Voice Recorder - Equipment Description and Data

DMC: JLENS-A-CS-60-0009-00A-000B-A

Language: en/US

Issue no: 001

Issue Date: 2013-07-30

Title: Voice Recorder - Equipment Description and Data

Security classification: Class01

Data Restrictions:

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Voice Recorder - Equipment Description and Data

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Description

1 INTRODUCTION

The [redacted] contains the crew workstations used for JLENS system operation. Supporting these workstations as well as other system functions are [redacted] of electronic equipment. [redacted]

2 EQUIPMENT DESCRIPTION

2.1 Key Product Characteristics

Key product characteristics of [redacted] are shown in Table 1

Table 1 Key Product Characteristics of [redacted].

CHARACTERISTIC	REQUIREMENT
Dimensions	[redacted]
Weight	[redacted]
Mounting	19-inch rack mount

All redactions on this page per (b)(3)(A)(i) & Title 10 Sec 130 (a)(c)

CHARACTERISTIC	REQUIREMENT
Analog interfaces	[redacted]
Digital interfaces	[redacted]
Network	[redacted]
Remote Windows programs	[redacted]
Standard control interface	[redacted]
Front panel	[redacted]
Power requirement	[redacted]
Operating temperature	[redacted]
Operating humidity	[redacted]
Operating altitude	[redacted]
Non-operating temperature	[redacted]
Non-operating humidity	[redacted]
Non-operating altitude	[redacted]
T1 channels	[redacted]
Archive recording	[redacted]
On-line recording	[redacted]
MTBF	[redacted]

2.2 Configuration

[redacted] configuration options specific to the [redacted] are shown in Table 2

Table 2 [redacted]

DESCRIPTION	PART NUMBER (CAGE CODE 62264)
[redacted]	[redacted]
[redacted]	
[redacted]	[redacted]
[redacted]	

All redactions on this page per (b)(3)(A)(i) & Title 10 Sec 130 (a)(c)

[redacted]

The front panel of the [redacted] is shown in Fig. 1.

2.3 [redacted] Front Panel Controls and Indicators

Three LEDs (1, Fig. 2) are located to the left of the archive drive (2).

- READY indicates that there is a medium in the archive drive
- RECORD indicates that the drive is archiving
- FAULT indicates that there is a problem with the drive or medium

The audio section (4, Fig. 2) is located below the archive drive.

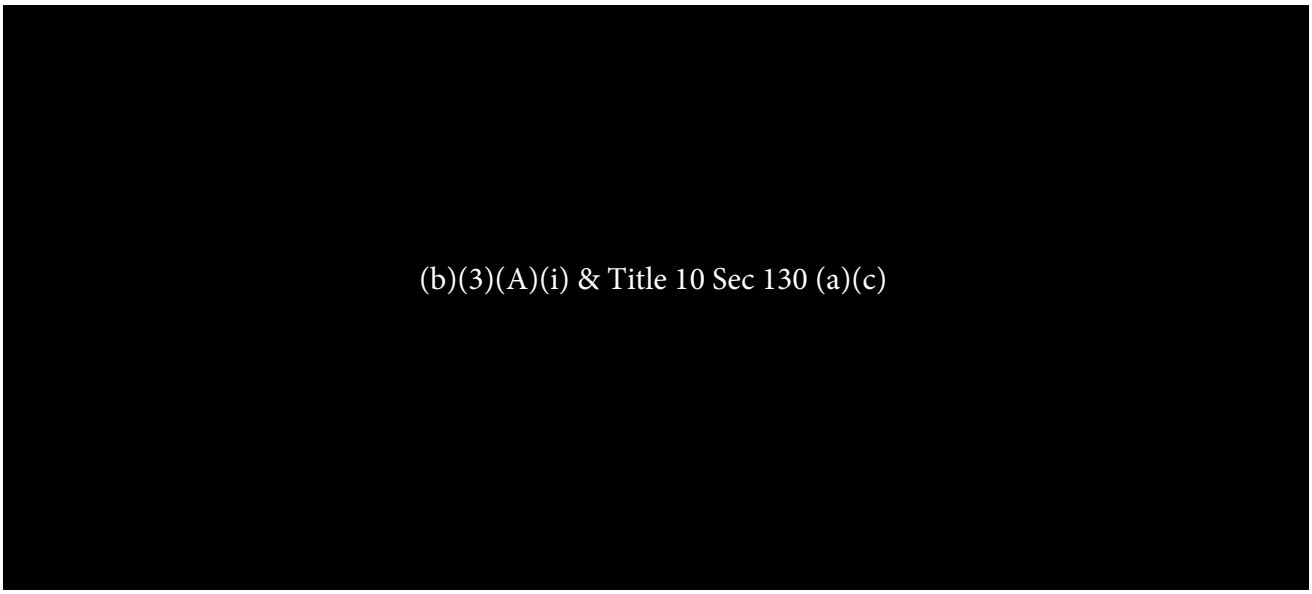
- VOLUME controls speaker and headphone volume
- LINE OUT provides a constant level line out jack to allow for external recording
- HEAD PHONE provides a 1/4 inch headphone jack

- Two USB connectors provide alphanumeric keyboard or modem connections which are used for remote diagnostics

The POWER switch (3, Fig. 2) can be left on so the voice recorder powers up when external power is supplied, or turned off to keep the voice recorder from powering up automatically when external power is supplied.

The POWER switch is operated with a key, two of which are supplied with the voice recorder. This switch is used to power up only. Avoid using this switch to power down the voice recorder.

The knob and keypad shown in Fig. 3 are located in the center of the front panel of the voice recorder. The knob and keypad are used for data selection and entry. Frequently an item in a menu is scrolled to by turning the knob. Items are then selected by pressing the knob for PUSH TO SELECT.



The display screen shown in Fig. 4 is located in the left third of the front panel of the voice recorder. The display screen presents information on the operation of the recorder. The bottom row of keys is referred to as the soft keys and their current functions are shown across the bottom of the display, which changes depending on context.

The keys to right of the display screen (SETUP, INFO, RECALL, and EXIT) are referred to as mode keys.

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The front view of [redacted] mounted in rack 7A13A12 or 17A13A12 is shown in Fig. 5.

2.4 [redacted] Rear Panel

The left portion of the rear panel of the voice recorder is shown in Fig. 6 and items on the panel are identified below.

- Power on/off switch (1)
- AC power receptacle (2)
- Power supply cooling fan (3)

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The center rear panel ports of the voice recorder are identified below and shown in Fig. 7. All of the connectors are [redacted].

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

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The USB ports ( ) can be set up to use a keyboard or mouse. They can also be used to connect a USB hard drive for archiving up to The RS232 port (,) has several uses. It can be used to receive time source data from a GPS clock and other functions.

The right portion of the rear panel (Fig. 8) of the voice recorder contains the . The is the recording/telephone board and it is connected using a splitter to the to record the voice recorder trunks. The panel contains two connectors).

Intentionally left blank

High Speed Recorder Power On - Normal operation procedures

DMC: JLENS-A-SP-20-0001-01A-131A-A

Language: en/US

Issue no: 001

Issue Date: 2013-09-24

Title: High Speed Recorder Power On - Normal operation procedures

Security classification: Class01

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High Speed Recorder Power On - Normal operation procedures

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References

Table 1 References

Data Module/Technical Publication	Title
JLENS-A-00-00-0000-00A-131A-A	Personnel Electrostatic Discharge - Normal operation procedures
JLENS-A-SP-20-0000-01A-131A-A	Signal Data Processor (SDP) Cluster Rack (Blade Center) Power On - Normal operation procedures

Preliminary Requirements

Required Conditions

Table 2 Required Conditions

Title	Data Module
Signal Data Processor (SDP) Cluster Rack (Blade Center) Power On - Normal operation procedures	

Required Persons

Table 3 Required Persons

Category/Trade	Number Required	Trade code	Estimated time spent
System Operator/Maintainer	(1)	14E	0.50 Hour

Support Equipment

Table 4 Support Equipment

Nomenclature	Identification No.	Qty	Remarks
FLASHLIGHT	Pt. No : 6230-00-299-3035	1.00 EA	

Consumables, Materials, and Expendables

Table 5 Consumables, Materials, and Expendables

Nomenclature	Identification No.	Qty	Remarks
None			

All redactions on this page per (b)(3)(A)(i) & Title 10 Sec 130 (a)(c)

Spares

Table 6 Spares

Nomenclature	Identification No.	Qty	Remarks
None			

Safety Conditions

WARNINGS

- [redacted] **Verbally inform all occupants prior to any maintenance activity.**
- **Hazardous voltage may be present while performing this procedure. Verify that the power source is disconnected before attempting to repair, remove, or replace any electrical component.**

CAUTION

This procedure contains Electrostatic Discharge Sensitive (ESDS) hardware. Refer to the included cautions when handling these items.

Procedure

WARNINGS

- [redacted] **Verbally inform all occupants and verify that no maintenance is being performed. Failure to comply may result in death or injury to personnel and damage to equipment.**
- **Hazardous voltage may be present while performing this procedure. Verify that the power source is disconnected before attempting to repair, remove, or replace any electrical component. Failure to comply may result in death or injury to personnel and damage to equipment.**

Note 1

[redacted]

All redactions on this page per (b)(3)(A)(i) & Title 10 Sec 130 (a)(c)

Note 2

To perform high speed recorder power on after [redacted] intialization, perform Step 1 through Step 8. To perform a high speed recorder power cycle, perform Step 9 through Step 15.

1 Locate red equipment rack [redacted] (2, Fig. 1) on [redacted] forward interior wall.

Figure 1 [redacted] Interior View.

CAUTION

Electrostatic Discharge Sensitive (ESDS) hardware is present in this location as indicated by the ESDS symbol. Personnel electrostatic charge must be dissipated prior to contact with any ESDS hardware. Refer to JLENS-A-00-00-0000-00A-131A-A for directions to dissipate personnel electrostatic charge. Failure to comply may result in immediate or latent ESD damage to equipmen

2 Verify power switches (1, Fig. 2) (3) on rear of high speed recording tape drive [redacted] (2) are set to | (ON) position.

All redactions on this page per (b)(3)(A)(i) & Title 10 Sec 130 (a)(c)

[redacted]

3 Verify power switches (1, Fig. 2) (3) on rear of high speed recording tape drive [redacted] (2) are set to | (ON) position.

4 Verify 12 disk drive (2, Fig. 3) power LEDs (3) on front of high speed recording tape drive [redacted] (1) are illuminated and not flashing.

[redacted]

5 Verify 12 disk drive (2, Fig. 3) power LEDs (3) on front of high speed recording tape drive [redacted] (1) are illuminated and not flashing.

6 Verify high speed data recorder assembly [redacted] (3, Fig. 4) power switches (1) (2) on rear of recorder are set to | (ON) position.

All redactions on this page per (b)(3)(A)(i) & Title 10 Sec 130 (a)(c)

[redacted]

7 Verify POWER LEDs (4, Fig. 5) on rear of both high speed data recorder assembly power supplies (2) (3) are illuminated and not flashing.

[redacted]

8 Verify all LEDs (2-8, Fig. 6) on rear of high speed recorder assembly (1) are illuminated and not flashing.

All redactions on this page per (b)(3)(A)(i) & Title 10 Sec 130 (a)(c)

[redacted]

9 Set both high speed data recorder [redacted] (3, Fig. 4) power switches (1) (2) on rear of recorder to O (OFF) position.

10 Wait for minimum of 5 seconds.

11 Set both high speed data recorder [redacted] (3, Fig. 4) power switches (1) (2) on rear of recorder to | (ON) position.

12 Verify [redacted] (8, Fig. 6) on recorder assembly (1) are illuminated and not flashing.

13 Verify [redacted] (7, Fig. 6) on recorder assembly (1) are flashing.

14 Verify [redacted] (6, Fig. 6) on recorder assembly (1) are illuminated and not flashing.

15 Verify [redacted] (3, Fig. 6) on recorder assembly (1) are flashing.

Requirements after job completion

Required Conditions

Table 7 Required Conditions

Title	Data Module
None	

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Start Data Recording - Normal operation procedures

DMC: JLENS-A-OP-00-0010-00A-131A-A

Language: en/US

Issue no: 001

Issue Date: 2013-02-10

Title: Start Data Recording - Normal operation procedures

Security classification: Class01

Data Restrictions:

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Start Data Recording - Normal operation procedures

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Preliminary Requirements

Required Conditions

Table 1 Required Conditions

Title	Data Module
None	

Support Equipment

Table 2 Support Equipment

Nomenclature	Identification No.	Qty	Remarks
None			

Consumables, Materials, and Expendables

Table 3 Consumables, Materials, and Expendables

Nomenclature	Identification No.	Qty	Remarks
None			

Spares

Table 4 Spares

Nomenclature	Identification No.	Qty	Remarks
None			

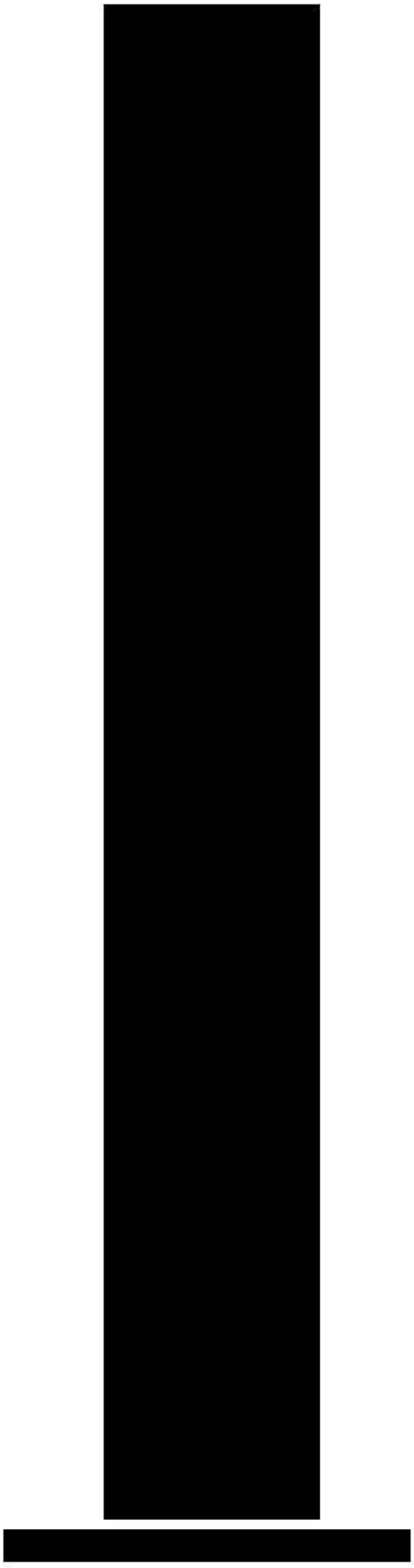
Safety Conditions

None

Procedure

1 Click Config Setup button in Primary Commands panel (Fig. 1). Config Setup window opens (Fig. 2).

All redactions on this page per (b)(3)(A)(i) & Title 10 Sec 130 (a)(c)



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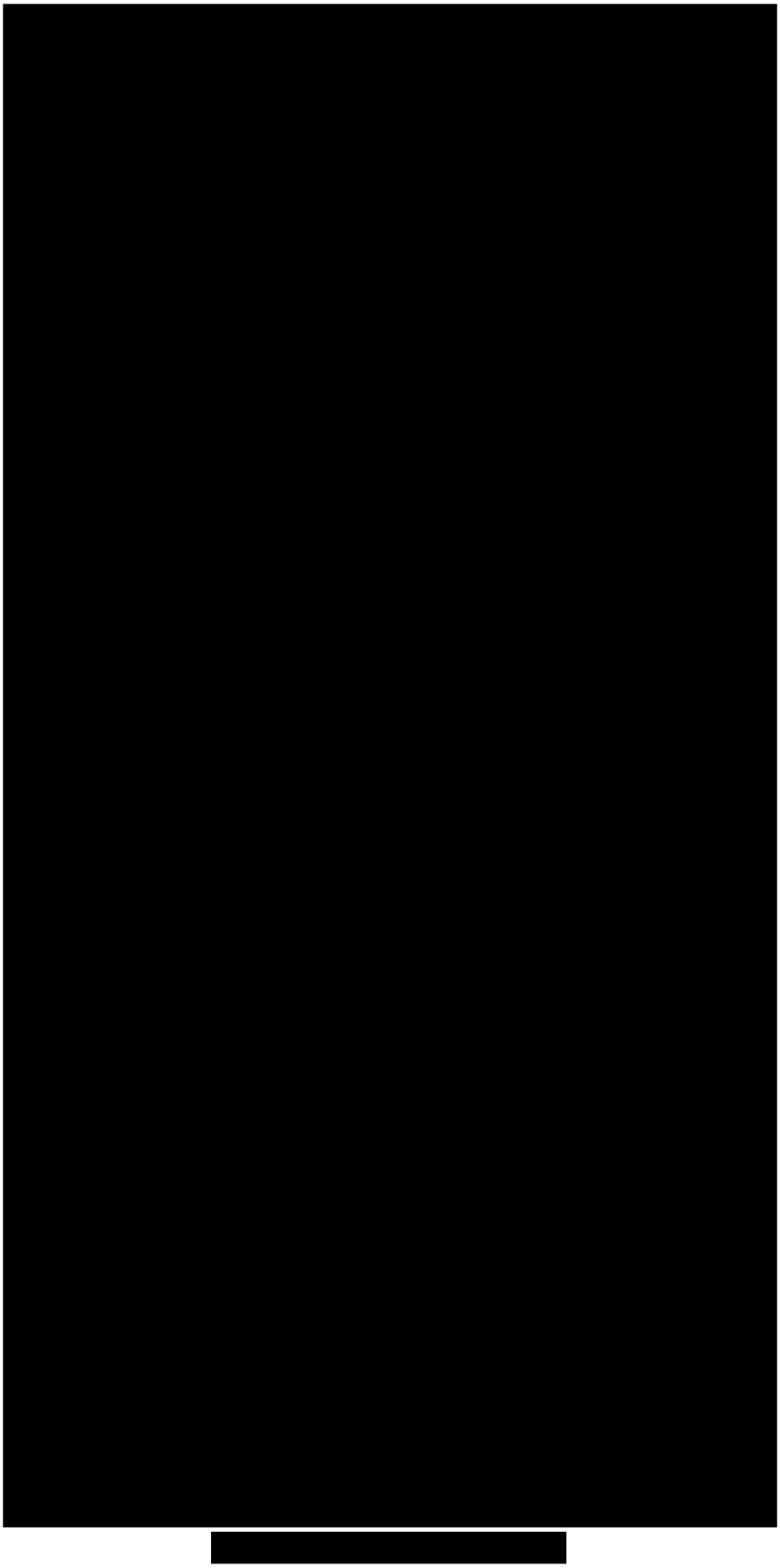

2 Click Data Recording button in Config Setup window. Data Recording Window opens (Fig. 3).

(b)(3)(A)(i) & Title 10 Sec 130 (a)(c)

3 Select desired parameters and click Start button in CPG Data Recorder Controls pane.

4 Click Close icon.

5 Click Close icon in Config Setup window (Fig. 2).

Requirements after job completion

Required Conditions

Table 5 Required Conditions

Title	Data Module
None	

Intentionally left blank

Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) Performance Specification (JPS) – Spiral 1 (U)

30 October 2002

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List of Tables (U)

JLENS Performance Specification (JPS) – Spiral 1 (U)

1.0 Introduction (U)

1.1 (U) Scope. The JLENS Performance Specification (JPS) – Spiral 1 (JPSS1) describes the initial product in a spiral development approach with progressively greater capability and defines the performance requirements and operating environment for the JS1 system employing currently available technologies with specific attention given to Land Attack Cruise Missile Defense (LACMD). The system will (a) enable b(3) systems to perform b(3) Land Attack Cruise Missiles (LACM) under the b(3) concept, (b) contribute to the b(3) and (c) support additional missions. The scope of operations ranges from single Service applications to a full Joint environment in all phases of warfare.

