

Attachment 0001

SYSTEM DESCRIPTIONS

1. System Name: Battle Command Common Services (BCCS) and Tactical Server Infrastructure (TSI)

- a System Manager:** Program Executive Office, Command, Control, and Communications (Tactical) (PEO C3T), Project Manager (PM) Mission Command (MC), Product Director (PD) Strategic Mission Command (SMC)
- b System Proponent:** U.S. Army Combined Arms Center, U.S. Training and Doctrine Command (TRADOC) Capability Manager (TCM) Fort Leavenworth, KS, PM Mission Command
- c System Deployed:** BCCS v3,v4,v4.1,v5
- d System Overview:** Consolidate Army and other programs hardware into one server baseline and provide Automation and Provisioning of Enterprise (Microsoft) and WFA (Warfighter) Applications. Foundation hardware that provides the infrastructure that enables MC systems interoperability, Data Mediation, Data Exchange, Joint addressing, and Tactical Messaging. BCCS provides cross-cutting applications and services to the Command Post Computing Environment (CP CE); known as the CP CE “Glue” that enables Mission Command during Unified Land Operations (ULO).
- e System Interoperates With:** Various software components from PM Mission Command (Common Software, Command Web, etc.), DCGS and WINT. GOTS applications reside on a BCCS Server stack.
- f Other Systems Dependent On:**

Command Web:

Global Command and Control System-Army (GCCS-A), Distributed Common Ground Station Army (DCGS-A), Battle Command Common Services (BCCS)/Tactical Server Infrastructure (TSI), Data Dissemination Service (DDS), Command & Control Infrastructure Virtual Machine (C2I VM), and Tactical Services Security System (TS3).

FBCB2:

Blue Force Tracking (BFT), Network Operations Center (NOC), Tactical Radio Systems, Global Positioning System (GPS)

GCCS-A:

BCCS/TSI, DDS, TS3

Common Software:

BCCS/TSI, DDS, C2I/C2R, TS3, CMP/GTCS, NRTS, SAM

g Software Application Description:

i Language: Powershell/.Net Scripts

ii Source Line of Code: NA.

iii Operating System: Windows 2008 R2, Windows 2012 R2

iv Software Version(s): V3, V4, V5

v COTS: Microsoft AD, SQL, Exchange, Sharepoint, System Center Configuration Manager, System Center Operations Manager, XMPP Chat,

VMware Vsphere

vi GOTS: SCCM Gold Master.

h Software Development Tools/ Applications:

Support Tools/Applications	Description
BCCS Infrastructure:	
Visual Studio	Build scripts for Storage appliances and GUI's
PowerShell	Enterprise Scripts
Norton Ghost	Use for imaging SMC Laptops
VMware-V-sphere 5 essentials/ VMware Workstation 10	Host development and test VMs
Visual Studio	Build scripts for Storage appliances and GUI's

i **Hardware:** The following is a subset of hardware equipment to support and field BCCS/TSI hardware/software requirements. This is not an all-inclusive list.

Test Hardware Resources	Description
-------------------------	-------------

Dell M90, M6300, M6400, M6500, M6600, M6700, M6800	Dell laptops configured to reflect a DIV and/or BDE Tactical Network Architecture
Sun 4100, Sun 4170, Dell DCS1130, Dell R420XR, Dell R430	The blade server supporting BCCS/TSI server stacks, hardware hosting the virtual infrastructure
Cisco 3560G, Dell Nforce, Mellanox	Switch Backbones for BCCS/TSI
Netapp 2020, 2040, 2240, 2552, Dell Equallogic RAID 6210x	Storage appliance to host all virtual machines for either BCCS or TSI, Network Attached Storage device
XFR 6400	DDS Server Blades
HP Elitebook 8560p	COTs laptops used for development and testing
Lenovo W520	COTs laptops used for development and testing
Mounted Family of Computer Systems (MFoCS) Basic and Intermediate	Ruggedized computing hardware for Mounted Computing Environment
JV-5	Legacy ruggedized computing hardware
MRT+	Legacy ruggedized computing hardware

j. Software Sustainment and Maintenance:

- i. Sustain BCCS 5.0.3 & 5.0.4 (Historical)
 - Number of specifications analyzed: 0
 - Number of Latent Defects implemented: IAVA's
 - Number of New capabilities implemented: 0
 - Deliverables:
 - Test Report
 - Test Plan
 - Configuration Management Plan
 - Software Release Plan
 - Meeting Minutes
 - Trip Reports
 - Risk Management Framework Documentation
 - Cybersecurity Software Release Updates
 - IAVA Technical Bulletin (TB)
 - IAVA Monthly Updates

- IAVA Quarterly Updates
 - Software Version Description
 - Source Code
 - Software User Manual
 - Training Manual
 - Specifications
 - Software Change Request
 - Schedules
- ii. Sustain Version BCCS 5.0.6/TSI 1.0.3 (FY19)
 - Number of specifications: 0
 - Number of Latent Defects to be implemented: IAVA's
 - Number of New capabilities to be implemented: 0
 - Deliverables:
 - Test Report
 - Test Plan
 - Configuration Management Plan
 - Software Release Plan
 - Meeting Minutes
 - Trip Reports
 - Risk Management Framework Documentation
 - Cybersecurity Software Release Updates
 - IAVA Technical Bulletin (TB)
 - IAVA Monthly Updates
 - IAVA Quarterly Updates
 - Software Version Description
 - Source Code
 - Software User Manual
 - Training Manual
 - Specifications
 - Software Change Request
 - Schedules

k. System and Software Acquisition Support: N/A

Tactical Server Infrastructure (TSI) - See BCCS. TSI is the next generation of BCCS to be fielded with Common Operating Environment Version 3 (COE V3). The Common Operating Environment (COE) is an approved set of computing technologies and standards that enable secure and interoperable applications to be rapidly developed and executed across a variety of Computing Environments. The goals of the COE are to standardize end-user environments,

standardize software development kits, establish streamlined enterprise software processes that rely on common pre-certified reusable software components and develop deployment strategies that give users direct access to new capabilities. COE Version 3 (COE V3) looks to ensure that all Computing Environments (CEs) and organization are operating from a common set of map data as well as utilizing common geospatial standards and data products. COE V3 also includes the integration of initial unified data strategy. COE V3 comprises of training that is less complex and more sustainable.

Tactical Defense Cyberspace Operations Infrastructure (TDI) - will enable the Army to better array cyberspace defenders and capabilities locally, regionally, and globally by providing operational and tactical commanders a DCO warfighting capability that enables various cyberspace defenders to engage and initiate a tactical operation against cyber threats and vulnerabilities either remotely or onsite within key cyberspace terrain and/or tasked critical assets. The TDI offers dedicated, prepositioned, forward storage and compute resources needed to host virtualized platforms that are physically integrated with either the SIPRNet, or other mission networks (MPE) – ready at the time of need in high/extremely high risk environments. The TDI will facilitate the generation of transformational defensive effects in cyberspace from the strategic level to the tactical edge through the delivery of mission protection, discovery/counter-infiltration, cyberspace support, cyberspace readiness, and threat emulation capabilities.

2. **System Name:** Mission Command – Common Software (MC-CS)

- a. **System Manager:** Program Executive Office, Command, Control, and Communications (Tactical) (PEO C3T), Project Manager (PM) Mission Command (MC). The Communication Electronics Command (CECOM)

Software Engineering Center (SEC) C3T provides Post Production Software Support (PPSS) in sustainment.

- b. **System Proponent:** U.S. Army Combined Arms Center, U.S. Training and Doctrine Command (TRADOC) Capability Manager (TCM) Fort Leavenworth, KS, PM Mission Command
- c. **System Deployed:** The Common Software product suite of applications is utilized and deployed in various Battle Command Application. For Battle Command Common Services (BCCS) which is operational on approximately 700 servers in the 82nd ABN DIV, 101st ASSLT, 10th MTN DIV, 3rd ID, 4th ID, 1st CAV, SBCTs, USFK, National Guard units, Army schools, training centers, and battle laboratories. DDS has 2 systems fielded (DDS 1.7.1 P2, DDS 1.7.1.1). Not applicable for TS3 as it is an SDK other WFA's integrate into their own system.
- d. **System Overview:** Foundation software that provides the software infrastructure which enables MC system interoperability, Data Mediation, Data Exchange, Joint addressing, and Tactical Messaging. Common Software provides cross-cutting applications and services known as the "Glue" that enables Mission Command. MC-CS includes: Common Message Processor (CMP), DDS Client Interface (DCI), Command and Control Registry (C2R), Data Dissemination Service (DDS), SIGACTS Manager (SAM), Near Real Time Server (NRTS), Ground Tactical Communication Services (GTCS), Command and Control Infrastructure (C2I), Tactical Services Security System (TS3)
 - **Common Message Processor (CMP), Client -** is a generic military message processor for tactical systems that can prepare, receive, analyze, and validate military standard (MIL-STD) message baselines in either text-based (e.g., Message Text Format) or binary (e.g., Variable Message Format) format. It can identify errors in message structure, content and context as per the associated MIL-STD specifications. Currently, the CMP provides these services for many MIL-STD and system-specific header and message specifications, including annual revisions for a total of more than 30 supported baselines. The CMP software product is one component of the Army's CS Program. The CMP provides several processes and several client Graphical User Interface (GUI) applications as well as an extensive Java and C/C++ API that provide many capabilities to the CMP user, system integrator and application developer. The two primary graphical applications include the Message Editor and the Message Center. The Message Editor may be invoked from the Message Center or as a stand-alone. It provides the user with the capability to interactively create and edit messages in accordance

with military messaging standards. The Message Center provides the user with a client/server connection to the Journal Server to provide a method of monitoring all incoming and outgoing messages.

- **Data Dissemination Service (DDS) Client Interface (DCI)** - the DCI interface allows Army Battle Command Systems to connect to DDS to publish and subscribe situation awareness data for all capability set data categories across all software baselines, from live friendly and enemy position reports to static data. The DCI provides the capabilities to connect to a DDS Servers. DCI also provides the user with the ability to perform the following actions:
 - Subscribe to advertisements on the DDS server
 - Create, view, and remove user's subscriptions on the DDS Server
 - Query data based on constructed criteria
 - View and create advertisements on the DDS server
 - Publish data to the user's advertisements on the DDS server
 - Monitor life related event of DDS servers
- **Command and Control Registry (C2R)** - the C2R dynamically and consistently coordinates and collaborates command and control naming, addressing, network structures and configurations, operations, and relationships across many different types of systems potentially deployed globally. It is deployed on Windows platforms in a client/server architecture supporting various computer language application programmable interfaces for access to the data. The C2R is essentially the Address Book for the battlefield, serving as a repository for Command and Control data required to support unit addressing. C2R is used by battlefield applications, system service software (SW), and warfighter personnel of the Army Signal Corps. C2R also supports Joint and Allied interoperability.
- **Data Dissemination Service (DDS)** - the DDS provides a service oriented core Army repository for ABCS supporting reliable and secure dissemination of real time data allowing interoperability between Warfighter Functional Areas (WFAs) via the publish and subscribe concept for building a common picture. The DDS supports Joint and coalition interoperability including support for classification and redaction to meet the Army data dissemination requirements.
- **Significant Activities (SIGACT) Manager (SAM)** - the SAM provides support for Improvised Explosive Device (IED) reporting from Upper and Lower Tactical Internet (TI) for Army Battle Command System (ABCS). It processes SIGACT Events from Command Post of the Future (CPOF) and mediates this data using GOTS products into Variable Message Format (VMF) data for Force XXI Battle Command Brigade and Below (FBCB2) consumption. There is version support for VMF standards with a 47001C Header, as well as Army Software Block

2 (SWB2) and Capability Set 2011-2012 (CS11/12) CS data handling four (4) IED types: Vehicle Borne, Suicide Bomber, Equipment and 'Explosive' IED. Messages are sent on the Situational Awareness (SA) multicast group based upon a group URN and delivered to Ground Tactical Communication Software (GTCS) to be broadcast and vice-versa, the listener receiving multicast data on the same group and publishing CS data to DDS/PASS.

- **Near Real Time Server (NRTS)** - the NRTS provides data dissemination and mediation support for VMF and CS data between Upper and Lower Tactical Internet (TI) for Army Battle Command System (ABCS). NRTS served as a precursor to DDS aggregation proving correlation and deconfliction to Situational Awareness (SA) Position Reports to live data via VMF generation. It also processed Field Artillery Scatterable Mines (FASCAM) messages for mine reporting. This product supports the Army Software Block 2 (SWB2) and Capability Set 2011-2012 (CS11/12) ABCS baselines. NRTS resided on Upper TI and processed VMF messages from Force XXI Battle Command Brigade and Below (FBCB2) into the Publish and Subscribe Service (PASS) and Data Dissemination Service (DDS).
- **Ground Tactical Communication Services (GTCS)** - the GTCS provides reliable message delivery through Local Area Networks (LAN) and Wide Area Networks (WAN). The GTCS is the host-resident portion of the communications profile, and runs on Microsoft workstations. The GTCS Computer Software Component (CSC) provides message transmission/reception for different environments. Communication via a LAN uses User Datagram Protocol (UDP)/Internet Protocol (IP) and Transport Connection Protocol (TCP) in accordance with (Military Standard) MIL-STD-2045-47001C specification.
- **Command and Control Infrastructure (C2I)** - C2I provides Command and Control Repository (C2R) Server (AD LDS, Web Service and Change Notification Facility) and common messaging/mediation services Common Message Processor (CMP) Server, Ground Tactical Communication Software (GTCS) Server, Command and Control Service Bus (C2SB) including Enterprise Service Bus (ESB) Addressing, Messaging and COMM components, Significant Activities Manager (SAM)/Field Artillery Scatterable Mines (FASCAM) plugin, Data Dissemination Services Client Interface (DCI), Universal Collaboration Bridge (UCB) functionality for BCCS Virtual Infrastructure. C2I consists of several components that together provide a way of dynamically and consistently coordinating and collaborating C2 naming, addressing, network structures and configurations, operations, and relationships across many different types of systems potentially deployed

globally. It also provides the ability for clients to send and receive tactical messages in different environments. Communication via a LAN uses User Datagram Protocol (UDP)/Internet Protocol (IP) and Transport Control Protocol (TCP) in accordance with MIL-STD-2045-47001C specifications.

- **Tactical Services Security System (TS3)** - TS3 is a software developer toolkit which currently contains specific products for securing various web services and web applications by leveraging open source COTS and utilizing the current standards and technologies. TS3 products provide authentication and authorization of users for access to software applications. TS3 is a system not a service.

- e. **System Interoperates With:** Various software components from PM MC (Common Software, Command Web, etc.), Distributed Common Ground Station (DCGS) and Warfighter Information Network-Tactical (WIN-T). GOTS applications reside on a BCCS Server stack. DDS interoperates with Army Battle Command Systems (ABCS) including Advanced Field Artillery Tactical Data System (AFATDS), Force XXI Battle Command Brigade and Below (FBCB2), Tactical Airspace Integration System (TAIS), Command Web, AMDWS, Command Post of the Future (CPOF), Distributed Common Ground System (DCGS), Global Command and Control System-Army (GCCS-A), Command and Control Infrastructure (C2I). Not applicable for TS3 as it is an SDK other WFA's integrate into their own system.

f. **Other Systems Dependent On:**

Command Web:

Global Command and Control System-Army (GCCS-A), DCGS-Army (DCGS-A), BCCS/ Tactical Server Infrastructure (TSI), Data Dissemination Service (DDS), and Tactical Services Security System (TS3).

FBCB2:

Blue Force Tracking (BFT), Network Operations Center (NOC), Tactical Radio Systems, Global Positioning System (GPS)

GCCS-A:

BCCS/TSI, DDS, TS3

Common Software:

BCCS/TSI, DDS, C2I/C2R, TS3, CMP, GTCS, NRTS, SAM

DDS (Microsoft SQL Server/SQL Express, Microsoft Active Directory, Microsoft SCOM Server, BCCS)

TS3 (Not applicable for TS3 as it is an SDK other WFA's integrate into their own system).

g. Software Application Description:

- i. Language: Java, C++, C#, JavaScript, XML, DDMS 1.3
- ii. Source Line of Code: Approximately 2 million
- iii. Operating System: Windows 2008 R2, Windows 2012 R2
- iv. Software Version(s): CMP 13.2.2.0 and CMP 13.2.2.1; DCI 13.2.2.0, DCI 13.2.2.0 P1 and DCI 13.2.2.0 P2, C2R 10.1.8.1, DDS 1.7.1.1 P2, DDS 1.7.1.1 and DDS 1.7.1.2, SAM 2.0.1, NRTS 2.5.0.10, GTCS 5.1.13.0, C2I 13.2.5, TS3 15.07.31.6, TSI 16.06.30.9, and TSI 16.06.30.10
- v. COTS: Microsoft AD, SQL, Exchange, SharePoint, System Center Configuration Manager (SCCM), System Center Operations Manager, XMPP Chat, VMware Vsphere, DDS (Java, OpenSSL, Apache (Tomcat, TomEE, Apache Server)), Not applicable for TS3 (TS3 is a SDK)
- vi. GOTS: SCCM Gold Master, DDS(Tactical Security System Services (TS3)), Not applicable for TS3 (TS3 is a SDK)

h. Software Development Tools/ Applications:

Support Tools/Applications	Description
JIRA	Track Project Management Activities
ImgBurn	Recordable media
Mapforce	Design/ Architecture Tools
VMWare Vsphere Client	Virtual Machine Management
SQL Server	Database Management
winmerge	Compare both folders and files
windiff	Microsoft server utility to compare folders and files
MyEclipse	Design/ Architecture Tools
Visual Studio (C#,C++)	Development Tool
Tortoise SVN	Common Message Processor (CMP)
XML Spy	Design/ Architecture Tools

Notepad++	Built-in Windows test editor
WinRAR	Compressor utility
Apache Tomcat	Web Server
AutoMate7	Automate processes
Wireshark	Network packet analyzer
Eclipse	Design/ Architecture Tools
KeystoreExplorer	Java command line utility
Dotfuscator Software Services	post-development re-compilation system for .NET applications
Keytool	Certificate management utility
CXF	Web services
Maven	Configuration Management code build tool
SQL Express	Light version of Microsoft SQL Server
JDK 1.7	Java Development Kit

DDS:

Support Tools/Applications	Description
Genuitec My Eclipse	Development Tool
Altova XML Spy	XSD management tool
Apache Ant	Build tool
Altova Mapforce	XSLT Tool
VMWare	Host/test environment

TS3:

Support Tools/Applications	Description
Visual Studio	.Net development environment
Eclipse	Java development environment
XML Spy	Read and modify XML files

i. **Hardware:** The following is a subset of hardware equipment to support and field BCCS/TSI hardware/software requirements. This is not an all-inclusive list.

Test Hardware Resources	Description
Dell M90, M6300, M6400, M6500, M6600, M6700, M6800	Dell laptops configured to reflect a DIV and/or BDE Tactical Network Architecture
Sun 4100, Sun 4170, Dell DCS1130, Dell R420XR, Dell R430	The blade server supporting BCCS/TSI server stacks, hardware hosting the virtual infrastructure
Cisco 3560G, Dell Nforce, Mellanox	Switch Backbones for BCCS/TSI
Netapp 2020, 2040, 2240, 2552, Dell Equallogic RAID 6210x	Storage appliance to host all virtual machines for either BCCS or TSI, Network Attached Storage device
XFR 6400	DDS Server Blades
HP Elitebook 8560p	COTs laptops used for development and testing
Lenovo W520	COTs laptops used for development and testing
Mounted Family of Computer Systems (MFoCS) Basic and Intermediate	Ruggedized computing hardware for Mounted Computing Environment
JV-5	Legacy ruggedized computing hardware
MRT+	Legacy ruggedized computing hardware

DDS:

Test Hardware Resources	Description
BCCS Server Stack	Server Blades provided with BCCS V4/5

TS3:

Test Hardware Resources	Description
-------------------------	-------------

N/A, software based solution	
------------------------------	--

j. **Software Sustainment and Maintenance:**

i. Sustain MC-CS - Phased Transition to Sustainment FY18 (Historical)

- Number of specifications analyzed: 0
- Number of Latent Defects implemented: IAVA tests against BCCS Gold Disc
- Number of New capabilities implemented: 0
- Deliverables:
 - Test Report
 - Test Plan
 - Configuration Management Plan
 - Software Release Plan
 - Meeting Minutes
 - Risk Management Framework Documentation
 - Cybersecurity Software Release Updates
 - IAVA Technical Bulletin (TB)
 - IAVA Monthly Updates
 - IAVA Quarterly Updates
 - Specifications
 - Schedules

ii. Sustain MC-CS (FY19)

- Number of specifications to analyze: 0
- Number of Latent Defects to be implemented: 36 (across 10 products)
- Number of New capabilities to be implemented: 6 (OS upgrade)
- Deliverables:
 - Test Report
 - Test Plan
 - Configuration Management Plan
 - Software Release Plan
 - Meeting Minutes
 - Trip Reports
 - Risk Management Framework Documentation
 - Cybersecurity Software Release Updates
 - IAVA Technical Bulletin (TB)
 - IAVA Monthly Updates
 - IAVA Quarterly Updates
 - Software Version Description
 - Source Code
 - Software User Manual

- Training Manual
- Specifications
- Software Change Request
- Schedules

k. System and Software Acquisition Support: N/A

3. **System Name:** Tactical Digital Media (TDM)

- a. **System Manager:** Program Executive Office, Command, Control, and Communications (Tactical) (PEO C3T), Project Manager (PM) Mission Command (MC), Product Director (PD) Strategic Mission Command (SMC)
- b. **System Proponent:** PM Mission Command
- c. **System Deployed:** Begin fielding 2QFY18
- d. **System Overview:** Tactical Digital Media (TDM): TDM provides Combat Camera Companies (COCAM), Public Affairs Officers (PA), and Military Information Support Operations units (MISO) a modernized and robust, state-of-the-art, standardized, and resourced set of capabilities to acquire and process digital media/visual information (VI) products for delivery within a fully integrated army tactical network operations environment and the Defense Video & Imagery Distribution System (DVIDS). TDM kits include cameras and video equipment, laptops, night-vision devices and audio capabilities. TDM is used to support missions to communicate information, record historical events, and support decision-making events by providing accurate information.
- e. **System Interoperates With:** N/A
- f. **Other Systems Dependent On:** N/A
- g. **Software Application Description:**
 - i. Language: N/A
 - ii. Source Line of Code: N/A
 - iii. Operating System: Windows 10
 - iv. Software Version(s): PDSS, current version is TDM1.0.0N4QCY17
 - v. COTS: Adobe Creative Cloud
 - vi. GOTS:N/A

h. **Software Development Tools/ Applications:**

Support Tools/Applications	Description
Adobe Creative Cloud	
Windows 10	

- i. **Hardware:** The following is a subset of hardware equipment to support and field hardware/software requirements. This is not an all-inclusive list.

