number/Name)** JS1 / *Joint Spectrum Center*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Joint Spectrum Center				
Spectrum Tool (SXXI, Coalition Joint Spectrum Management Planning Tool (CJSMPT), JSDR) Version Releases	3	2017	4	2024
JOERAD Releases	3	2017	4	2024
Emerging Spectrum Technology Research Projects	3	2017	4	2024
Spectrum Data Sharing Capability Deployments	3	2017	4	2024
Increment Two GEMSIS	1	2017	4	2019
E3 Program Outputs	1	2017	4	2024