1.2 (U) Concept. The JS1 system (Figure 1-1) will reduce technical risk on JLENS, develop tactics, techniques, and procedures (TTP) for use of an aerostat, and develop and test interoperability for b(3) To achieve this quickly and to minimize cost, non-developmental items should be used where appropriate.

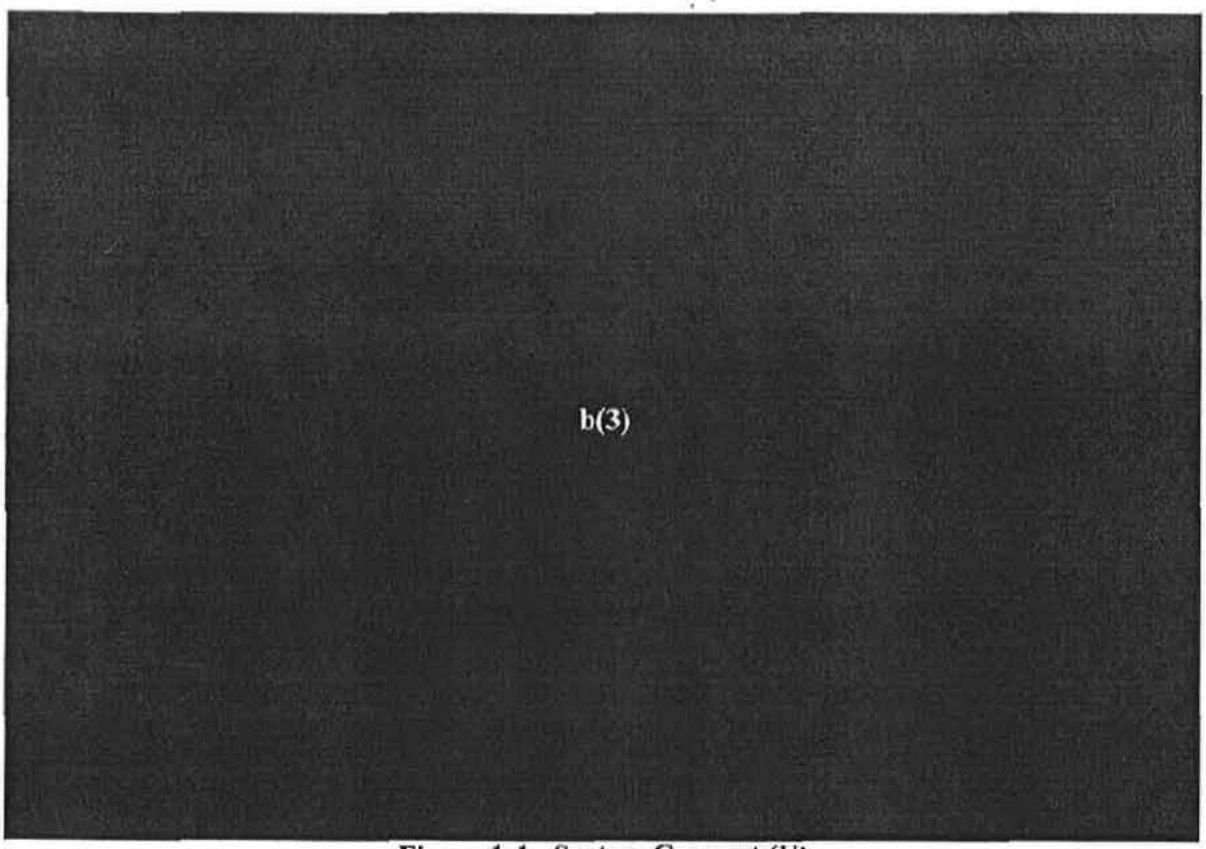


Figure 1-1. System Concept (U)

1.3 (U) Mission. One mission of this system is to provide surveillance information and fire control support for low altitude LACMD. Specifically, this system provides b(3) b(3) for engagement decision and for b(3) b(3) The surface weapon system then develops an engagement solution, launches, communicates with, and controls the interceptor in flight. Additional JLENS Spiral 1 missions may include support of information dominance, communications relay, and tracking of moving surface targets and other airborne threats.

2.0 (U) System Description. The JS1 system (Figure 2-1) includes a platform, payload and mobile processing station. The platform is a non-rigid, aerodynamically shaped, helium and air filled air vehicle that is tethered to a mooring station. The tether is a cable that secures the air vehicle, controls operating altitude, transmits power and provides a fiber optic communications path between the mobile processing station on the ground and the payload. The mobile processing station includes operator workstations, data processors, and communications equipment. Power is supplied by organic generators or from commercial power sources. Figure 2-2 depicts a notional specification tree. The system shall meet or exceed the requirements set forth herein and the system performance set forth in paragraph 3.0, Table 3-1.

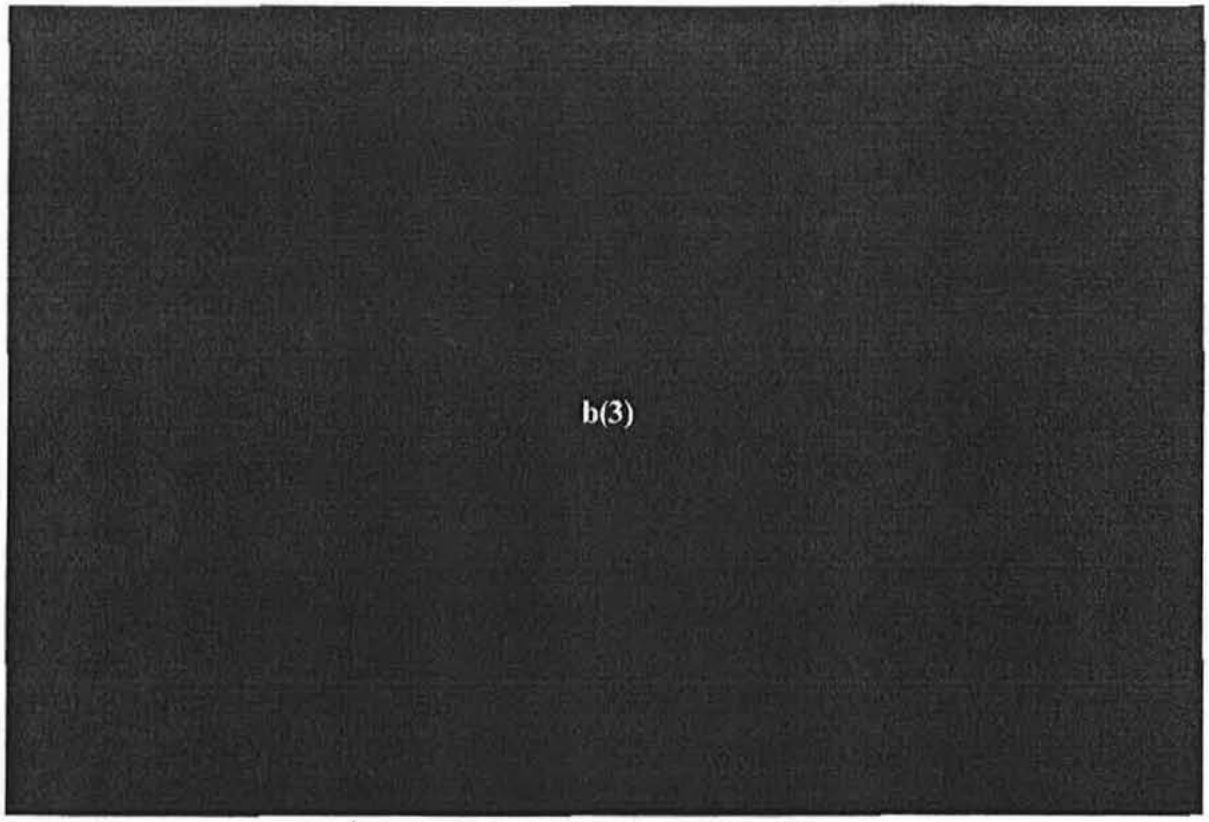


Figure 2-1. System Description (U)

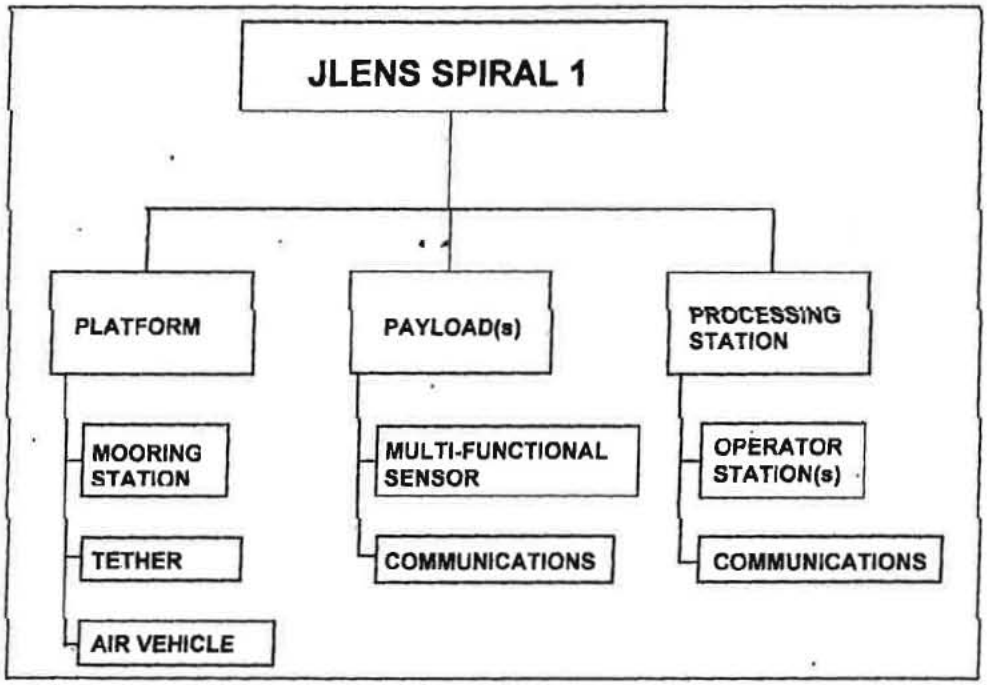


Figure 2-2. JLENS – Spiral 1 Notional Specification Tree (U)

2.1 (U) Platform. The platform shall consist of the air vehicle, tether and mooring station. The mooring station shall provide for launch and recovery of the air vehicle.

2.1.1 (U) Air Vehicle. The air vehicle shall be a 32 meter-class aerostat. The air vehicle, including payload, shall be capable of maintaining operational altitudes with blowdown. The air vehicle, including payload, shall be capable of maintaining operational altitude [redacted] b(3)

2.1.2 (U) Tether. The tether, which provides the connection between the mooring station and air vehicle, shall be a fiber optic tether. It shall provide a fiber optic communications path between the mobile processing station and the payload. It shall also provide power to the payload from the power generation system.

2.1.3 (U) Mobile Mooring Station. The mobile mooring station shall be a 32 meter class design capable of handling the air vehicle described in paragraph 2.1.1. Provision shall be made for an emergency generator capability to support aerostat flight safety.

2.2 (U) Payload. The payload shall consist of a government-off-the-shelf (GOTS) fire control radar with modifications to provide both fire control and limited local area surveillance capabilities from an aerostat platform.

2.3 (U) Mobile Processing Station. The b(3) based processing station shall house the operator workstation, flight director controls and communications equipment. The processing station shall have the capability to perform system initialization and mission operations control of the radar and communications system. It shall have an embedded training capability to support sustainment training of operators and maintainers. b(3)

b(3)

2.4 (U) Operational Modes.

b(3)

2.4.1 (U) Simulation/Training. The Processing Station shall have a capability to be driven by simulation of the radar outputs in either a stand-alone or a distributed interactive network. The distributed simulation control shall be in b(3)

b(3)

2.4.2

b(3)

2.5 (U) Networks. Live and simulation/training modes of operation shall be configured to communicate in air defense networks.

2.5.1

b(3)

2.5.2 (U) Link 16. The system shall communicate as a participant on the Link 16 network.

2.5.3

b(3)

2.6 (U) External Communications. The system shall maintain communications in the

b(3)

2.7 (U) Transportability. The system shall not suffer damage or degradation while being moved to a theater via strategic airlift, sealift, and rail.

2.8 (U) Standardization and Commonality. This system shall comply with the applicable information technology standards contained in the Joint Technical Architecture-Army (JTA-A) and the Department of Defense (DoD) Technical Architecture Framework for Information Management (TAFIM), with appropriate military standards publications for joint interoperability, and with applicable Defense Information Infrastructure Common Operating Environment (DII COE) standards. b(3)

2.9 (U) Combat Identification Support. The system shall provide information to support combat identification (CID) functions that shall be performed by battle management centers and nodes using IFF interrogation.

2.10 (U) Location, Position and Alignment. The b(3)

2.11 (U) Environmental Monitoring. The system shall include weather monitoring and instrumentation equipment. The system shall be capable of obtaining and using weather and environmental forecasts and observations.

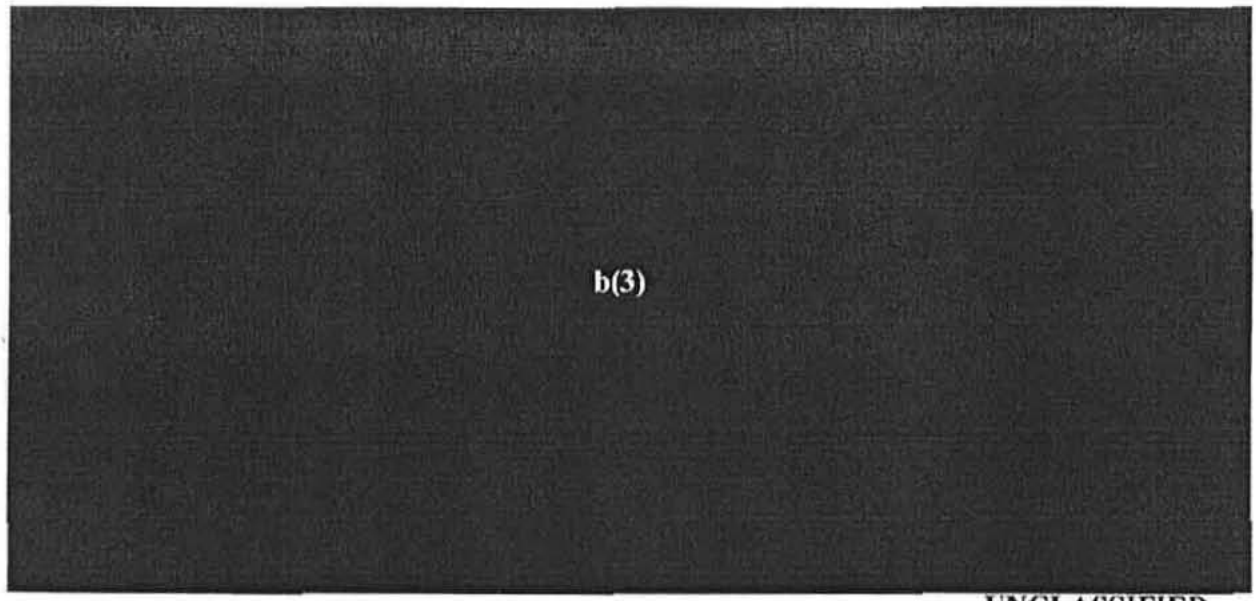
2.12 (U) Storage Devices. All classified data storage devices shall be easily removable from the computer without the use of tools or special equipment.

2.13 (U) Common Hardware and Software (CHS). CHS-II shall be used where appropriate.

2.14 (U) Commercial Practices. Commercial practices and procedures shall be followed to the extent possible.

3.0 (U) System Performance. Table 3-1 shows system performance requirements.

Table 3-1. System Performance Requirements (U)



UNCLASSIFIED

Appendix B - Acronyms (U)

b(3)	
b(3)	
b(3)	
C2	Command and Control
CHS	Common Hardware and Software
CID	Combat Identification
b(3)	
CM	Cruise Missile
CNR	Combat Net Radio
COTS	Commercial / Contractor Off-The-Shelf
dB	Decibels
dBsm	Decibels Referenced To One Square Meter
DII COE	Defense Information Infrastructure Common Operating Environment
DIS	Distributed Interactive Simulation
DOD	Department of Defense
DTED	Digital Terrain Elevation Data
b(3)	
b(3)	
b(3)	
b(3)	
b(3)	
GFE	Government Furnished Equipment
GHz	Gigahertz
GOTS	Government Off-The-Shelf
GPS	Global Positioning System
GS/DS	General Support / Direct Support
HLA	High Level Architecture
b(3)	
IFF	Identification Friend or Foe
INS	*Inertial Navigation System*
JLENS	Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System

JMNS	Joint Mission Need Statement
JPSS1	JLENS Performance Specification – Spiral 1
JS1	JLENS - Spiral 1
JTA	Joint Technical Architecture
[redacted]	b(3)
km	kilometers
LACM	Land Attack Cruise Missile
LACMD	Land Attack Cruise Missile Defense
m	Meters
MHz	Megahertz
[redacted]	b(3)
MOPP	Mission Oriented Protective Posture
mph	Miles Per Hour
[redacted]	b(3)
Pd	Probability of Detection
RCS	Radar Cross Section
[redacted]	b(3) b(3) b(3) b(3) b(3)
TADIL J	Tactical Data Information Link J
TTP	Tactics, Techniques, and Procedures
UHF	Ultra High Frequency
[redacted]	b(3)
[redacted]	b(3)

DEPARTMENT OF THE ARMY
PROGRAM EXECUTIVE OFFICE, MISSILES AND SPACE
5250 MARTIN ROAD
REDSTONE ARSENAL, AL 35898-8000

REPLY TO
ATTENTION OF

April 29, 2010

Joint Land Attack Cruise Missile Defense
Elevated Netted Sensor System Product Office

b(6)
Raytheon Systems Corporation
350 Lowell Street
Andover, Massachusetts 01810

Dear b(6)

The following data item submitted for approval, via the noted transmittal letter under contract DASG60-98-C-0001, CLIN 0018, is approved.