Test Hardware Resources	Description
-------------------------	-------------

j. Software Sustainment and Maintenance:

- i. Develop TDM 1.0.0 (Historical)
 - Number of specifications analyzed: 0
 - Number of Latent Defects implemented: 0
 - Number of New capabilities implemented: 1 (initial fielded Windows 10 image)
 - Deliverables:
 - Produced image baseline for Delivered to PM for IOC
- ii. Develop TDM 1.1.0 (Historical)
 - Number of specifications analyzed: 0
 - Number of Latent Defects implemented: 0
 - Number of New capabilities implemented: 1 (update to latest version of Window 10)
 - Deliverables:
 - Initial release to PM
 - Monthly ACAS scans
 - Quarterly Images (2)
 - Maintain AKO portal (user access)
- iii. Sustain TDM 1.1.0 (FY19)
 - Number of specifications to analyze: 0
 - Number of Latent Defects to be implemented: 0
 - Number of New capabilities to be implemented: 1 (update to latest version of Window 10)
 - Deliverables:
 - Monthly ACAS scans
 - Quarterly Images (3)
 - Maintain AKO portal (user access)
 - Maintain SIPR image

k. System and Software Acquisition Support: N/A

4. **System Name:** Force XXI Battle Command Brigade and Below (FBCB2)

- a. **System Manager:** Program Executive Office, Command, Control, and Communications (Tactical) (PEO C3T), Project Manager (PM) Mission Command (MC), Product Manager (PdM) Joint Battle Command - Platform (JBC-P)
- b. **System Proponent:** U.S. Army Combined Arms Center, U.S. Training and Doctrine Command (TRADOC) Capability Manager (TCM) Fort Leavenworth, KS
- c. **System Deployed:** Worldwide. Over 120,000+ systems down to the platform level.
- d. **System Overview:** FBCB2 is a digital, battle command information system that provides integrated, on-the-move, timely, relevant battle command information to tactical combat, combat support and combat service support leaders and soldiers. Provides the capability to pass orders and graphics allowing the warfighter to visualize the commander's maneuver intent. FBCB2 supports situational awareness (SA) and command and control (C2) down to the soldier/platform level across battlefield operating systems (BOS) and echelons.
- e. **System Interoperates With:** AFATDS, LRAS3, FOS, IDM, ABRAM (M1A1, M3A3), Paladin, TAIS, Stryker, BRADLEY (A3BFIST, M2A3, M3A3), BC SVR, EDM, MFCS, TAIS, USMC (JTCW, D-DACT), AMDWS, CPOF, GCCS-A, JWARN, M2A3, UH60M, Knight, AH64D, CH47F, MBCOTM, OH58D, DCGS-A, NETT WARRIOR, DDS, C2R, TIGR, ISYSCON, BFT-AVN
- f. **Other Systems Dependent On:** AFATDS, LRAS3, FOS, IDM, ABRAM (M1A1, M3A3), Paladin, TAIS, Stryker, BRADLEY (A3BFIST, M2A3, M3A3), BC SVR, EDM, MFCS, TAIS, USMC (JTCW, D-DACT), AMDWS, CPOF, GCCS-A, JWARN, M2A3, UH60M, Knight, AH64D, CH47F, MBCOTM, OH58D, DCGS-A, NETT WARRIOR, ACADA, RADIAC
- g. **Software Application Description:**
 - i. Language: C, C++, JAVA, JAVASCRIPT, XML
 - ii. Source Lines of Code: Approximately 3.5 to 6.0 Million (FBCB2/JCR)
 - iii. Operating System: Red Hat Enterprise Linux (RHEL 3, 4, 5, 6)

- h. **Software Development Tools/ Applications:** The following is a sample list of support tools/applications required to sustain the FBCB2/JCR software. This is not meant to be an all-inclusive list.

Support Tools/Applications	Description
Telelogic DOORS	Requirements Traceability
IBM Rational ROSE	Design Modeling
IBM Rational ClearQuest	Software Change Control System
IBM Rational ClearCase	Source Code Configuration Management
HP Quality Center	Test Management System
GCC and G++	Compiler
GDB, DDD, Coverity	Debugger
XDesigner, WxDesigner, XRT widget library,	Graphical User Interface (GUI) Builder
Postgres, MySQL	Relational Database Management System
Data Distribution Services (DDS) software	Develop Software to communicate with other ABCS
C2R Software	Develop software to provide command and control message routing
CJMTK Software	Map Display development
Eclipse/Netbeans	Java IDE
Jenkins	Build Management
Red Hat Enterprise Linux	Operating System
VMware	Virtualization software
Install anywhere	Application installer
Rhapsody Architect	Design Modeling
Falconview	Geospatial Tools

- i. Hardware: The following is a subset of hardware equipment list required to maintain, test and operate FBCB2/JCR software. This is not meant to be an all-inclusive list.

Test Hardware Resources	Description
MFoCS computer	Vehicle mounted Processing Unit, Display and keyboard
JV5 computer	Vehicle mounted Processing Unit, Display and keyboard
JV5 B2 computer	Vehicle mounted Improved Processing Unit, &
Dell XFR-TSG	Tactical Service Gateway laptop
DAGR/PLGR	GPS positioning data
BFT2 transceiver-MT 2011	Blue Force Tracking transceiver
BFT1 transceivers	Blue Force Tracking transceiver
KGV-72	Programmable In-line Encryption Device
JPT	Joint Platform Tablet
EV4 computer	Processing Unit, Display and keyboard

j. **Software Sustainment and Maintenance:**

- i. Sustain baselines FBCB2 6.5, JCR 1.3.1.x, JCR 1.3.2 V/N (FY18-Historical)
- Number of specifications: 0
 - Number of Latent Defects implemented: 53 (See System Requirements Matrix Table 1 & 2 below)
 - Number of New capabilities implemented: 0
 - Deliverables: 71 (annually)
 - Schedules
 - Test Report
 - Test Plan
 - Technical Manuals
 - Lab SOP documents
 - Software with Release Notes
 - Information Assurance Vulnerability Management Patch Software
 - Trip Reports
 - Meeting Minutes
 - Bi-weekly Status slides
 - Configuration Management Documentations (S4/SHAAC)
 - Risk Management Framework (RMF) Documentation
- ii. Sustain baselines JCR 1.3.1.x, JCR 1.3.2 V/N, JBC-P 1.6.0.6, 1.6.0.7, FSS 2.x (FY19)
- Number of specifications: 0
 - Number of Latent Defects to analyze: IAVM's
 - Number of New capabilities to be implemented: 0

- Deliverables: 80 (annually)
 - Schedules
 - Test Report
 - Test Plan
 - Technical Manuals
 - Lab SOP documents
 - Software with Release Notes
 - Information Assurance Vulnerability Management Patch Software
 - Trip Reports
 - Meeting Minutes
 - Bi-weekly Status slides
 - Configuration Management Documentations (S4/SHAAC)
 - Risk Management Framework (RMF) Documentation
- iii. Technical Support of FBCB2 6.5, JCR 1.3.x V/N (Historical)
 - Develop quarterly IAVA updates and support (JCR)
 - Attend technical meetings
 - Provide analysis on issues reported
 - Assist with RMF documentation
- iv. Technical Support FBCB2 6.5, JCR 1.3.x V/N, JBC-P 1.6.0.x (FY19)
 - Develop quarterly IAVA updates and support (JCR, JBC-P)
 - Attend technical meetings
 - Provide analysis on issues reported
 - Assist with RMF documentation

k. System and Software Acquisition Support: N/A

Table 1. System Requirements Matrix for JCR 1.3.2 v5 Software Change Requests (PPSS)				
SCR	Description	Category	Funding	Actions
T28212	JCR LOG does not currently operate on MFoCS HW in the BFT2 configuration due to external RFID interrogator not supported on MFoCS hardware.	2	OMA	MC CCB approved, March 2017 Release May 2017
T28217	CJMTK Map Server intermittently drops requests from Map Manager when left running for an extended period (overnight).	2	OMA	MC CCB approved, March 2017 Release May 2017

T28223	JCR LOG does not currently operate on MFoCS HW in the BFT2 configuration due to internal RFID interrogator not supported on MFoCS hardware. Modify the JCR 1.3.2.0 software (changes	2	OMA	MC CCB approved, March 2017 Release May 2017
--------	--	---	-----	---

Table 2. System Requirements Matrix for JCR 1.3.2 v6 Software Change Requests (PPSS)				
SCR	Description	Category	Funding	Actions
T28216	TiGR v2.07 and related dependencies removed	2	OMA	MC CCB approved, Release 9/18.
T27863	After receiving a Land Route Report, when selecting "Display Message", there is no other option to see the route's attributes within the window.	2	OMA	MC CCB approved, Release 9/18.
T27910	While editing a SPOT report message, four display titles are don't display correctly in the SPOT long form.	2	OMA	MC CCB approved, Release 9/18.
T28088	Mismatch between system type values recognized by JCR versus those	2	OMA	MC CCB approved, Release 9/18.

	recognized by external systems.			
T28182	Type/Subtype values show as buttons on SPOT short form GUI.	2	OMA	MC CCB approved, Release 9/18.
T28183	Bottom left field of SPOT short form GUI incorrectly shows "Send successful".	2	OMA	MC CCB approved, Release 9/18.
T28191	Introduce two code aliases, "Start_JCR" and "Stop_JCR" to simplify code development and test.	2	OMA	MC CCB approved, Release 9/18.
T28224	Corrections were needed to fix Land route and Spot messages. GUI and script changes were needed to prevent system issues.	2	OMA	MC CCB approved, Release 9/18.
Various	Security items/STIGs implemented.	NA	OMA	Accounts for 40 security patches.

Joint Capabilities Release (JCR): See FBCB2. JCR is the next generation of FBCB2.

Field Service Station (FSS) - The FSS project is a project under the direction of PdM JBC-P. FSS is an enhanced, integrated product to provide field service functionality for BFT1/BFT2 transceivers and KGV-72 encryption devices. It unifies the required field servicing functionality for all products into a single application as the FSS. The FSS end product will be used by the soldier, not the FSR, to perform basic field service and maintenance procedures. FSS 2.0 will allow the soldier to zeroize, configure, provision, perform basic testing of and update the firmware on BFT1/BFT2 transceivers and KGV-72 devices via a common graphical user interface.

JBC-P PDSS Yearly Dollar Amounts:

FY 16 PDSS (N/A)

FY 17 PDSS (\$620,000)

FY 18 PDSS (\$1,222,000)

FY 19 PDSS (\$2,500,000)

Note: PDSS work will transition to PPSS in FY20

5. System Name: Joint Battle Command-Platform (JBC-P)

- a. **System Manager:** Program Executive Office, Command, Control, and Communications (Tactical) (PEO C3T), Project Manager (PM) Mission Command (MC), Product Manager (PdM) Joint Battle Command - Platform (JBC-P)
- b. **System Proponent:** U.S. Army Combined Arms Center, U.S. Training and Doctrine Command (TRADOC) Capability Manager (TCM) Fort Leavenworth, KS
- c. **System Deployed:** Worldwide. Over 120,000+ systems down to the platform level.
- d. **System Overview:** JBC-P is the Army's next generation friendly force tracking system, equipping Soldiers with a faster satellite network, secure data encryption and advanced

logistics. JBC-P includes an intuitive interface with features like touch-to-zoom maps and drag-and-drop icons. JBC-P incorporates the common hardware solution known as the Mounted Family of Computer Systems (MFoCS), standardized tactical computers that are scalable and tailorable to the mission and vehicle. JBC-P builds on the situational awareness capability known as Force XXI Battle Command Brigade and Below/Blue Force Tracking (FBCB2/BFT), which is integrated on more than 120,000 platforms and is fielded or authorized to every brigade combat team in the Army.

e. **System Interoperates With:** AFATDS, LRAS3, FOS, IDM, ABRAM (M1A1, M3A3), Paladin, TAIS, Stryker, BRADLEY (A3BFIST, M2A3, M3A3), BC SVR, EDM, MFCS, TAIS, USMC (JTCW, D-DACT), AMDWS, CPOF, GCCS-A, JWARN, M2A3, UH60M, Knight, AH64D, CH47F, MBCOTM, OH58D, DCGS-A, NETT WARRIOR, DDS, C2R, TIGR, ISYSCON, BFT-AVN

f. **Other Systems Dependent On:** AFATDS, LRAS3, FOS, IDM, ABRAM (M1A1, M3A3), Paladin, TAIS, Stryker, BRADLEY (A3BFIST, M2A3, M3A3), BC SVR, EDM, MFCS, TAIS, USMC (JTCW, D-DACT), AMDWS, CPOF, GCCS-A, JWARN, M2A3, UH60M, Knight, AH64D, CH47F, MBCOTM, OH58D, DCGS-A, NETT WARRIOR, ACADA, RADIAC

g. Software Application Description:

- i. Language: C, C++, JAVA, JAVASCRIPT, XML
- ii. Source Lines of Code: Approximately 3.5 to 6.0 Million (FBCB2/JCR)
- iii. Operating System: Red Hat Enterprise Linux (RHEL 3, 4, 5, 6, 7)

h. Software Development Tools/ Applications: The following is a sample list of support tools/applications required to sustain the JBC-P software. This is not meant to be an all-inclusive list.

Support Tools/Applications	Description
JIRA	Software changes traceability
Test Track Pro	Manages requirements, defects, and issues
Telelogic DOORS	Requirements Traceability
IBM Rational ROSE	Design Modeling
IBM Rational ClearQuest	Software Change Control System
IBM Rational ClearCase	Source Code Configuration Management
HP Quality Center	Test Management System
GCC and G++	Compiler
GDB, DDD, Coverity	Debugger
XDesigner, WxDesigner, XRT widget library,	Graphical User Interface (GUI) Builder

Postgres, mySQL	Relational Database Management System
Data Distribution Services (DDS) software	Develop Software to communicate with other ABCS
C2R Software	Develop software to provide command and control message routing
CJMTK Software	Map Display development
Eclipse/Netbeans	Java IDE
Jenkins	Build Management
Red Hat Enterprise Linux	Operating System
VMware	Virtualization software
Install anywhere	Application installer
Rhapsody Architect	Design Modeling
Falconview	Geospatial Tools

i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate JBC-P software. This is not meant to be an all-inclusive list.

Test Hardware Resources	Description
MFoCS computer BLK1/2 (Intermediate/Basic)	Vehicle mounted Processing Unit, Display and keyboard
JV5 computer	Vehicle mounted Processing Unit, Display and keyboard
JV5 B2 computer	Vehicle mounted Improved Processing Unit, &
Dell XFR-TSG	Tactical Service Gateway laptop
DAGR/PLGR	GPS positioning data
BFT2 transceiver-MT 2011	Blue Force Tracking transceiver
BFT1 transceivers	Blue Force Tracking transceiver
KGV-72	Programmable In-line Encryption Device
JPT	Joint Platform Tablet
EV4 computer	Processing Unit, Display and keyboard

j. Software Sustainment and Maintenance:

i. Not Applicable- JBC-P is not currently in PPSS. JBC-P 1.6.0.7 will enter sustainment in 2QFY20.

k. System and Software Acquisition Support (PDSS):

- i. Development of JBC-P 1.6.1 (Security Improvements) (FY 19/20)
 - Number of specifications: 1
 - Number of Latent Defects to be implemented: 3 (Table 1. System Requirements Matrix for JBC-P PDSS (FY19/FY20))
 - Number of New capabilities to be implemented: 0
 - Deliverables: 35 (annually)
 - Schedules
 - Test Report
 - Test Plan
 - Software with Release Notes

- Information Assurance Vulnerability Management Patch Software
- Trip Reports
- Meeting Minutes
- Weekly Action Reports
- Bi-weekly Status slides
- Configuration Management Documentations (S4/SHAAC)
- Risk Management Framework (RMF) Documentation
- ii. Technical Support of JBC-P 1.6.0.7/1.6.1 (FY19)
 - Develop quarterly IAVA updates and support (, JBC-P)
 - Attend technical meetings
 - Provide analysis on issues reported
 - Assist with RMF documentation / EMASS

Table 1. System Requirements Matrix for JBC-P PDSS (FY19/FY20)					
Fiscal Year	Description	Category	LOE	Funding	Actions
FY19	Upgrade JBC-P 1.6.0.7 from Redhat 6.7 to 7.5	2	High	OPA	CCB approved, 8/18 Expected completion 6/19
FY20	Implement Trusted Platform Module (TPM) 2.0 to run on MFoCS BLK1/BLK2 Hardware	2	High	OPA	CCB submission pending, 6/19 Customer requested requirements be queued for FY20 efforts.
FY20	Implement Secure Boot utilizing TPM 2.0	2	Med	OPA	CCB submission pending, 6/19 Customer requested

					requirements be queued for FY20 efforts.
--	--	--	--	--	--

6. System Name: Command Web (CMD Web)

- a. **System Manager:** Program Executive Office, Command, Control, and Communications (Tactical) (PEO C3T), Project Manager (PM) Mission Command (MC), Product Director (PD) Strategic Mission Command (SMC)
- b. **System Proponent:** PM Mission Command
- c. **System Deployed:** 1
- d. **System Overview:** Command Web is a collection of tactical edge web-based applications or “widgets” designed to provide Engineer staffs and leaders with tools that support their functional responsibility for Mobility, Counter-Mobility, Survivability and Construction missions. These tools include the ability to create, receive and analyze obstacle and hazard information; road, route and bridge

information; and engineering project information and provide relevant information to the Common Operational Picture (COP). A separate Maneuver widget allows Engineer soldiers to view relevant COP information (maneuver graphics, Blue PLI, Enemy Sit, etc.) to provide context for executing the Engineer functions above and supports limited collaboration with other Engineering Staff cells and with the rest of the integrated Battle Staff during the planning and execution processes. Data and products from the widgets are displayed on the common Command Post Computing Environment (CP CE) map.

- e. **System Interoperates With:** Command Post of the Future (CPOF); Data Dissemination Service (DDS), Command & Control Infrastructure (C2I), Joint Battle Command-Platform (JBC-P)
- f. **Other Systems Dependent On:** Global Command and Control System-Army (GCCS-A), Distributed Common Ground Station-Army (DCGS-A), Battle Command Common Services (BCCS), Data Dissemination Service (DDS), Command & Control Infrastructure Virtual Machine (C2I VM), Tactical Services Security System (TS3)
- g. **Software Application Description:**
 - i Language: ActionScript, JavaScript, HTML, C#, Java
 - ii Source Line of Code: approximately 750,000
 - iii Operating System: Windows Server 2008 R2
 - iv Software Version(s): Maneuver BC15.0.x, Engineering Mobility Service BC15.0.x, Obstacles & Hazards Service BC15.0.x, Projects Service BC15.0.x, CP CE Map BC15.0.x
 - v COTS: Apache Mina, Apache ActiveMQ, jQuery, jQuery DynaTree, Google Earth extensions
 - vi GOTS: NASA Worldwind

h. Software Development Tools/ Applications:

Support Tools/Applications	Description
MS Visual Studio	.Net Source code development
MS SQLServer 2012 Enterprise	Database development tool
FlashBuilder	Flash/ActionScript code development

NetBeans	Java code development
Eclipse	Java/JavaScript code development
Subversion	Source code configuration management
Stash	Source code configuration management
Jira	Requirements/bug tracking
Nexus	Java dependency management
Jenkins	Automated build management
Automated Build Studio	Automated build scripts
InstallShield	Software Installer
VMware VSphere 5	Host test VMs
Confluence	Document management
Fisheye	Software QA
Mozilla Firefox	Web browser client

i. Hardware: The following is a subset of hardware equipment list required to maintain, test and operate Command Web. This is not an all-inclusive list.

Test Hardware Resources	Description
Dell M6800, M6700, M6600, M6500, M6400, M6300	Dell laptops configured to reflect a DIV and/or BDE Tactical Network Architecture
Dell Dart Frog	BCCS v4 hardware hosting the virtual infrastructure
NetApp 2240	BCCS v4 Network Attached Storage device
Cisco 3750G 24 port GbE switch	BCCS v4 hardware used to establish subnet among the development and test work stations.
Dell R420 Server	BCCS v5 hardware hosting the virtual infrastructure
Dell Equilogix RAID	BCCS v5 Network Attached Storage device
Dell Force10 Switch	BCCS v5 hardware used to establish subnet among the development and test work stations

j. Software Sustainment and Maintenance:

i. Sustain Version 15.0.4 (Historical)

- Number of specifications analyzed: 0
- Number of Latent Defects implemented: IAVA's
- Number of New capabilities implemented: 0
- Deliverables: 46 (Annually)
 - Quarterly Information Assurance (IA) Updates with Release Approval Paperwork
 - Quarterly Security Technical Implementation Guide (STIG) Checklists
 - Monthly IA Scans
 - IAVA Compliance Reports
 - Technical Bulletins
 - Updated Virtual Machines (VMs) with Release Notes and VM Deployment Guides

ii. Sustain Version 15.0.4 (FY19)

- Number of specifications to analyze: 0
- Number of Latent Defects to be implemented: IAVA's
- Number of New capabilities to be implemented: 0
- Deliverables: 46 (Annually)
 - Quarterly Information Assurance (IA) Updates with Release Approval Paperwork
 - Quarterly Security Technical Implementation Guide (STIG) Checklists
 - Monthly IA Scans
 - IAVA Compliance Reports
 - Technical Bulletins
 - Updated Virtual Machines (VMs) with Release Notes and VM Deployment Guides

iii. Develop Version 15.0.5 (FY19)

- Number of specifications to analyze: 0
- Number of Latent Defects to be implemented: 3 (CWEB-510, CWEB-511, CWEB-512)
- Number of New capabilities to be implemented: 6 (See System Requirements matrix for Command Web 15.0.5)
- Deliverables: 14 (Annually)
 - Widget Installers
 - Software Suitability/Supportability Statements

- Software Safety Hazard Analysis Checklists
- Updated Virtual Machines
- Release Notes
- Installation Guide
- Configuration Guide
- Virtual Machine Deployment Guides
- Test Plan
- Test Report

k. System and Software Acquisition Support: N/A

Table I. System Requirements Matrix for Command Web 15.0.5				
Req #	CAT	Requirement Title	Funding Source	Comments
CWEB-510	2	Update EMS Installer to identify correct version of SQLServer	OMA	PdD SMC Approved implementation of fix on 10 July 2018
CWEB-511	2	Update OHS Installer to identify correct version of SQLServer	OMA	PdD SMC Approved implementation of fix on 10 July 2018
CWEB-512	2	Update Projects Installer to identify correct version of SQLServer	OMA	PdD SMC Approved implementation of fix on 10 July 2018
CWEB-513	2	Update Maneuver VM to Windows Server 2016	OMA	Possible upgrade depending on PM MC/PdD SMC decision
CWEB-514	2	Update TMCWebAppServer VM to Windows Server 2016	OMA	Possible upgrade depending on PM MC/PdD SMC decision
CWEB-516	2	Implement code fixes in accordance with PM MC IA Process for Software Assurance (SwA) Code Scan findings	OMA	SwA Code Scan findings still pending from SEC Services

7. **System Name:** Global Command and Control System - Army (GCCS-A)

- a. **System Manager:** Program Manager Mission Command (PM MC), Product Manager Strategic Mission Command (PdM SMC), under the direction of the Program Executive Office Command, Control, and Communications-Tactical (PEO C3T).
- b. **System Proponent:** U.S. Army Combined Arms Center, U.S. Army Training And Doctrine Command (TRADOC) System Manager (TSM) Fort Leavenworth, KS
- c. **System Deployed:** GCCS-A is operational on approximately 2400 Regular Army, Army Reserve, Army National Guard, Marine, Air Force, Navy logistics workstations platforms in CONUS and OCONUS units. The units are BCDs, USARPAC, USAREUR, USSOUTHCOM, ARCENT, FORSCOM, EUSA, USARSO, HQDA, SDDC, EUCOM, 82ND ABN DIV, 101ST ASSLT, 10TH MTN DIV, 1ST ID, 2ND ID, 3RD ID, 4TH ID, 25TH ID, 1ST CAV, and USFK. GCCS-A is also available at a variety of Army schools, training centers, and Mission laboratories. As the Army's executive agent for the Global Command and Control-Joint (GCCS-J) System, the GCCS-A Program Office has also deployed GCCS-J to 21 sites.

In a peacetime scenario, approximately 45% of the inventory is deployed with forward based units and/or supporting exercises at a given time. Forward support will be provided by field support engineers under a separate contract.

