Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Defense Information Systems Agency	Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	152.272	19.307	13.197	8.750	-	8.750	9.073	9.128	9.352	9.574	Continuing	Continuing
JS1: *Joint Spectrum Center*	152.272	19.307	13.197	8.750	-	8.750	9.073	9.128	9.352	9.574	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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	20.298	13.197	9.539	-	9.539
Current President's Budget	19.307	13.197	8.750	-	8.750
Total Adjustments	-0.991	0.000	-0.789	-	-0.789
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments	-0.991	-	-0.789	-	-0.789

Change Summary Explanation

The decrease of -$0.789 in FY 2018 is attributable to a reduced number of Hazards of Electromagnetic Radiation to Ordnance (HERO) surveys in support of forward deployed forces, number of ordnance susceptibility information updates and acquisition program reviews. Part of the overall decrease (-$0.328) is attributed to the Service Requirements Review Board (SSRB) contract reduction.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Defense Information Systems Agency			Date: May 2017
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
JS1: *Joint Spectrum Center*	152.272	19.307	13.197	8.750	-	8.750	9.073	9.128	9.352	9.574	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 2016	FY 2017	FY 2018
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 2016 Accomplishments: Enhancements to Spectrum Technology and Test Initiative in support of Spectrum Engineering Analysis and Relocation efforts. Supports evaluation of future and existing spectrum analysis tools.			
FY 2017 Plans: 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 2018 Plans:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
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.			
Title: DoD Electromagnetic Environmental Effects (E3) Program	4.009	0.000	3.315
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 2016 Accomplishments:*** Will convert the JOERAD to a web-enabled application compliant with the Standard Spectrum Resource Format. Will 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 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 2017 Plans:*** N/A The decrease of -$4.009 from FY 2016 to FY 2017 is due to the elimination of the DoD E3 program. Hazards of HERO surveys will be eliminated for Forward Deployed Forces, Ordnance suscepibility information will not be updated, and acquisition program reviews will cease. DSO will no longer develop spectrum management techniques for emerging spectrum technologies. ***FY 2018 Plans:***			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
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 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. The increase of +$3.315 from FY 2017 to FY 2018 supports additional HERO surveys for Forward Deployed Forces, Ordnance suscepibility updates, and acquisition program E3 reviews and guidance.			
Title: Emerging Spectrum Technologies (EST)	3.318	3.251	3.715
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 2016 Accomplishments:*** Will focus on collaboration with the Science and Technology community (including Assistant Security Defense for Research and Engineering (ASDR&E), Service Labs and Defense Advanced Research Projects Agency (DARPA)) to develop and begin execution of 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. The DSA Spectrum Management Roadmap will be updated to include application of DSA in spectrum sharing scenarios. An initial set of Joint standard ontologies for spectrum operations will be developed. ***FY 2017 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			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
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. The decrease of -$0.067 from FY 2016 to FY 2017 will slightly reduce collaboration efforts with Science and Technology communities in developing spectrum technology roadmaps. ***FY 2018 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. 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. The increase of +$0.464 from FY 2017 to FY 2018 will begin examination and impact assessments of the most mature portions of the SAR&DP, STR, and AWS-3 SSTD efforts. Produce specific algorithmic and technique changes associated with specific tools and techniques in current use. Prototype implementations to verify viability and collect metrics on improvements.			
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 2016 Accomplishments:*** GEMSIS Increment Two develops and implements the Integrated Spectrum Desktop enhanced capabilities with integration of improved frequency assignment and spectrum management tools and web services from JSDR, SXXI, End to End Spectrum Supportability (E2ESS), and Coalition Joint Spectrum Management Tool (CJSMPT). Will improve/enhance user interface and deliver the Spectrum dashboard to enable quick access to information and capabilities. Integation efforts will include implementation of E2ESS (Host Nation Spectrum Worldwide Database Online (HNSWDO) and Stepstone capabilities combined),	11.097	9.063	0.837

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
SXXI, JSDR, and CJSMPT maintenance and version releases and other enterprise service integration into the Integrated Spectrum Desktop. ***FY 2017 Plans:*** Continue efforts to enhance the Integrated Spectrum Desktop capabilities and improve the JSDR, SXXI, E2ESS, and CJSMPT to improve user interface within ISD. Integration efforts will continue with E2ESS, SXXI, JSDR, and CJSMPT maintenance and version releases into the ISD. The decrease of -$2.629 from FY 2016 to FY 2017 returns program to planned funding levels to support the development of the backward capable frequency assignment capability through the integration of SXXI and SXXI Legacy. ***FY 2018 Plans:*** Continue SXXI Legacy, E2ESS, and JSDR maintenance and version releases. The decrease of -$7.898 in FY 2018 is due to completion of Increment 2 development efforts. Part of the overall decrease (-$0.328) is attributed to the Service Requirements Review Board (SSRB) contract reduction.			
Accomplishments/Planned Programs Subtotals	19.307	13.197	8.750

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• O&M, DW/PE 0303153K: *O&M, DW*	33.135	33.014	36.408	-	36.408	35.707	36.072	36.067	-	Continuing	Continuing

Remarks

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.

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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.