JLENS FCR Prime Item Development Specification (Rev G)
(CDRL Repository folder\SDD\CDRL B009\034b – PIDS (Orbit CDR) Resubmittal)

Transmittal Letter, Date: 10-JLSDD-0548b, 15 April 2010

This letter does not constitute or authorize a change to the contract terms and conditions or to the negotiated contract price.

The JLENS Product Office point of contact for this action is b(6)
For Configuration Management issues, contact b(6)

Sincerely,

b(6)

JLENS Product Office

April 8, 2010
CAGE Code 49956
H389009 Rev G

JOINT LAND ATTACK CRUISE MISSILE DEFENSE ELEVATED NETTED SENSOR SYSTEM (JLENS)
Fire Control Radar Prime Item Description Specification (FCR PIDS) (U)

Raytheon Contract No. DASG60-98-C-0001 CLIN00018 B009

b(7)(c)

CAGE CODE: 49956
DOCUMENT NUMBER:H389009 Rev G

Prepared by:
Raytheon Company
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(U) Revision History

Revision	Authorization	Date	Description
Rev -	ED 6115818	12/18/06	Draft
Rev A	CN7025576	4/5/07	Rev A
Rev B	CN7026469	5/18/07	Rev B
Rev C	CN7026743	5/31/07	Rev C
Rev D	CN7030454	12/12/07	Rev D
Rev E	CN7037696	10/27/08	Rev E
Rev F	CN269760	2/24/10	Rev F
Rev G	CN270469	4/08/10	Rev G
			UNCLASSIFIED

1 (U) Scope

1.1 (U) Description

(U) The Fire Control Radar (FCR) [redacted] b(3) [redacted]

(U) The FCR transmit and receive functions are performed by hardware suspended from the aerostat and the Signal Data Processor (SDP) is located on the ground. Included in the FCR prime item are the super-rack and bridge, supporting circuitry mounted on the aerostat super-rack, and equipment mounted on the bridge. The air vehicle imposes weight limitations while the tether imposes both power and data flow restrictions.

(U) The FCR utilizes a [redacted] b(3) [redacted] which has been shown to support the low loss, bandwidth and environmental requirements of the Fire Control System (FCS). The FCR design also incorporates an exciter which [redacted] b(3) [redacted]

1.2 (U) Document Overview

(U) The FCR Prime Item Development Specification (PIDS) defines the performance requirements and operating environment for a JLENS System Development and Demonstration (SDD) FCR, derived from the JLENS System Specification. This document also allocates those requirements down to the configuration item level either by derivation or allocation.

1.3 (U) Document Organization

(U) This document presents a requirement flowdown of performance specifications. The flowdown is parsed to: the Antenna Equipment Unit (AEU), [redacted] b(3) [redacted], 300 VDC Filter Assembly, Azimuth and Elevation (Az/El) Drives, Gimbal and Damper Assembly, Inertial Navigation System (INS), Global Positioning System (GPS), Identification Friend or Foe (IFF) Subsystem, Lightning Protection Module (LPM), Rack Equipment Group (REG) which contains the Power Distribution Unit (PDU), Data Distribution Unit (DDU), and Servo Control Unit (SCU), Heat Exchanger Unit (HEU), the Signal and Data Processor (SDP), and Software components. Section 3.7 of this document is divided into sections corresponding to these Subsystems.

2 (U) Applicable Documents

2.1 (U) General

(U) The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 (U) Government Documents

2.2.1 (U) Specifications, standards, and handbooks

(U) The following specifications, standards, and handbooks of the exact revision listed below form a part of this specification to the extent specified herein.

(U) MIL-STD-130L, *Identification Marking of U.S. Military Property*, 20 December 2004

b(3)

(U) MIL-STD-1472F, *Department of Defense Design Criteria Standard, Human Engineering*, 23 August 1999

(U) MIL-STD-1366D, *Interface Standard for Transportability Criteria*, 18 December 1998

(U) MIL-STD-464A, *Electromagnetic Environmental Effects Requirements for Systems*, 19 December 2002

(U) MIL-STD-461E,*Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment*, 20 August 1999

(U) MIL-STD-1474D *Department of Defense Design Criteria Standard, Noise Limits*

(U) MIL-STD-882D *Department of Defense Standard Practice for System Safety*, 10 February 2000

(U) MIL-HDBK-419A, *Grounding, Bonding, and Shielding for Electronic Equipments and Facilities*, dated 29 December 1987

(U) MIL-HDBK-454A, *General Guidelines for Electronic Equipment*, 3 November 2000

2.2.2 (U) Other Government documents, drawings, and publications

(U) The following other Government documents, drawings, and publications of the exact revision level shown form a part of this document to the extent specified herein.

(U) Performance Specification for the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS), MIS-PRF-55628 Revision A

(U) National Telecommunications and Information Administration (NTIA), *Manual of Regulations and Procedures for Federal Radio Frequency Management*, May 2003, Revision: January 2006

b(3)

(U) JLENS System Threat Assessment Report (STAR), dated 1 July 2004.

(U) JLENS Information Support Plan, dated 30 June 2006 version 3.1.

(U) JLENS Information Assurance Strategy, dated 17 February 2005.

2.3 (U) Non-Government Publications

(U) The following documents of the exact revision listed below form a part of this document to the extent specified herein.

(U) H308499 Coolant, Glycol Based, Organic Acid Salt Inhibited

(U) NFPA-780, *Standard for the Installation of Lightning Protection Systems*, 2004 Edition

(U) ANSI-Z535 (2002) American National Standard for Product Safety Signs and Labels

(U) H381794 JLENS System Specification (A-Spec), Rev D, 13 November 2006.

(U) JLENS Hazardous Material Management Plan

(U) JLENS System Safety Program Plan

(U) Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) System Internal IRS, Document Number H381785.

2.4 (U) Order of Precedence

(U) In the event of a conflict between the text of this document and the references cited herein, the text of H381794 takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3 (U) Requirements

3.1 (U) Fire Control Radar Definition

3.1.1 *(U) Fire Control Radar Description*

(U) The FCR receives handover tracks originating from the Surveillance Radar through the respective Communications and Processing Group (CPG) and over the appropriate networks (e.g., Link-16 and CEC), and [redacted] b(3) The FCR interface is [redacted] b(3) and the FCR Signal and Data Processor (SDP) in the CPG Data Processing Shelter (DPS). [redacted] b(3) Similarly, the [redacted] b(3) Once appropriate radar actions are taken, the resulting data is passed back [redacted] b(3)

3.1.1.1 *(U) FCR Partitioning*

(U) The FCR is functionally and physically partitioned between the airborne payload and the ground-based Signal Data Processor (SDP), located within the Data Processing Shelter of the CPG. Figure 1 shows the functional block diagram of the FCR airborne payload.

FIGURE 1. *(U) FCR payload block diagram*

(U) The FCR Payload portion of the FCR prime item consists of subsystems and components that reside inside and outside of the aerostat windscreen.

3.1.1.1.1 *(U) FCR Payload Inside the Windscreen*

(U) The FCR Payload inside the windscreen includes the bridge that attaches to the Platform Frame, and all assemblies that hang from and are attached to the bridge.

(U) The Bridge is a part of the Antenna Mount Assembly. The Antenna Mount Assembly includes a Gimbal and Damper Assembly, a Marmon Clamp for attachment of the remainder of the hanging payload, azimuth support tube, Azimuth and Elevation Drive, Cable Wrap, and upper antenna support beam.

(U) The remaining items attached to the Antenna Mount Assembly are:

a. b(3)

b. IFF Subsystem,

c. Inertial Navigation System (INS) and GPS Assemblies,

d. Lightning Protection Modules (LPM).

3.1.1.1.1.1 b(3)

a. Antenna Equipment Unit,

b. b(3)

c. a 300 VDC Filter Assembly.

(U) All are housed in RFI shielded enclosures to prevent noise desensitization of the radar and to provide isolation from Electromagnetic Interference (EMI).

b(3)

3.1.1.1.1.1.1 (U) Antenna Equipment Unit (AEU)

b(3)

3.1.1.1.1.1.2 b(3)

b(3)

3.1.1.1.1.1.2.1 b(3)

b(3)

b(3)

b(3)

3.1.1.1.1.1.2.2 b(3)

b(3)

b(3)

3.1.1.1.1.3 (U) 300 VDC Filter Assembly

(U) The 300 VDC Filter Assembly conditions 300 VDC power that is supplied by the Power Distribution Unit, part of the Rack Equipment Group (REG), before it enters the RFI enclosure of the Antenna a[redacted] b(3)

3.1.1.1.1.2 (U) Antenna Mount Assembly

(U) The Antenna Mount Assembly (AMA) is part of the FCR Payload. The AMA contains the major subassemblies: Bridge, Gimbal and Damper Assembly, Az/El Drives, cable wrap. As the aerostat moves under changing wind conditions, the orientation of the FCR antenna must be actively stabilized in elevation. This minimizes the amount of electronic steering required. In concert with the INS and REG, the AMA provides the antenna positioning servo function. Azimuth and elevation steering control is required to complete the antenna mechanical positioning function. Azimuth active stabilization is not required simultaneously with Elevation control. The AMA provides motion control in elevation to maintain pointing accuracy. Each axis consists of a drive motor, a position sensor that is coupled to the drive axis, a gear reducer, failsafe brake, bearings and precision machined housings to provide a mechanical interface between the AMA components and the rest of the system. Control for both axes is provided through the drive control electronics, located in the Rack Equipment Group (REG).

(U) The AMA Cable Wrap Assembly carries electrical cables (power and signal) and cooling hoses around the azimuth axis to the rotating antenna without the need for slip rings.

(U) The AMA Gimbal/Damper and Truss assemblies attach the b(3 to the aerostat. The damper function limits the antenna movement to prevent damage to the aerostat.

3.1.1.1.1.3 (U) INS/GPS

3.1.1.1.1.3.1 (U) Inertial Navigation System (INS)

(U) The Inertial Navigation System (INS) b(3) measures the position and attitude of the Antenna so that it can be steered and located.

3.1.1.1.1.3.2 (U) GPS Receiver

(U) The b(3) provides data to the SDP for determination of b(3) . It also provides a one pulse per second reference for use by the Data Distribution Unit (DDU) b(3)

3.1.1.1.1.4 (U) IFF Combined Interrogator & Transponder Subsystem

(U) The FCR contains an IFF Subsystem to support target identification. The IFF Subsystem includes a Combined Interrogator/Transponder, an RF beamformer, a fan assembly, and an antenna assembly. The IFF Subsystem is part of the FCR Payload and is mounted on the Antenna. The FCR design includes allocations for IFF Subsystem weight, power.

3.1.1.1.1.5 (U) Lightning Protection Modules

(U) Lightning Protection Modules on the AMA protect copper conductors in cables that interconnect the components and subsystems inside the windscreen to those outside the windscreen. These provide a zeroize interface to the IFF, INS, and GPS.

3.1.1.1.2 *(U) FCR Payload Outside the Windscreen*

(U) The FCR Payload subsystems and components that reside outside the windscreen consist of the Rack Equipment Group (REG) and the Heat Exchanger Unit (HEU). These components are suspended beneath the super-rack.

3.1.1.1.2.1 (U) Rack Equipment Group

(U) The Rack Equipment Group (REG) contains the

a. Power Distribution Unit (PDU),

b. Data Distribution Unit (DDU) and the

c. Servo Control Unit (SCU).

3.1.1.1.2.1.1 *(U) Power Distribution Unit*

(U) The Power Distribution Unit (PDU) receives 400 Hz AC power from the Platform PDU and distributes AC and DC power to all FCR Payload components and subsystems. The AC-DC converters within the FCR PDU provide 300 VDC to the [b(3)] The PDU also responds to FCR payload interlocks by removing power to an activated interlock. The PDU controls the application of power to the FCR Payload based upon temperature sensors in the HEU and commands from the SDP. It returns status to the PDU.

3.1.1.1.2.1.2 *(U) Data Distribution Unit (DDU)*

(U) The Data Distribution Unit (DDU) performs timing and data distribution interface functions for the FCR Payload.

(U) The DDU receives its commands from and delivers data to the FCR Signal and Data Processor.

3.1.1.1.2.1.3 *(U) Servo Control Unit*

(U) The Servo Control Unit (SCU) provides the power electronics for controlling the Azimuth and Elevation Drives and brakes [b(3)] The Elevation Drive functions as part of an active stabilization servo loop. Brake and motor commands are received from the DDU.

3.1.1.1.2.2 (U) Heat Exchanger Unit

(U) The Heat Exchanger Unit (HEU) maintains the temperature of the AEU [b3] and REG.

(U) The HEU is located outside of, and in front of, the windscreen in the Super Rack and houses the coolant pump, heat exchanger, and coolant sensors. The HEU also includes motors, air fans, with RF shielding, a thermostatic control valve, fluid filter and an electrical coolant heater. [b(3)] and also to maintain the temperature. [b3] The HEU sensors monitor pressure, flow-rate and temperature. These sensors interface to the DDU within the REG and provide data to the SDP. This data is used to monitor system readiness and to provide fault detection and isolation.

3.1.1.1.3 *(U) FCR Signal and Data Processor (SDP)*

(U) The FCR Signal and Data Processor (SDP) is hosted by the CPG DPS. It receives data from and transmits commands to the FCR Payload via a communications path that includes the CPG and the Platform.

(U) The SDP is a Commercial Off-the-Shelf (COTS) parallel, multi-processor system, which hosts all of the tactical Software Items (SI) [b(3)] SIs within the SDP communicate with CPG CCS workstations through CCP. Those workstations are used as tactical and maintenance displays and interface with the FCR through the CCP.

(U) All software items including those hosted by the SDP are listed in **Table I**.

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TABLE I. *(U) Software Item descriptions*

UNCLASSIFIED

Software Item Acronym	Software Item Name	Software Item Description
MAP	Mission Application Processing	MAP Provides real-time mission processing to command the FCR to acquire, track, discriminate and engage targets in support of the JLENS mission. MAP receives tactical command inputs from CCP. These inputs include mission profile designation and doctrine commands. The MAP receives test command inputs from ESM to support Operability Assessment. MAP consists of Resource Management (RM) and Tracker components. The RM component is responsible for the scheduling of radar actions on the timeline. The tracker component is responsible for modeling target dynamics.
CCP	Communications & Control Processing	CCP interfaces to the CPG's Tactical Display. The CCP provides translation between internal and external message data formats.
SPS	Signal Processing	b(3)
BSG	Beam Steering Generator	BSG receives beam-pointing commands from MAP and provides the computations of T/R element phase and gain data values. These beam commands are sent to the Beam Steering control hardware to control the steering of the beam for the phased array antenna.
b(3)		
ESM	Equipment Status Monitor	ESM controls the Operational Assessment for the FCR. ESM includes system initialization, on-line diagnostics, system level tests, fault detection/isolation and calibration.
DCA	Data Collection & Analysis	b(3)

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3.1.1.2 *(U) FCR Mission*

(U) The primary FCR mission is to provide the JLENS Orbit with fire control quality tracks to the network in support of low altitude Land Attack Cruise Missile Defense (LACMD). The FCR is a multifunction, b(3) The FCR is elevated by the JLENS FCS air vehicle to a nominal altitude of 10 kft (3.048 km) (MSL).

(U) The FCR provides the JLENS Orbit with

a. target acquisition,

b. precision track,

c. b(3)

(U) The FCR also provides data for midcourse interceptor guidance

b(3)

(U) In addition, secondary FCR missions include

a. Surface Moving Target (SMT),

b. Large Caliber Rocket (LCR), and

c. Tactical Ballistic Missile (TBM) boost detect mode.

(U) Specifically, the FCR provides capability to the JLENS Orbit that

b(3)

c. provides target data on surface moving targets,

d. detects, tracks, and provides launch point estimates of Tactical Ballistic Missiles (TBM) and Large Caliber Rockets (LCR).

(U) The FCR mission critical functions are described by the following:

b(3)

b. Detection of ABTs, TBMs, LCRs, and/or SMTs at ranges commensurate with the target signature,

b(3)

d. Provide Combat Identification data in order to support engagements.

(U) All four missions provide search and precision track operations. In precision track, track quality data is provided that is suitable for handover to a choice of the following intercepting missiles:

b(3)

(U) The Air Breathing Target (ABT) is the primary mission and provides support to the Land Attack Cruise Missile Defense (LACMD) and the b(3) The mission utilizes three target acquisition modes:

a. b(3)

b. Cued Search, and

c. b(3)

(U) Each of these modes provides the capability to acquire Air Breathing Targets and transition to precision track. In Cued Search and b(3) the transition is automatic upon completion of track initiation, while in b(3)

(U) The FCR provides the capability to detect and track Surface Moving Targets (SMTs). The FCR reports SMT tracks to Mission Operations workstation in the CPG.

(U) The FCR has the capability to detect and track TBMs in their boost phase of flight, providing an early warning of TBM attacks which includes a launch point estimate on each detected and tracked missile.

(U) The FCR typically operates at 10,000 feet (3.048 km) above mean sea level. b(3)

(U) The Large Caliber Rocket mission is similar to the TBM mission in that an elevated FCR sensor provides a platform for early detection, warning, and launch point estimates for this class of targets.

3.1.2 *(U) FCR Interfaces*

(U) The FCR interfaces with the CPG and the Platform. The FCR prioritization and long term planning are determined by the CPG. The FCR provides data to the CPG.