- d. **System Overview:** GCCS-A is the Army component of the GCCS-Family of Systems (FoS). GCCS FoS modernization will be the DoD Joint Command and Control (JC2) System of Record. The GCCS FoS is made up of the GCCS-Joint (GCCS-J), GCCS-Army (GCCS-A), GCCS-Maritime (GCCS-M), and GCCS-Air Force (GCCS-AF). Together, these systems interoperate with a variety of other systems to provide critical Joint and service warfighting Command and Control (C2) capabilities such as situational awareness, force planning, and force protection capabilities.

GCCS-A is the Army's strategic, theater, and tactical command and control system. It provides a seamless link of operational information and critical data from the strategic Global Command and Control System-Joint (GCCS-J) to Army theater elements and below. GCCS-A assists in mission planning, deployment support, operations in theater and redeployment. It provides a common picture of Army tactical operations to the joint and coalition community and delivers joint asset visibility to the Army to facilitate operations. GCCS-A is the commander's battle command asset for force planning and projection, readiness and situational awareness and is the system of record for theater Army headquarters worldwide.

GCCS-A is a strategic core system that provides timely and user-friendly strategic and theatre command and control capabilities at Division headquarters and above including units deployed in support of contingency missions to include operations in Southwest Asia and the Republic Of Korea. GCCS-A has continuing requirements for improvements needed by the Warfighter in these critical environments. These changes include, but are not limited to, increased ease of system use and integration of a web-based COP which provides a more integrated and intuitive Battlefield picture.

GCCS-A must maintain and improve interoperability with Land/WarNet Capabilities Set requirements, ABCS and joint systems. SEC plans on maintenance releases which are aligned with the overall software Land/WarNet /BC release schedule, plus emergency fix releases when required and approved by appropriate authorities.

Critical Software fixes will be implemented to maintain and improve interoperability with ABCS, joint and coalition systems to improve situational awareness to support decision-making.

Additional efforts include maintaining readiness by providing field software engineers on-site and rapid resolution of field software problems and issues. Also, ensure effective management and renewal of commercial software license and to maintain security certification and accreditation IAW DoDI 8510.10 and AR 25-2.

- e. **System Interoperates With:** Global Command and Control-Joint (GCCS-J), Air Defense Systems Integrator (ADSI); Theater Battle Management Core Systems (TBMCS); All Source Analysis System (ASAS); Advanced Field Artillery Tactical Data System (AFATDS); Tactical Airspace Integration System (TAIS); Battle Command Sustainment Support System (BCS3); United States Marine Corp (USMC) Intelligence Operations Systems; Air and Missiles Defense Workstation (AMDWS); Command Post of the Future (CPOF); Force XXI Battle Command Brigade and Below (FBCB2); Joint Capabilities Release (JCR); Distributed Common Ground System-Army (DCGS-A); Joint Automated Deep Operations Coordination System (JADOCS); Data Distribution System (DDS); Joint Operation Planning and Execution System (JOPES); Global Status of Resources and Training System (GSORTS); Army Status of Resources and Training System (ASORTS); Computerized Movement Planning and Status System (COMPASS); Joint Total Asset Visibility (JTAV); Integrated Meteorological System (IMETS); Digital Topographic Support System (DTSS).
- f. **Other Systems Dependent On:** Army ABCS systems and Global Command and Control-Joint (GCCS-J).
- g. **Software Application Description:**
 - i. Language: Java, JavaScript, Python, XML.
 - ii. Source Line of Code: Approximately 1 Million.

- iii. Operating System: Windows XP 32-Bit, Windows 7, Windows 2003 Server, Windows 2008 Server
- iv. Software Version(s): GCCS-A -KES, 4.2b P7, 4.2b P6 SP1, and B4.1b; DDS 1.6.x
- v. COTS: Weblogic, Secure Desktop Global (SGD)
- vi. GOTS: Software Engineering Center (SEC) Mil-Std-2525 Symbology Renderer

h. Software Development Tools/ Applications:

A list of software Development Tools or Applications used for Configuration Management, Requirements Management, Trouble Tickets Tracking Tool, Design/Architecture Tools, Operating Systems, Special Test Equipment/ Software, and Other SW COTs products. This is not an all-inclusive list.

Support Tools/Applications	Description
JIRA	Track Project Management Activities
Perforce MS SharePoint	Configuration Management and source-code repository
Oracle	Database Management System (DBMS)
Red Hat Enterprise Linux	Host Oracle database
VMware-V-sphere 5 essentials/ VMware Workstation 9	Host development and test Virtual Machines
Microsoft Visio	Diagrams and Charts
TortoiseSVN (Subversion)	Source-code Repository and Version Control
Eclipse/Netbeans	Java (Integrated Development Environment)
Maven Jenkins, Sonatype Nexus	Dependency Control Build Management

- i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate GCCS-A software. This is not an all-inclusive list.

Test Hardware Resources	Description
Dell M6600, M6400	Dell Laptops configured to reflect an entire GCCS-A architecture, from production servers (Data Forwarding Gateway, Main Forwarding Gateway, Enterprise Web Servers etc) to client workstations.
Dell M610 Power Edge Blade Server and M1000 Chasis	The blade server stores development resources such as software, VMware, Perforce, and JIRA.
KVM Console	To monitor blade and Chasis operation
Cisco ASA 5505 switches/	Provide firewall and aggregate data.
Cisco 3750G 24 port GbE switch	Use to establish subnet among the development and test work stations.

Dell T620	To configure and run multiple VMs with removable media
Cisco Systems SF102-24-Port 10/100 Switch with 2 Mini-GBIC Port and 2 GE Uplink Ports 1U	Used to configure NIPR and SIPR in the lab while allowing DHCP
T5220, T4-1 servers	Standard GCCS-A servers

j. Software Sustainment and Maintenance:

i. Sustain GCCS-A Version 4.2 & 4.3 (Historical) Note: 4.2 is planned to divest by May 2019

- Number of specifications to analyze: 0
- Number of Latent Defects Implemented: 55 (See Table I.)
- Number of New capabilities implemented: 0
- Deliverables:
 - Monthly and Quarterly Gold Discs
 - Updated lab diagrams (i.e. IP configurations, lab layout, lab)
 - Software releases documentation
 - Test reports, Test plans
 - Technical Bulletins
 - Weekly Action Reports
 - Quality Assurance results
 - Configuration Management
 - Technical Manuals
 - CCB requests

ii. Sustain GCCS-A 4.3 (FY19)

- Number of specifications to analyze: 0
- Number of Latent Defects to be implemented: IAVA's
- Number of New capabilities to be implemented: 0
- Deliverables:
 - Monthly and Quarterly Gold Discs
 - Updated lab diagrams (i.e. IP configurations, lab layout, lab)
 - Software releases documentation
 - Test reports, Test plans
 - Technical Bulletins
 - Weekly Action Reports
 - Quality Assurance results
 - Configuration Management
 - Technical Manuals
 - RMF Maintenance (eMass scans, POAM updates and reviews, SCA-V, ATO renewals, routine maintenance verification of security controls, documentation refresh/updates

k. System and Software Acquisition Support: N/A

Table 1. GCCS-A 4.2 and 4.3				
Issue Type	Description	Category	Funding	Actions
Bug	ETMS/GMC fail to start and/or display PASS after application of SUNSEC	2	OMA	MCCB, Fixed
Bug	Re-IP of Operational System fails on J2ADM	2	OMA	MCCB, Fixed
Task	Redesign 6009 Lab Environment	2	OMA	MCCB, Fixed
Task	Finalize 4.2c Baseline Documentation	2	OMA	MCCB, Fixed
Story	Address findings from 4.2c SWIT	2	OMA	MCCB, Fixed
Sub-task	GCCSA-27 Upgrade DCI version > Server Issue-01 & -02 related	2	OMA	MCCB, Fixed
Sub-task	GCCSA-27 Document folder missing > Client Issue-10 (part 1 of 2)	2	OMA	MCCB, Fixed
Sub-task	GCCSA-27 Creation of View Only accounts on client	2	OMA	MCCB, Fixed
Story	HBSS Capability Implementation	2	OMA	MCCB, Fixed
Bug	DCGS-A Chemical Event not properly displaying on Map	2	OMA	MCCB, Fixed
Task	GCCS-A CM Plan	2	OMA	MCCB, Fixed
Sub-task	GCCSA-27 ICSF Graphics do not match between the CPOF and client > Server Issue-03	2	OMA	MCCB, Fixed
Sub-task	GCCSA-27 OBS-POS tracks are not removed on the COP server > Server Issue-05	2	OMA	MCCB, Fixed
Sub-task	GCCSA-27 Determine if references to the GCCS-J Client are crucial component > Client Issue-03	2	OMA	MCCB, Fixed
Sub-task	GCCSA-27 Inject issue - this functionality is needed for additional steps > Client Issue-05	2	OMA	MCCB, Fixed
Sub-task	GCCSA-27 Determine if legacy items from prior XP/java files apply or have been changed in Windows 7 > Client Issue-11	2	OMA	MCCB, Fixed
Sub-task	GCCSA-27 Firefox issue of the line that reads false > Client Issue-13	2	OMA	MCCB, Fixed
Task	Security TTPs	2	OMA	MCCB, Fixed
Story	Evaluation of GCCS-A Test Procedures	3	OMA	MCCB, Fixed

Task	CM File Cabinet Clean-up	2	OMA	MCCB, Fixed
Bug	Subscription errors with DCI 13 on 4.2c client	2	OMA	MCCB, Fixed
Story	Record (& Resolution) of 42c SAT Dry Run Issues	3	OMA	MCCB, Fixed
Sub-task	GCCSA-93 Steps in the ETM-S DDS test case need CPOF	2	OMA	MCCB, Fixed
Task	Figure out Oracle DB Licensing	2	OMA	MCCB, Fixed
Story	Evaluate ability to pull patches from vendors directly.	2	OMA	MCCB, Fixed
Bug	ICSF Chart will NOT close after running Office OFCPTH Client Test Case	2	OMA	MCCB, Fixed
Bug	Zone Boot button unavailable in GMC after zone is shut down	2	OMA	MCCB, Fixed
Bug	CST submenu not available in Chart	2	OMA	MCCB, Fixed
Task	Ensure Mozilla plugin nppdf32.dll gets updated with IAVAs	2	OMA	MCCB, Fixed
Task	Figure out how to configure GMC email	2	OMA	MCCB, Fixed
Bug	No brief alert message while Threshold times changed in GMC_TrackStatus	2	OMA	MCCB, Fixed
Task	Build the 4.2c GMC, ETMS code	2	OMA	MCCB, Fixed
Bug	Excessive Logging of TMS files	3	OMA	MCCB, Fixed
Sub-task	GCCSA-37 Evaluate use of PERMSFX	2	OMA	MCCB, Fixed
Task	Resolution of TB 1605 Issue - Windows and MS Office CAC Activation	2	OMA	MCCB, Fixed
Task	Test Automation	2	OMA	MCCB, Fixed
Task	Review and Implement FRAGO-4	2	OMA	MCCB, Fixed
Task	FRAGO-5 compliance	2	OMA	MCCB, Fixed
Bug	Cannot access JEM as of 4Q16 IAVAs	2	OMA	MCCB, Fixed
Task	Mozilla Firefox SHA-1 deprecation	1	OMA	MCCB, Fixed
Bug	CA certificate Import in FireFox sometimes doesnt work	2	OMA	MCCB, Fixed
Bug	CMP applications do not open	2	OMA	MCCB, Fixed
Bug	GCCS-A TMS Connection with CPOF Dropping	2	OMA	MCCB, Fixed

Bug	KES/CPOF TMS Connection Blue Feed Issues	2	OMA	MCCB, Fixed
Task	Update Core Depot Assessment (CDA) Document	2	OMA	MCCB, Fixed
Story	SW Quality Assessment	2	OMA	MCCB, Fixed
Task	Obtain Official Baseline HW from PM	2	OMA	MCCB, Fixed
Bug	Swap Space issue on KES	2	OMA	MCCB, Fixed
Bug	KES SYSAUX Tablespace Error	2	OMA	MCCB, Fixed
Epic	Support for ATO Extension Approval	3	OMA	MCCB, Fixed
Story	Validate/Update 4.2 STIG settings	3	OMA	MCCB, Fixed
Story	ATO Documentation Updates	3	OMA	MCCB, Fixed
Story	Validation of Security Controls	2	OMA	MCCB, Fixed
Sub-task	GCCSA-207 Provide a list of Applicable STIGs	2	OMA	MCCB, Fixed
Sub-task	GCCSA-207 Current ACAS Scan Results	2	OMA	MCCB, Fixed
Sub-task	GCCSA-207 Comment Technical STIGs	2	OMA	MCCB, Fixed
Sub-task	GCCSA-208 Updated HW/SW List	3	OMA	MCCB, Fixed
Sub-task	GCCSA-208 Review PPS Document	3	OMA	MCCB, Fixed
Sub-task	GCCSA-208 Create Network Diagram	3	OMA	MCCB, Fixed
Sub-task	GCCSA-208 Complete AppDev Document	2	OMA	MCCB, Fixed
Task	GCCSA 6009 Down Lab NIPR Machine Replacement/Resolution	2	OMA	MCCB, Fixed
Bug	Hostnames larger than 36 characters causes connection failures with TMS.	2	OMA	MCCB, Fixed
Bug	Failed logins are not being reported on monitoring	2	OMA	MCCB, Fixed
Bug	Intrusion Prevention	2	OMA	MCCB, Fixed
Bug	COP certificate for application only.	2	OMA	MCCB, Fixed
Bug	Record keeping and inspection service does not exist.	2	OMA	MCCB, Fixed
Bug	No way to remove data from COP	2	OMA	MCCB, Fixed

Bug	Firefox console outputs syntax error for requested json	2	OMA	MCCB, Fixed
Bug	When is view changed, menu options for overlays and feeds are not refreshed on the my/shared products containers.	2	OMA	MCCB, Fixed
Bug	If details view is open for a graphic when it is deleted from the map, the details view remains open	2	OMA	MCCB, Fixed
Bug	If multiple systems publish data to same category with same ID, the data will be overwritten	2	OMA	MCCB, Fixed
Bug	Scrolling through a large number of tiles causes the browser to become unresponsive	2	OMA	MCCB, Fixed
Bug	Finishing a multi-point drawing with a double click causes an error	2	OMA	MCCB, Fixed
Bug	Retract option missing from map for platforms published as POS-RPTs	2	OMA	MCCB, Fixed
Bug	WAN overlays appear in browse overlays list	2	OMA	MCCB, Fixed
Bug	Publish to WAN does not work from browse overlays list	2	OMA	MCCB, Fixed
Bug	Mine overlay shows up as yellow when it should be red.	2	OMA	MCCB, Fixed
Bug	Overlay for Killbox located in Australia was drawn in Canada.	2	OMA	MCCB, Fixed
Bug	Track updates do not process to FoS. Only Adds and Deletes process correctly.	2	OMA	MCCB, Fixed
Bug	Compass directions are not displayed for DMS coordinates in details view	2	OMA	MCCB, Fixed
Bug	Cesium map settings do not save when changed through the map configuration interface	2	OMA	MCCB, Fixed
Bug	MCJC2CUI service account credentials cannot be validated on install	2	OMA	MCCB, Fixed
Bug	Track ownership is changed from originating system to GCCS-A	2	OMA	MCCB, Fixed
Bug	Unknown and suspect track symbols are shown in error with "?" located outside of symbol in random position	2	OMA	MCCB, Fixed
Bug	User cannot login after certain group membership changes	2	OMA	MCCB, Fixed
Bug	Monitoring dashboard does not get updates from mustang logs.	2	OMA	MCCB, Fixed
Bug	The echelon field is not being populated when translating a track to TMS track	2	OMA	MCCB, Fixed

Bug	Plugin names 10 characters cause graphical glitches in IE	2	OMA	MCCB, Fixed
Bug	Filters on routes are not saved to reloadable configuration	2	OMA	MCCB, Fixed
Bug	TMS track to POS-RPT translation fails when track contains unexpected Unicode characters	2	OMA	MCCB, Fixed
Bug	Geometry of some rectangular objects may not translate correctly when received from GCCS-J	2	OMA	MCCB, Fixed
Bug	EMS symbology is may not be correctly received by GCCS-J	2	OMA	MCCB, Fixed
Bug	Human Readability	2	OMA	MCCB, Fixed
Bug	SIG INT Space overlays break ICSF Chart	2	OMA	MCCB, Fixed
Bug	Digit in Symbol Code	2	OMA	MCCB, Fixed

8. System Name: Command Post of the Future (CPOF)

- a. **System Manager:** Program Executive Office, Command, Control, and Communications (Tactical) (PEO C3T), Project Manager (PM) Mission Command (MC), Product Manager (PdM) Tactical Mission Command (TMC) and Product Manager (PdM) Strategic Mission Command (SMC)
- b. **System Proponent:** U.S. Army Combined Arms Center, U.S. Training and Doctrine Command (TRADOC) Capability Manager (TCM) Fort Leavenworth, KS
- c. **System Deployed:** Command Post of the Future (CPOF) will be operational on approximately 21,000+ workstations worldwide.
In a peacetime scenario, approximately 45% of the inventory is deployed with forward based units and/or supporting exercises at a given time. Forward support will be provided by field support engineers under a separate contract.
- d. **System Overview:** SMC products include Command Post of the Future (CPOF). PdM Strategic Mission Command (SMC) supports the enabling infrastructure for Mission Command systems and migrating to a net-centric enterprise services environment. Efforts include server architecture and consolidation, security integration, and common product development. SMC products include Battle Command Common Services (BCCS) Infrastructure and Applications.
 - i. **Command Post of the Future (CPOF)**
 - Common Operating Picture (COP) – Commander’s situational awareness and decision support tool for company and above. Integrates data feeds from other Army, Joint, and Coalition systems into an operating picture that is tailorable by users to meet their particular needs
 - 2D & 3D Map Centric Collaboration supported by Voice Over Internet Protocol (VOIP) and augmented by white boarding, map boarding and collaborative texting, all used simultaneously in the same environment
 - Real-Time, Distributed Collaborative and Temporal Planning Tools & Significant Activities (SIGACT) Management
 - Shared Workspace provides Commander with Real-Time planning for senior level Battle Update Briefs (BUB)
 - Core framework for MC Workstation (providing collaborative C2/Maneuver, Fires, Sustainment, Airspace functions)
 - Personalized Assistant that Learns (PAL)
- e. **System Interoperates With:** Command Web; Advanced Field Artillery Tactical Data System (AFATDS); Air and Missiles Defense Workstation (AMDWS); Blue Force Tracking (BFT); Command and Control Personal Computer (C2PC); Distributed Common Ground System-Army (DCGS-A); Global Command and Control System-Army (GCCS-A); Force XXI Battle Command Brigade And Below (FBCB2), Joint Battle Command Platform (JBC-P), Tactical Airspace Integration System (TAIS).

- f. **Other Systems Dependent On:** Army Battle Command Systems (ABCS), Battle Command Common Services (BCS/BCCS), Joint Warning And Reporting Network (JWARN), Warfighter Information Network – Tactical (WIN-T), Standardized Integrated Command Post System (SICPS)

g. **Software Application Description:**

- i. Language: C#, C++, Java, JavaScript, Python, XML
- ii. Source Line of Code: Approximately 5.1M for BC10, 5.4M for MC13
- iii. Operating System: Windows XP 32-Bit, Windows Vista 32-Bit, Windows 2008 Server, Windows 2003 Server.
- iv. COTS: CoMotion, CoMotion Software Development Kit, CoMotion C2, Oculus Map Framework, 3PDK, Commercial Joint Mapping Toolkit (CJMTK), .Net Framework
- v. GOTS: Software Engineering Center (SEC) Mil-Std-2525 Symbology Renderer
- vi. Software Version(s): The software versions are listed in the tables below for each baseline.
- vii. Operating Environment: Microsoft (MS) Exchange Server, MS SQL Server, Virtual Center Management Server, MS SharePoint, MS IIS.

BC10 & MC13 Baseline		
CPOF	CPOF	BC10, BC13,
Infrastructure Services	C2R Server	BC10.x
	NRTS	2.5.x
	SigAct Manager (SAM)	2.x
	CMP Editor (Command Post Messaging)	MC13.0.x
	DCI	MC13.0.x
	GTCS (Ground Tactical Communication Services)	5.1.x
	C2R Client	5.1.x
BCCS	DDS	1.7.x

- h. **Software Development Tools/ Applications:** The following is a sample list of support tools/applications required to sustain the BC software. This is not meant to be an all- inclusive list.

Support Tools/Applications	Description
Configuration Management Tools	Perforce/P4V, Microsoft SharePoint, Tortoise SVN , SVN Repository , CruiseControl, GIT

Support Tools/Applications	Description
Requirements Management Tools	Rational Team Concert, IBM Rational DOORS, TestLink, JIRA
Trouble Tickets Tracking Tool	JIRA
Design/ Architecture Tools	Enterprise Architect, Microsoft Visio, Balsamiq, Oxygen XML Author, Adobe Illustrator, Adobe Photoshop, Adobe InDesign, Adobe Acrobat Pro, Adobe Fireworks, Flash, Adobe Bridge, SQL
Operating Systems	Windows Server 2008 R2, Windows 7, Windows 10, Windows Server 2012 R2
Simulators/Stimulators	PeopleTracker, AirTrack simulator, MTS simulator, Packet Storm, Data Dissemination Service Simulator
Special Test Equipment/Software	Rational Quality Manager, Testopia, TestLink Test Machines – Servers & Clients, Eggplant
Other SW COTs products	Eclipse SDK, Google Web Toolkit (GWT) 2.4 and 2.5, JProfiler, Eclipse Memory Analyzer, VMWare, NotePad++, Berkeley DB, Ventrilo, CJMTK, InstallShield,

- i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate BC products software. This is not meant to be an all inclusive list.

Test hardware Resources	Description
Dell M90/6200/6400/6500/6600/6700/6800/Latitude 5414	For Clients running Window 7,10 64-bit, Windows
Centralized data storage	FAS2020, FAS2040, FAS2240
Cisco	Router

j. **Software Sustainment and Maintenance:**

- i. Sustain Versions BC10.0.4, BC13.0.4P1, BC13.0.5 and BC13.0.6 (Historical)
 - Number of specifications to analyze: 0
 - Number of Latent Defects Implemented: 0
 - Number of New capabilities implemented: 0
 - Deliverables:
 - Monthly and Quarterly Gold Discs
 - Risk Management Framework Documentation
- ii. Sustain Versions BC10.0.4, BC13.0.4P1, BC13.0.5 and BC13.0.6 (FY19)
 - Number of specifications to analyze: 0

- Number of Latent Defects to analyze: 0
 - Number of New capabilities to be implemented: 0
 - Deliverables:
 - Monthly and Quarterly Gold Discs
 - Risk Management Framework Documentation
- iii. Develop Version BC13.0.7 (FY19-FY20)
- Number of specifications to analyze: 0
 - Number of Latent Defects to be implemented: 3 See Table I. (System Requirements Matrix for CPOF Version BC13.0.7)
 - Number of New capabilities to be implemented: 0
 - Deliverables:
 - Software Release with documentation
 - Software Assurance scans and analysis
 - Applicable Technical Bulletins

k. System and Software Acquisition Support: N/A

Table I. System Requirements Matrix for CPOF Version BC13.0.7				
Req #	CAT	Requirement Title	Fund	Comments
SwA	3	Resolve App Dev STIG CAT-1 software vulnerabilities identified in Software Assurance (SwA) scans.	OMA	Modifications will be presented at PM MC CCBs. PM approval is expected.
Bug	3	Implement code fixes to address reported software issues.	OMA	Modifications will be presented at PM MC CCBs. PM approval is expected.
TB	3	Implement code fixes to replace Technical Bulletins.	OMA	Modifications will be presented at PM MC CCBs. PM approval is expected.