3.1.3 (U) Threat

b(1)

3.1.3.1 (U) Air Breathing Targets (ABTs)

~~SECRET/NOFORN~~

TABLE II. *(U) Typical ABT Threat Characteristics*

Parameter	ABT
b(1)	

~~SECRET/NOFORN~~

3.1.3.1.1 (U) Stressing LACM Threat Characteristics

~~SECRET/NOFORN~~

TABLE III. *(U) Stressing LACM Threat Characteristics*

Parameter	LACM
b(1)	

~~SECRET/NOFORN~~

3.1.3.2 (U) Tactical Ballistic Missiles (TBMs)

~~SECRET/NOFORN~~	
TABLE IV. *(U) TBM Characteristics*	
Parameter	**TBM**
b(1)	
	~~SECRET/NOFORN~~

3.1.3.3 (U) Large Caliber Rockets (LCRs)

~~SECRET/NOFORN~~	
TABLE V. *(U) LCR Characteristics*	
Parameter	**LCR**
b(1)	
	~~SECRET/NOFORN~~

3.1.3.4 (U) Surface Moving Targets (SMTs)

~~SECRET/NOFORN~~	
TABLE VI. *(U) SMT Characteristics*	
Parameter	**SMT**
b(1)	
	~~SECRET/NOFORN~~

3.1.3.5 b(3) b(3)

3.1.3.5.1 b(3)

b(1)

b(1)

b(1)

~~SECRET/NOFORN~~

TABLE VII. b(3)

b(1)

~~SECRET/NOFORN~~

3.1.3.5.2 b(3)

b(1)

~~SECRET/NOFORN~~

TABLE VIII. b(3)

b(1)

~~SECRET/NOFORN~~

3.1.3.5.3 b(3)

b(1)

3.1.4 (U) States and Modes

(U) The FCR may transition between these states and their modes.

3.1.4.1 (U) Storage State

(U) The Storage State ensures the availability of the radar after long or short periods of storage. It consists of the short-term and long-term storage modes. The FCR normally transitions into and out of the storage state from/to the deployment state. *This state is a non-operational state.*

3.1.4.1.1 (U) Short-Term Storage Mode

(U) The radar equipment is placed in short-term storage mode with the owning organization when mission requirements require the unit to perform functions other than their normal missions. b(3) The equipment is placed in the short-term storage without pre-conditioning and is maintained at a reduced maintenance level. b(3) The items are to be removable by the operator using standard tools. b(3) The equipment is returned to operations in accordance with the appropriate technical manuals and guidance documents. Transition from this mode to the operational state is within the emplacement timeline defined in the requirements. *This mode is a non-operational mode.*

3.1.4.1.2 (U) Long-Term Storage Mode

(U) The radar equipment is placed in long-term storage mode when mission requirements do not require the equipment for both peacetime and wartime operations. The equipment may remain stored through the duration of its service life. The radar equipment is prepared and pre-conditioned for transition into long-term storage in accordance with the appropriate technical data. b(3) The equipment is returned to operations in accordance with the appropriate technical data and guidance documents. *This mode is a non-operational mode.*

3.1.4.2 (U) Movement State

(U) The movement state consists of the transport mode for intra-theater and inter-theater shipment of the FCR using non-organic means. The march-order mode for the movement in-theater is by organic means. *This state is a non-operational state.*

3.1.4.2.1 (U) Transport Mode

(U) In the transport mode, the equipment is placed into an air, ground, rail, or water transport configuration. The FCR equipment is transportable by C-130, C-17 and C-5 fixed-wing military aircraft for strategic airlift, sealift, and/or rail. Transitions to the transport mode are conducted using organic equipment or the transportation unit's special handling equipment. It remains in the transport configuration until it arrives at its final destination or is prepared for road march. *This mode is a non-operational mode.*
In the transport mode all equipment is packaged for transportation in 8'x8'x20' ISO containers.

3.1.4.2.2 (U) March Order Mode

(U) The FCR transitions to the march-order mode when required to move by organic means, as part of the FCS. A JLENS unit is mobile with sufficient vehicles, personnel, supplies, and both system peculiar and common equipment to displace the entire unit in one move. The FCR must be capable of movement on primary and secondary roads, as well as movement off-road. It must be capable of limited off-road movement to reach pre-selected emplacement sites over cross-country terrain and unimproved roads. The radar is capable of relocating on public roads and highways, including those having unimproved road surfaces (such as gravel or hard-packed dirt), to support emplacement at prepared sites. In this mode, the FCR is appropriately packaged into 8'x8'x20' ISO containers. *This mode is a non-operational mode.*

3.1.4.3 (U) Deployment State

(U) The deployment state serves primarily as the transition between the movement and operations states, consisting mainly of assembly and disassembly of the radar equipment. *This state is a non-operational state.*

3.1.4.3.1 (U) Emplace Mode

(U) The emplace mode includes the physical positioning of the FCR payload onto the aerostat, (the SDP is already physically positioned in the CPG) and the physical integration of the radar into the FCS. The system equipment transitions to the emplace mode upon arrival at its designated location. After physical positioning and integration, the radar begins initialization. Initialization is the power-up sequence for the FCR that ends with the radar ready to begin configuration for an assigned mission. *This mode is non-operational.*

3.1.4.3.2 (U) Displace Mode

(U) The displace mode provides the capabilities to transition radar equipment to march order configurations prior to entering the movement state. The assigned crews shut down, disassemble, and stow all deployed equipment in preparation for movement. *This mode is a non-operational mode.*

3.1.4.4 (U) Operations State

(U) The FCR operations state begins with the system configuration for a mission and continues through all tactical or training operations. The operations state also includes maintenance and sustainment activities. The operations state also includes a moored configuration where the system can be in any operational mode except tactical. The transistion from the operations state, moored configuration, to the operations state, at altitude configuration, is through the deployment state. *This state is an operational state.*

3.1.4.4.1 (U) Configuration Mode

(U) The configuration mode provides the ability for the operators to build and implement a mission profile. The mission profile contains the performance parameters for the radar and communications systems to meet the tasks in the assigned mission. Operator system interfaces are provided for monitoring external stimuli. Data communications, both external and internal to the radar, are provided to receive commands, provide status, and exchange data. The configuration mode can be entered as many times as is necessary during operations to change the performance parameters due to mission assignment change. *This mode is an operational mode.*

3.1.4.4.2 (U) Tactical Mode

(U) The Tactical Mode provides the capability to perform all assigned mission operations to include: surveillance, detection, tracking and discrimination, threat evaluation, and engagement support. The system operates in the tactical mode concurrent with the configuration mode. In this mode, the radar may or may not be radiating, depending on desired operations. As commanded by the FCS CPG, the FCR transitions to the tactical mode, through the configuration mode, when emplacement functions are completed. The FCR transitions out of the tactical mode when ordered to do so by the FCS CPG. In order for the radar to be in the Tactical Mode, it must be assembled into the FCS which is in the Tactical Mode. *This mode is an operational mode.*

3.1.4.4.3 (U) Training Mode

(U) The training mode is not applicable to the FCR.

3.1.4.4.4 (U) Operations Sustainment Mode

(U) The operations sustainment mode functions allow the FCR to sustain continuous operations as part of the FCS for extended periods of time. It includes refueling, retraining, and re-supplying operations. This mode can be concurrent with the other modes in the Operations State. *This mode is an operational mode.*

3.1.4.5 (U) Maintenance State

3.1.4.5.1 (U) Corrective Maintenance Mode

(U) The corrective maintenance mode is for repair of system failures resulting in unscheduled maintenance actions. Repair is defined as the restoration or replacement of parts to return the end items to an operational condition and maintain efficient operations. This mode is a non-operational mode.

3.1.4.5.2 (U) Preventive Maintenance Mode

(U) The preventive maintenance mode allows the JLENS crew to perform scheduled PMCS designed to extend and ensure the operational readiness of the system. Preventive maintenance tasks may be conducted on individual prime items on a non-interference basis with system operation as long as safety policies and procedures allow. Transition to and from the preventive maintenance mode can occur from the storage, transportation, or operation states. This can be either an operational or non-operational mode.

3.2 (U) Fire Control Radar Characteristics

3.2.1 (U) Fire Control Radar Performance

3.2.1.1 (U) Missions

3.2.1.1.1 (U) Primary Mission

3.2.1.1.1.1 (U) Detection

(U) [FCR-13] The FCR, while in the Tactical Mode, shall perform detection against the ABT threat defined in 3.1.3.1 Air Breathing Targets when operating in the environments defined in 3.1.3.5 b(3)

b(1)

3.2.1.1.1.2 (U) Probability of Detection

b(1)

3.2.1.1.1.3 (U) Tracking

(U) [FCR-15] The FCR, while in the Tactical Mode, shall perform tracking of detected ABTs, which are defined in 3.1.3.1 *Air Breathing Targets* , when operating in the environments defined in 3.1.3.5 b(3)

b(1)

3.2.1.1.1.4 (U) Probability of Tracking

b(1)

3.2.1.1.1.5 (U) Interceptor Detection and Tracking

(U) [FCR-550] The FCR, in the Tactical Mode and as commanded, b(3)

3.2.1.1.1.6 (U) False Tracks

b(1)

3.2.1.1.1.7 (U) Fire Control Cues

(U) [FCR-17] While in the Tactical Mode, the FCR shall accept cues which are derived from the JLENS Surveillance System.

(U) [FCR-18] While in the Tactical Mode, the FCR shall accept cues which are derived from external sensors.

(U) [FCR-19] While in the Tactical Mode, the FCR shall b(3)

3.2.1.1.1.8 (U) Probability of Evaluation

b(1)

3.2.1.1.1.9 (U) Simultaneous Engagements

b(1)

3.2.1.1.2 (U) Secondary Missions

3.2.1.1.2.1 (U) Tactical Ballistic Missiles (TBMs)

3.2.1.1.2.1.1 (U) Detection

b(3)

3.2.1.1.2.1.2 (U) Tracking

b(3)

3.2.1.1.2.1.3 (U) Launch Point Estimates

[redacted] b(1)

3.2.1.1.2.2 (U) Large Caliber Rockets (LCRs)

3.2.1.1.2.2.1 (U) Detection

(U) [FCR-26] [redacted] b(3)

3.2.1.1.2.2.2 (U) Tracking

(U) [FCR-575] [redacted] b(3)

3.2.1.1.2.2.3 (U) Launch Point Estimates

[redacted] b(1)

3.2.1.1.2.3 (U) Surface Moving Targets (SMTs)

3.2.1.1.2.3.1 (U) SMT Detection Range

[redacted] b(1)

3.2.1.1.2.3.2 (U) SMT Target Loading

[redacted] b(1)

3.2.1.1.2.3.3 (U) SMT Target Location Error

[redacted] b(1)

3.2.1.1.2.3.4 (U) SMT Number of False Tracks

[redacted] b(1)

3.2.1.1.2.3.5 (U) SMT Information

[redacted] b(1)

3.2.1.1.3 (U) Interleaving

(U) [FCR-30] [redacted] b(3)

3.2.1.2 (U) Functions

3.2.1.2.1 (U) Sector Surveillance

(U) [FCR-8] The FCR shall perform sector surveillance [redacted] b(3)

3.2.1.2.1.1 (U) Azimuth Surveillance Coverage

(U) [FCR-64] The FCR, while in the Tactical Mode, shall provide commandable, 360° in azimuth, sectored azimuth coverage extents [redacted] b(3)

(U) [FCR-513] The FCR, in the Tactical Mode, shall act upon [redacted] b(3)

3.2.1.2.1.2 (U) Sectored Surveillance Range

3.2.1.2.1.2.1 (U) Optimized Large Target Surveillance Coverage

3.2.1.2.1.2.1.1 [redacted] b(3)

[redacted] b(1)

3.2.1.2.1.2.1.2 [redacted] b(3)

[redacted] b(1)

3.2.1.2.1.2.2 (U) Optimized Stressing Target Surveillance Coverage

3.2.1.2.1.2.2.1 b(3)

b(1)

3.2.1.2.1.2.2.2 b(3)

b(1)

3.2.1.2.2 (U) Target Classification, Discrimination and Identification Support

3.2.1.2.2.1 (U) Target Classification

b(1)

3.2.1.2.2.2 b(3)

3.2.1.2.2.3 (U) Target Discrimination

(U) For the requirements in this section, when both the SMT and ABT missions overlap in time and azimuth sector, b(3) b(1)

(U) By definition, a "surface" target is a target which is located on the surface of the Earth.

(U) In this context, "airborne" means non-surface.

b(1)

(U) By definition, a "surface" target is a target which is located on the surface of the Earth.

3.2.1.2.3 (U) Terrain Analysis

3.2.1.2.4 b(3)

3.2.1.2.4.1 b(3) b(3)

3.2.1.2.4.2 b(3) b(3)

3.2.1.2.4.3 b(3) b(3)

3.2.1.2.5 b(3) b(3)

3.2.1.2.6 (U) Identification Friend or Foe (IFF)

3.2.1.2.6.1 (U) IFF Range

b(1)

3.2.1.2.6.2 (U) IFF Modes

(U) [FCR-47] The FCR shall include an on-board IFF system consisting of interrogator and transponder that supports modes 1, 2, 3/A, C, 4, 5 (level 1 and level 2), and S (transponder function only) and is compatible with DoD IFF systems.

3.2.1.2.7 (U) Location, Position, and Alignment

3.2.1.2.7.1 (U) Inertial Navigation System

(U) [FCR-50] The FCR shall incorporate a GPS-aided inertial navigation system for automatic positioning, orientation determination and data alignment / registration.

3.2.1.2.7.2 (U) Global Position System (GPS)

3.2.1.2.7.2.1 (U) GPS b(3)

(U) [FCR-53] The GPS receivers which are part of the FCR shall b(3)

3.2.1.2.7.2.2 (U) Global Air Traffic Management (GATM)

(U) There are no FCR requirements in this area.

3.2.1.2.7.2.3 (U) Initialization Utilizing GPS

(U) [FCR-57] The FCR shall perform system initialization and synchronization b(3)

3.2.1.2.8 b(3)

b(3)

3.2.1.3 (U) Additional Capabilities

3.2.1.3.1 (U) Automatic Initialization

(U) [FCR-62] The FCR SDP, upon power application, shall automatically initialize to a point where it can accept configuration commands from the FCS CPG.

3.2.1.3.2 (U) Emission Control (EMCON)

(U) [FCR-77] The FCR shall execute an EMCON command from the FCS CPG which reduces all radiated energy in compliance with MIL-STD-464A, Section titled Emission control (EMCON), see Appendix H of the JLENS System Specification, which can be b(3)

b(3)

3.2.1.3.3 (U) Data Processing Reserve Capability

(U) [FCR-79] The FCR, with the exception of the signal processor, shall be designed such that there is an inherent 50% reserve of computer memory and computer throughput for data processing.

3.2.1.3.4 (U) Data Recording and Storage

3.2.1.3.4.1 (U) Near Real Time

3.2.1.3.4.2 (U) Removable Storage Media

(U) [FCR-84] The FCR shall be designed such that all classified data storage media including floppy disks, hard disks, compact disks, and tapes are easily removed from the computer with the use of standard tools or standard equipment.

3.2.1.3.4.3 (U) Non-Volatile Storage Devices

(U) [FCR-86] The FCR shall provide non-volatile data storage devices with removable media.

3.2.1.3.5 (U) Data Recording

3.2.1.3.5.1 b(3) b(3)

3.2.1.3.5.2 (U) Messages

(U) [FCR-469] b(3)

3.2.1.3.5.3 (U) Data Types

(U) [FCR-471] The FCR, in the appropriate operational mode, shall record all data types listed herein while meeting the operational performance requirements. Data types include:

a. initialization parameters,

b. b(3)

c. status, and

d. b(3)

3.2.1.3.6 (U) Instrumented Range

b(3)

3.2.1.3.7 (U) Cues

(U) [FCR-475] While in the Tactical Mode, the FCR shall execute cues, which may require a volume search, from the FCS CPG, given sufficient radar resources.

3.2.1.3.8 b(3)

b(3)

3.2.1.3.9 (U) Target Tracking

3.2.1.3.9.1 (U) General

(U) [FCR-481] The FCR, in the Tactical Mode, shall track ABTs operating above the radar horizon at ranges commensurate with their signature and location within the electronic field of view of the FCR.

3.2.1.3.9.2 (U) Maximum Number of Tracks

(U) The following track loading requirements are mutually exclusive and exclusive of the simultaneous engagements requirements in 3.2.1.1.1.9 Simultaneous Engagements

3.2.1.3.9.2.1 (U) Track Loading - Precision Tracks

b(1)

3.2.1.3.9.2.2 (U) Track Loading - Surveillance Tracks

b(1)

3.2.1.3.9.3 (U) Track Initiation

(U) [FCR-488] The FCR shall provide automatic track initiation of detected targets.

3.2.1.3.9.4 (U) Update Rate

(U) [FCR-490] The FCR, in the Tactical Mode, shall update tracks to maintain accuracy unless the update rate is specified by the associated CPG.

(U) [FCR-491] The FCR, in the Tactical Mode, shall act upon track update rate commands from the FCS CPG.

[redacted] b(3)

(U) [FCR-557] The FCR, in the Tactical Mode, shall act upon track update rate commands from the CPG for tracks which are part of an engagement.

3.2.1.3.9.5 (U) Drop Track

(U) [FCR-494] The FCR, in the Tactical Mode, shall act upon a command from the FCS CPG to drop track by dropping the identified track.

3.2.1.3.9.6 (U) Transition to Precision Track

[redacted] b(3)

3.2.1.3.10 (U) Accuracy

3.2.1.3.10.1(U) Range

[redacted] b(1)

3.2.1.3.10.2(U) Velocity

[redacted] b(1)

3.2.1.3.10.3(U) Azimuth and Elevation

[redacted] b(1)

3.2.1.3.10.4(U) Position

[redacted] b(1)

3.2.1.3.11 (U) Latency

[redacted] b(1)

3.2.1.3.12 (U) Azimuth Coverage

3.2.1.3.12.1 (U) Electrical Scan Extent

(U) [FCR-512] The FCR shall have an b(3)

3.2.1.3.12.2 (U) Mechanical Slew Extent

(U) [FCR-515] The FCR shall have a b(3)

(U) [FCR-516] The FCR shall have a 360° b(3)

3.2.1.3.13 (U) Mission Control

(U) [FCR-518] The FCR shall act upon configuration commands, including priority, from the FCS CPG.

(U) [FCR-519] The FCR shall act upon ABT, TBM, LCR and SMT mission commands (priority and sector) from the FCS CPG.