9. System Name: Standardized Integrated Command Post System (SICPS)

- a. **System Manager:** Program Executive Office, Command, Control, and Communications Tactical (PEO C3T), Project Manager (PM) Mission Command (MC), Product Director (PD) Strategic Mission Command (SMC)
- b. **System Proponent:** PEO-C3T/PM Mission Command
- c. **System Deployed:** CPP V2/V4 Total Fielded 704; CCS Total Fielded 1695; and CPCS Total Fielded 1322.
- d. **System Overview:** SICPS is System of Systems consisting of Harbormaster Command Control Center (HCCC), Command Center System (CCS), Command Post Platform (CPP) and Command Post Communications System (CPCS). CCS is a ruggedized, scalable turnkey system comprised of audio/video equipment, a display system, and associated support equipment that provide ground commanders and staff the ability to simultaneously view the Common Operating Picture. CPP enables multiple Command and Control and Combat Service Support applications, tactical communications systems, and a local area network into a vehicle mounted platform. The CPP provides an internal infrastructure with connectivity to Army, Joint, and Coalition/NATO tactical communications networks. CPCS is a digital intercommunications system that provides ground commanders and staff the ability of bridging, cross banding and conferencing various radios, phone lines, VoIP and network devices.
- e. **System Interoperates With:** Win-T Inc 1, CCS (Command Center System), CPCS/TOCNET OTC, TOCNET, CP LAN, TMSS, ABCS, FBCB2, ECU.
- f. **Other Systems Dependent On:** STE, POTS, NOTEBOOK CAU, AN/VRC-106, LAN ROUTERS/SWITCHES, ECU, BIT COMPUTER, MAIN AND AUX. PATCH PANELS, PD-8 POWER STRIP, NETSCREEN 50, DC-AC INVERTER, SUNFIRE X4100 x3, DAGR (GPS RECEIVER), BCCS, CONSOLE, POWER DISTRIBUTION PANEL, MEDIA CONVERTER CHASSIS, NETGUARDIAN, AN/VRC-104(v)3.
- g. **Software Application Description - Commercial off the Shelf (COTS) product:**
 - i. Language: Java, JavaScript, XML/XSLT,
 - ii. Source Line of Code: N/A
 - iii. Operating System: Windows 7 (now), Windows 10 (Future)

Software COTS include:

- Wanscaler
- ASA 5510 –Cisco IOS, 3825 –Cisco IOS, 2951 –Cisco IOS, 3750 Catalyst (switch) – Cisco IOS
- ActivIdentity ActivClient CAC x86 6.2 6.2
- Adobe Flash Player ActiveX 27.0.0.187
- Adobe Flash Player NPAPI 27.0.0.187
- Adobe Reader 11.0.23
- Adobe Shockwave 12.2.9.199
- Adobe swMSM 12.0.0.1
- Castle Rock Computing SNMPc Enterprise Army 9.0.7a
- Castle Rock Computing SNMPc OnLine 12.1.6.1a
- Dell Security Device Driver Pack 1.4.055
- DoD PKE InstallRoot 5.0.1
- McAfee Agent 5.0.5.658
- McAfee DAT Version 8715
- McAfee DLP Endpoint 10.0.100.372
- McAfee Host Intrusion Prevention 8.00.0801
- McAfee Policy Auditor Agent 6.2.0.342
- McAfee Scan Engine Version 5900.7806
- McAfee VirusScan Enterprise 8.8.08000
- Microsoft .NET Framework 4.6.01590
- Microsoft EMET 5.52 5.52
- Microsoft Office Professional Plus 2013 15.0.4569.1506
- Microsoft SQL Server 2008 R2 Native Client 10.53.6000.34
- Mozilla Firefox 52.5.0
- Oracle Java 1 8.0.1510.12
- Oracle Java Auto Updater 2.8.151.12
- Simon Tatham PuTTY 0.70

h. Software Development Tools/ Applications: A list of software Development Tools or Applications used for Configuration Management, Requirements Management, Trouble Tickets Tracking Tool, Design/Architecture Tools, Operating Systems, Special Test Equipment/ Software, and Other SW COTs products.

Support Tools/Applications	Description
Microsoft Office	MS Word, Excel, Power Point
Software Application (SOFT CAU)	To replicate the CAU functionality on a separately authorized laptop systems

i. Hardware: The following is a subset of hardware equipment list required to maintain, test and operate the Common Software products. This is not an all-inclusive list.

Test Hardware Resources	Description
Dell M6800, M6600, M6400	SMC Kits (Dell Laptops) configured to support an entire BCCS architecture, production servers (Enterprise Servers etc.) to client WFA workstations hosting the MC-CS products.
Dell 1130/R420Xr Blade Servers Sun 4100/4170 Blade Servers	The blade servers host test and development resources such as Software, VMware and MC-CS products and enterprise services
KVM Console	To monitor blade and Chassis operation
Cisco ASA 55105, 3825, 2951, 3750 Catalyst (switch) switches	Provide firewall and aggregate data.

j. Software Sustainment and Maintenance:

- i. Sustain Version 2.1.20 (Historical)
 - Number of specifications to analyze: 0
 - Number of Latent Defects implemented: 0
 - Number of New capabilities implemented: 0
 - Deliverables:
 - IAVA & STIGS for COTS Software
- ii. Sustain Version 2.1.20 (FY19)
 - Number of specifications to analyze: 0
 - Number of Latent Defects to be implemented: 0
 - Number of New capabilities to be implemented: 0
 - Deliverables:
 - IAVA & STIGS for COTS Software
- iii. Sustain DVA V 1.5.41 (FY20)
 - Number of specifications to analyze: 0
 - Number of Latent Defects to be implemented: TBD
 - Number of New capabilities to be implemented: 0
 - Deliverables:
 - IAVA & STIGS
 - Support bug fixes as appropriate (i.e. Cat I - Cat V)

k. System and Software Acquisition Support: N/A

Fires Systems Yearly External to SEC Dollars:

FY 16 External to SEC (\$16,021,583)

FY 17 External to SEC (\$9,852,831)

FY 18 External to SEC (\$14,049,852)

Acceptable FY 19 External to SEC Range (\$12,842,329 - \$14,194,153)

In the follow on years, there will be a plus or minus 3 percent each year after.

1. System Name: Joint Automated Deep Operations Coordination System (JADOCS)

- a. **System Manager:** SEC providing Post Production Software Support (PPSS) and Post Deployment Software Support (PDSS) in support of Program Manager Fire Support Command and Control (PM FSC2)
- b. **System Proponent:** United States Army Field Artillery School (USAFAS), Training and Doctrine Command (TRADOC) Capability Manager Fires Cells (TCM-Fires Cells) Software Division (SD) and Product Director Fire Support Command and Control (PD FSC2)
- c. **System Deployed:** JADOCS is deployed worldwide to Army, Corps, Divisions Brigades, and Battalions. It is employed by Active forces (Army, Air Force, USMC, Coalition Forces), National Guard (Army and USMC) and Reserves (Army and USMC). The number of systems currently in the field is: Air Force (1421), Army (1132), Marine Corps (49), Navy (183), Joint (630) and Coalition (677). Total number of JADOCS systems in the field is 4115.
- d. **System Overview:** JADOCS processes, stores and manipulates critical Command, Control, Communications, Computers, and Intelligence (C4I) information. It provides users with an integrated set of tools for data management and analysis, mission planning, coordination and execution of a variety of capabilities. The technology is employed on existing LAN multi-service headquarters architectures to provide horizontal and vertical integration of data that is resident on existing systems of record, and JADOCS operates within available bandwidths in echelons where it is deployed. The JADOCS application resides on Commercial-Off-The-Shelf/Government Furnished Equipment (COTS/GFE) personal computer platforms.

Historically, the highly complex JADOCs system has been developed and sustained by SEC FD providing Post Production Software Support/Post Deployment , Software Support (PPSS/PDSS) and System and Software Acquisitions Support for assigned

deployed Mission Critical Defense Systems (MCDSS). Support of deployed systems requires that Software Problem Reports (SPRs), software/hardware change proposals, and proposed improvements/enhancements be analyzed, solutions designed, implemented, tested, and documented.

- e. **System Interoperates With:** Advanced Field Artillery Tactical Data System (AFATDS), All Source Analysis System-Remote Work Station (ASAS-RWS), Theater Battle Management Core Systems (TBMCS), Global Command and Control System (GCCS).
- f. **Other Systems Dependent On:** AMDWS, ADSI, FAAD C2, TAIS, IAMD C2, IBS, JIAMD C2, JSTARS, CAC2S
- g. **Software Application Description:**
 - i Language: C, C++, Script_REM, XML, Data_#, VBASIC, IS, CSHARP, SCRIPT, Data_., SQL, HTML, CSS, JAVA, JAVASCRIPT
 - ii Source Line of Code by Software Version:
 - BC10.1.1 - Approximately 2.4 million and WLOC: 42
 - BC10.1.2 - Approximately 2.4 million and WLOC: 42
 - Version 2.0 – Approximately 3.4 million and WLOC:4,024,669
 - Version 2.0.1 – To be Developed
 - iii Operating System: Microsoft Windows.
 - iv COTS: Yes
 - v GOTS: Yes
- h. **Software Development Tools/ Applications:** A sample of the support tools/applications used is provided. This is not an all-inclusive list.

Support Tools/Applications	Description
Windows 2003 Server	OS Load
Redhat 5 Linux	OS Load
Windows InstallShield 2010 Professional	Install
MSXML 6.01 SP1	Install Prerequisite
Samba 3.6.5	Server
Support Tools/Applications	Description
Microsoft Visual Studio 2005 Professional	C / C++ Development
Apache ANT 1.7.0	Java Development
Apache Maven 2.2.1	Java Development

Oracle JDK 1.7.0_80	Java Development
Nexus 2.1.2	Java Development
Eclipse Helios	Java Development
Eclipse Delta Pack 3.6	Java Development
JBoss 5.1.0 GA	Java Development
TortoiseSVN 1.7.10.23359	Version Control
CollabNet Subversion server 1.7.7-1	Version Control
Roxio	DVD Burner

- i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate AFATDS software. This is not an all-inclusive list. 3 Laptop computers to run JADOCS, 3 GETAC/Miltope to run AFATDS and tactical software, 1 BCCS server stack to run tactical server software such as GCCS-J and MIDB, 1 8-port network switch, and 1 network printer.

j. **Software Sustainment and Enhancement:**

- i. Sustain Version BC10.1.1 and BC10.1.2 (Historical)
- Number of specifications: 0
 - Number of Latent Defects Implemented: 21
 - Number of New capabilities implemented: 0
 - Deliverables:41 (annually)
 - Schedules
 - Software with Release notes
 - Software System Safety Release Letter
 - Specifications
 - ECPs
 - Test Report
 - Monthly Cybersecurity Update Software Release Information
 - Version Description Document
 - Meeting Minutes
- ii. Sustain Version 2 (FY19)
- Number of specifications: 44
 - Number of Latent Defects to be Implemented: 12
 - Number of New capabilities implemented: 0
 - Deliverables:20 (annually)
 - Schedules
 - Software with Release notes
 - Software System Safety Release Letter
 - Specifications
 - ECPs

- Test Report
 - Monthly Cybersecurity Update Software Release Information
 - Version Description Document
 - Meeting Minutes
- iii. Development of JADOCS Version 2.0 (Historical)
 - Number of Latent Defects Implemented: 53
- iv. Develop Version 2.0.1 (FY19)
 - Number of specifications to analyze: 44
 - Number of Latent Defects under analysis: 219
 - Number of New capabilities to be implemented: 12 (See JADOCS Version 2.0.1 Capabilities below)
 - Deliverables expected: 34 (annually)
 - Specifications
 - ECPs
 - Schedules
 - Operator Notes
 - Technical Bulletins/Technical Manual
 - Instructor and Key Personnel Training Material
 - Software Delivery with Release Notes
 - Version Description Document
 - Safety Assessment Report
 - Test Plan
 - Test Report
 - Meeting minutes
- k. **System and Software Acquisition Support:**
 - i. Development of JADOCS Version 2.0 (Historical)
 - Number of specifications: 44
 - Number of New capabilities implemented: 31 (See System Requirements Matrix for JADOCS Version 2 below)
 - Deliverables: 34 (annually)
 - Specifications
 - ECPs
 - Schedules
 - Operator Notes
 - Technical Bulletins/Technical Manual
 - Instructor and Key Personnel Training Material
 - Software Delivery with Release Notes
 - Version Description Document
 - Safety Assessment Report
 - Test Plan
 - Test Report
 - Meeting minutes
 - ii. Technical Support of JADOCS Version 2.0 (Historical)

- Develop quarterly IAVA updates and support
- Attend technical meetings
- Provide analysis on issues reported
- Travel to support troubleshooting JADOCS with the Navy CANES operating environment

JADOCS Version 2.0.1 Capabilities

CAP	Title	Description	Source	CAP Comment	System	Cat.	Status	System Comment
0673	Optimize Processing Speeds When Polling Large Databases	The JADOCS software shall be modified to increase performance for: polling MIDB, large databases, and improve hardware to enhance/reduce memory leaks caused by inadequate use amount of memory. See #44 too. Better processor and more RAM mean better operations.	CENTCOM TSCR 2318-J103	.	JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected MC Summit CCB-21 Feb 18-Deferred Summit CCB - 2 May 17 - Open CCB - 12 Oct 2016: Deferred 12/4/14 - Deferred at CCM. selected per customer TAM# 238
0747	Update Software with Service Pack Notifications	A notification shall be triggered upon startup of the application to notify the operator if a Service Pack has not been applied in 120 days along with the AKO website to obtain the latest Service Pack. Field units are not visiting the Service Pack download site on a Quarterly basis, thus exposing the system and others connected to the network unresolved risk and dangers. The operator must take an affirmative action to acknowledge the warning.	FD, NFR	SRR 10 Sep 15 Updated Op Description	JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected MC Summit CCB-21 Feb 18-Open Summit CCB - 2 May 17 - Open CCB - 12 Oct 2016: Deferred
0912	Update Weather to Use GALWEM Weather Common Components	The JADOCS software shall be modified to pull weather data using the Weather Common Components (WxCC) provided by GALWEM.	Air Force Michael Moore, DAFC. ACC/A5W (402) 294-1638	.	JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected MC Summit CCB-21 Feb 18-Open Summit CCB - 2 May 17 - Open CCB - 12 Oct 2016: Deferred
0924	Implement Remaining C2AOS-C2IS Web Services	The JADOCS software shall be modified to interface with the remaining C2AOS-C2IS web services not already implemented.	TCM Fires Cells Earl Edkin (580) 442-6854 TSCR 2318-J058A		JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected MC Summit CCB-21 Feb 18-Open Summit CCB - 2 May 17 - Open CCB - 12 Oct 2016: Deferred

0926	Upgrade JADOCS to Interface with the Latest GCCS-J Software	The JADOCS software shall be modified to interface with the GCCS-J Phoenix implementation.	TCM Fires Cells Earl Edkin (580) 442-6854		JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected MC Summit CCB-21 Feb 18-Open Summit CCB - 2 May 17 - Open CCB - 12 Oct 2016: Deferred
0927	Upgrade JADOCS to Interface with the Latest MIDB Software	The JADOCS software shall be modified to update its implementation for MIDB 2.9.	TCM Fires Cells Earl Edkin (580) 442-6854		JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected MC Summit CCB-21 Feb 18-Open Summit CCB - 2 May 17 - Open CCB - 12 Oct 2016: Deferred
0933	Implement Scheduled POA&M Fixes	Implement corrections for software weaknesses that are scheduled to be completed in this version as identified in the Plan of Action and Milestones (POA&M).	Cyber Security Policy DoDI 8510.01, Risk Management Framework (RMF) for DoD Information Technology (IT)	updated source; updated description per AFATDS V6.8.1.1P2 SRR	JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected MC Summit CCB-21 Feb 18-Open Summit CCB - 2 May 17 - Open CCB - 12 Oct 2016: Deferred
0934	Automated Tagging and Patching	Implement the capability to perform automated tagging and patching using System Center Configuration Manager (SCCM).	ARCYBER 2A OPOD 2016-129 IAVM Program Implementation	updated source	JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected MC Summit CCB-21 Feb 18-Open Summit CCB - 2 May 17 - Open CCB - 12 Oct 2016: Deferred
1037	Remove MSXML and Replace with Xerces XML	The JADOCS software shall be updated to remove all dependencies to Microsoft XML Core Services (MSXML). The JADOCS software shall replace MSXML with the Xerces XML library.	PD FSC2 Summit CCB - 2 May 2017	updated source	JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected MC Summit CCB-21 Feb 18-Open Summit CCB - 2 May 17 - Open
1038	JADOCS Dynamic Window Scaling	The JADOCS software shall be updated to recognize display resolutions and to dynamically scale windows according to current monitor resolution.	PD FSC2 Summit CCB - 2 May 2017	updated source	JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected MC Summit CCB-21 Feb 18-Open Summit CCB - 2 May 17 - Open
1058	Implement the USMTF 2004 B.1.02.05 ATO Format	The JADOCS software shall be modified to allow the operator to import a United States Message Text Format (USMTF) 2004 B.1.02.05 Air Tasking Order (ATO) produced by C2AOS-C2IS ATO Management Service (ATOMS).	PD FSC2 Ling Lee Dietrich		JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected MC Summit CCB-21 Feb 18-Open

1063	Create an FSCM from Enagement Zones.	The JADOCS Software shall be modified to allow the operator to create an Fires Support Coordination Mesasure (FSCM) from exsiting engagement zones.	USFK TSCR 7313-J205	Updated source organization	JADOCS	2	OMA-Selected	CCB - 26 Apr-4 May 18-Selected
------	--------------------------------------	---	---------------------	-----------------------------	--------	---	--------------	--------------------------------

Table I. System Requirements Matrix for JADOCS Version 2

REQ	PRI	REQUIREMENT TITLE	JADOCS	EXTERNAL	FUND	COMMENTS
2-0658	1	Maintain Backward Compatibility to JADOCS 1.0.5.1	X		Customer	JADOCS V2 PWS para 3.2.2 Modification approved at RIPR 3 Modification approved at RIPR 1
2-0660	1	Upgrade the DDS Client Interface	X		Customer	JADOCS V2 PWS para 3.3.5.3 New requirement selected in a CCB action and approved for implementation at 29Mar16 SRR 2 Originally deferred at 13Oct15 TIPR 1
2-0661	1	Upgrade JADOCS to Use Wildfly 9	X		Customer	JADOCS V2 PWS para 3.3.6.5 Modification approved at TIPR 3
2-0662	1	Add SSL Option to Server Connections	X		Customer	JADOCS V2 PWS para 3.3.6.5 Modification approved at RIPR 1
2-0663	1	Make JADOCS fully PK-enabled	X		Customer	JADOCS V2 PWS para 3.3.6.5
2-0664	1	Add Capability for Time Sensitive Target 10-Line Generator	X		Customer	TSCR 2318-J051 Modification approved at RIPR 3 Modification approved at TIPR 1
2-0665	1	Add Approval Entry for Airspace Control Authority (ACA) in Target Managers	X		Customer	TSCR 2318-J056
2-0666	1	Develop Interface with AOC C2AOS-C2IS Web Services	X		Customer	TSCR 2318-J058A Modification approved at TIPR 3 Modification approved at TIPR 1
2-0668	1	MIDB Access/Download/Import Updates/Search and Sort	X		Customer	TSCR 2318-J061 Modification approved at RIPR 3
2-0669	1	Create a Subordinate Maritime Target Manager	X		Customer	TSCR 2318-J062 New requirement approved at RIPR 1
2-0670	1	Interface with GCCS-J/13 for Intelligence Reports	X		Customer	TSCR 2318-J065
2-0671	1	Expand List of Coordination Measures to Include Surface and Air Coordination Measures that Can be Shared with Other Systems (Display and Meta Data)	X		Customer	TSCR 2318-J069 Modification approved at SRR 2

Table I. System Requirements Matrix for JADOCS Version 2						
REQ	PRI	REQUIREMENT TITLE	JADOCS	EXTERNAL	FUND	COMMENTS
2-0672	1	Provide a Supplemental Map Engine (NASA World Wind) to the JADOCS Map	X		Customer	TSCR 2318-J074
2-0677	1	JADOCS ATO Management	X		Customer	TSCR 2318-J145
2-0679	1	Add Vital Area Rings on Naval High Value Units	X		Customer	TSCR 3100-J174 Modification approved at TIPR 2
2-0680	1	Update to the Latest Version of the MIDB System	X		Customer	TSCR 3113-J177 New requirement approved at TIPR 1
2-0681	1	Expand JADOCS Data Exchange with Second Generation South Korea Fires System; ROK Joint Fires Operations System Korea (JFOSK)	X	ROK JFOSK	Customer	TSCR 3296-J183
2-0683	1	Implement .ovl Files	X		Customer	TSCR 3296-J185
2-0684	1	Ability to Import/Export/Process/Display KML and Shapefiles	X		Customer	TSCR 2318-J108
2-0686	1	Active Directory and User Verification	X		Customer	JADOCS V2 PWS para 3.3.5.4
2-0687	1	Apply System Software Security Countermeasures	X		Customer	JADOCS V2 PWS para 3.3.6.5 Modification approved at SRR 3
2-0688	1	Establish and Implement a XML Interface with Joint Targeting Toolbox	X		Customer	TSCR 0071-J010 Modification approved at TIPR 3
2-0689	1	Establish a Radar Import and Manage Function	X		Customer	TSCR 2318-J025
2-0690	1	Add Functionality for Targeting Alerts and Storage	X		Customer	TSCR 2318-J055
2-0691	1	Develop an Interface to Net-Enabled Weapons Systems	X		Customer	TSCR 2318-J060 Modification approved at SRR 2 Modification approved at TIPR 1
2-0695	1	Implement Duplicate Target Entry Alerts	X		Customer	TSCR 3065-J170
2-0699	1	Permit Missions Transfer Among Managers	X		Customer	Selected at 4Dec14 CCM; TSCR 2318-J014
2-0700	1	Implement Capability to Display Digital Nautical Charts	X		Customer	Selected at 4Dec14 CCM; TSCR 2318-J066 Modification approved at TIPR 3 Modification approved at TIPR 1

Table I. System Requirements Matrix for JADOCS Version 2

REQ	PRI	REQUIREMENT TITLE	JADOCS	EXTERNAL	FUND	COMMENTS
2-0701	1	Import TLAM Route Files	X		Customer	Selected at 4Dec14 CCM; TSCR 3100-J175 Modification approved at RIPR 3
2-0875	1	Migrate JADOCS to Support Windows 10	X		Customer	New requirement approved at RIPR 3
2-0876	1	Migrate JADOCS to Support Windows Server 2012	X		Customer	New requirement approved at RIPR 3
0659	1	Data Exchange (USMTF 2004, XML, and ABCS Symbology (USAS))	X		Customer	Deferred at 13Oct15 TIPR 1 JADOCS V2 PWS para 3.3.4
0667	1	Integrate Kinetic/Non Kinetic Fires Functionality	X		Customer	Deferred at 4Dec14 CCM
0673	1	Optimize Processing Speeds When Polling Large Databases	X		Customer	Deferred at 4Dec14 CCM
0674	1	Interface with NATO Joint Targeting System	X		Customer	Deferred at 4Dec14 CCM
0675	1	Implement a Graphical User Interface for Sys Admin Tools	X		Customer	Deferred at 4Dec14 CCM
0676	1	Populate JASMAD/TBMCS AOC WS 10.1/2	X		Customer	Retired: CCM AI 00204-006
0678	1	Create Tasking Message	X		Customer	Retired at 4Dec14 CCM
0682	1	Ability to Create User-Defined Graphic Overlays or Scalable Vector Graphics	X		Customer	Retired at 19Mar15 SRR; TSCR 3296-J184
0692	1	Enhance the JADOCS Interface with DCGS Family of Systems	X		Customer	Deferred: CCM AI 00204-013
0693	1	Create a Stability Operations Mission Manager	X		Customer	Deferred at 19Mar15 SRR; TSCR 2318-J105
0694	1	Process NATO ATO Formats	X		Customer	Deferred at 29Mar16 SRR 2 TSCR 2318-J113 Modification approved at 13Oct 2015 TIPR 1

2. **System Name:** Profiler Virtual Module (PVM)

- a. **System Manager:** SEC providing Post Production Software Support (PPSS) on support of Program Manager Fire Support Command and Control (PM FSC2).
- b. **System Proponent:** United States Army Field Artillery School (USAFAS), Training and Doctrine Command (TRADOC) Capability Manager Fires Cells (TCM-Fires Cells) Software Division (SD) and Product Director Fire Support Command and Control (PD FSC2).
- c. **System Deployed:** The PVM replaces the MMS-P which is deployed worldwide to Field Artillery Battalions and Fires Brigades. A few MMS-P are also located the FA school and the development base. The number of MMS-P systems currently in the Army inventory is approximately 108.
- d. **System Overview:** The Profiler Virtual Module (PVM) is the successor to the Computer, Meteorologicla Data– Profiler (CMD-P), which is a Tactical Operations Cell (TOC) based system developed for the U.S. Army to provide meteorological information to primarily support the Fires community. The system produces 30-km atmospheric profiles for a 500km x 500 km domain, independent of the physical location of the PVM. The atmospheric profiles are produced using a mesoscale numerical forecasting model. The Weather Research and Forecasting (WRF) model, in conjunction with ancillary processing software, will be used to produce meteorological messages that are disseminated to the Advanced Field Artillery Tactical Data System (AFATDS) using the TOC Local Area Network (LAN). Historically, the PVM system has been developed and sustained by SEC FD providing Post Production Software Support/Post Deployment, Software Support (PPSS/PDSS) and System and Software Acquisitions Support for assigned deployed Mission Critical Defense Systems (MCDSs). Support of deployed systems requires that Software Problem Reports (SPRs), software/hardware change proposals, and proposed improvements/enhancements be analyzed, solutions designed, implemented, tested, and documented.
- e. **System Interoperates With:** Advanced Field Artillery Tactical Data System (AFATDS) and Global Broadcasting Service (GBS)
- f. **Other Systems Dependent On:** AFATDS
- g. **Software Application Description:**
 - i. Language: Ada, Java, C, MATLAB, Bourne Shell, XML, make, SQL, Perl, C/C++, Python, Ant
 - ii. Source Line of Code by Software Version:
 - Version 1.0.0.4 - Approximately .36 million and WLOC: 1049
 - iii. Operating System: Red Hat Enterprise Linux.
 - iv. COTS: Yes
 - v. GOTS: N/A.

- h. **Software Development Tools/ Applications:** A sample of the support tools/applications used is provided. This is not an all-inclusive list.

Support Tools/Applications	Description
GNAT Pro	Compiler
Netbeans	IDE
Red Hat	Operating System
Java JDK	Compiler
PGI Workstation	Compiler

- i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate MMS-P software. The list for PVM is still under development but will be similar. This is not an all-inclusive list. 1 each AN/GMK-2 CMD-P, 1 each GBS receiver set, 1 each power supply, 1 each laser printer, and 2 each AFATDS to receive and send data with the MMS-P.

j **Software Sustainment and Enhancement:**

i. Sustain Version 1.0.0.4 (Historical)

- Number of specifications: 3
- Number of Latent Defects Implemented: 18 (annually)
- Number of New capabilities implemented: 0
- Deliverables: 22 (annually)
 - Schedules
 - Software with Release notes
 - Safety Assessment Report
 - Risk Management Framework (RMF) documentation
 - Specifications
 - ECPs
 - Test Report
 - Monthly Cybersecurity Update Software Release Information
 - Version Description Document
 - Meeting Minutes

ii. Assist with developing software fixes and enhancements for any critical issues (FY19)

- Number of specifications to analyze: 3
- Number of Latent Defects under analysis: 7
- Number of New capabilities: 0
- Deliverables expected: 22

k **System and Software Acquisition Support:**

- i. Assist with developing new software capabilities (FY19)
 - Number of New capabilities possible for implementation: 0

3. **System Name:** Counter-fire Target Acquisition Radar System, AN/TPQ-53

- a. **System Manager:** SEC providing Post Production Software Support (PPSS) in support of Product Manager Radars (PdM Radars)
- b. **System Proponent:** United States Army Field Artillery School (USAFAS), Training and Doctrine Command (TRADOC) Capability Manager Field Artillery Brigade-DIVARTY (TCM FA BDE-D) and Product Manager (PdM) Radars.
- c. **System Deployed:** The AN/TPQ-53 is deployed worldwide to Field Artillery Battalions and Fires Brigades. A few AN/TPQ-53 are also at the FA school and the development base. The number of systems currently in the Army inventory is approximately 0. Awaiting FRP decision from MDA.
- d. **System Overview:** The AN/TPQ-53 is a highly mobile counter-fire target acquisition radar system. The principle functions of the system are to detect, track, classify, and accurately determine the origin and impact point of enemy indirect fires. The AN/TPQ-53 System is capable of locating hostile mortar, artillery, and rocket fire in a clutter environment, and provides friendly artillery registration and adjustment. The AN/TPQ-53 System provides the soldier continuous and responsive counter-battery target acquisition for all types and phases of military operations. The System supplies 90 degree coverage against all threats at nominal ranges and accuracies and 360 degree azimuth coverage against mortar, cannon, and rocket targets at ranges up to 20 km. (Q53 is currently under development by the PdM. Effort for the duration of this task order will be technical support and Live-Fire Testing support.)
- e. **System Interoperates With:** AN/TPQ-53, Firefinder AN/TPQ-36 (FF-Q36), Firefinder AN/TPQ-37 (FF-Q37), AN/TPQ-50, Advanced Field Artillery Tactical Data System (AFATDS), and Forward Area Air Defense Command and Control (FAADC2). AN/TPQ-53 communicates with other fire support systems using TacLink 2000 Radio Modem, SINCGARS Radios, Harris Very High Frequency/Ultra High Frequency (VHF/UHF) Radios, and AN/PSC-5 (SATCOM) Radios.
- f. **Other Systems Dependent On:** AFATDS and FAADC2
- g. **Software Application Description:**
 - i. Language: Ada, C, C++, DATA, JAVA, SCRIPT, Awk, MATLAB
 - ii. Source Line of Code by Software Version:
 - Version 2.07 - Approximately 2.2 million
 - Radar Virtual Software Version 3 – .6 million and WLOC: 34,266
 - iii. Operating System: Red Hat Enterprise Linux.
 - iv. COTS: N/A.
 - v. GOTS: N/A.

- h. **Software Development Tools/ Applications:** This system is still under development and as noted above has no planned development under this task order.
- i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate Q-53 software. This list was prepared for the Q36 and is similar to what is projected for the Q53. This is not an all-inclusive list. 2 each Single Channel Ground and Air Radio System (SINCGARS) radios, 2 each Advance System Improvement Program (ASIP) radios, 2 each Test Support System (TSS), 2 each Advanced Field Artillery Data System (AFATDS) on Compact Computer Unit (CCU), 2 each AFATDS on TADPOLE, 1 each AFATDS on GETACH, 1 each FAADC2 with Bull Frog (actual), 1 each FAADC2 With C2S C-RAM simulator, 2 each HP6940 Printer, 2 each Printer, RITEC.
- j. **Software Sustainment and Enhancement :** Transition to sustainment expected in FY22
- k. **System and Software Acquisition Support:**
- i. Technical Support of AN/TPQ-53 Version 2.07 (Historical)
 - Develop and execute Q-53 test procedures
 - Support training material review
 - Cyber Security Support
 - Develop RMF documentation, scan the software, update POA&M, IAVA support
 - Provide technical support at meetings
 - Provide Q-53 OEM support for OneSAF Radar Training Support (ORTS)
 - Provide support for the Collective Training System (CTS)-OneSAF solution
 - Provide Verification and Validation efforts
 - Analyze problem reports during customer test, acceptance test, and deployed systems
 - Provide qualified licensed Q-53 GFE operators
 - Support creating, reviewing, and commenting on statutory and regulatory documentation
 - Training and Support for the Sim-Over Live (SOL) equipment
 - Support the ability to fully transition the Q-53 software
 - Number of specifications to analyze: 19
 - Number of Latent Defects Under Analysis: 222
 - Number of New capabilities implemented: 0
 - Deliverables expected:24 (annually)
 - Risk Management Framework Data Entry/ Documentation
 - Test Report
 - Trip Report
 - Meeting Minutes
 - ii. Technical Support of AN/TPQ-53 Version 2.07 follow on version (FY19)
 - Develop and execute Q-53 test procedures

- Support training material review
- Cyber Security Support
- Develop RMF documentation, scan the software, update POA&M, IAVA support
- Provide technical support at meetings
- Provide Q-53 OEM support for OneSAF Radar Training Support (ORTS)
- Provide support for the Collective Training System (CTS)-OneSAF solution
- Provide Verification and Validation efforts
- Analyze problem reports during customer test, acceptance test, and deployed systems
- Provide qualified licensed Q-53 GFE operators
- Support creating, reviewing, and commenting on statutory and regulatory documentation
- Training and Support for the Sim-Over Live (SOL) equipment
- Support the ability to fully transition the Q-53 software
- Number of specifications to analyze: 19
- Number of Latent Defects Under Analysis: 222
- Number of New capabilities implemented: 0
- Deliverables expected:24 (annually)
 - Risk Management Framework Data Entry/ Documentation
 - Test Report
 - Trip Report
 - Meeting Minutes

iii. Development of the Radar Virtual Software Q53 Version 3 (Historical)

- Number of specifications to analyze: 3
- Number of Latent Defects Implemented: 3
- Number of New capabilities implemented: 10(See System Requirements matrix for RVS Q-53 Version 3)
- Deliverables: 14 (annually)
 - ECPs/Specifications
 - Schedules
 - RDD
 - CSL
 - Test Report
 - Test Plan
 - Student Guide
 - Instructor Guide
 - Software
 - VDD
 - Meeting Minutes

iv. Development of the Radar Virtual Software Q53 Version 4 (Historical)

- Number of specifications to analyze: 3
- Number of Latent Defects Implemented: TBD – currently in formal test

- Number of New capabilities implemented: 14 (See System Requirements matrix for RVS Q-53 Version 4)
 - Deliverables: 13 (annually)
 - ECPs/Specifications
 - Schedules
 - RDD
 - CSL
 - Test Report
 - Test Plan
 - Student Guide
 - Instructor Guide
 - Software
 - VDD
 - Meeting Minutes
- v. Development of the Radar Virtual Software Q53 Version 5 (FY19)
- Number of specifications to analyze: 3
 - Number of Latent Defects Under Analysis: 50
 - Number of New capabilities to be implemented: 10 (See RVS Q53 Version 5 capabilities list)
 - Deliverables expected: 13 (annually)
 - ECPs/Specifications
 - Schedules
 - RDD
 - CSL
 - Test Report
 - Test Plan
 - Student Guide
 - Instructor Guide
 - Software
 - VDD
 - Meeting Minutes
- vi. Development of the OneSAF Radar Training Support (ORTS) Version 6.xx (FY19)
- Number of specifications to analyze: 1
 - Number of Latent Defects Under Analysis: 19
 - Number of New capabilities implemented: 0
 - Deliverables expected: 11 (annually)
 - Test Report
 - Software with Release Notes
 - VDD
 - Trip Reports
 - Meeting Minutes

• Table I. System Requirements Matrix for RVS Q-53 Version 3

REQ #	PRI	Requirement Title	RVS Q-53	EXTERNAL	FUND	COMMENTS
3-0889	1	Emulate Q-53 Functionality	X		CUST	Modifications were presented and approved at electronic SRR 2 held 1-3 May 2017
3-0890	1	Update Instructor Station Operating System	X		CUST	Modifications were presented and approved at RIPR 1 held 19 Jan 2017 Modifications were presented and approved at TRR held 20 June 2017
3-0891	1	Add a RVS Q-53 Exam	X		CUST	
3-0892	1	Different Hostile and Friendly Fire Target Numbers	X		CUST	
3-0893	1	Change Modes Command from AFATDS	X		CUST	
3-0894	1	Friendly Fire Targets Received Only with Correct Site Data	X		CUST	Modifications were presented and approved at electronic SRR 2 held 1-3 May 2017
3-0895	1	Update Scenarios that Require Entering FSS Terrain Data	X		CUST	
3-0896	1	Allow Students to Enter Net Members into System in any Order	X		CUST	
3-0897	1	Separate Instructional Scenario into Initialization and Operational Scenarios	X		CUST	
3-0905	1	Train Capabilities of Operator Level Fault Isolation Tests	X		CUST	
3-0867	3	Modify a Scenario to Train the Functionality of the Indirect Fire Protection Capability	X		CUST	CCB Action: deferred at SRR on 13 Dec 2016
3-0898	2	Add Automatic Target Processing into the Instructional Scenario and into a Hostile Scenario	X		CUST	CCB Action: deferred at SRR on 13 Dec 2016

• Table I. System Requirements Matrix for RVS Q-53 Version 3

REQ #	PRI	Requirement Title	RVS Q-53	EXTERNAL	FUND	COMMENTS
3-0899	2	Develop Training Scenario to Emphasize Functions and Operations of the System Resource Manager Display	X		CUST	CCB Action: deferred at SRR on 13 Dec 2016
3-0900	2	Additional Maintenance Scenario	X		CUST	CCB Action: deferred at SRR on 13 Dec 2016
3-0901	2	Ability to Simulate Uploading DTED from the SS Computer	X		CUST	CCB Action: deferred at SRR on 13 Dec 2016
3-0902	2	Add JMUL Viewer to a Training Scenario	X		CUST	CCB Action: deferred at SRR on 13 Dec 2016
3-0903	3	Addition of the Ping Function to the Instructional Scenario	X		CUST	CCB Action: retired at SRR on 13 Dec 2016
3-0906	3	Improve IS Interoperability with the SS during Scenarios	X		CUST	CCB Action: deferred at SRR on 13 Dec 2016
3-0908	3	Ability to Share Scenario History from the IS Student Window with the SS Display	X		CUST	CCB Action: deferred at SRR on 13 Dec 2016

Table I. System Requirements Matrix for RVS Q-53 Version 4

REQ #	CAT	Requirement Title	RVS Q-53	EXTERNAL	FUND	COMMENTS
4-0899	2	Develop Training Scenario to Emphasize Functions and Operations of the System Resource Manager Display	X		CUST	
4-0900	3	Additional Maintenance Scenario	X		CUST	
4-0901	2	Ability to Simulate Uploading DTED from the SS Computer	X		CUST	
4-0902	2	Add JMUL Viewer to a Training Scenario	X		CUST	
4-1043	3	Update Software to Grade the Manual Deleting of Zones	X		CUST	
4-1044	2	Add Manual Friendly Fire Parameter Task to Combined Scenarios	X		CUST	
4-1045	2	Line Up Report Data in the Correct Columns	X		CUST	
4-1046	4	Add Rocket Target to Scenarios using Rocket Mode	X		CUST	
4-1047	2	Incorporate Army Network Capability	X		CUST	Modifications approved at SRR
4-1048	3	Incorporate IFPC Rev S	X		CUST	
4-1050	2	Incorporate Low QE Capability	X		CUST	
4-1052	2	Incorporate Location Averaging Changes	X		CUST	
4-1053	1	Update Instructor Station OS to 7.4 RHEL	X		CUST	
4-1054	2	Emulate Q-53 Functionality	X		CUST	CCB Action: Selected at CCM on 8 November 2017

RVS Q53 Version 5 capabilities list:

RVS Q53 V5 Development	Cust	Emulate the Q-53 tactical software.
RVS Q53 V5 Development	Cust	Remove the Low QE to match the tactical system
RVS Q53 V5 Development	Cust	Make all targets Radar relative
RVS Q53 V5 Development	Cust	TACD performance
RVS Q53 V5 Development	Cust	Remove unneeded logging
RVS Q53 V5 Development	Cust	Reactivate buffer task
RVS Q53 V5 Development	Cust	Optimize server configuration
RVS Q53 V5 Development	Cust	Manually enter saved search data
RVS Q53 V5 Development	Cust	Manually enter saved friendly fire data
RVS Q53 V5 Development	Cust	Assign scenario to a station without a student

4. **System Name:** Light Weight Counter Mortar (LCMR) AN/TPQ-50 (LCMR Q50)

- a. **System Manager:** SEC providing Post Production Software Support (PPSS) on support of Product Manager Radars (PdM Radars)
- b. **System Proponent:** United States Army Field Artillery School (USAFAS), Training and Doctrine Command (TRADOC) Capability Manager Field Artillery Brigade-DIVARTY (TCM FA BDE-D) and Product Manager (PdM) Radars.
- c. **System Deployed:** The AN/TPQ-50 is deployed worldwide to Maneuver Brigades. A few are also at the FA school and the development base. The number of systems currently in the Army inventory is approximately 151.
- d. **System Overview:** The AN/TPQ-50 Lightweight Counter Mortar Radar (LCMR Q50) detects and locates mortar firing positions with a range of 10km by detecting, tracking and pinpointing the origin of the weapon position. The AN/TPQ-50 provides 6400 mil/360 degree surveillance and mortar location. The system can be assembled and disassembled in 20 minutes by two soldiers. When a mortar is detected, the AN/TPQ-50 sends a warning message indicating a round is incoming. After sufficient data is collected by the radar's software, the point of origin is transmitted. The AN/TPQ-50 was designed to be operated in a stand-alone or vehicle mount configuration, allowing greater flexibility and speed of deployment.

Historically, the highly complex LCMR Q50 system has been developed and sustained by SEC FD providing Post Production Software Support/Post Deployment , Software Support (PPSS/PDSS) and System and Software Acquisitions Support for assigned deployed Mission Critical Defense Systems (MCDSSs). Support of deployed systems requires that Software Problem Reports (SPRs), software/hardware change proposals, and proposed improvements/enhancements be analyzed, solutions designed, implemented, tested, and documented.

- e. **System Interoperates With:** FireFinder AN/TPQ-36 (FF-Q36), FireFinder AN/TPQ-37 (FF-Q37), AN/TPQ-50, AN/TPQ-53, Advanced Field Artillery Tactical Data System (AFATDS), and the Forward Area Air Defense Command and Control (FAADC2). AN/TPQ-50 communicates with other fire support systems using Combat Net Radio SINCGARS Improvement Program Internet Controller (SIP-INC), SINCGARS, TSEC/KY-57, AN/VRC-46 Series Radios, Harris Very High Frequency/Ultra High Frequency (VHF/UHF) Radios, AN/PSC-5 (SATCOM) Radio, and 2 or 4 Wire Landline.
- f. **Other Systems Dependent On:** AFATDS and FAADC2
- g. **Software Application Description:**
 - i. Language: C, C#, C++, DATA, SCRIPT, XML
 - ii. Source Line of Code by Software Version:
 - Version 2.0.2 - Approximately 1.75 million and WLOC: 9,165,619

- Version 2.0.3 - Approximately 2.1 million and WLOC: 9,435,035
 - Version 2.1.1 – Approximately 34.2 million and WLOC: 848,263
 - Version 2.1.x – To be Developed
 - Radar Virtual Software AN/TPQ-50 Version 1 – 2.7 million and WLOC: 2,559,159
 - Onesaf Radar Training Support (ORTS) Version 6.04.00 - .85 million and WLOC: 0
- iii. Operating System: Red Hat Enterprise Linux, QNX.
- iv. COTS: Yes.
- v. GOTS: N/A.

h. Software Development Tools/ Applications:

MS Windows 7 SP1

QNX Momentics 6.3.2

InstallShield SP1 16.0d 2010

Java SE Dev Update55

MS VisualStudio

PFPS FalconView 3.3.0.42

PuTTY

- i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate Q-36 software. This is not an all-inclusive list. 2 each AN/TPQ-50 (Complete systems with spares case), 2 each V3 Rugged Laptop Computers.

j. Software Sustainment and Enhancement:

- i. Develop Version 2.1.1 (Historical)
- Number of specifications to analyze: 13
 - Number of Latent Defects Implemented: 55
 - Number of New capabilities implemented: 4 (See System Requirements matrix for LCMR Q50 Version 2 below)
 - Deliverables: 44 (annually)
 - ECP/Specifications
 - Schedules
 - SAR
 - RDD
 - Risk Management Framework Documentation
 - Test Report
 - Test Plan
 - Technical Manuals
 - Operator Notes

- Training Material
 - Cybersecurity Update Software Release
 - Software with Release Notes
 - VDD
 - Trip Reports
 - Meeting Minutes
- ii. Sustain Version 2.0.2, 2.0.3, 2.1.1 (Historical)
 - Number of specifications: 13
 - Number of Latent Defects Implemented: 38 (annually)
 - Number of New capabilities implemented: 0
 - Deliverables: 46 (annually)
 - Service Pack with Release Notes
 - Software System Safety Release Letter
 - Test Report
 - Cybersecurity Update Software Release
 - VDD
- iii. Sustain Version 2.0.2, 2.0.3, 2.1.1 (FY19)
 - Number of specifications: 13
 - Number of Latent Defects to be Implemented: 38 (annually)
 - Number of New capabilities implemented: 0
 - Deliverables: 46 (annually)
 - Service Pack with Release Notes
 - Software System Safety Release Letter
 - Test Report
 - Cybersecurity Update Software Release
 - VDD
- iv. Develop Version 2.1.x (FY19)
 - Number of specifications to analyze: 13
 - Number of Latent Defects under analysis: 111
 - Number of New capabilities to be implemented: 14 (See OMA – Selected LCMR Q50 Version 2.1.x Capabilities below)
 - Deliverables expected: 44 (annually)
 - ECP/Specifications
 - Schedules
 - SAR
 - RDD
 - Risk Management Framework Documentation
 - Test Report
 - Test Plan
 - Technical Manuals
 - Operator Notes
 - Training Material
 - Cybersecurity Update Software Release
 - Software with Release Notes

- VDD
- Trip Reports
- Meeting Minutes

k. System and Software Acquisition Support:

- i. Development of the Radar Virtual Software Q50 Version 1 (Historical)
 - Number of specifications to analyze: 3
 - Number of Latent Defects Implemented: 0
 - Number of New capabilities implemented: 8 (See System Requirements Matrix for RVS Q50 Version 1 below)
 - Deliverables: 13 (annually)
 - ECP/Specifications
 - Schedules
 - RDD
 - Test Report
 - Test Plan
 - Instructor Guide
 - Student Guide
 - Software
 - VDD
 - Meeting Minutes
- ii. Development of the OneSAF Radar Training Support (ORTS) Version 6.04.00 (Historical)
 - Number of specifications to analyze: 1
 - Number of Latent Defects Implemented: 24
 - Number of New capabilities implemented: 0
 - Deliverables: 11 (annually)
 - ECP/Specifications
 - Test Report
 - Software with Release Notes
 - VDD
- iii. Development of the Radar Virtual Software Q50 Version 2 (FY19)
 - Number of specifications to analyze: 3
 - Number of Latent Defects Under Analysis: 6
 - Number of New capabilities to be implemented: To be Determined
 - Deliverables: 13 (annually)
 - ECP/Specifications
 - Schedules
 - RDD
 - Test Report
 - Test Plan
 - Instructor Guide
 - Student Guide
 - Software
 - VDD

– Meeting Minutes

v. Develop Version 2.1.x and Technical Support (FY19)

- Number of New capabilities to be implemented: 4 (See PdM – Selected LCMR Q50 Version 2.1.x Capabilities below)
- Provide Program Manager Technical Support for 120 units in multiple locations receiving the LCMR Q50 software package
- Provide technical support to PdM Radars as requested