3.2.1.3.14 (U) Combat Identification (CID) Support

3.2.1.3.14.1 (U) Target Classification and Discrimination

3.2.1.3.14.1.1 (U) Target Classification

(U) [FCR-523] The FCR, in the Tactical Mode, shall act upon b(3) commands from the FCS CPG.

b(1)

b(1)

3.2.1.3.14.1.1.1 b(1)

b(1)

3.2.1.3.14.1.1.2 b(1)

b(1)

3.2.1.3.14.1.1.3 b(1)

b(1)

3.2.1.3.14.1.2 (U) Target Discrimination

b(3)

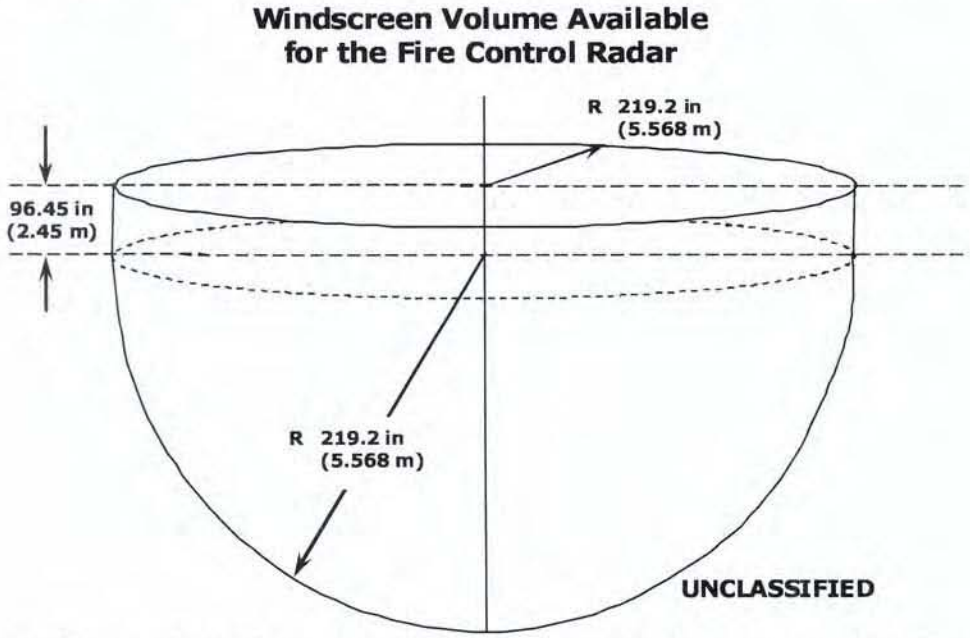
3.2.1.3.14.2(U) IFF

(U) [FCR-535] The FCR in the Tactical Mode shall act upon a command to perform an IFF interrogation on a designated track from the FCS CPG.

3.2.1.4 (U) Design Constraints

3.2.1.4.1 (U) Payload Weight

(U) [FCR-3430] All FCR airborne equipment which is to be installed within the windscreen shall fit within the volume shown in Figure 2.



UNCLASSIFIED FIGURE 2. (U) Windscreen Volume Available for the Fire Control Radar

3.2.1.4.2 (U) Payload Power

(U) [FCR-438] The FCR payload shall draw a maximum average of 62 kVA total, where:

b(3)

d. The radar loads on the three phases should be balanced.

3.2.1.4.3 (U) Temperature Control

3.2.1.4.3.1 (U) Operation From Cold Start

(U) [FCR-441] The FCR, when the FCS is in the moored configuration, shall be functionally operational within [redacted] b(3)

3.2.1.4.3.2 (U) Operation from Hot Start

(U) [FCR-443] The FCR, when the FCS is in the moored configuration, shall be functionally operational within [redacted] b(3) Note: The Platform's chiller is needed for the radar to meet this system level requirement.

3.2.1.4.3.3 (U) Temperature for Maintenance

(U) [FCR-445] For maintenance or emplacement, the FCR, when the FCS is in the moored configuration, shall be brought to the necessary temperature for ground functionality testing. See 3.2.5.1.1.1 Temperature, Operations.

3.2.1.4.3.4 (U) Coolant Constraints

(U) [FCR-447] For commonality, the coolant used in the FCR shall be H308499 Coolant, Glycol Based, Organic Acid Salt Inhibited.

3.2.1.4.4 (U) Failure Degradation

[redacted] b(3)

(U) [FCR-3207] If a receiver channel fails, the FCR shall reconfigure the operating channels in order to preserve [redacted] b(3)

3.2.1.4.5 (U) USMCEB Certification

(U) [FCR-453] The FCR shall be designed to be certifiable by the U.S. Military Communications-Electronics Board (USMCEB) to operate in frequency bands in accordance with The Manual of Regulations and Procedures for Federal Radio Frequency Management, chapter titled Allocations, Allotments and Plans, dated May 2003, revised January 2006. GFE and COTS are, by definition, already USMCEB certifiable. This includes all all IFF sub-systems and GPS sub-systems which are part of the FCR.

3.2.1.4.6 (U) Operational Bandwidth

3.2.1.4.6.1 (U) General

[redacted] b(1)

(U) [FCR-457] The FCR, while in the appropriate mode, shall execute a command for frequency band utilization from the FCS CPG.

3.2.1.4.6.2 [redacted] b(1)

[redacted] b(1)

3.2.1.4.7 [redacted] b(3)

[redacted] b(3)

3.2.1.4.8 (U) Performance in b(3)

b(1)

3.2.1.4.9 (U) Performance in Clutter and Multipath

(U) [FCR-539] The FCR detection range, detection accuracy (b(3) , and tracking requirements shall be met in the Clutter and Multipath environments defined in Appendix C of the JLENS System Specification, when configured into the FCS and in an operational mode.

(U) [FCR-3646] The FCR b(3) Clutter and Multipath environments defined in Appendix C of the JLENS System Specification, when configured into the FCS and in the tactical mode.

3.2.1.5 (U) Control of Data Recording

(U) [FCR-94] The FCR shall act upon configuration commands from the CPG for selecting data recording details in addition to the automatic level.

3.2.2 (U) System Interface Requirements

3.2.2.1 (U) External Interface Requirements

(U) [FCR-4090] The FCR **shall** have external interfaces in accordance with the JLENS System Internal IRS.

(U) [FCR-4132] The FCR **shall** have external interfaces in accordance with the JLENS System External IRS.

3.2.2.2 (U) Internal Interface Requirements

(U) See the FCR Internal Interface Requirements Specification (IRS), Critical Item Development Specifications (CIDSs), and Software Requirements Specifications (SRSs).

3.2.3 (U) Physical Characteristics

3.2.3.1 (U) Protective Coatings

(U) [FCR-154] All exterior surfaces of airborne equipment external to the windscreen **shall** be painted with Chemical Agent Resistant Coating (CARC), in accordance with H372287, with exterior topcoat 383 Green (color 34094 of Fed-Std-595).

(U) [FCR-4133] All exterior surfaces of any FCR components of the Hull Measurement System which are exterior to the aerostat shall be painted with Chemical Agent Resistant Coating (CARC), in accordance with H372287, with exterior topcoat white (color 37875 of Fed-Std-595).

(U) [FCR-4088] All exterior surfaces of FCR airborne equipment internal to the windscreen which are visible when the windscreen is unfurled shall be painted with exterior topcoat 383 Green (color 34094 of Fed-Std-595, this is non-CARC paint), except for COTS hardware or where paint interferes with function such as when electrical conductivity is needed.

3.2.3.2 (U) Enclosure Constraints

(U) [FCR-156] FCR enclosures which are mounted on the aerostat, exterior to the windscreen, and have the purpose to protect the equipment interior from NBC shall protect internal equipment from contamination, see 6.2, caused by an NBC event as described in 3.2.5.2.8.1 *Nuclear, Biological, and Chemical, Definitions*.

3.2.3.3 (U) Packaging Constraints

b(3)

3.2.4 (U) Subsystem Quality Factors

3.2.4.1 (U) Reliability

3.2.4.1.1 (U) MTBSA

(U) The FCR mission critical functions are described by the following:

a. Contribute to the Single Integrated Air Picture,

b. Detection of ABTs, TBMs, LCRs, and/or SMTs at ranges commensurate with the target signature,

c. b(3)

d. b(3)

3.2.4.1.1.1 (U) General

b(3)

3.2.4.1.1.2 (U) Airborne Equipment

b(3)

3.2.4.1.2 (U) MTTR

(U) [FCR-432] b(3)

3.2.4.2 (U) Maintainability

3.2.4.2.1 (U) Monitoring and Fault Isolation

3.2.4.2.1.1 (U) Monitoring

(U) [FCR-167] While in an operational mode, the FCR shall continually monitor its operational status. Operational status is provided to the FCS CPG.

3.2.4.2.1.2 (U) Fault Storage

(U) [FCR-169] The FCR shall store the detected faults either in non-volatile memory or on removable data storage media.

3.2.4.2.1.3 (U) Failure Detection and Isolation

(U) [FCR-171] The FCR shall detect all radar failures that will result in system critical failures using a combination of [redacted]

3.2.4.2.1.4 [redacted]

(U) [FCR-174] While in the appropriate operational mode, the operational performance of the FCR shall meet the performance requirements in 3.2.1 *Fire Control Radar Performance* [redacted]

3.2.4.2.1.5 (U) Standard Test Equipment

[redacted]

3.2.4.2.1.6 (U) Non-Standard Test Equipment

(U) [FCR-179] Where standard [redacted] cannot be used, the contractor shall obtain government approval prior to FCR CDR.

3.2.4.2.1.7 [redacted]

(U) [FCR-181] [redacted]

3.2.4.2.1.8 [redacted]

[redacted]

3.2.4.2.2 (U) Prognostics

[redacted]

3.2.4.3 (U) Configuration Checks

3.2.4.3.1 (U) Initialization

(U) [FCR-186] The FCR shall perform configuration checks during FCR initialization.

3.2.4.3.2 (U) Transition to Operational Mode

(U) [FCR-188] The FCR shall pass all configuration checks prior to transitioning to an operational mode.

3.2.4.3.3 (U) Manual Override

(U) [FCR-190] The FCR shall accept and implement commands overriding the automatic configuration checks.

3.2.4.3.4 (U) Logs

(U) [FCR-192] The FCR shall include a configuration log which includes the results of the configuration checks.

3.2.5 (U) Environmental Conditions

3.2.5.1 (U) Natural Environments

3.2.5.1.1 (U) Temperature

3.2.5.1.1.1 (U) Operations

(U) [FCR-197] The FCR in an appropriate operational mode shall meet the performance specified in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* during exposure to an ambient temperature range from -40°C to +49°C (Mean Sea Level). Temperature as a function of altitude is provided in Appendix F of the JLENS System Specification.

3.2.5.1.1.2 (U) Storage and Movement

(U) [FCR-199] The FCR in the appropriate operational mode shall meet the performance specified in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to an ambient temperature range from -46°C to +71°C while in the storage and movement configuration, with the allowance of environmental kits and procedures for temperature extremes.

3.2.5.1.2 (U) Relative Humidity

3.2.5.1.2.1 (U) Operations

(U) [FCR-201] The FCR, in an appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* during exposure to a relative humidity range from 3 to 100% non-condensing.

3.2.5.1.2.2 (U) Deployment, Storage, and Movement

(U) [FCR-3539] The FCR, in an appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure, while in the deployment, storage, and movement configurations, to a relative humidity range from 3 to 100% non-condensing.

3.2.5.1.3 (U) Rain in Operations

3.2.5.1.3.1 (U) Blowing Rain

b(3)

3.2.5.1.3.2 (U) Dripping Rain

b(3)

3.2.5.1.4 (U) Hail in Operations

(U) [FCR-215] The FCR airborne equipment outside the windscreen shall survive during exposure to hail up to one-half inch (1.27 cm) in diameter while in the appropriate operational mode.

(U) The FCR ground based equipment is contained within the FCS CPG DPS and is protected from hail.

3.2.5.1.5 (U) Snow in Operations

(U) [FCR-220] The FCR, in the appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* except sensor performance, which can degrade, during exposure up to 10.2 cm (4 inches) of snow accumulation on ground equipment surfaces where the snow has a density of 0.3 gram per cubic centimeter.

(U) [FCR-3484] The FCR, in the appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* except sensor performance, which can degrade, during a snow falling rate of up to 2.54 cm/hour (1 inch/hour).

(U) Note: The falling snow does not accumulate on the aerostat.

3.2.5.1.6 (U) Salt Fog

(U) [FCR-224] The FCR, in the appropriate operational mode, shall meet performance specifications in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* when exposed to a salt atmosphere in sea locations and coastal regions.

(U) [FCR-225] The FCR, in the appropriate operational mode, shall meet performance specifications in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to a salt atmosphere in sea locations and coastal regions while in a non-operational mode.

3.2.5.1.7 (U) Sand and Dust in Operations

(U) [FCR-229] The FCR, in the appropriate operational mode, shall meet performance in 3.2.1 *Fire Control Radar Performance* (degraded sensor performance during operation is permitted) and 3.2.4 *Subsystem Quality Factors* when exposed to blowing dust (up to 149 μm diameter in concentrations of up to 10 ± 7 g/m^3 (0.3 ± 0.2 g/ft^3) for velocities up to 8.9 m/s (17.3 knots) (32.04 km/hr).

(U) [FCR-3485] The FCR, in the appropriate operational mode, shall meet performance in 3.2.1 Fire Control Radar Performance (degraded sensor performance during operation is permitted) and 3.2.4 Subsystem Quality Factors when surface equipment is exposed to blowing sand for diameters in the range of 150 to 850 μm diameter in concentrations of up to 1.1 ± 0.3 g/m^3 (0.033 ± 0.0075 g/ft^3) for velocities up to 29.0 m/s (56.4 knots) (104.5 km/hr).

(U) [FCR-3486] The FCR, in the appropriate operational mode, shall meet performance in 3.2.1 Fire Control Radar Performance (degraded sensor performance during operation is permitted) and 3.2.4 Subsystem Quality Factors when airborne equipment is exposed to blowing sand for diameters in the range of 150 to 850 μm diameter in concentrations of up to 0.18 -0.0/+0.2 g/m^3 (0.005 -0.0/+0.0057 g/ft^3) for velocities up to 29.0 m/s (56.4 knots) (104.5 km/hr). Note: for the Tactical Mode, blowing sand does not reach operational altitude.

3.2.5.1.8 (U) Fungus

(U) [FCR-233] The FCR shall be either composed of materials that inhibit the fungus growth or composed of materials which are protected from environments that would encourage fungus growth.

3.2.5.1.9 (U) Wind

3.2.5.1.9.1 (U) Operational Wind Conditions

(U) [FCR-236] The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1. *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* while being subjected to winds up to 73 km/hr (40 knots) with turbulence of 1.98 m/s rms (6.5 fps) for 10% of the operational time, and winds of (Flight 46) for the remaining 90% of the operational time. b(3)

3.2.5.1.9.2 (U) Survival Wind Conditions

3.2.5.1.9.2.1 (U) Steady State Winds with Turbulence

(U) [FCR-239] The FCR, when assembled into the FCS which is either moored or at altitude, whether operational or non-operational, shall survive an exposure to steady state winds of up 148 km/hr (80 knots) with turbulence of 3.05 m/s (10 fps) rms.

3.2.5.1.9.2.2 (U) Steady State Winds Only

(U) [FCR-241] The FCR, in the storage, movement, or operations configurations, shall survive an exposure to steady state winds of up to 185 km/hr (100 knots).

3.2.5.1.10 (U) Lightning

3.2.5.1.10.1(U) Direct or Near Strike - Ground Equipment

(U) [FCR-244] The FCR ground equipment, in the Operations State, Movement State, or Storage State, shall be protected from direct and indirect lightning, including LEMP, in accordance with the lightning requirements of MIL-STD-464. Relevant sections of MIL-HDBK-419A and NFPA-780 can be used for guidance. In the Movement or Storage State all FCR equipment is protected by the shipping containers.

3.2.5.1.10.2(U) Direct or Nearby Strike - Airborne Equipment

(U) [FCR-246] The FCR airborne equipment, when in the operations configuration, shall survive direct or indirect lightning strikes to the aerostat lightning cage, which produces a maximum induced current of 145 kA including LEMP. Relevant sections of MIL-HDBK-419A and NFPA-780 can be used for guidance.

3.2.5.1.10.3(U) Status Recovery

(U) [FCR-248] The FCR shall return to the state and mode existing prior to a near lightning strike after a controlled restart not requiring repair. By definition, a nearby lightning strike does not cause equipment damage. A controlled restart is according to procedures.

3.2.5.2 (U) Induced Environments

3.2.5.2.1 (U) Vibration

3.2.5.2.1.1 (U) Operational

(U) [FCR-252] The FCR, in the Tactical Mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* while being subjected to vibration levels caused by operation.

3.2.5.2.1.2 (U) Other than Operational

(U) [FCR-254] The FCR, in the appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and *3.2.4 Subsystem Quality Factors* following exposure to vibration levels caused by normal transportation, maintenance, or storage. Transportation includes, air, ground (both road and [redacted] b(3) [redacted] and sea.

3.2.5.2.2 (U) Shock

3.2.5.2.2.1 (U) Functional Shock

(U) [FCR-257] The FCR, while in an operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* applicable to that operational mode, while being subjected to shock levels caused during normal operation of that mode.

3.2.5.2.2.2 (U) LRU Drop Shock

(U) [FCR-259] The FCR LRUs shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after the LRUs are subjected to drop shock static equivalent loads NGT 5.0 g longitudinal, 5.0 g vertical, and 5.0 g lateral at the center of gravity of the container, while packaged in their transit containers according to the applicable technical documentation.

3.2.5.2.2.3 (U) Transit Drop

3.2.5.2.2.3.1 (U) Transit Edge-Wise Drop

(U) [FCR-4134] After assembly to an operational configuration and while in the appropriate operational mode, the FCR components, which are packaged for the Movement State in ISO containers or ISO shelters, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 System Quality Factors after exposure to a b(3) while the FCR equipment is mounted in the designated ISO shelters or ISO containers for that equipment and while the JLENS equipment is in the transport configuration.

3.2.5.2.2.3.2 (U) Transit Bottom Face Drop

(U) [FCR-4135] After assembly to an operational configuration and while in the appropriate operational mode, the FCR non-fragile components, see 6.2, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 System Quality Factors after exposure to b(3) while the FCR equipment is mounted in the designated ISO shelters or ISO containers for that equipment and while the JLENS equipment is in the transport configuration.

3.2.5.2.2.3.3 (U) Transit Bottom Face Drop for Fragile Hardware

(U) [FCR-261] After assembly to an operational configuration and while in the appropriate operational mode, the FCR fragile components, see 6.2, which are packaged for the Movement State in ISO containers or ISO shelters, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 System Quality Factors after exposure b(3) while the FCR equipment is mounted in the designated ISO shelters or ISO containers for that equipment and while the JLENS equipment is in the transport configuration.

3.2.5.2.2.3.4 (U) Transit Shock Indicators for Fragile Hardware

(U) There are no requirements for the FCR in this area.

3.2.5.2.2.3.5 (U) Container Handling for Fragile Hardware

(U) There are no requirements for the FCR in this area.

3.2.5.2.2.3.6 (U) Fixture Handling for Fragile Hardware

(U) [FCR-4136] Each FCR unique transportation fixture onto which fragile hardware is mounted shall be marked with special handling procedures using MIL-STD-129P as guidance.

3.2.5.2.3 (U) Ordnance

(U) [FCR-3200] The FCR shall contain no electrically initiated devices (EID) or electro-explosive devices (EED).