Table I. System Requirements Matrix for LCMR Q50 Version 2						
Req #	CAT	Requirement Title	LCMR Q50	Ex te rn al	Fund	Comments
LCMR Q50 V2.1.1 Requirements						
2-0879	2	Integrate CTS-OneSAF_V1 into the LCMR Q50 Laptop Software	X		OMA	Modifications were presented and approved at TIPR 1 held 23 March 2017 CCB Action: Category was changed from "3" to "2" per the electronic CCB held 26 January - 2 February 2017
2-0888	1	Implement VMF MIL-STD-6017B_VID_CS13-14-v5_20110815	X		OMA	Modifications were presented and approved at RIPR 1 held 15 December 2016
2-0947	1	Implement VMF COE_v2_VID_v3-2014-05-23	X		OMA	New requirement approved for implementation at RIPR 1 held 15 December 2016 Modifications were presented and approved at TIPR 1 held 23 March 2017
2-1026	2	Enable Downleg Tracking	X		OMA	New requirement approved for implementation at electronic SRR 2 held 22-24 May 2017
2-0878	3	Integrate Application Control/Change Control (SolidCore)	X		OMA	CCB Action: deferred at SRR on 2 November 2016

LCMR Q50 Version 2.1.x Selected Capabilities:

CAP	Title	Description	Source	CAP Comment	Cat.	Status	System Comment
0002	Implement MIL-STD-2045-47001D CHG1 and MIL-STD-188-220D CHG1	Implement MIL-STD-2045-47001D w/CHANGE 1 (47001D CHG1) application header protocol and MIL-STD-188-220D w/CHANGE 1 (220D CHG1) communications protocol for messaging in order to maintain interoperability with supported and supporting units. Backwards compatibility to MIL-STD-188-220C and MIL-STD-2045-47001C communication protocols must be maintained.	COE3 STDV-1 Memorandum for Members of the FISB, Subject: Fire Support Communications Military Standard Requirements for Army Capability Set (CS) 17-18 dated 10 May 2016	12 Apr 2018 Updated Description	1	OMA - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 Open / 1 (OMA) Summit CCB 19 Jul 17 Open / 1 CCB - 14 Sep 16: Deferred to future version added LCMR Q50 on 27Jul16
0841	Implement VMF MIL-STD-6017C_COE_v3_VID_v2_2017-09-28	Implement Variable Message Format (VMF) MIL-STD-6017C_COE_v3_VID_v2_2017-09-28 to maximize interoperability with AFATDS 6.8.1.1(P2). Critical message changes include updates to the K02.50 Radar Deployment Order to support radar capabilities and K02.55 Record of Fire to support Centaur and AFATDS capabilities. Backwards compatibility will not be maintained for MIL-STD-6017 due to the significant functional differences between MIL-STD-6017 and MIL-STD-6017C. All references to older versions of the systems shall be removed from all operator screens and message formats.	COE3 STDV-1 Memorandum for Members of the FISB, Subject: Fire Support Communications Military Standard Requirements for Army Capability Set (CS) 17-18 dated 10 May 2016	Modified the title and description to reflect the updated MIL-STD-6017C_COE_v3_VID_v2_2017-09-28 redlines that were approved at the TIPR 2 for AFATDS V6.8.1.1(P2) held on 28 June 2018.	1	OMA-Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 Open (OMA) Summit CCB 19 Jul 17 - Open / 1 CCB - 21 Nov 2016: remains Deferred CCB - 14 Sep 2016: Deferred to a future version Added LCMR Q50 on 27Jul16
0960	Save/Load Configuration	Provide the ability for the operator to save and load user defined system configurations. The file will contain mission critical data required for initializing the system for operations. This will allow for expedited	PdM Radars DRB 14: 6I TAR ZE-0278	12 Apr 2018 Updated Description	2	OMA - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 - Open (PM) Summit CCB 19 Jul 17 - Open / 2

		system emplacement.					
0966	Hide Tactical Graphics Labels	Provide the operator the ability to hide tactical graphics labels on the Plan Position Indicator (PPI) while still displaying the graphic.	PdM Radars DRB 14: 6I TAR ZE-0284	12 Apr 2018 Updated Description	2	OMA - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 - Open (PM) Summit CCB 19 Jul 17 - Open / 2
0968	MIJI Reports to AFATDS	Modify the interference threshold parameters for sending the K04.10: Initial Meaconing, Intrusion, Jamming and Interference (MIJI) Report Message. Only send the MIJI Report message when the interference threshold parameters have been met or when a new event has occurred. This will reduce the number of MIJI Report messages being sent. An event is defined by time, frequency, and azimuth of the jamming source.	PdM Radars DRB 14: 6I TAR ZE-0286	12 Apr 2018 Updated Description	2	OMA - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 - Open (PM) Summit CCB 19 Jul 17 - Open / 2
0970	Add Commanders Priority	Provide the operator the capability to set commander's priority for zones based on the commander's guidance.	PdM Radars DRB 14: 6I TAR ZE-0288	12 Apr 2018 Updated Description	2	PdM - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 - Open (PM) Summit CCB 19 Jul 17 - Open / 2
0980	A New User Created in SAT Can Log into SAT without Requiring Password Update	Update SAT to require a password change for when a newly created user first logs in.	PdM Radars DRB14: 6I TAR ZE-0299	12 Apr 2018 Updated Description	2	OMA - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 - Open (PM) Summit CCB 19 Jul 17 - Open / 2
0982	AFATDS Free Text Message Isn't Processed as Plain Text on NGG	Update the laptop software to remove the interpretation of HTML tags sent in a Free Text message from AFATDS. This will display the actual message received as plain text, rather than displaying the message as if it were in a browser	PdM Radars DRB 14: 6I TAR ZE-0301	12 Apr 2018 Updated Description	2	OMA - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 - Open (PM) Summit CCB 19 Jul 17 - Open / 2
0990	Notify AFATDS of Changes in the Commanded Search Parameters	Modify the laptop software to provide a preformatted K01.1 message to notify AFATDS when the commanded search parameters sent in the RDO do not match the actual search parameters on the radar.	PdM Radars DRB 14: 6I TAR ZE-0309	12 Apr 2018 Updated Description	2	PdM - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 - Open (PM) Summit CCB 19 Jul 17 - Open / 2
1006	Voltage Fault Reporting	Update the Columns tree to provide accurate detailed voltage (v) and amperage faults. This will allow the operator to be able to troubleshoot more effectively with accurate data.	PdM Radars DRB 14: 6I TAR ZE-0332	12 Apr 2018 Updated Description	2	OMA - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 - Open / 2 (PM) Summit CCB 19 Jul 17 - Open / 3

1041	Assign Target Numbers Upon Transmission	Enhance target number processing to detect duplicate targets being sent from the cylinder, and prevent duplicate targets being added to the Targets window.	TAR ZE-0499 DRB 20	12 Apr 2018 Updated Description	2	OMA - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 - Open / 2 (PM)
1055	Remove TLE Threshold Processing	Modify the laptop software to remove the TLE Threshold processing limitation, so all valid (don't violate the VID) targets will be transmitted to AFATDS while Automatic Target Processing (ATP) is active.	TCM FAB-D	12 Apr 2018 Updated Description	2	OMA - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 - Open / 2 (PM)
1057	Replace the RSUG Installer	Replace the Radar Software Upgrade Graphical User Interface (RSUG) with a new software installation tool.	PdM Radars		2	PdM - Selected	CCB 3 May 18 - Selected Summit CCB 6 Feb 18 - Deferred
1059	Provide Operator Error For Invalid Coordinates	If the operator enters an invalid northing, the system shall provide an error stating the coordinate is invalid and not apply the change. A valid northing is less than 9,384,749 (84 degrees Latitude) in the northern hemisphere, and greater than 1,061,179 (-80 degrees Latitude) in the southern hemisphere.	TAR ZE-0580 DRB 27		2	OMA - Selected	CCB 3 May 18 - Selected
1060	Update Laptop OS to RHEL 7	Update the Laptop Operating System (OS) from Red Hat Enterprise Linux (RHEL) 6 to RHEL 7. To continue receiving security updates after RHEL 6 reaches End of Life on 30 November 2020, the Laptop OS needs to be upgraded to RHEL 7	FD		1	OMA - Selected	CCB 3 May 18 - Selected
1061	Allow RPAS to run on radar system laptops as a plugin	Modify Q-50 software to support hosting RPAS on the Laptop hard drive. The necessary additions to the operator's manual will be performed as part of this task. This capability will provide rapid analysis capability to the users and planners in the field and ensure the radar systems are properly positioned to provide the best performance capability for Counterfire and Force Protection.	FD		3	PdM - Selected	CCB 3 May 18 - Selected
1072	POA&M for LCMR Q50 Version 2.1	Implement corrections for software weaknesses from previous versions identified in the Plan of Action and Milestones (POA&M) for LCMR Q50 Version 2.1.	FD		1	OMA - Selected	CCB 13 Sep 2018
1073	Update Java Software in LCMR Q50	Integrate the latest Java Version 11 software into LCMR Q50. Java Version 8 support is being	FD		1	OMA - Selected	CCB 13 Sep 2018

		discontinued, and security updates will no longer be available as of January 2019.					

Table I. System Requirements Matrix for RVS Q50 Version 1

REQ #	PRI	Requirement Title	RVS Q50	EXTERNAL	FUND	COMMENTS
1-0881	1	Develop the Instructor Station for the RVS Q50	X		CUST	
1-0882	1	Develop the Student Station for the RVS Q50	X		CUST	
1-0883	1	Develop RVS CTS-OneSAF Q50 to Support LCMR Q50 Training	X		CUST	
1-0884	1	Develop Initialization Scenarios to Support LCMR Q50 Training	X		CUST	
1-0885	1	Develop Operational Scenarios to Support LCMR Q50 Training	X		CUST	Modifications were presented and approved at TIPR 1 held 14 Sep 2017
1-0886	1	Develop an Instructional Combined Scenario for LCMR Q50 Training	X		CUST	
1-0887	1	Develop Final Exams to Support LCMR Q50 Training Evaluations	X		CUST	Modifications approved at SRR held 2 Nov 2016
1-0909	1	Develop Combined Scenarios to Support LCMR Q50 Training	X		CUST	Modifications were presented and approved at TIPR 1 held 14 Sep 2017 Added new requirement at electronic CCB held 15-19 Sep 2016

5. **System Name:** LIGHTWEIGHT COUNTER MORTAR RADAR AN/TPQ-49 (LCMR Q49)

- a. **System Manager:** SEC providing Post Production Software Support (PPSS) in support of United States Marine Corps.
- b. **System Proponent:** Marine Corps Systems Command.
- c. **System Deployed:** The AN/TPQ-49 is deployed worldwide to Maneuver Brigades. A few are also at the FA school and the development base. The number of systems is approximately 151.
- d. **System Overview:** The AN/TPQ-49 Lightweight Counter Mortar Radar (LCMR) provides the ability to automatically detect and locate mortar firing positions by detecting, tracking and backtracking the mortar shell to the weapon position. When properly sited, the AN/TPQ-49 System provides continuous 360 degree (6400 mils) azimuth surveillance using an electronically scanned antenna. The system can also be configured to scan less than a full circle, which provides more focused coverage with more frequent update rates. After indirect fire is detected and tracked, the AN/TPQ-49 sends a message to the operator, indicating the Point of Origin (POO) and the shell Point of Impact (POI). The AN/TPQ-49 provides continuous surveillance of incoming and outgoing rounds. The Q-49 maximum search sector is 360° in azimuth with a 450 meter minimum range and 10,000 meter maximum range in distance.

Historically, the SEC FD is responsible for providing Post Production Software Support/Post Deployment Software Support (PPSS/PDSS) and System and Software Acquisition Support for assigned deployed Mission Critical Defense Systems (MCDSs). Support of deployed systems requires that Software Problem Reports (SPRs), software/hardware change proposals, and propose improvements/enhancements be analyzed, solutions designed, implemented, tested, and documented.

- e. **System Interoperates With:** FIREFINDER Radar AN/TPQ-36 (FF-Q36), FIREFINDER Radar AN/TPQ-37 (FF-Q37), LCMR (V) 2 AN/TPQ-48, AN/TPQ-48A, Advanced Field Artillery Tactical Data System (AFATDS), and Forward Area Air Defense Command and Control (FAADC2). The system software platforms communicates with other fire support systems using Combat Net Radio SINGARS Improvement Program-Internet Controller (SIP-INC), SINGARS, Enhanced Position Location Reporting System (EPLRS) Radios, Harris Very High Frequency/Ultra High

Frequency (VHF/UHF) Radios, and AN/PSC-5 (SATCOM) Radios and 2 or 4 Wire Landline.

f. **Other Systems Dependent On:** FF-Q36, FF-Q37, LCMR, AFATDS, and FAADC2

g. **Software Application Description:**

- i. Language: C, C#, C++, DATA, MATLAB, SCRIPT, VBASIC, XML
- ii. Source Line of Code by Software Version:
 - Version 4.2.3.08 - Approximately .5 million and WLOC: 3782
 - Version 4.3.0 - Approximately 1 million and WLOC: 192,008
- iii. Operating System: Red Hat Enterprise Linux, QNX.
- iv. COTS: Yes.
- v. GOTS: N/A.

h. **Software Development Tools/ Applications:**

MS Windows 7 SP1

QNX Momentics 6.3.2

InstallShield SP1 16.0d 2010

Java SE Dev Update55

MS VisualStudio

PFPS FalconView 3.3.0.42

PuTTY

i. **Hardware:** AN/TPQ-49, Miltope RLC-3G, Miltope RLC-3G Hard Drive 160GB

j. **Software Sustainment and Enhancement (USMC OMA):**

- i. Sustain Version 4.2.3.08 and 4.3.0 (Historical)
 - Number of specifications: 8
 - Number of Latent Defects Implemented: 5 (annually)
 - Number of New capabilities implemented: 0
 - Deliverables: 34 (annually)
 - Software System Safety Release Letter
 - Schedules
 - Test Report
 - Service pack with Release Notes
 - VDD
 - Meeting Minutes
- ii. Sustain Version 4.2.3.08 and 4.3.0 (FY19)
 - Number of specifications: 8

- Number of Latent Defects to be Implemented: 5 (annually)
- Number of New capabilities implemented: 0
- Deliverables: 34 (annually)
 - Software System Safety Release Letter
 - Schedules
 - Test Report
 - Service pack with Release Notes
 - VDD
 - Meeting Minutes

iii. Develop and Sustain Version 4.3.x (FY19)

- Number of specifications to analyze: 8
- Number of Latent Defects under analysis: 18
- Number of New capabilities to be implemented: 14 Pending (See LCMR Q49 Capabilities below)
- Deliverables expected: 34 (annually)
 - Software System Safety Release Letter
 - Schedules
 - SAR
 - Test Report
 - Test Plan
 - Service Pack with Release Notes
 - Software
 - VDD
 - Meeting Minutes

k System and Software Acquisition Support (USMC OMA): As requested by USMC.

LCMR Q49 Capabilities for possible selection:

CAP	Title	Description	Source	CAP Comment	System	Status
0698	Update the Interface between Q49 & FAAD C2S to Comply with the CRAM RES ICD	Update the AN/TPQ-49 source code and documentation to comply with CRAM RES ICD, Rev. H, dated 14 May 2012, which is the version being implemented by the Firefinder radars for 12.03. The Forward Area Air Defense (FAAD) Command and Control System (C2S) Interface allows the AN/TPQ-49 to connect to the Counter-Rocket, Artillery, and Mortar (C-RAM) system of systems as a Radar Element Subsystem (RES). The Interface Control Drawing (ICD) for the Command and Control System (C2S) and the Radar Element Subsystem (RES), defines and describes each of the messages	FD	updated radar model	LCMR Q49	USMC - Pending

		used to exchange information between the FAAD C2S and the AN/TPQ-49.				
0747	Update Software with Service Pack Notifications	A notification shall be triggered upon startup of the application to notify the operator if a Service Pack has not been applied in 120 days along with the AKO website to obtain the latest Service Pack. Field units are not visiting the Service Pack download site on a Quarterly basis, thus exposing the system and others connected to the network unresolved risk and dangers. The operator must take an affirmative action to acknowledge the warning.	FD, NFR	SRR 10 Sep 15 Updated Op Description	LCMR Q49	USMC - Pending
0793	Implement Scheduled POA&M Fixes	Implement corrections for software weaknesses that are scheduled to be completed in this version as identified in the Plan of Action and Milestones (POA&M) for each system.	NFR	07Jul15 - CCB, action taken by FD to redline the title/description during analysis phase.	LCMR Q49	USMC - Pending
0833	Add Address Book Functionality	Implement a JMUL or Address Book to reference input of unit data.	FD		LCMR Q49	USMC - Pending
0834	Implement Functionality to Process and Store RDO Messages Received from AFATDS	Implement the functionality to process, store, and display on the map received RDO messages from AFATDS. Currently the K02.50 Target Acquisition messages are viewable but radar zone data must be entered manually.	FD		LCMR Q49	USMC - Pending
0835	Implement Automated Target Message Processing	Implement the capability to automatically generate the appropriate target message (K02.4 CFF or K02.9 Target Data) based on the type of radar zone the target (Point of Origin) originates. Indicate the radar zone type the target is associated with.	FD		LCMR Q49	USMC - Pending
0836	Implement Functionality to Process and Store Received Geometry Data	Implement the functionality to process, store, display on the map, and print received geometry messages from AFATDS (i.e., K02.7 Survey Control Point, K02.15 FSCM). Based on the lack of the LN-270 for the USMC models, knowledge of known Azimuth Marks and control points as provided from AFATDS would benefit the operator.	FD		LCMR Q49	USMC - Pending
0837	Implement Database Functionality to Provide File Maintenance Capability for the Operator	Provide database functionality that would facilitate a file maintenance capability for the operator within the radar operations program. Create the following databases: 1) Hostile Targets, 2) Friendly Targets, 3) Received Messages, and 4) Zones.	FD		LCMR Q49	USMC - Pending
0838	Provide Embedded Training	Implement an embedding training capability to provide the operator a more effective means to train in a training scenario environment using simulation. Provide a means to train an operator on the system basics of establish initialization parameters, establish communication and process	FD		LCMR Q49	USMC - Pending

		targets in a training environment without actually connecting to a live cylinder.				
0839	Provide Enhancements to Radar Maintenance Capability	Provide enhancements to radar maintenance capability that would separate the operator maintenance functionality from the depot level maintenance functionality.	FD		LCMR Q49	USMC - Pending
0840	Implement an Interface to RPAS	Implement an interface to the Radar Position Analysis System (RPAS).	FD		LCMR Q49	USMC - Pending
0841	Implement VMF MIL-STD-6017C_COE_v3_VID_v2_2017-09-28	Implement Variable Message Format (VMF) MIL-STD-6017C_COE_v3_VID_v2_2017-09-28 to maximize interoperability with AFATDS 6.8.1.1(P2). Critical message changes include updates to the K02.50 Radar Deployment Order to support radar capabilities and K02.55 Record of Fire to support Centaur and AFATDS capabilities. Backwards compatibility will not be maintained for MIL-STD-6017 due to the significant functional differences between MIL-STD-6017 and MIL-STD-6017C. All references to older versions of the systems shall be removed from all operator screens and message formats.	COE3 STDV-1 Memorandum for Members of the FISB, Subject: Fire Support Communications Military Standard Requirements for Army Capability Set (CS) 17-18 dated 10 May 2016	Modified the title and description to reflect the updated MIL-STD-6017C_COE_v3_VID_v2_2017-09-28 redlines that were approved at the TIPR 2 for AFATDS V6.8.1.1(P2) held on 28 June 2018.	LCMR Q49	USMC - Pending
0842	Improve Windows Management and Screen Modality	The system screens are not modal and should be. This will force the operator to focus on a single task at one time. Where it is practical and feasible make all screens and pop-ups modal.	FD		LCMR Q49	USMC - Pending
1040	Desensitize Sense and Warn	Disallow the operator from selecting "Sense and Warn" during Radar operations. Sense and Warn is a selectable option in the Radar Settings screen for the LCMR Q-49.	USMC FTAS GySgt Anthony Nickum DRB: 6I TAR LG-0072		LCMR Q49	USMC - Pending

6. **System Name:** Pocket-Sized Forward Entry Device (PFED) (to be replaced by PFED Inc 2), AN/PSG-10, AN/PYG-3, AN/PYG4

- a. **System Manager:** SEC providing Post Production Software Support (PPSS) on support of Program Manager Fire Support Command and Control (PM FSC2)
- b. **System Proponent:** United States Army Field Artillery School (USAFAS), Training and Doctrine Command (TRADOC) Capability Manager Fires Cells (TCM-Fires Cells) Software Division (SD) and Product Director Fire Support Command and Control (PD FSC2)
- c. **System Deployed:** The PFED is deployed worldwide to Maneuver Battalions. A few PFEDs are also at the FA school and the development base. The number of systems currently in the Army inventory is approximately 3303.
- d. **System Overview:** The PFED addresses the need of a small, portable, rugged communications enabled computer that is capable of performing fire support functions for a dismounted Forward Observer (FO). PFED currently allows the FO to communicate digitally to its controlling headquarters or allocated firing unit. PFED performs specifically chosen aspects of existing FO capabilities for the conduct, planning and execution of fire support operations. (PFED has minimal effort applied and this information is provided as background.)

Historically, the SEC FD is responsible for providing Post Production Software Support/Post Deployment Software Support (PPSS/PDSS) and System and Software Acquisition Support for assigned deployed Mission Critical Defense Systems (MCDSs). Support of deployed systems requires that Software Problem Reports (SPRs), software/hardware change proposals, and propose improvements/enhancements be analyzed, solutions designed, implemented, tested, and documented.

- e. **System Interoperates With:** Advanced Field Artillery Tactical Data System (AFATDS), Centaur, Forward Observer Systems (FOS), Precision Lightweight GPS Receiver (PLGR), Leica Vector IV, and Mark VII. PFED communicates with fire support systems using Combat Net Radio SINCGARS ASIP, Harris High Frequency/Ultra High Frequency (HF/UHF) Radios, AN/PSC-5 (SATCOM) Radio, and 2 Wire Landline.
- f. **Other Systems Dependent On:** AFATDS, Centaur, FOS
- g. **Software Application Description:**
 - i. Language: ADA, C.
 - ii. Source Line of Code by Software Version:
 - Version 5.0 - Approximately 0.2 million and WLOC: 0
 - Version BC 11/12 - Approximately 0.2 million and WLOC: 0
 - iii. Operating System: Windows Mobile 6.5.

- iv. COTS: Yes
- v. GOTS: Yes

h. Software Development Tools/ Applications:

Support Tools/Applications	Description
Microsoft Visual Studio	Development environment
Microsoft embedded Visual C++	Compiler
Adacore JGNAT	Compiler

- i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate 2 each Model 3900/5700 R-PDA w/Stylus (PFEDs), 2 each R-PDA Protective Covers, 10 each A/C Battery Chargers, 10 each Communication Domes, 10 each Wire Line Adapter Cables, 10 each SINCGARS Communication Cables, 10 each TACLINK Cards, 8 each Model 3900/5700 w/Communication Domes.
- j. **Software Sustainment and Enhancement:** Manpower initiative program, the work would be as needed. No current historical data.
- k. **System and Software Acquisition Support:** Manpower initiative program, the work would be as needed.