3.2.5.2.4 (U) Electromagnetic Environment Effects (E3)

3.2.5.2.4.1 (U) Electromagnetic Compatibility / Electromagnetic Interference

3.2.5.2.4.1.1 (U) Emissions

(U) [FCR-269] The FCR shall control unintentional emissions using MIL-STD-461E, RE102-4 Army curve as a guide.

(U) [FCR-3693] The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of intra-system radiated and conducted emissions.

3.2.5.2.4.1.2 (U) Interference

3.2.5.2.4.1.2.1 (U) In-Band Interference

(U) [FCR-3704] The FCR airborne equipment excluding the IFF subsystem and the GPS, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of spurious in-band electromagnetic interference using MIL-STD-461E, b(3) as a guide. Note: It is assumed that the interference frequency will be b(3)

3.2.5.2.4.1.2.2 (U) Out-of-Band Interference

(U) [FCR-3705] The FCR airborne GPS equipment, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of spurious non-in-band electromagnetic interference, b(3)

(U) [FCR-270] The FCR airborne equipment, excluding the IFF subsystem, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of spurious non-in-band (out of band) electromagnetic interference in accordance with Table IX.

UNCLASSIFIED	
Table IX *Electromagnetic Interference for the* b(3)	
FREQUENCY(MHz)	FIELD STRENGTH (V/m)
b(3)	
This environment encompasses Own Force (Land, Sea, and Air), Non-Hostile Emitters (Neutrals), and ambient sources (such as broadcast stations, etc.).	
UNCLASSIFIED	

(U) [FCR-3706] The IFF subsystem which is part of the FCR airborne equipment, in the appropriate operational mode, shall meet performance requirements in 3.2.1.2.6 *Identification Friend or Foe (IFF)* and 3.2.4 *Subsystem Quality Factors* in the presence of b(3)

3.2.5.2.4.1.3 (U) Susceptibility

(U) [FCR-3707] The FCR airborne GPS equipment shall be designed in accordance with MIL-STD-461E, b(3)

3.2.5.2.4.2 (U) Grounding and Bonding

(U) [FCR-272] Grounding and bonding on the FCR shall be implemented in accordance with the electrical bonding and external grounds requirements of MIL-STD-464A.

3.2.5.2.5 b(3)

b(1)

3.2.5.2.6 (U) Electrostatic Discharge (ESD)

(U) [FCR-276] The FCR LRUs or equipment cabinets as appropriate, except for GFE, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* following exposure to an electrostatic b(3)

(U) Note: ESD directly to connector pins is not included. This only includes ESD to the module external surfaces and the LRU external surfaces.

3.2.5.2.7 b(3)

b(1)

3.2.5.2.8 (U) Nuclear, Biological, and Chemical (NBC)

3.2.5.2.8.1 (U) Definitions

b(3)

3.2.5.2.8.2 (U) Exposure and Decontamination

3.2.5.2.8.2.1 (U) Movement

(U) The ISO containers provide NBC protection for the FCR in the movement configuration.

3.2.5.2.8.2.1.1 (U) Contamination/Decontamination

3.2.5.2.8.2.1.2 (U) Non-GFE Transportation Enclosures

3.2.5.2.8.2.2 (U) Tactical or Configuration Mode

3.2.5.2.8.2.2.1 b(3)

b(3)

3.2.5.2.8.2.2.2 b(3)

b(3)

3.2.5.2.8.2.2.3 (U) Restoration after NBC Event

(U) [FCR-290] The FCR, after subjection to worst case chemical and biological contamination, as specified herein, shall be restorable to an operational condition such that use of MOPP IV gear need not be continued, after being decontaminated using JLENS specific decontamination procedures.

3.2.5.2.8.2.2.4 (U) Operate Through

(U) [FCR-292] The FCR, in the Tactical Mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* during and following exposure to NBC contaminants.

3.2.5.2.8.2.2.5 (U) NBC MOPP IV Gear

(U) [FCR-294] The FCR design shall be such that trained and acclimatized personnel can operate and maintain external mission critical equipment while wearing a full NBC protective ensemble MOPP IV gear without further contaminating the system. Neither equipment inside the windscreen nor the SDP is considered to be external.

3.2.6 (U) Transportation

3.2.6.1 (U) Land Transportation

3.2.6.1.1 (U) Rail Transportation

b(3)

3.2.6.1.1.1 (U) Vibration

(U) [FCR-302] The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to the Railroad Transportation vibrations NGT 0.488 g rms longitudinal, 0.488 g rms vertical, and 0.488 g rms lateral, incurred while in the movement configuration, as presented in Appendix E of the JLENS System Specification.

3.2.6.1.1.2 (U) Shock

(U) [FCR-304] The FCR, while in the appropriate operational mode, shall meet performance requirements specified in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after being subjected to rail impact static equivalent loads NGT 5.0 g longitudinal, 3.0 g vertical and 3.0 g lateral, incurred while in the movement configuration as presented in Appendix E of the JLENS System Specification. Note: The accelerations provided here are applied to the center of mass of the ISO container. Accelerations on individual components will depend on packaging.

3.2.6.1.2 (U) Road Transportation

3.2.6.1.2.1 (U) Highways

(U) [FCR-307] The FCR, in the Transport Mode, shall be transportable on highways defined in MIL-STD-1366D including an allowance for special permits where the limits for load, vibration, and shock are presented in Appendix E of the JLENS System Specification.

3.2.6.1.2.2 (U) Secondary Roads

(U) [FCR-309] The FCR, in the transport configuration, shall be transportable on secondary roads where the limits for load, vibration, and shock are presented in Appendix E of the JLENS System Specification.

3.2.6.1.2.3 (U) Unimproved Roads

(U) [FCR-311] The FCR, in the transport configuration, shall be transportable on unimproved roads where the limits for load, vibration, and shock are presented in Appendix E of the JLENS System Specification.

3.2.6.1.2.4 (U) Off-Road

(U) [FCR-313] The FCR, in the transport configuration, shall be transportable off-road for up b(3)

3.2.6.1.2.5 (U) Large Assembly Transport Vibrations

(U) [FCR-3642] The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 *Subsystem Quality Factors* after exposure to the Large Assembly Transport vibration where the vibration levels are NGT those represented by the Perryman Cross-Country Course No. 1 and the mobility profile for primary, secondary and unimproved roads given in Table X of the JLENS System Specification, in the transport configuration.

3.2.6.2 (U) Sea Transportation

3.2.6.2.1 (U) General

(U) [FCR-316] The FCR, in the transport configuration, shall be marine transportable in accordance with MIL-STD-1366D section titled Water Transportation (Load on / Load off), where load limits and vibrations are presented in Appendix E of the JLENS System Specification.

3.2.6.2.2 (U) Vibration

(U) [FCR-318] The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to the Ship Transportation vibrations NGT 0.315 g rms longitudinal, 0.315 g rms vertical, and 0.315 g rms lateral, incurred while in the transport configuration as presented in Appendix E of the JLENS System Specification.

3.2.6.3 (U) Air Transportation

3.2.6.3.1 (U) General

(U) [FCR-321] The FCR, in the transport configuration, shall be transportable on C-130 (except ISOs which differ from 8' x 8' x 20'), C-5 and C-17 aircraft. The shock and vibrations experienced during C-130, C-5, and C-17 aircraft transport are presented in Appendix E of the JLENS System Specification.

3.2.6.3.2 (U) Vibration

(U) [FCR-323] The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to the aircraft random vibrations NGT 5.17 g rms longitudinal, 5.17 g rms vertical, and 5.17 g rms lateral, incurred while in the transport configuration, as presented in Appendix E of the JLENS System Specification.

3.2.6.4 (U) Transportation Packaging

(U) [FCR-3697] Transportation enclosures which are non-GFE and delivered as part of the FCR shall be able to withstand contamination/decontamination described herein such that it protects the equipment contained within the enclosure.

3.2.7 (U) Flexibility and Expansion

(U) There are no FCR requirements in this area.

3.3 (U) Design and Construction

3.3.1 (U) Materials

3.3.1.1 (U) General

3.3.1.2 (U) Hazardous Materials

(U) [FCR-331] The FCR shall be designed such that components containing hazardous materials listed in the EPA-17 and Class I Ozone Depleting Substances are only utilized in compliance with the JLENS Hazardous Materials Management Plan (HMMP). Note: Appendix A of the JLENS System Specification contains the aforementioned lists.

(U) [FCR-3593] The FCR shall have no radioactive materials which are defined by the Nuclear Regulation Commission that have greater than 0.002 microcuries per gram or activity per item equals or exceeds 0.01 microcuries.

3.3.2 (U) Nameplates and Product Marking

3.3.2.1 (U) Unique Identification

(U) [FCR-334] The FCR shall have all equipment marked in accordance with MIL-STD-130L for unique identification with the following provisos and exceptions.

(U) Provisos to this requirement are:

a. Only hardware and software items with a unit acquisition cost NLT $5,000.

b. All hardware items with a unit acquisition cost less than $5,000 when they are serially managed, mission critical, or controlled inventory items.

(U) Exceptions to this requirement are as specified in MIL-STD-130L section titled Detailed Requirements subsection titled Exemptions:

a. "COTS items marked with commercial identification (firm name, logo, part number, etc.), and which present no identification difficulty may be exempt from additional marking requirements. This exemption extends to COTS items identified on a VICD."

b. "Parts within an assembly or a sub-assembly, that are not subject to removal, replacement, or repair or"

c. "When parts are deemed too small for the application of complete marking in accordance with MIL-STD-130L section titled Machine-readable information (MRI) marking, a logo or other abbreviated marking [will] be substituted for the design activity identification."

3.3.2.2 (U) Labels

(U) [FCR-2344] The FCR shall have danger, caution, signs, labels, tags, and markings to warn of specific voltages, current, thermal, or physical hazards including:

1. Color code per ANSI Z535.1
2. For potentials between 70 and 500 Volts, display "WARNING" sign and list maximum voltage.
3. For potentials in excess of 500 Volts, display the "DANGER" and "HIGH VOLTAGE" signs and list maximum voltage.
4. Microwave of RF Radiation warning signs, labels, or tags should be in accordance with ANSI Z535.3, ANSI Z535.4, or ANSI Z535.5.
5. Indicate the number of persons needed to lift the item and how many pounds it weighs.

3.3.3 (U) Safety

(U) [FCR-3421] The ground based FCR equipment shall provide a local emergency power shutdown capability.

(U) [FCR-2331] The FCR shall comply with the applicable portions of MIL-HDBK-454A Guidelines on Personnel Hazards, Flammability, and Electrical Overload Protection.

(U) [FCR-3444] The FCR shall limit personnel exposure to acoustic noise levels in accordance with MIL-STD-1474D, Steady-State Noise, Personnel Occupied Areas and MIL-STD-1472F, Acoustical Noise. Hearing protection or electronic communication may be used.

(U) [FCR-2335] The FCR shall have catastrophic hazards mitigated by at least three barriers derived from independent sources, one of which must be a fail-safe device. Fail-safe device, barrier, and critical hazard are defined in "JLENS SSPP".

(U) [FCR-2336] The FCR shall have critical hazards mitigated by at least two barriers one of which must be a fail-safe device. Fail-safe device, barrier, and critical hazard are defined in "JLENS SSPP".

3.3.3.1 (U) Hardware Safety

(U) [FCR-361] The FCR shall have hardware safety interlocks which cannot be overridden by software.

(U) [FCR-3598] The FCR shall have lift points that are clearly labeled.

(U) [FCR-3597] The FCR shall have a configuration that prevents equipment from tipping over or falling on personnel performing operations, maintenance, or training tasks.

(U) [FCR-2305] The FCR shall have a maintenance platform which has built in safety features to mitigate falling hazards.

(U) [FCR-3596] The FCR shall have floor surfaces and stair and step treads that provide non-slip characteristics.

(U) [FCR-3605] As a guideline, the FCR will use Commercial Off the Shelf (COTS) equipment that has been listed or certified to an appropriate commercial standard by a Nationally Recognized Test Laboratory (NRTL). Note: Examples of NRTLs are Underwriters Laboratories (UL), Canadian Standards (CSA) or TUV Rheinland (TUV). Any COTS equipment that has this certification **shall** be considered as having met the provisions of this requirement and will be accepted for use without any further modification. For any modified COTS, recertification by a NRTL will be required unless the modifications are only minor and do not alter its form, fit, or functional characteristics.

3.3.3.1.1 (U) Radiation Safety

(U) [FCR-2296] The FCR shall have failsafe means to inhibit radiation if worst case radiation levels on the ground would exceed the permissible levels (controlled and uncontrolled) as specified in IEEE C95.1-2005.

(U) [FCR-2301] The FCR shall cancel any transmit action that is commanded by a data path if the integrity of the data path is lost.

(U) [FCR-2302] The FCR shall reinitialize to a non-radiating state after a safety critical hardware fault/failure.

3.3.3.1.2 (U) Mechanical Safety

(U) [FCR-2341] The FCR shall have physical guards to prevent inadvertent exposure of personnel to surface temperatures outside the maximum/minimum (Reference MIL-STD-1472F, section titled Thermal Contact Hazards Table XXI, or less than 0 degrees Celsius) except for surface temperatures induced by climatic environment.

(U) [FCR-2307] The FCR shall have a failsafe interlock which disables mechanical motion of the radar when maintenance is being performed on the FCR payload.

(U) [FCR-2334] The FCR equipment shall have connectors which preclude the mismating of cables in a manner which would cause malfunction, damage to equipment or hazard to personnel. Where design considerations require plug and receptacles of similar configuration in close proximity, the mating plugs and receptacles should be suitably coded or marked to clearly indicate the mating connectors.

(U) [FCR-2315] The FCR shall use self sealing connectors for coolant lines to reduce the likelihood of coolant leakage during FCR operation and maintenance as appropriate.

(U) [FCR-3600] The FCR interlocks shall be fail-safe.

(U) [FCR-2321] The FCR interlocks shall be self-resetting.

(U) [FCR-2316] The FCR shall mitigate overheating hazards that result in damage to equipment.

(U) [FCR-2312] The FCR shall vent battery enclosures to prevent the buildup of flammable gas, as appropriate.

(U) [FCR-3599] The FCR equipment shall have door or hinged covers that are provided with stops to hold them open as appropriate.

(U) [FCR-2310] The FCR shall have a combination of procedures, guards and safety devices to preclude contact with moving mechanical parts such as gears, fans, and belts during operation and maintenance.

3.3.3.1.3 (U) Electrical Safety

(U) [FCR-3604] The FCR shall have external conductive surfaces of equipment housing hazardous voltages grounded to a common static and safety ground point.

(U) [FCR-3603] The FCR shall have a means to reduce the voltage at test points to less than 300V if the potential to be measured is in excess of 300V peak.

(U) [FCR-2325] The FCR shall ensure that powered ends of connectors are protected from accidental contact.

(U) [FCR-3602] The FCR high voltage circuits containing capacitors which store more than 0.25 joules shall have discharging devices unless they discharge to 30V or less within 2 seconds after power removal for maintenance purposes. Note: This does not apply to batteries.

(U) [FCR-2326] The FCR shall have Ground Fault Circuit Interruptors (GFCI) for all external outlets.

(U) [FCR-2328] The FCR shall have visible markings for LRUs sensitive to Electrostatic Discharge (ESD).

(U) [FCR-3601] The FCR assemblies which contain circuits operating at potentials in excess of 500 volts shall be completely enclosed with any access covers and plates equipped with non-bypassable interlocks that activate to shutdown power.

(U) [FCR-2324] The FCR shall prevent shorting of circuits carrying more than 25A. Appropriate means may include guards and warning labels.

(U) [FCR-2319] The FCR shall have at least 3 barriers, to preclude accidental contact under all conditions of operation and maintenance, for all potentials between 30V and 500V.

(U) [FCR-2333] The FCR equipment shall have exposed external metallic parts, surfaces, and shields, exclusive of antenna and transmission line terminals, at ground potential during normal operation as suggested in MIL-HDBK-454A, General Guidelines for Electronic Equipment, Guideline 1, Ground.

(U) [FCR-2332] The FCR shall have a point on all electrically conductive chassis that will serve as the common tie point for static and safety grounds as suggested in MIL-HDBK-454A, General Guidelines for Electronic Equipment, Guideline 1, Ground.

3.3.3.2 (U) Software Safety

3.3.3.2.1 (U) Initialization into a Safe State

(U) [FCR-357] The FCR shall initialize (power-up) into a non-radiating state.

(U) [FCR-3187] The FCR shall validate the contents of operational software executables and data files prior to execution or use.

3.3.3.2.2 (U) Transition to a Hazardous Condition

(U) [FCR-359] The FCR shall allow the system to perform a function which inherently increases Mishap Probability only if either of the following conditions are satisfied:

a. All relevant pre-requisite safety checks are passed prior to performing the potentially hazardous function.

b. The overridable safety checks have been explicitly over-ridden.

(U) [FCR-3190] The FCR shall execute safety critical functions to completion, barring loss of power. Exiting a safety critical function gracefully may be considered executing to completion.

3.3.3.2.3 (U) Safety Critical Alerts

(U) [FCR-363] The FCR software shall provide safety critical alerts to the CPG.

(U) [FCR-3615] The FCR software shall provide hazardous condition alerts to the CPG.

(U) [FCR-3284] The FCR shall verify correct transfer of safety critical messages. Verification may include providing acknowledgements, performing cyclic redundancy checks, or checking message protocol formats.

(U) [FCR-3184] The FCR software shall provide safety critical alerts that are distinct from routine alerts.

3.3.3.2.4 (U) Safe Shutdown

(U) [FCR-367] The FCR shall provide for a safe shutdown when so commanded by the associated CPG.

3.3.4 (U) Human Engineering

(U) [FCR-2264] The FCR shall have spacing of connectors and controls external to the windscreen that is compatible with maintenance in cold weather/MOPP IV protective clothing as specified in MIL-STD-1472F, section titled Spacing.

(U) [FCR-2266] The FCR shall have controls using the guidance of MIL-STD-1472F, section titled Controls.

(U) [FCR-3590] The FCR shall present visual signals using the guidance of MIL-STD-1472F, section titled Visual Displays.

(U) There are no audio signals in the FCR.

3.3.4.1 (U) Anthropometrics

(U) [FCR-2268] The FCR shall have reach access for inserting, adjusting, and/or removing a unit or assembly as specified in MIL-STD-1472F, section titled Physical Access.

(U) [FCR-2269] The FCR replacement units, assemblies, and connectors shall meet the insertion, removal, and grip force requirements in MIL-STD-1472F, section titled Design for Maintainer.

(U) [FCR-2270] The FCR shall have visual access for corrective and preventative maintenance tasks as specified in MIL-STD-1472F, section titled Visual Access.

(U) [FCR-2271] The FCR shall have access openings and clearance dimensions for inserting, adjusting, and/or removing a unit or assembly as specified in MIL-STD-1472F, section titled Physical Access.

(U) [FCR-2272] The FCR units and assemblies shall be configured for removal, carry, and replacement as specified in MIL-STD-1472F, section titled Weight.

(U) [FCR-2273] The FCR shall have interchangeable line replacement units as specified in MIL-STD-1472F, section titled Design for Maintainer.

(U) [FCR-3715] The FCR shall have spacing of connectors and controls internal to the windscreen that is compatible with maintenance in cold weather gear as specified in MIL-STD-1472F, section titled Spacing.

(U) [FCR-3714] The FCR hardware internal to the windscreen shall be maintainable and supportable by the 5th to 95th percentile of Army personnel while wearing combat gear and protective clothing (cold weather gear) in accordance with MIL-STD-1472F, sections titled Physical Accommodation and Workspace Design.

(U) [FCR-3713] The FCR hardware external to the windscreen shall be maintainable and supportable by the 5th to 95th percentile Army personnel while wearing combat gear and protective clothing (cold weather gear, Mission Oriented Protective Posture (MOPP) IV gear) in accordance with MIL-STD-1472F, sections titled Physical Accommodation and Workspace Design.

3.3.5 (U) System Security

3.3.5.1 (U) Information Assurance (IA)

3.3.5.1.1 (U) Security Design and Configuration

(U) [FCR-375] The FCR shall use approved IA products or IA-enabled products for all information system security functions.

[redacted] b(3)

(U) [FCR-381] The FCR shall only use binary or machine executable public domain software products or other software products, such as those commonly known as freeware of shareware, that have been assessed for information assurance impacts or which have been approved by the DAA.

(U) [FCR-4070] The security support structure of the FCR shall be isolated. Means of isolation may include the use of partitions and/or domains that control of, access to, and integrity of hardware, software, and firmware that perform security functions.

3.3.5.1.2 (U) Enclave and Computing Environment

[redacted] b(3)

b(3)

(U) [FCR-390] The FCR shall implement virus protection for all servers, workstations, and mobile computing devices.

3.3.5.1.3 (U) Enclave Boundary Defense

3.3.5.1.4 (U) Physical and Environmental

3.3.5.2 b(3)

b(3)

3.3.5.3 b(3)

b(3)

3.4 (U) Documentation

(U) There are no FCR requirements in this area.

3.5 (U) Logistics

3.5.1 (U) Supply

(U) The FCR has no requirements in this area

3.5.2 (U) Maintenance

3.5.2.1 (U) Preventive Maintenance Check and Services (PMCS)

3.5.2.1.1 (U) Scheduled Maintenance

b(3)

3.5.2.2 (U) Airborne Equipment Scheduled Maintenance Cycle

b(3)

3.5.3 (U) Vehicles, Shelters, and Trailers

(U) There are no FCR requirements in this area.

3.5.4 (U) Lifting and Handling Equipment

(U) [FCR-416] The FCR shall be designed to use military lifting and handling equipment, unless the government approves justification for non-military equipment.

(U) [FCR-417] The FCR shall be designed such that standard military vehicles can be used for handling.

3.5.5 (U) March Order and Emplacement

3.5.5.1 (U) Emplacement Time

b(3)

3.5.5.2 (U) March Order Time

b(3)

3.6 (U) Personnel and Training

(U) This section is not applicable.

3.7 (U) Subsystem Characteristics

3.7.1 (U) Hardware Components

b(3)

b(1)

~~SECRET~~

(U) TABLE X. *FCR Operating Frequencies*

b(1)			

~~SECRET~~

b(1)

~~SECRET~~

b(3)

b(1)

b(1)

3.7.1.1 (U) AEU Requirements

(U) The AEU requirements apply after calibration has been performed.

3.7.1.1.1 (U) AEU Operation in the Aerostat Environment

(U) [FCR-1109] The AEU requirements shall apply in the operating environment of the aerostat, including the windscreen, confluence lines, and lightning cage.

3.7.1.1.2 (U) Antenna Waveform Requirements

b(1)

3.7.1.1.3 (U) AEU Scan Requirements

b(3)

b(3)

~~SECRET~~

(U) TABLE XI. *AEU elevation scan loss*

b(1)

~~SECRET~~

b(3)

3.7.1.1.4 (U) AEU Aperture Efficiency

b(1)

3.7.1.1.5 (U) AEU Blake Chart Constant (BCC)

b(3)

(U) ***BCC Term Definitions***

b(3)

b(1)

3.7.1.1.6 (U) AEU Transmit Requirements

3.7.1.1.6.1 (U) AEU Transmit Antenna Pattern

(U) [FCR-994] [redacted] b(3)

~~SECRET~~
(U) TABLE XII. *AEU transmit array normal beamwidths*
b(1)
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3.7.1.1.6.2 (U) AEU Transmit Waveforms

(U) The nominal AEU transmit waveforms are defined in Table XXIV in the Appendix.

3.7.1.1.7 (U) AEU Receive Array Requirements

(U) The AEU Receive Array Requirements are met for the clutter defined in Appendix C of the JLENS System Specification.

3.7.1.1.7.1 (U) AEU Receive Antenna Pattern

(U) [FCR-1013] [redacted] b(3)

~~SECRET~~
(U) TABLE XIII. *AEU receive array normal beamwidths*
b(1)
~~SECRET~~

3.7.1.1.7.2 (U) AEU Receive Noise Figure

b(1)

3.7.1.1.7.3 (U) AEU Receive Dynamic Range

b(1)

[redacted] b(1)

3.7.1.1.7.4 [redacted] b(3)

[redacted] b(1)

3.7.1.1.7.5 [redacted] b(3)

[redacted] b(3)

3.7.1.1.7.6 (U) AEU Monopulse Slope

[redacted]

~~SECRET~~
(U) TABLE XIV. [redacted] b(3) b(1)
~~SECRET~~

[redacted] b(3)

b(3)

3.7.1.1.7.7 (U) AEU Pointing Errors

(U) [FCR-1033] The AEU pointing errors, relative to the array face, shall be as defined in Table XV.

~~SECRET~~
(U) TABLE XV. b(1)
b(1)
~~SECRET~~

3.7.1.1.7.8 b(3)

b(1)

3.7.1.1.7.9 b(3)

b(1)

3.7.1.1.7.10(U) AEU Antenna Stability Noise and Asynchronous Coherencies

b(1)

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(U) TABLE XVI. *AEU stability noise requirements*

b(1)

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3.7.1.2 b(3)

b(3)

3.7.1.2.1 b(3)

3.7.1.2.1.1 b(3)

b(3)

~~SECRET~~

(U) Table XVII. *FCR instantaneous bandwidths and RF operating frequencies*

b(1)

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b(1)

3.7.1.2.2 b(3)

3.7.1.2.2.1 b(3)

b(1)

3.7.1.2.2.2 b(3)

b(1)

3.7.1.2.2.3 b(3)
b(3)

3.7.1.2.3 b(3)
b(1)

3.7.1.2.3.1 b(3)
b(1)

3.7.1.2.3.2 b(3)
b(1)

3.7.1.2.4 b(3)
b(1)

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(U) TABLE XVIII. b(3)

b(1)

~~SECRET~~

3.7.1.3 (U) Antenna Mount Requirements

3.7.1.3.1 (U) Az Drive Requirements

(U) [FCR-946] b(3)

(U) [FCR-948] b(3)

3.7.1.3.2 (U) El Drive Requirements

(U) [FCR-950] b(3)

(U) [FCR-952] b(3)

(U) [FCR-953] Limit switches shall be provided to prevent damage to the elevation drive due to overtravel.

(U) [FCR-954] Mechanical stops shall be provided to prevent damage to the elevation drive due to overtravel.

3.7.1.3.3 (U) Gimbal and Damper Assembly Requirements

(U) [FCR-958] The Gimbal and damper assembly shall restrict the motion of the FCR payload to prevent damage to the platform in winds up to 148 km/hr (80 knots) and 3.05 m/s (10 fps) turbulence

3.7.1.4 (U) INS Requirements

(U) [FCR-3319] The INS shall provide position and orientation data.

(U) [FCR-933] The INS shall provide attitude data b(3)

(U) [FCR-934] The INS shall be capable of alignment in b(3)

(U) [FCR-935] The INS determination of the three Euler angles (or, equivalently, the pitch, roll and yaw angles) of the receive antenna reference plane shall be as shown in Table XIX after INS alignment. b(3)

UNCLASSIFIED		
(U) Table XIX. *INS Angle Errors*		
Description		**Value**
Yaw	1 sigma variation	b(3)
	Bias	
Pitch	1 sigma variation	
	Bias	
Roll	1 sigma variation	
	Bias	
UNCLASSIFIED		

3.7.1.5 (U) GPS Requirements

(U) [FCR-3575] The GPS shall provide measurements with a position error (SEP) of NGT 10 m (1σ).

3.7.1.6 (U) IFF Requirements

(U) [FCR-3320] The IFF Interrogator's field of view shall be aligned with the field of view of the radar.

(U) [FCR-3321] The IFF Interrogator's azimuth coverage shall be b(3)

(U) [FCR-3441] The IFF Interrogator's elevation coverage shall be b(3)

3.7.1.7 (U) LPM Requirements

(U) [FCR-3324] The LPM shall provide b(3) currents caused by lightning strikes.

3.7.1.8 (U) REG Requirements

3.7.1.8.1 (U) PDU Requirements

(U) [FCR-3195] The REG PDU shall provide power to all airborne FCR hardware components.

3.7.1.8.2 (U) DDU Requirements

(U) The DDU requirements are covered in multiple sections above.

3.7.1.8.3 (U) SCU Requirements

b(3)

(U) [FCR-3327] The SCU shall provide stable azimuth loop compensator characteristics when commanded by the SDP.

(U) [FCR-3329] The SCU shall provide continuous stable elevation loop compensator characteristics for the operational wind conditions.

(U) [FCR-3328] The SCU shall provide azimuth and elevation motor brake control.

3.7.1.9 (U) HEU Requirements

(U) [FCR-908] The HEU shall regulate the operating temperature of the b3 and REG.

(U) [FCR-914] The HEU, when the FCR is operating in the tactical mode or during calibration shall have an outlet temperature between 30°C and 40°C

(U) [FCR-918] The HEU shall provide a heating element capable of heating the REG and b3 to operational temperature from an ambient temperature of b3. Above 0°C the b3 and REG are powered to provide additional heating to meet this requirement.

(U) [FCR-3443] The HEU shall provide a cooling element to assist in cooling the REG and b3 to operational temperature from an ambient temperature of b3. Note: the FCS Platform chiller assists in cooling the equipment.

3.7.1.10 (U) SDP Requirements

(U) [FCR-3488] The SDP shall include multiple CPUs, thereby enabling parallel processing.

(U) [FCR-3489] The SDP shall include removable disk drives.

(U) [FCR-3490] The SDP shall include a tape drive.

(U) [FCR-3491] The SDP shall provide the capability to transfer data from disk to tape.

b(3)

3.7.2 (U) Software Components

3.7.2.1 (U) Beam Steering Generator (BSG)

(U) [FCR-3461] The BSG software shall compute beam steering coefficients in response to radar pointing and beam definition commands.

3.7.2.2 (U) Communications and Control Processing (CCP)

(U) [FCR-3463] The CCP software shall provide the interface between the FCR and the FCS CPG in accordance with the JLENS System IRS.

3.7.2.3 (U) Data Collection & Analysis (DCA)

(U) [FCR-3464] The DCA software shall have commandable levels of data recording which include a minimum level, a full test level, and a maximum of NLT two intermediate levels.

3.7.2.4 (U) Equipment Status Monitor (ESM)

(U) [FCR-3462] The ESM software shall support calibration/alignment of the b3

(U) [FCR-3465] The ESM software shall perform FCR software state control.

(U) [FCR-3498] The ESM software shall determine if a b(3) is non-functional and send status to MAP.
(U) [FCR-3499] The ESM software shall determine if b(3) is non-functional.
b(3)

3.7.2.5 (U) Mission Application Processing (MAP)

(U) [FCR-1067] The MAP software shall b(3) as commanded by the CPG.
(U) [FCR-931] The MAP software shall support b(3)
Note: b(3) will only be enabled if testing determines that b(3)
(U) [FCR-3439] The MAP software shall translate an ECR state vector commanded in an IFF interrogation request from the CPG into IFF body coordinates for commanding the CIT to perform the interrogation.
(U) [FCR-3504] The MAP shall have the capability to b(3)
b(1)
(U) [FCR-1123] The MAP software shall have the capability to b(3)
(U) [FCR-3208] The MAP software shall perform position and orientation estimation and data alignment / registration incorporating data from b(3)
b(3)
(U) [FCR-3505] The MAP software shall have the capability b(3)
(U) [FCR-3506] The MAP software shall b(3)
(U) [FCR-857] The MAP software automatic b(3) shall be dependent on the radar configuration as provided by the CPG.
(U) [FCR-3292] The MAP software shall b(3)
(U) [FCR-3293] The MAP software shall command b(3)
b(1)
(U) [FCR-3500] The MAP software shall respond to b(3)
(U) [FCR-3507] The MAP software shall have the capability to support calibration/recalibration of the hardware.

3.7.2.6 b(3)

b(3)

b(3)

3.7.2.7 (U) Signal Processing (SPS)

b(3)

(U) [FCR-3502] The SPS software shall respond to a notification of a b(3) corresponding to the appropriate case. In the absence of such a condition, the SPS will use b(3)

b(1)

b(3)

(U) [FCR-3508] The SPS software shall have the capability to process calibration data.

4 (U) Verification

4.1 (U) Requirement Verification Matrix Content

(U) The Requirements Verification Matrix (RVM) that is presented in Table XXIII contains information in columns that show where and how each requirement will be verified. The content of these columns are defined in the following.

4.1.1 (U) FCR PIDS Absolute Number

(U) This column contains the absolute number of the requirement in this document.

4.1.2 (U) FCR PIDS Paragraph Number

(U) This column contains the paragraph number of the requirement in this document.

4.1.3 (U) Test Period

(U) This column contains the test period where the requirement verification will be conducted for the purpose of sell-off of the completion of the prime item. The sell-off of the verification of a requirement at the PIDS level of verification may (or may not) be used at the sell-off at the System and/or Orbit level of verification. The sell-off of the requirement at the PIDS level of verification is the criterion that will be used by System Integration for the acceptance of the prime item into the System Integration process.

(U) As part of the process of this final verification activity, there will be an acceptance sign-off activity in the post-test review meeting signifying that the requirement is verified. If there are analysis data that must be examined prior to sign-off, a post analysis meeting will be conducted to review and sign-off the analysis and acceptance of the completed verification.

4.1.4 (U) Verification Level

(U) This column contains the specification level at which the requirement verification will be conducted for the purpose of sell-off of the completion of the prime item. The level may be the PIDS level, the major component level, the supplier product acceptance (verification) level, the review o fthe design (PDR/CDR) level, the subsystem integration level, a "thread" level, or other level within the prime item IPT test program. The levels must be defined and scheduled in the prime item development plan.

4.1.5 (U) Verification Method

4.1.5.1 (U) Demonstration (D)

(U) Demonstration is an exhibition of the operability or supportability of an item under intended service use conditions. Sufficient data for requirements verification can be obtained by observing functional operation of the system, or a part of the system, without the use of instrumentation or special test equipment beyond that inherently provided in the system being verified.

4.1.5.2 (U) Test (T)

(U) Test is the verification method by which the operability, supportability, performance capability or other specified qualities of an item are verified when subjected to controlled conditions that are real or simulated. These verifications may require use of special test equipment and instrumentation that is not an integral part of the system being verified to obtain quantitative data for analysis, as well as qualitative data derived from displays and indicators inherent in the item(s) for monitor and control.

4.1.5.3 (U) Analysis (A)

(U) Analysis is the method used to verify requirements by determining qualitative and quantitative properties and performance of the system by studying and examining engineering drawings, software, and hardware flow diagrams, software and hardware specifications, and other software and hardware documentation. It also includes performing modeling, simulation, and/or calculations and analyzing the results. Analysis techniques include interpretation or interpolation/extrapolation of analytical or empirical data collected under defined conditions.

4.1.5.4 (U) Inspection (I)

(U) Inspection is the verification method used to verify characteristics of an item by inspecting engineering documentation produced during development or by inspection of the product itself to verify conformance with specified requirements. Inspection is nondestructive and consists of visual inspections or simple measurements without the use of precision measurement equipment. Inspection typically applies to a single parameter or attribute with a yes/no answer.

4.1.6 (U) Verification Location

(U) This column identifies the location where the verification will be conducted.