7. **System Name:** Centaur Light Weight Technical Fire Direction System (LWTFDS), AN/PYG1(V)2

- a. **System Manager:** SEC providing Post Production Software Support (PPSS) on support of Program Manager Fire Support Command and Control (PM FSC2)
- b. **System Proponent:** United States Army Field Artillery School (USAFAS), Training and Doctrine Command (TRADOC) Capability Manager Fires Cells (TCM-Fires Cells) Software Division (SD) and Product Director Fire Support Command and Control (PD FSC2)
- c. **System Deployed:** The Centaur is deployed worldwide to Field Artillery Battalions. A few Centaurs are also at the FA school and the development base. The number of systems currently in the Army inventory is approximately 1234.
- d. **System Overview:** The Centaur system is a handheld technical fire direction system for multi-service, joint, and combined forces, providing technical solution information to the fire direction centers in cannon field artillery units for field artillery fire missions. The Centaur is considered to be the primary backup to the Advanced Field Artillery Tactical Data System (AFATDS) for technical fire direction solutions. The system is also intended for emergency mission, early entry, or degraded battlefield scenarios. The Centaur incorporates the North Atlantic Treaty Organization (NATO) Armaments Ballistics Kernel (NABK) which is also used by AFATDS. The Centaur also provides the capability to compute safety data and to check computed firing commands against safety limits to provide confidence that artillery fires will be restricted to safe impact areas.

Historically, the SEC FD is responsible for providing Post Production Software Support/Post Deployment Software Support (PPSS/PDSS) and System and Software Acquisition Support for assigned deployed Mission Critical Defense Systems (MCDSs). Support of deployed systems requires that Software Problem Reports (SPRs), software/hardware change proposals, and proposed improvements/enhancements be analyzed, solutions designed, implemented, tested, and documented.

- e. **System Interoperates With:** AFATDS, FOS, PFED, GDU-R, PALADIN, M777A2 and M119A2. Centaur communicates with fire support systems using Combat Net Radio (CNR) Single Channel Ground and Airborne Radio System (SINCGARS) and 2 Wire Landline
- f. **Other Systems Dependent On:** AFATDS, FOS, PFED, GDU-R, HOWITZERS: M119A1, M119A2, M198, M777, M777A2, PALADIN, MORTAR: M327
- g. **Software Application Description:**
 - i. Language: ADA, C, C++.

- ii Source Line of Code by Software Version:
 - Version 12.04 - Approximately 0.925 million and WLOC: 461,554
- iii Operating System: Windows Mobile 6.5
- iv COTS: N/A.
- v GOTS: N/A

h. **Software Development Tools/ Applications:** A sample of the support tools/applications used is provided. This is not an all-inclusive list.

Support Tools/Applications	Description
Microsoft Visual Studio	Development environment
Microsoft embedded Visual C++	Compiler
Adacore JGNAT	Compiler

- i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate AFATDS software. This is not an all-inclusive list. 2 each Model 5500/5700 R-PDA w/Stylus (Centaurus), 2 each R-PDA Protective Covers, 2 each Digital Fire Control Systems (DFCS), 2 each Advanced Fire Control Systems (AFCS), 10 each A/C Battery Chargers, 10 each Communication Domes, 10 each Wire Line Adapter Cables, 10 each SINCGARS Communication Cables, 10 each TACLINK Cards, 8 each Model 5700 w/Communication Domes (GDU-R), 12 each SD Memory Cards (2 GB), 2 each SD Memory Card Readers, 1 each FD Office Automation compliant personal computer with AGM Operating System and software.
- j. **Software Sustainment and Enhancement:** Manpower initiative program, the work would be as needed.
 - i. Sustain Version 12.04 (Historical)
 - Number of specifications: 3
 - Number of Latent Defects Implemented: 3 (annually)
 - Number of New capabilities implemented: 6 (See Systems Requirements Matrix for Version 13 below)
 - Deliverables: 19 (annually)
 - System Software Safety Release Letter
 - Schedules
 - Safety Assessment Report
 - ECP/Specifications
 - Requirements Definition Document
 - Risk Management Framework Documentation
 - Test Report
 - Test Plan
 - Software Development Plan
 - Schedules

- Software with Release Notes
 - Training Documents
 - VDD
 - Meeting Minutes
- ii. Develop Version 12.05 (FY19)
- Number of specifications: 3
 - Number of Latent Defects under analysis: 0
 - Number of New capabilities to be implemented: 0
 - Deliverables: 0 (annually)

k. **System and Software Acquisition Support:** Manpower initiative program, the work would be as needed.

Table I. Systems Requirements Matrix for Version 13

REQ #	CAT	Requirement Title	FOS	Centaur	REUSE	EXTERNAL	FUND	COMMENTS
INTEROPERABILITY (REUSE) Requirements								
13-0793	1	Implement Scheduled POA&M Fixes	X	X	X		OMA	
HANDHELDS Requirements (Centaur)								
13-0066	1	Periodic NABK Updates		X		AFATDS PDFCS DFCS DFC	OMA	
13-0745	2	Add Scroll Bars to Dialog Screens for the Centaur RTHD-2		X			OMA	
13-0794	2	Centaur Fire Unit Ammunition Quick Entry		X			OMA	
13-0866	1	Centaur Marine TACLINK Capability		X			CUST	New requirement approved at electronic SRR 2 held 15-20 April 2016
13-0874	2	Build Centaur Version 13.00.00 as Version 12.04.00		X			OMA	New requirement approved at electronic SRR 2 held 15-20 April 2016

8. System Name: FIREFINDER AN/TPQ-36 (FF-Q36), AN/TPQ-36

- a. **System Manager:** SEC providing Post Production Software Support (PPSS) on support of Product Manager Radars (PdM Radars)
- b. **System Proponent:** United States Army Field Artillery School (USAFAS), Training and Doctrine Command (TRADOC) Capability Manager Field Artillery Brigade-DIVARTY (TCM FA BDE-D) and Product Manager (PdM) Radars.
- c. **System Deployed:** The AN/TPQ-36 FIREFINDER radar is deployed worldwide to Maneuver and some Fires Brigades. The number of systems currently in the Army inventory is approximately 115.
- d. **System Overview:** The FF-Q36 is a highly mobile radar system located at Battery echelons. The FF-Q36 provides the Commander with the capability for first-round location of hostile mortars, short-range artillery, and rocket projectiles. The FF-Q36 is a multi-service system. The FF-Q36 can also track the fire of friendly weapons. The radar also provides impact prediction, registration, and subsequent adjustment information in order to help direct friendly fire. The FF-Q36 performs projectile detection, projectile tracking, projectile discrimination, trajectory fitting, and extrapolation in support of the field artillery mission. The FF-Q36 is capable of locating medium-range, high-angle, lower-velocity indirect fire weapons such as mortars and shorter-range artillery and rocket projectiles launched at any angle within selected 90-degree azimuth sectors. The FF-Q36 can locate simultaneous and volley-fire weapons. It can also be used to register and adjust friendly fire. Upon projectile detection, the weapon location is computed and is used to direct counter-battery fires. The FFQ36 is an integral component of the Counter Rocket, Artillery, and Mortar (C-RAM) program which provides timely and localized notification so troops can take protective cover and providing the necessary and timely information required to make the best decisions on how react to the enemy action and with what resources.

Historically, the SEC FD is responsible for providing Post Production Software Support/Post Deployment Software Support (PPSS/PDSS) for assigned deployed Mission Critical Defense Systems (MCDSSs). Support of deployed systems requires that Software Problem Reports (SPRs), software/hardware change proposals, and proposed improvements/enhancements be analyzed, solutions designed, implemented, tested, and documented.

- e. **System Interoperates With:** FF-Q36, FF-Q37, AN/TPQ-48, AN/TPQ-49, AN/TPQ-50, AN/TPQ-53, Advanced Field Artillery Tactical Data System (AFATDS),

Forward Area Air Defense Command and Control (FAADC2) and Forward Observer System (FOS). FF-Q36 communicates with other fire support systems using Combat Net Radio SINCGARS Improvement Program-Internet Controller (SIP-INC), SINCGARS, Enhanced Position Location Reporting System (EPLRS) Radios, Harris Very High Frequency/Ultra High Frequency (VHF/UHF) Radios, AN/PSC-5 (SATCOM) Radio, and 2 or 4 Wire Landline.

f. **Other Systems Dependent On:** AFATDS and FAADC2

g. **Software Application Description:**

- i. Language: Ada, C, C++, DATA, SCRIPT
- ii. Source Line of Code by Software Version:
 - Version 11.01.03 - Approximately 5.4 million and WLOC: 135,365
 - Version 11.01.03.02 – Approximately 5.6 million and WLOC: 299,269
- iii. Operating System: Red Hat Enterprise Linux.
- iv. COTS: N/A.
- v. GOTS: CTS-OneSaf, CFE

h. **Software Development Tools/ Applications:** A sample of the support tools/applications used is provided. This is not an all-inclusive list.

Support Tools/Applications	Description
TRS RP Compiler	Compiler
C Compile	TRS GCC Compiler
Red Hat	Operating System
RMI	Compiler
TRS RP OS	Operating System
PC SIM	PC Sim
GNAT ADA Compiler	Compiler

i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate Q-36 software. This is not an all-inclusive list. 1 each AN/TPQ-36(V) 12 Thales Raytheon Systems (TRS) RP w/S 788 Electronic Upgrade shelters, Radar Processor (RP) Software Engineering Testing Station (SETS), 2 each Miltope Model TSC RLC-3G, 1 each TSC-750M-V2, , 7 each TSC-750M 915, 1 each TSC-750M 915x700, Digital Upgrade (DU) Hughes Micro Processor (HMP 3637A) Radar Processor (RP) in S 250 radar shelter, 2 each Single Channel Ground

and Air Radio System (SINGARS) radios, 2 each Advance System Improvement Program (ASIP) radios, 2 each AN/PSC 5 series SATCOM radios, 2 each AN/PRC 150 (Harris) High Frequency (HF) radios, 4 each Enhanced Position Location Reporting System (EPLRS) radios, 2 each Test Support System (TSS), 1 each Radar Environment Simulator (RES), 1 each Legacy Radar Environmental Simulator System (LRESS), 2 each Advanced Field Artillery Data System (AFATDS) on Compact Computer Unit (CCU), 1 each AFATDS on GETAC, 1 each FAADC2 with Bull Frog (actual), 1 each FAADC2 With C2S C-RAM simulator, 4 each NETGEAR CARD, 10 each TACLINK 3000+ Card, 2 each HP6940 Printer, and 2 each Printer (RITEC).

j. Software Sustainment and Enhancement:

- i. Sustain Version 11.01.03 (Historical)
 - Number of specifications: 0
 - Number of Latent Defects Implemented: 53 (annually)
 - Number of New capabilities implemented: 0
 - Deliverables: 25 (annually)
 - Software System Safety Release Letter
 - Schedules
 - Test Report
 - Cybersecurity Update Software Release
 - Interactive Electronic Technical Publication
 - Software Service Pack with Release Notes
 - VDD
 - Meeting Minutes
- ii. Sustain Version 11.01.03 (FY19)
 - Number of specifications: 0
 - Number of Latent Defects under analysis: Monthly IAVA
 - Number of New capabilities to be implemented: 0
 - Deliverables: 25 (annually)
 - Software System Safety Release Letter
 - Schedules
 - Test Report
 - Cybersecurity Update Software Release
 - Software with Release Notes
 - Software Service Pack with Release Notes
 - VDD
 - Meeting Minutes

k. System and Software Acquisition Support: N/A

9. System Name: FIREFINDER AN/TPQ-37 (FF-Q37)

- a. **System Manager:** SEC providing Post Production Software Support (PPSS) on support of Product Manager Radars (PdM Radars)
- b. **System Proponent:** United States Army Field Artillery School (USAFAS), Training and Doctrine Command (TRADOC) Capability Manager Field Artillery Brigade-DIVARTY (TCM FA BDE-D) and Product Manager (PdM) Radars.
- c. **System Deployed:** The AN/TPQ-37 FIREFINDER radar is deployed worldwide to Maneuver and Fires Brigades. The number of systems currently in the Army inventory in is approximately 75.
- d. **System Overview:** FF-Q37 is a highly mobile radar system located at the target acquisition battery, at the National Guard Field Artillery brigade and the Field Artillery battery echelons. The FF-Q37 provides the Commander with the capability for first-round location of hostile cannon and rocket projectiles. The radar also provides impact prediction, registration, and subsequent adjustment information in order to help direct friendly fire. The FF-Q37 performs automated projectile detection, projectile tracking, projectile discrimination, trajectory fitting, and extrapolation in support of the field artillery mission. The FF-Q37 is capable of locating longer-range, low-angle, higher-velocity weapons such as longer-range artillery and rocket projectiles launched at any angle within selected 90-degree azimuth sectors. The FF-Q37 can locate simultaneous and volley-fire weapons. It can also be used to register and adjust friendly fire. Upon projectile detection, the weapon location is computed and is used to direct counter-battery fires. The FF-Q37 is an integral component of the Counter Rocket, Artillery, and Mortar (C-RAM) program which provides timely and localized notification so troops can take protective cover and providing the necessary and timely information required to make the best decisions on how react to the enemy action and with what resources.

Historically, the SEC FD is responsible for providing Post Production Software Support/Post Deployment Software Support (PPSS/PDSS) for assigned deployed Mission Critical Defense Systems (MCDSs). Support of deployed systems requires that Software Problem Reports (SPRs), software/hardware change proposals, and proposed improvements/enhancements be analyzed, solutions designed, implemented, tested, and documented.

- e. **System Interoperates With:** FF-Q37, FIREFINDER AN/TPQ-36 (FF-Q36), AN/TPQ-48, AN/TPQ-49, AN/TPQ-50, AN/TPQ-53, Advanced Field Artillery Tactical Data System (AFATDS), Forward Area Air Defense Command and Control (FAADC2) and Forward Observer System (FOS). FF-Q37 communicates with other fire support systems using Combat Net Radio SINCGARS Improvement Program-Internet Controller (SIP-INC), SINCGARS, Enhanced Position Location Reporting

System (EPLRS) Radios, Harris Very High Frequency/Ultra High Frequency (VHF/UHF) Radios, AN/PSC-5 (SATCOM) Radio, and 2 or 4 Wire Landline.

f. **Other Systems Dependent On:** AFATDS and FAADC2

g. **Software Application Description:**

- i. Language: C, C++, DATA, JAVA, SCRIPT, ULTRA16, XML
- ii. Source Line of Code by Software Version:
 - Version 11.01.03 – Approximately 5.5 million and WLOC: 144,086
 - Version 11.01.04 – Approximately 3.3 million and WLOC: 207,395
- iii. Operating System: Red Hat Enterprise Linux.
- iv. COTS: Yes
- v. GOTS: CTS-OneSAF, CFE, FF-Q37 RP.

h. **Software Development Tools/ Applications:** A sample of the support tools/applications used is provided. This is not an all-inclusive list.

Support Tools/Applications	Description
Sun OS	Operating System
MTASSM for Unix	Assembler
GNAT Compiler	Compiler
Red Hat Enterprise Linux	OS
GNAT Ada Compiler	Compiler

- i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate Q-37 software. This is not an all-inclusive list. 1 each Miltope Model TSC RLC-3G, 1 each TSC-750M-V2, 7 each TSC-750M 915, 1 each TSC-750M 915x700, , 1 each AN/TPQ37(V) 10, with Receiver Exciter (REX) upgrade in a modified S 250 radar shelter, 1 each RMI Radar Processor Simulator (RPS), 2 each Joint Tactical Radio Systems (JTRS), 2 each Advance System Improvement Program (ASIP) radios, 2 each AN/PSC 5 series SATCOM radios, 2 each AN/PRC 150 (Harris) High Frequency (HF) radios, 4 each Enhanced Position Location Reporting System (EPLRS) radios, 2 each Test Support System (TSS), 1 each Radar Environment Simulator (RES), 1 each Legacy Radar Environmental Simulator System (LRESS), 2 each Advanced Field Artillery Data System (AFATDS) on Compact Computer Unit (CCU), 1 each AFATDS on GETAC, 1 each FAADC2 with Bull Frog (actual), 1 each FAADC2 With C2S C-RAM simulator, 4 each NETGEAR CARD, 10 each TACLINK 3000+ Card, 2 each HP6940 Printer, and 2 each Printer (RITEC).

j. **Software Sustainment and Enhancement:**

- i. Sustain Version 11.01.03 and 11.01.04 (Historical)

- Number of specifications: 0
 - Number of Latent Defects Implemented: 58 (annually)
 - Number of New capabilities implemented: 0
 - Deliverables: 51 (annually)
 - Software System Safety Release Letter
 - Schedules
 - Test Report
 - Cybersecurity Update Software Release
 - Software Service Pack with Release Notes
 - VDD
 - Meeting Minutes
- iii. Sustain Version 11.01.04 (FY19)
- Number of specifications: 0
 - Number of Latent Defects under analysis: Monthly IAVA
 - Number of New capabilities implemented: 0
 - Deliverables: 26 (annually)
 - Software System Safety Release Letter
 - Schedules
 - Test Report
 - Cybersecurity Update Software Release
 - Software Service Pack with Release Notes
 - VDD
 - Meeting Minutes

k. **System and Software Acquisition Support:** N/A

10. System Name: Forward Observer System (FOS) (to be replaced by PFED Inc 2), M981 FISTV, M7 BFIST, A3 BFIST, M707 Knight, M1200 Armored Knight, M1131 Stryker, TUA Knight, M7 BFIST SA

- a. **System Manager:** SEC providing Post Production Software Support (PPSS) on support of Program Manager Fire Support Command and Control (PM FSC2)
- b. **System Proponent:** United States Army Field Artillery School (USAFAS), Training and Doctrine Command (TRADOC) Capability Manager Fires Cells (TCM-Fires Cells) Software Division (SD) and Product Director Fire Support Command and Control (PD FSC2)
- c. **System Deployed:** The FOS is deployed worldwide to maneuver and fires units. The number of systems currently in the Army inventory is approximately 4070.
- d. **System Overview:** FOS is an automated fire support system used by JFOs located on multiple mounted and dismounted platforms. FOS provides the commander, fire support officer, fire support team, forward observer and survey team with an automated decision-making capability for the employment of fire support systems. FOS performs automated fire mission, artillery target intelligence, fire planning, survey and geometry processing in support of the field artillery mission. FOS provides an interface with FBCB2 on the TI, the TACP CASS and the aircraft for terminal control. FOS can employ PSS-SOF and digital scene matching for refinement of precision target location.

Historically, the SEC FD is responsible for providing Post Production Software Support/Post Deployment Software Support (PPSS/PDSS) for assigned deployed Mission Critical Defense Systems (MCDSs). Support of deployed systems requires that Software Problem Reports (SPRs), software/hardware change proposals, and proposed improvements/enhancements be analyzed, solutions designed, implemented, tested, and documented.

- e. **System Interoperates With:** Bradley A2 Operation Desert Storm (ODS), M7 Bradley Fire Support Team (M7 BFIST), A3 BFIST, M7 BFIST SA (Situational Awareness), M1131 StrykerFSV, M707 Knight, M1200 Armored Knight, TUA (Targeting Under Armor) Knight, FOS, Pocket- Sized Forward Entry Device (PFED), Advanced Field Artillery Tactical Data System (AFATDS), Mortar Fire Control System (MFCS), Lightweight Technical Fire Direction System (Centaur), LEICA Victor IV, MARK IV, TACP CASS, B-52 A/C, F/A-18, Lightweight Laser Designator Rangefinder (LLDR), Targeting Station Control Panel (TSCP), Fire Support Command, control and Coordination (FSC3) Firefinder AN/TPQ-36 (FF-Q36), and Firefinder AN/TPQ-37 (FF-Q37). FOS communicates with fire support systems using Combat Net Radio SINCGARS Improvement Program-Internet Controller (SIP-INC),

SINCGARS, Enhanced Position Location Reporting System (EPLRS) Radios, Harris AN/PRC-150 High Frequency (HF) Radios, AN/PSC-5 Satellite Communications (SATCOM) Radios, Joint Tactical Radio System (JTRS), and 2 or 4 Wire Landline. FOS communicates with Close Support Systems using the Harris AN/PRC117F and AN/PRC-117G Ultra High Frequency (UHF) Radio.

- f. **Other Systems Dependent On:** Bradley A2 ODS, M7 BFIST, A3 BFIST, M1131 StrykerFSV, M707 Knight, M1200 Armored Knight, TUA Knight, PFED, AFATDS, MFCS, Centaur, FBCB2, TACP CASS, A-10 A/C, B-52 A/C, F/A-18 A/C, KIOWA-IDM, APACHE-IDM, LLDR, IPAD, M7 BFIST SA
- g. **Software Application Description:**
 - i. Language: Ada, C, C++, DATA, SCRIPT, XML
 - ii. Source Line of Code by Software Version:
 - Version 12.05 – Approximately .88 million and WLOC: 126,803
 - Version 12.01.04 – Approximately 4.1 million and WLOC: 20,601
 - Version 11.01.14 - Approximately .88 million and WLOC: 338,384
 - Version 11.01.13 - Approximately .88 million and WLOC: 337,996
 - Version 11.01.11 – Approximately 4.1 million and WLOC: 16,987
 - Version 11.01.10 – Approximately 4.1 million and WLOC: 69,867
 - iii. Operating System: Red Hat Enterprise Linux.
 - iv. COTS: N/A.
 - v. GOTS: Yes
- h. **Software Development Tools/ Applications:** A sample of the support tools/applications used is provided. This is not an all-inclusive list.

Support Tools/Applications	Description
Altova Xmlspy	editor maint.
SDL	Contenta and client lic IETM support
Red Hat	Operating system
Abortext	Editor
BakBone	BakBone Prod
Solar Wind	Performance Monitor
Wonderdesk	SQL web wonderdesk

- i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate AFATDS software. This is not an all-inclusive list. 10 each SCU-2 with HD, 10 each SCU with HD, 10 each Tacter-31M RHC, 4 each Tacter-

31A RHC, 6 each Panasonic Toughbook CF-18 with TACLINK 3000, 6 each Panasonic Toughbook CF-19 with TACLINK 3000, 6 each Panasonic Toughbook CF-29 with TACLINK 3000, 6 Panasonic Toughbook CF-30 with TACLINK 3000, 1 each Hellfire Ground Support System (HGSS), 1 each Lightweight Laser Designator Rangefinder (LLDR), 1 each Mark VII Laser, 1 each IPADS, 2 each SINCGARS, 2 each ASIP, 3 each EPLRS, 2 each AN/PRC-150 HF Radios, 2 each AN/PSC-5 SATCOM Radios, 3 each AN/PRC-117F UHF Radios, and 3 each AN/PRC-117G UHF Radios. Additional systems needed for testing are: 6 each AFATDS, 2 each Centaur, 6 each FBCB2, 3 each PFED, 3 each MFCS, 1 each IDM, 4 each Air Force TACP CASS, OSRVT.

j. Software Sustainment and Enhancement:

- i. Sustain Version 12.05, 12.01.04, 11.01.14, 11.01.13, 11.01.11, 11.01.10 (Historical)
 - Number of specifications: 12
 - Number of Latent Defects Implemented: 73 for sustainment and 53 for 12.05 development
 - Number of New capabilities implemented: 23 (See Systems Requirements Matrix for Version 13 below)
 - Deliverables: 117 (annually)
 - Software System Safety Release Letter
 - Schedules
 - Safety Assessment Report
 - Risk Management Framework documentation
 - Test Report
 - Cybersecurity Update Software Release
 - Software Service Pack with Release Notes
 - VDD
 - Meeting Minutes
 - Operator Notes
- ii. Sustain Version 12.05, 12.01.04, 11.01.14, 11.01.13 (FY19)
 - Number of specifications: 12
 - Number of Latent Defects to be implemented: 73
 - Number of New capabilities implemented: 0
 - Deliverables: 117 (annually)
 - Software System Safety Release Letter
 - Schedules
 - Safety Assessment Report
 - Risk Management Framework documentation
 - Test Report
 - Cybersecurity Update Software Release
 - Software Service Pack with Release Notes
 - VDD
 - Meeting Minutes
 - Operator Notes

- iii. Develop Version 12.06 (FY19)
 - Number of specifications: 12
 - Number of Latent Defects implemented: currently in formal test
 - Number of new capabilities implemented: 8 (See System Requirements Matrix for FOS Version 12.06 below)
 - Deliverables: 21 (annually)
 - RDD
 - Schedules
 - ECP/Specifications
 - Safety Assessment Report
 - Risk Management Framework documentation
 - Test Report
 - Test Plan
 - Software Development Plan
 - Operator Notes
 - Computer-Based Training
 - Trip Reports
 - Software Service Pack with Release Notes
 - VDD
 - Meeting Minutes
- iv. Develop Version 12.07 (FY19)
 - Number of specifications: 12
 - Number of Latent Defects under analysis: 20
 - Number of New capabilities to be implemented: 6 pending (See FOS 12.07 capabilities below)
 - Deliverables: 21 (annually)
 - RDD
 - Schedules
 - ECP/Specifications
 - Safety Assessment Report
 - Risk Management Framework documentation
 - Test Report
 - Test Plan
 - Software Development Plan
 - Operator Notes
 - Computer-Based Training
 - Trip Reports
 - Software Service Pack with Release Notes
 - VDD
 - Meeting Minutes

k. **System and Software Acquisition Support:** Provide system and software support to PM FSC2 as requested (FY19)

Table I. Systems Requirements Matrix for Version 13

REQ #	CAT	Requirement Title	FOS	Centaur	REUSE	EXTERNAL	FUND	COMMENTS
INTEROPERABILITY (REUSE) Requirements								
13-0793	1	Implement Scheduled POA&M Fixes	X	X	X		OMA	
FOS Requirements								
13-0042	2	Implement a New Software Release of DPSS-SM	X				OMA	
13-0094	3	Incorporate XNP	X		X		OMA	
13-0095	2	Anti-Tampering Software	X		X		OMA	Modifications approved at TRR held 10 June 2016
13-0432	2	Add the Ability to Re-orient the Map	X		X		OMA	
13-0513	3	Process Message Deletions on Transmission	X				OMA	
13-0616	2	Implement an Interface with PFED INC II	X			PFED	OMA	
13-0629	2	Remove Obsolete Fire Support Vehicles from the FOS	X				OMA	
13-0703	2	Decouple Fires Applications from Their Current Operating Systems	X				OMA	
13-0747	2	Update Software with Service Pack Notifications	X		X		OMA	
13-0795	2	Do Not Allow Invalid Geometries/ACMs to be Saved to the Geometry/ACM File	X				OMA	
13-0796	3	Protect the FOS Fire Mission File	X				OMA	
13-0797	3	Update Member Data Routing	X				OMA	
13-0798	3	Implement the Ability to Save and Restore the FOS Database	X				OMA	
13-0803	2	Remove Support for the SDU	X		X		OMA	
13-0804	2	Remove Support for the Windows OS	X				OMA	Modifications approved at electronic SRR 2 held 15-20 April 2016
13-0806	2	Update MAP Reuse Products to the Latest Release of OpenMap	X		X		OMA	
13-0807	3	Update MAP_DT 3D Map to JOGL 2.0	X		X		OMA	
13-0808	3	Update MAP_DT 3D Map To Allow for Exploration	X		X		OMA	
13-0811	3	Remove 188-220A Communications Protocol	X		X		OMA	

Table I. Systems Requirements Matrix for Version 13

REQ #	CAT	Requirement Title	FOS	Centaur	REUSE	EXTERNAL	FUND	COMMENTS
13-0813	2	Conduct Proximity Checks Against Friendly Positions Embedded within Messages	X				OMA	
13-0872	1	FOS Process TLE in BFIST	X			TPU	OMA	New requirement approved at electronic SRR 2 held 15-20 April 2016
13-0873	2	Build FOS Version 13.00.00 as Version 12.05.00	X		X		OMA	New requirement approved at electronic SRR 2 held 15-20 April 2016
13-0041	3	Implement a New Software Release of PSS-SOF Products	X				OMA	Deferred at CCM; 22 July 2015
13-0704	3	Provide HBSS Security to FD Applications Using Native HBSS Solutions or Equivalent Stand Alone Capabilities	X		X		OMA	Retired at CCM; 22 July 2015

Table I. System Requirements Matrix for FOS Version 12.06

REQ #	CAT	Requirement Title	FOS	EXTERNAL	FUND	COMMENTS
12-0002	2	Implement MIL-STD-2045-47001D CHG1 and MIL-STD-188-220D CHG1	X	AFATDS PF-D	OMA	Modifications were approved at RIPR 1 held 6 September 2017 Modifications were approved at TIPR 2 held 28 June 2018
12-0594	2	Add 155mm XM1128 HE Projectile	X	AFATDS PF-D	OMA	New requirement was approved for implementation at RIPR 2 held 23 March 2018
12-0764	2	New Error for Incompatible Version of Address Book	X		OMA	
12-0799	2	Make Line 8 on the CAS Aircrew Briefing Required for Transmission	X		OMA	
12-0800	2	Remove Support for the SCU	X		OMA	New requirement was approved for implementation at TIPR 1 held 18 January 2018
12-0933	1	Implement Scheduled POA&M Fixes	X		OMA	
12-1022	2	Merge Fires Applications With The Current Operating Systems	X		OMA	
12-1025	2	Add 155mm Bonus Projectile	X	AFATDS PF-D	OMA	New requirement was approved for implementation at RIPR 1 held 6 September 2017
12-0591	2	M1A1 105mm HE IM Projectile	X	AFATDS PF-D	OMA	CCB Action at SRR: this capability was deferred to a future version
12-0878	2	Integrate Application Control/Change Control (SolidCore)	X		OMA	CCB Action at SRR: this capability was deferred to a future version
12-1024	2	Add IMI 155mm M999 HE Projectile	X	AFATDS PF-D	OMA	CCB Action at SRR: this capability was deferred to a future version

FOS 12.07 Capabilities expected to be selected:

FOS 12.07 Development	OMA	Add 155mm M1122A1 HE Projectile
FOS 12.07 Development	OMA	Excalibur 1b Shape Trajectory Round
FOS 12.07 Development	OMA	Add M1113 155mm HE Projectile
FOS 12.07 Development	OMA	Upgrade to Red Hat Enterprise Linux 7 or 8 5. Remove JCR EPLRS Terrestrial Interface 6. Process Target Location Error (TLE) for Stryker Vehicle 7. AFATDS V7.0 interface
FOS 12.07 Development	OMA	Add M1A1 105mm HE IM Projectile
FOS 12.07 Development	OMA	Add M1125 155mm Smoke Projectile

11. System Name: Advanced Field Artillery Tactical Data System (AFATDS). AN/GYK47(V) 1, AN/GYK-47(V) 3, AN/GYK-48(V) 1, AN/GYK-56, AN/GYK-57, AN/GYK-58, AN/GYK-59

- a. **System Manager:** SEC providing Post Deployment Software Support (PDSS) on support of Program Manager Fire Support Command and Control (PM FSC2)
- b. **System Proponent:** United States Army Field Artillery School (USAFAS), Training and Doctrine Command (TRADOC) Capability Manager Fires Cells (TCM-Fires Cells) Software Division (SD) and Product Director Fire Support Command and Control (PD FSC2)
- c. **System Deployed:** The AFATDS system is deployed worldwide to Maneuver and Field Artillery units, and Fires Brigades. The number of systems currently in the Army inventory is approximately 3400.
- d. **System Overview:** AFATDS is the automated command and control system for the fire support War Fighting Function (WFF). The fire support WFF encompasses the collective and coordinated use of target acquisition data, indirect-fire weapons, fixed-wing aircraft, offensive information operations, and other lethal and non-lethal means against targets located throughout an area of operations. AFATDS is the command and control system for the fires brigade and FA battalion in addition to the fire support duties it performs for the maneuver commander.

Historically, the highly complex AFATDS system has been developed and sustained by SEC FD providing Post Production Software Support/Post Deployment, Software Support (PPSS/PDSS) and System and Software Acquisitions Support for assigned deployed Mission Critical Defense Systems (MCDSs). Support of deployed systems requires that Software Problem Reports (SPRs), software/hardware change proposals, and proposed improvements/enhancements be analyzed, solutions designed, implemented, tested, and documented.

- e. **System Interoperates With:** Effects Management Tool (EMT), FIREFINDER AN/TPQ37 (FF-Q37), Forward Observer Systems (FOS), Pocket-Sized Forward Entry Device (US Army System) (PFED), FIREFINDER Radar AN/TPQ-36 (FF-

Q36), AN/TPQ-49, AN/TPQ50, AN/TPQ-53, Army Battle Command System (ABCS), Airborne Target Handover System-Improved Data Modem (ATHS-IDM), Joint Automated Deep Operations Coordination System (JADOCS), AN/TPQ-48, Multiple Launch Rocket System (MLRS), Centaur, Joint Tactical Warning System (JTWS), Gun Display Unit-Replacement GDU-R, Army Ground Station Module (AGSM), High Mobility Artillery Rocket System (HIMARS), MMS-Profilers (MMS-P), PALADIN, HOW M777, Theater Battle Management Core Systems (TBMCS), Systema Informatico di Reggimento (SIR) (Italian C2 FA System), Battlefield Artillery Target Engagement System (BATES) (United Kingdom C2 FA System), Artillerie Data Lage Einsatz-Rechner verbund (ADLER) (German C2 FA System), and Automation des titres et liaison de l'Artillerie sol-sol (ATLAS) (French C2 FA System). AFATDS communicates with other fire support systems using the AN/VRC-46 Family of Combat Net Radio (CNR), Single Channel Ground and Airborne Radio System (SINCGARS) CNR, Mobile Subscriber Equipment (MSE), High Frequency/Ultra High Frequency (HF/UHF) Radios, Enhanced Position Location Reporting System (EPLRS) Radios, AN/PSC-5 (SATCOM) Radio, and 2 or 4 Wire Landline.

- f. **Other Systems Dependent On:** FF-Q36, FOS, ABCS, CENTAUR, GDU-R, PALADIN, FF-Q37, PFED, MLRS, M777, AN/TPQ-48, HIMARS, AN/TPQ-49, AN-TPQ-50, AN/TPQ-53, MMS-P

g. **Software Application Description:**

- i. Language: SQL, DATA, XML, Ada, Java, SCRIPT.
- ii. Source Line of Code by Software Version:
 - Version 6.8.0.1 - Approximately 5.2 million and WLOC: 100
 - Version 6.8.1.1 – Approximately 5.6 million and WLOC: 76,281
- iii. Operating System: Windows 7.0/10.0
- iv. COTS: N/A.
- v. GOTS: N/A.

h. **Software Development Tools/ Applications:**

Windows 7/10

Windows 2003 Server

Windows Vista

Windows XP

Redhat 5 Linux

Windows InstallShield 2009

Windows Services for Unix

Samba 3.4.2

Samba 3.0.27

Active Perl 5.8.8 Build 822

Perl 5.6.1

Perl 5.005_03

Rational Apex 4.2.0b

GNAT Pro 6.1.1

GPS 4.2.1

Sun Studio 8

Microsoft Visual C# 2008 Express with SP1

Apache ANT 1.7.1

Sun JDK 1.6.0_45

CVSNT

CVS 1.11.21

WINCVS 2.0.2.4 Build 4

Open SSH for Windows 3.8.1p1

PostgreSQL 8.3.21

- i. **Hardware:** The following is a subset of hardware equipment list required to maintain, test and operate AFATDS software. This is not an all-inclusive list. 7 each MILTOPE V3, 3 each GETACs and 7 each TACLINK Cards (Note: AFATDS uses GETAC, and MILTOPE V3 systems).
- j. **Software Sustainment and Enhancement :**
 - i. Sustain Version 6.8.0.1 and 6.8.1.1 (Historical)
 - Number of specifications: 0
 - Number of Latent Defects Implemented: 12 (annually)
 - Number of New capabilities implemented: 0
 - Deliverables:76 (annually)
 - Software System Safety Release Letter
 - Schedules
 - Safety Assessment Report
 - Risk Management Framework documentation
 - Test Report
 - Cybersecurity Update Software Release
 - Software Service Pack with Release Notes
 - VDD
 - Meeting Minutes

- Trip Reports
- ii. Sustain Version 6.8.0.1 and 6.8.1.1 (FY19)
 - Number of specifications: 0
 - Number of Latent Defects to be Implemented: 12 (annually)
 - Number of New capabilities implemented: 0
 - Deliverables:76 (annually)
 - Software System Safety Release Letter
 - Schedules
 - Safety Assessment Report
 - Risk Management Framework documentation
 - Test Report
 - Cybersecurity Update Software Release
 - Software Service Pack with Release Notes
 - VDD
 - Meeting Minutes
 - Trip Reports
- iii. Develop Version 6.8.1.1P2 (FY19)
 - Number of specifications: 25
 - Number of Latent Defects implemented: TBD currently in formal test
 - Number of New capabilities implemented: 11 (See System Requirements Matrix for AFATDS Version 6.8.1.1P2 below)
 - Deliverables:38 (annually)
 - RDD
 - Schedules
 - ECP/Specifications
 - Safety Assessment Report
 - Risk Management Framework documentation
 - Test Report
 - Test Plan
 - Software Development Plan
 - Operator Notes
 - Training material
 - Trip Reports
 - Software Service Pack with Release Notes
 - VDD
 - Meeting Minutes
- iv. Develop Version 6.8.1.2 (FY19)
 - Number of specifications: 25
 - Number of Latent Defects to analyze: 69
 - Number of New capabilities to be implemented:14 (See OMA AFATDS 6.8.1.2 Capabilities to be selected)
 - Deliverables expected:38 (annually)

- RDD
- Schedules
- ECP/Specifications
- Safety Assessment Report
- Risk Management Framework documentation
- Test Report
- Test Plan
- Software Development Plan
- Operator Notes
- Training material
- Trip Reports
- Software Service Pack with Release Notes
- VDD
- Meeting Minutes

k. System and Software Acquisition Support:

- i. Develop Version 6.8.1.1P2 (FY19)
 - Number of New capabilities implemented: 5 (See System Requirements Matrix for AFATDS Version 6.8.1.1P2 below)
- ii. Develop Version 6.8.1.2 (FY19)
 - Number of New capabilities to be implemented: 8 (See PM AFATDS Version 6.8.1.2 capabilities to be selected)

Table I. System Requirements Matrix for AFATDS Version 6.8.1.1P2

REQ #	CAT	Requirement Title	AFATDS	EXTERNAL	FUND	COMMENTS
6-0002	1	Implement MIL-STD-2045-47001D CHG1 and MIL-STD-188-220D CHG1	X	DFC DFCS FOS G/ATOR BLK2 PDFCS/AFCS PF-D Q50 Q-53 THS	OMA	Modifications approved at TIPR 2 Modifications approved at RIPR 2 New requirement approved for implementation at SRR 2 held 4 Oct 2017 'RE-SELECTED' in a CCB Action at RIPR 1 held 10 Aug 2017 'DEFERRED' in a CCB Action at SRR held 29 Jun 2017
6-0747	2	Update Software with Service Pack Notifications	X		OMA	
6-0841	2	Implement VMF MIL-STD-6017C_COE_v3_VID_v2_2017-09-28	X	DFC DFCS PDFCS/AFCS	OMA	Modifications approved at TIPR 2
6-0933	2	Implement Scheduled POA&M Fixes	X		OMA	Modifications approved at RIPR 2
6-0934	2	Automated Tagging and Patching	X		OMA	Modifications approved at TIPR 2 Modifications approved at RIPR 1
6-0935	2	Add Model M109A7 PIM	X	PDFCS	OMA	Modifications approved at TIPR 2 New requirement approved and added at RIPR 1
6-0936	2	Distinguish between Howitzers with Chrome or Steel Tube	X	DFCS PDFCS/AFCS	OMA	Modifications approved at TIPR 2 Modifications approved at RIPR 1
6-0937	2	Integrate NABK 14	X		OMA	Modifications approved at TIPR 1

Table I. System Requirements Matrix for AFATDS Version 6.8.1.1P2

REQ #	CAT	Requirement Title	AFATDS	EXTERNAL	FUND	COMMENTS
6-0948	2	Add JTT Interface Simulation to DFSTS	X		USMC	Modifications approved at TIPR 2 New requirement approved and added at RIPR 1
6-0949	2	Add Trace Route Feature to Network Diagram Troubleshooting	X		USMC	Modifications approved at TIPR 1 Modifications approved at RIPR 1
6-0950	2	Enhance Data Distribution to Support Cannon/Mortar Tech Solution Backup	X		USMC	Modifications approved at TIPR 2 Modifications approved at RIPR 2 Modifications approved at RIPR 1
6-0952	2	Add AN/TPS-80 G/ATOR Blk 2 Interface and RDO Upgrade to AFATDS Software	X	G/ATOR BLK2 Q-53	USMC	Modifications approved at TIPR 2 Modifications approved at TIPR 1
6-1030	2	Multiple Coordinating Altitude Destinations	X		OMA	New requirement approved and added at RIPR 1
6-1031	2	Increase Numeric Range on Atmospheric Pressure Field for MET	X		OMA	Modifications approved at TIPR 1
6-1032	2	NAG Schemas for CS 11-12	X	JBC-P	OMA	New requirement approved and added at RIPR 1
6-1039	2	Update TacLink Firmware Version	X		USMC	New requirement approved and added at RIPR 1
6-0938	2	EFC Wear Curves M777A2	X	M777A2	OMA	CCB Action: "RETIRED" at SRR 2
6-0939	2	EFC Wear Curves M119A3	X	M119A3	OMA	CCB Action: "RETIRED" at SRR 2
6-0940	2	Update M549 and M549A1 Aero FCI	X	M777A2 M109A6 M109A7	OMA	CCB Action: "DEFERRED" to a future version at SRR 2

Table I. System Requirements Matrix for AFATDS Version 6.8.1.1P2						
REQ #	CAT	Requirement Title	AFATDS	EXTERNAL	FUND	COMMENTS
6-0941	2	Update M795 and M795 IM HE Aero FCI	X	M777A2 M109A6 M109A7	OMA	CCB Action: "DEFERRED" to a future version at SRR 2
6-0951	2	Modify the AFATDS to Process PERM M1109 for EFSS Weapon System	X	EFSS THS	USMC	CCB Action: "DEFERRED" to a future version at TIPR 1
6-0953	2	ASCA Messages/CTIDP 7.1	X		CUST	CCB Action: "DEFERRED" to a future version at RIPR 1

PM AFATDS 6.8.1.2 Capabilities.

CAP	Title	Description	Source	System	Status
1064	Implement Cross Domain ATACMS (CD-ATACMS) Seeker Variant	US military planners foresee warfare in the near future in which the US Army is called upon to attack targets that would otherwise lie in the "traditional" domains of the US Air Force or US Navy, for example, land-based mobile missile launchers and ships at sea. Meanwhile, the target set for the US Army rocket artillery continues to grow with emphasis on moving or relocatable targets. Although missiles are in long-term development that could address some of these problems, there are currently no systems in the Warfighter inventory that can deliver rapid engagement of mobile targets at long ranges. The new Cross Domain ATACMS (CD-ATACMS) will give the US Army substantial new precision fire capabilities enabling it to play a decisive role in controlling sea lanes, islands, archipelagos, and important areas of ocean as well as holding at risk enemy long-range air defenses and command & control centers.	PM PFRMS	AFATDS	PM-Pending
1065	Implement GMLRS Extended Range Munitions	With the continuing development of the MLRS Guided Unitary program, a new variant of the GMLRS munition (GMLRS Unitary and GMLRS AW) is being developed and designated as the Ten Inch GMLRS Extended Range. This munition offers a significant extension in range with the Ten Inch composite case motor providing 20% more propellant. This reduces the short range engagement burden on Long range Precision Fires (LRPF) with increased maneuverability for target engagements. GMLRS ERG provides backward compatibility with GMLRS integrating all of the current GMLRS warheads (GMLRS Unitary and GMLRS Alternative Warhead). GMLRS ERG will provide future growth integrating future warhead variants – Penetration/Delayed Detonation, Explosively Formed Penetrators, and Electro-Magnetic Pulse/Dispense. The nose also will allow for future seeker or anti-jam integration	PM PFRMS	AFATDS	PM-Pending
1066	Update Current GMLRS Alternate Warhead (GMLRS-AW) Munitions Capability	The Deputy Secretary of Defense (DSD) has directed an update for fielding new capabilities for the current GMLRS Alternate Warhead (GMLRS-	PM PFRMS	AFATDS	PM-Pending

		AW) munitions. The new capability will add Point Detonate (PD) fuze capability and Vertical Trajectory requirements to both AFATDS C2 and M270A1/ HIMARS M142 Launcher software suites to support operational user needs.			
1067	Update DFSTS to support communications updates incorporated into AFATDS 6.8.1.1P2	Correctly build, receive and respond to the 6017C+ messages at DFSTS. Allow 6017B and 6017C+ messaging using the 47001D Chg1 header on IP networks and allow the use of 188-220D Chg1 with 47001D Chg1 headers on CNR.	Marine Corps	AFATDS	PM-Pending
1068	Implement capability in AFATDS to Compute artillery safety and produce safety "T"s	Currently artillery safety must be computed using CENTAUR on BUCS. This method uses a different muzzle velocity management method than AFATDS and DFCS. This method also requires the database to be replicated in AFATDS and CENTAUR while validation of "safe to fire" is accomplished by dry fire verification between the DFCS and AFATDS. DESIRED BEHAVIOR: Compute artillery safety "T"s, considering XO's Min QE, in AFATDS	Marine Corps	AFATDS	PM-Pending
1069	Add the XM1113 munition into AFATDS 6.8.1.2	Add the XM1113 munition into AFATDS 6.8.1.2	PM CAS	AFATDS	PM-Pending
1070	Add the XM1128 munition into AFATDS 6.8.1.2	Add the XM1128 munition into AFATDS 6.8.1.2	PM CAS	AFATDS	PM-Pending
1071	Implement Excalibur shape change capability	Implement Excalibur shape change capability	PM CAS	AFATDS	PM-Pending

OMA AFATDS 6.8.1.2 Capabilities:

AFATDS 6.8.1.2 Development	OMA	OpenLdap Randomly Crashes
AFATDS 6.8.1.2 Development	OMA	MUL Import after IAVA Updates
AFATDS 6.8.1.2 Development	OMA	Correct the importing of HF and ANW2 Comms Plans
AFATDS 6.8.1.2 Development	OMA	Allow on-call radar zones within EMT/FCW
AFATDS 6.8.1.2 Development	OMA	Preserve GCCS-J tracks within the Track Workspace
AFATDS 6.8.1.2 Development	OMA	Implement support to run AFATDS on 2012 Server
AFATDS 6.8.1.2 Development	OMA	AFATDS System name
AFATDS 6.8.1.2 Development	OMA	NSIS Installer instead of InstallShield
AFATDS 6.8.1.2 Development	OMA	Incorrect number of JDPIs returned from MIDB pull
AFATDS 6.8.1.2 Development	OMA	Error saving target list names with special characters from JTT
AFATDS 6.8.1.2 Development	OMA	Error pulling multiple target lists from MIDB or JTT
AFATDS 6.8.1.2 Development	OMA	AFATDS Database Duplicate record when pulling MIDB or JTT data
AFATDS 6.8.1.2 Development	OMA	Implement Updated NABK/FCI to support
AFATDS 6.8.1.2 Development	OMA	Remapping ASCA Weapon Model

12. System Name: Non-System Specific

- a. Support Software Environments and Facilities:**
- b. Historically, the contractor provided the following:**
 - i. Provided CORE level system administration support for the FD network.
 - ii. Operate the Eugene F. Crostley Software Development Facility.
 - iii. Provide CORE level support for Security to ensure compliance with the National Industrial Security Program.