4.2 (U) Requirements Verification Matrix

Table XX. ***(U) Requirements Verification Matrix***

~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-13	3.2.1.1.1.1.0-1	(U) The FCR, while in the Tactical Mode, shall perform detection against the ABT threat defined in 3.1.3.1 Air Breathing Targets when operating in the environments defined in 3.1.3.5 b(3) and Appendix C of the JLENS System Specification.	Analysis	FCR	Engineering
FCR-553	3.2.1.1.1.1.0-2	b(1)	Analysis, Demonstration	FCR, FCS	Engineering, Dugway
FCR-554	3.2.1.1.1.2.0-1	b(1)	Analysis, Demonstration	FCR, FCS	Engineering, Dugway
FCR-15	3.2.1.1.1.3.0-1	(U) The FCR, while in the Tactical Mode, shall perform tracking of detected ABTs, which are defined in 3.1.3.1 *Air Breathing Targets* , when operating in the environments defined in 3.1.3.5 b(3) and Appendix C of the JLENS System Specification.	Analysis	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-852	3.2.1.1.1.3.0-2	b(1)	Analysis, Demonstration	FCR, FCS	Engineering, Dugway
FCR-552	3.2.1.1.1.4.0-1	b(1)	Analysis	FCR	Engineering
FCR-550	3.2.1.1.1.5.0-1	(U) The FCR, in the Tactical Mode and as commanded b(3)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-570	3.2.1.1.1.6.0-1	b(1)	Analysis, Demonstration, Test	FCR	Engineering, SIL, Dugway
FCR-17	3.2.1.1.1.7.0-1	(U) While in the Tactical Mode, the FCR shall accept cues which are derived from the JLENS Surveillance System.	Test	Major Component	SIL
FCR-18	3.2.1.1.1.7.0-2	(U) While in the Tactical Mode, the FCR shall accept cues which are derived from external sensors.	Test	Major Component	SIL
FCR-19	3.2.1.1.1.7.0-3	(U) While in the Tactical Mode, b(3)	Test	Major Component	SIL
FCR-542	3.2.1.1.1.8.0-1	b(1)	Analysis	FCR	Engineering
FCR-543	3.2.1.1.1.8.0-2	b(1)	Analysis, Test	FCR	Engineering, SIL

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-547	3.2.1.1.1.9.0-1	b(1)	Analysis	FCR	Engineering
FCR-23	3.2.1.1.2.1.1.0-1	b(3)	Analysis	FCR	Engineering
FCR-572	3.2.1.1.2.1.2.0-1	b(3)	Analysis	FCR	Engineering
FCR-573	3.2.1.1.2.1.3.0-1	b(1)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-26	3.2.1.1.2.2.1.0-1	b(3)	Analysis	FCR	Engineering

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~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-575	3.2.1.1.2.2.2.0-1	b(3)	Analysis	FCR	Engineering
FCR-576	3.2.1.1.2.2.3.0-1	b(1)	Analysis	FCR	Engineering
FCR-585	3.2.1.1.2.3.1.0-1	b(1)	Analysis	FCR	Engineering
FCR-579	3.2.1.1.2.3.2.0-1	b(1)	Analysis	FCR	Engineering
FCR-581	3.2.1.1.2.3.3.0-1	b(1)	Analysis	FCR	Engineering
FCR-583	3.2.1.1.2.3.4.0-1	b(1)	Analysis, Demonstration, Test	FCR	Engineering, SIL, Dugway
FCR-890	3.2.1.1.2.3.5.0-1	b(1)	Test	Major Component	SIL

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~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-30	3.2.1.1.3.0-1	b(3)	Test	FCR	SIL
FCR-8	3.2.1.2.1.0-1	(U) The FCR shall perform sector surveillance b(3)	Demonstration, Test	FCR, Major Component	SIL, Pelham
FCR-64	3.2.1.2.1.1.0-1	(U) The FCR, while in the Tactical Mode, shall provide commandable, 360° in azimuth, sectored azimuth coverage b(3)	Inspection, Test	FCR, Major Component	Engineering, NFR
FCR-513	3.2.1.2.1.1.0-2	(U) The FCR, in the Tactical Mode, shall act upon b(3)	Test	FCS	Dugway
FCR-561	3.2.1.2.1.2.1.1.0-1	b(1)	Analysis, Demonstration	FCR, FCS	Engineering, Dugway

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~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-563	3.2.1.2.1.2.1.2.0-1	b(1)	Analysis, Demonstration	FCR, FCS	Engineering, Dugway
FCR-566	3.2.1.2.1.2.2.1.0-1	b(1)	Analysis, Demonstration	FCR, FCS	Engineering, Dugway

~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-568	3.2.1.2.1.2.2.2.0-1	b(1)	Analysis, Demonstration	FCR, FCS	Engineering, Dugway
FCR-3306	3.2.1.2.1.2.2.2.0-2	b(1)	Analysis, Test	Major Component	SIL
FCR-67	3.2.1.2.2.1.0-1	b(1)	Analysis	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-68	3.2.1.2.2.1.0-2	b(1)	Analysis	FCR	Engineering
FCR-75	3.2.1.2.2.3.0-2	b(1) (U) By definition, a "surface" target is a target which is located on the surface of the Earth. (U) In this context, "airborne" means non-surface.	Analysis	FCR	Engineering
FCR-3302	3.2.1.2.2.3.0-3	b(1) (U) By definition, a "surface" target is a target which is located on the surface of the Earth.	Analysis, Test	FCR	Engineering, SIL
FCR-36	3.2.1.2.4.1.0-1	b(3)	Analysis	FCR	Engineering
FCR-38	3.2.1.2.4.2.0-1	b(3)	Analysis	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-40	3.2.1.2.4.3.0-1	b(3)	Analysis	FCR	Engineering
FCR-90	3.2.1.2.5.0-1	b(3)	Test	Major Component	SIL
FCR-555	3.2.1.2.5.0-2	b(3)	Test	Major Component	SIL
FCR-45	3.2.1.2.6.1.0-1	b(1)	Demonstration	FCS	Dugway
FCR-47	3.2.1.2.6.2.0-1	(U) The FCR shall include an on-board IFF system consisting of interrogator and transponder that supports modes 1, 2, 3/A, C, 4, 5 (level 1 and level 2), and S (transponder function only) and is compatible with DoD IFF systems.	Test	Major Component	Vendor
FCR-50	3.2.1.2.7.1.0-1	(U) The FCR shall incorporate a GPS-aided inertial navigation system for automatic positioning, orientation determination and data alignment / registration.	Test	FCR	Pelham
FCR-53	3.2.1.2.7.2.1.0-1	(U) The GPS receivers which are part of the FCR shall be equipped b(3)	Inspection	Major Component	Engineering
FCR-57	3.2.1.2.7.2.3.0-1	(U) The FCR shall perform system initialization and synchronization b(3)	Demonstration	FCR	SIL

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~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-59	3.2.1.2.8.0-1	b(3)	Test	FCR	SIL
FCR-62	3.2.1.3.1.0-1	(U) The FCR SDP, upon power application, shall automatically initialize to a point where it can accept configuration commands from the FCS CPG.	Demonstration	FCR	Pelham
FCR-77	3.2.1.3.2.0-1	(U) The FCR shall execute an EMCON command from the FCS CPG which reduces all radiated energy in compliance with MIL-STD-464A, Section titled Emission control (EMCON), see Appendix H of the JLENS System Specification, which can be b(3)	Test	FCR, Major Component	NFR, SIL, Pelham
FCR-3692	3.2.1.3.2.0-2	b(3)	Test	FCR	Pelham
FCR-79	3.2.1.3.3.0-1	(U) The FCR, with the exception of the signal processor, shall be designed such that there is an inherent 50% reserve of computer memory and computer throughput for data processing.	Analysis	Major Component	Engineering
FCR-84	3.2.1.3.4.2.0-1	(U) The FCR shall be designed such that all classified data storage media including floppy disks, hard disks, compact disks, and tapes are easily removed from the computer with the use of standard tools or standard equipment.	Inspection	Major Component	Engineering
FCR-86	3.2.1.3.4.3.0-1	(U) The FCR shall provide non-volatile data storage devices with removable media.	Inspection	Major Component	Engineering

~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-467	3.2.1.3.5.1.0-1	b(3)	Analysis	FCR	Engineering
FCR-469	3.2.1.3.5.2.0-1	b(3)	Analysis	FCR	Engineering
FCR-471	3.2.1.3.5.3.0-1	(U) The FCR, in the appropriate operational mode, shall record all data types listed herein while meeting the operational performance requirements. Data types include: a. initialization parameters, b. b(3) c. status, and d. b(3)	Analysis, Demonstration	FCR	Engineering, SIL
FCR-473	3.2.1.3.6.0-1	b(3)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-475	3.2.1.3.7.0-1	(U) While in the Tactical Mode, the FCR shall execute cues, which may require a volume search, from the FCS CPG, given sufficient radar resources.	Test	Major Component	SIL
FCR-477	3.2.1.3.8.0-1	b(3)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-478	3.2.1.3.8.0-2	b(3)	Test	FCR	SIL
FCR-481	3.2.1.3.9.1.0-1	(U) The FCR, in the Tactical Mode, shall track ABTs operating above the radar horizon at ranges commensurate with their signature and location within the electronic field of view of the FCR.	Analysis	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-484	3.2.1.3.9.2.1.0-1	b(1)	Analysis, Test	Major Component	Engineering, SIL
FCR-486	3.2.1.3.9.2.2.0-1	b(1)	Analysis, Test	Major Component	Engineering, SIL

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~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-488	3.2.1.3.9.3.0-1	(U) The FCR shall provide automatic track initiation of detected targets.	Test	FCR	SIL
FCR-490	3.2.1.3.9.4.0-1	(U) The FCR, in the Tactical Mode, shall update tracks to maintain accuracy unless the update rate is specified by the associated CPG.	Test	Major Component	SIL
FCR-491	3.2.1.3.9.4.0-2	(U) The FCR, in the Tactical Mode, shall act upon track update rate commands from the FCS CPG.	Test	FCR	SIL
FCR-492	3.2.1.3.9.4.0-3	b(3)	Test	FCR	SIL
FCR-557	3.2.1.3.9.4.0-4	(U) The FCR, in the Tactical Mode, shall act upon track update rate commands from the CPG for tracks which are part of an engagement.	Test	FCR	SIL
FCR-494	3.2.1.3.9.5.0-1	(U) The FCR, in the Tactical Mode, shall act upon a command from the FCS CPG to drop track by dropping the identified track.	Test	Major Component	SIL
FCR-498	3.2.1.3.9.6.0-1	b(3)	Test	FCR	SIL
FCR-501	3.2.1.3.10.1.0-1	b(1)	Analysis, Demonstration	FCR	Engineering, Dugway
FCR-503	3.2.1.3.10.2.0-1	b(1)	Analysis, Test	FCR	Engineering, SIL

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-505	3.2.1.3.10.3.0-1	b(1)	Analysis, Test	FCR, Major Component	Engineering, NFR
FCR-507	3.2.1.3.10.4.0-1	b(1)	Analysis, Demonstration	FCR, FCS	Engineering, Dugway
FCR-509	3.2.1.3.11.0-1	b(1)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-512	3.2.1.3.12.1.0-1	(U) The FCR shall have an b(3)	Analysis, Test	Major Component	Engineering, NFR
FCR-515	3.2.1.3.12.2.0-1	(U) The FCR shall have a b(3)	Test	FCR	Pelham
FCR-516	3.2.1.3.12.2.0-2	(U) The FCR shall have a 360° b(3)	Test	FCR	Pelham
FCR-518	3.2.1.3.13.0-1	(U) The FCR shall act upon configuration commands, including priority, from the FCS CPG.	Test	Major Component	SIL
FCR-519	3.2.1.3.13.0-2	(U) The FCR shall act upon ABT, TBM, LCR and SMT mission commands (priority and sector) from the FCS CPG.	Test	FCR	SIL
FCR-523	3.2.1.3.14.1.1.0-1	(U) The FCR, in the Tactical Mode, shall act upon b(3) commands from the FCS CPG.	Test	FCR	SIL
FCR-4140	3.2.1.3.14.1.1.0-2	b(1)	Test	Major Component	SIL

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-4141	3.2.1.3.14.1.1.0-3	b(1)	Analysis	FCR	Engineering
FCR-4142	3.2.1.3.14.1.1.1.0-1	b(1)	Analysis	FCR	Engineering
FCR-527	3.2.1.3.14.1.1.1.0-2	b(1)	Test	FCR	SIL
FCR-528	3.2.1.3.14.1.1.1.0-3	b(1)	Analysis, Test	FCR	Engineering, SIL
FCR-529	3.2.1.3.14.1.1.1.0-4	b(1)	Analysis	FCR	Engineering
FCR-531	3.2.1.3.14.1.1.2.0-1	b(1)	Test	FCR	SIL
FCR-533	3.2.1.3.14.1.1.3.0-1	b(1)	Test	FCR, Major Component	SIL
FCR-525	3.2.1.3.14.1.2.0-1	b(3)	Analysis, Test	Major Component	Engineering, SIL

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-4072	3.2.1.3.14.1.2.0-2	b(3)	Test	Major Component	SIL
FCR-535	3.2.1.3.14.2.0-1	(U) The FCR in the Tactical Mode shall act upon a command to perform an IFF interrogation on a designated track from the FCS CPG.	Test	FCR	SIL
FCR-3430	3.2.1.4.1.0-1	(U) All FCR airborne equipment which is to be installed within the windscreen shall fit within the volume shown in Figure 2.	Analysis	Major Component	Engineering
FCR-438	3.2.1.4.2.0-1	(U) The FCR payload shall draw a maximum average of 62 kVA total, where: b(3) d. The radar loads on the three phases should be balanced.	Analysis, Test	Major Component	Engineering, Pelham
FCR-441	3.2.1.4.3.1.0-1	(U) The FCR, when the FCS is in the moored configuration, shall be functionally operational within b(3)	Analysis	FCR	Engineering
FCR-443	3.2.1.4.3.2.0-1	(U) The FCR, when the FCS is in the moored configuration, shall be functionally operational within b(3) Note: The Platform's chiller is needed for the radar to meet this system level requirement.	Analysis	FCR	Engineering
FCR-445	3.2.1.4.3.3.0-1	(U) For maintenance or emplacement, the FCR, when the FCS is in the moored configuration, shall be brought to the necessary temperature for ground functionality testing. See 3.2.5.1.1.1 Temperature, Operations.	Analysis	FCR	Engineering
FCR-447	3.2.1.4.3.4.0-1	(U) For commonality, the coolant used in the FCR shall be H308499 Coolant, Glycol Based, Organic Acid Salt Inhibited.	Inspection	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-449	3.2.1.4.4.0-1	b(3)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-3207	3.2.1.4.4.0-2	(U) If a receiver channel fails, the FCR shall reconfigure the operating channels in order to preserve b(3)	Test	FCR	Pelham
FCR-453	3.2.1.4.5.0-1	(U) The FCR shall be designed to be certifiable by the U.S. Military Communications-Electronics Board (USMCEB) to operate in frequency bands in accordance with The Manual of Regulations and Procedures for Federal Radio Frequency Management, chapter titled Allocations, Allotments and Plans, dated May 2003, revised January 2006. GFE and COTS are, by definition, already USMCEB certifiable. This includes all all IFF sub-systems and GPS sub-systems which are part of the FCR.	Analysis	FCR, Major Component	Engineering
FCR-456	3.2.1.4.6.1.0-1	b(1)	Test	Major Component	NFR, SIL
FCR-457	3.2.1.4.6.1.0-2	(U) The FCR, while in the appropriate mode, shall execute a command for frequency band utilization from the FCS CPG.	Test	Major Component	SIL
FCR-459	3.2.1.4.6.2.0-1	b(1)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-460	3.2.1.4.6.2.0-2	b(1)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-462	3.2.1.4.7.0-1	b(3)	Analysis, Test	FCR	Engineering, SIL

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-537	3.2.1.4.8.0-1	[redacted] b(1)	Analysis	FCR	Engineering
FCR-539	3.2.1.4.9.0-1	(U) The FCR detection range, detection accuracy [redacted] b(3) and tracking requirements shall be met in the Clutter and Multipath environments defined in Appendix C of the JLENS System Specification, when configured into the FCS and in an operational mode.	Analysis	FCR	Engineering
FCR-3646	3.2.1.4.9.0-2	(U) The FCR [redacted] b(3) in the Clutter and Multipath environments defined in Appendix C of the JLENS System Specification, when configured into the FCS and in the tactical mode.	Analysis, Demonstration	FCR	Engineering, SIL
FCR-94	3.2.1.5.0-1	(U) The FCR shall act upon configuration commands from the CPG for selecting data recording details in addition to the automatic level.	Test	FCR	SIL

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-4090	3.2.2.1.0-1	(U) The FCR **shall** have external interfaces in accordance with the JLENS System Internal IRS.	Inspection, Analysis, Demonstration, Test	FCS	Pelham, Dugway
FCR-4132	3.2.2.1.0-2	(U) The FCR **shall** have external interfaces in accordance with the JLENS System External IRS.	Inspection	Major Component	Engineering
FCR-154	3.2.3.1.0-1	(U) All exterior surfaces of airborne equipment external to the windscreen **shall** be painted with Chemical Agent Resistant Coating (CARC), in accordance with H372287, with exterior topcoat 383 Green (color 34094 of Fed-Std-595).	Inspection	FCR	Engineering
FCR-4133	3.2.3.1.0-2	(U) All exterior surfaces of any FCR components of the Hull Measurement System which are exterior to the aerostat shall be painted with Chemical Agent Resistant Coating (CARC), in accordance with H372287, with exterior topcoat white (color 37875 of Fed-Std-595).	Inspection	FCS	Engineering
FCR-4088	3.2.3.1.0-3	(U) All exterior surfaces of FCR airborne equipment internal to the windscreen which are visible when the windscreen is unfurled shall be painted with exterior topcoat 383 Green (color 34094 of Fed-Std-595, this is non-CARC paint), except for COTS hardware or where paint interferes with function such as when electrical conductivity is needed.	Inspection	Major Component	Pelham
FCR-156	3.2.3.2.0-1	(U) FCR enclosures which are mounted on the aerostat, exterior to the windscreen, and have the purpose to protect the equipment interior from NBC shall protect internal equipment from contamination, see 6.2, caused by an NBC event as described in 3.2.5.2.8.1 *Nuclear, Biological, and Chemical, Definitions.*	Analysis	Major Component	Engineering
FCR-158	3.2.3.3.0-1	(U) All FCR equipment while in the Storage or Movement State shall be packed in 8 ft height, 8 ft width and 20 ft length (2.44 m by 2.44 m by 6.10 m) or 8.5 ft height, 8 ft width and 20 ft length (2.59 m by 2.44 m by 6.10 m) ISO containers. ISO container sizes which differ from 8' x 8' x 20' require approval by the JLENS Government Product Manager.	Demonstration	FCR	Pelham

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-428	3.2.4.1.1.1.0-1	b(3)	Analysis	FCR, Major Component	Engineering
FCR-430	3.2.4.1.1.2.0-1	b(3)	Analysis	FCR, Major Component	Engineering
FCR-432	3.2.4.1.2.0-1	b(3)	Analysis	FCR, Major Component	Engineering
FCR-167	3.2.4.2.1.1.0-1	(U) While in an operational mode, the FCR shall continually monitor its operational status. Operational status is provided to the FCS CPG.	Test	FCR	Pelham
FCR-169	3.2.4.2.1.2.0-1	(U) The FCR shall store the detected faults either in non-volatile memory or on removable data storage media.	Test	FCR	SIL
FCR-171	3.2.4.2.1.3.0-1	(U) The FCR shall detect all radar failures that will result in system critical failures using a combination of b(3)	Analysis, Demonstration	FCR, Major Component	Engineering, Pelham
FCR-172	3.2.4.2.1.3.0-2	b(3)	Analysis	FCR	Engineering
FCR-174	3.2.4.2.1.4.0-1	(U) While in the appropriate operational mode, the operational performance of the FCR shall meet the performance requirements in 3.2.1 *Fire Control Radar Performance* b(3)	Analysis	FCR	Engineering
FCR-176	3.2.4.2.1.5.0-1	b(3)	Inspection	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-177	3.2.4.2.1.5.0-2	b(3)	Inspection	FCR	Engineering
FCR-179	3.2.4.2.1.6.0-1	(U) Where standard b(3) cannot be used, the contractor shall obtain government approval prior to FCR CDR.	Inspection	FCR	Engineering
FCR-181	3.2.4.2.1.7.0-1	b(3)	Analysis	FCR	Engineering
FCR-183	3.2.4.2.1.8.0-1	b(3)	Analysis	FCR	Engineering
FCR-434	3.2.4.2.2.0-1	(U) The FCR shall provide data which can be used for prognostics to the FCS CPG.	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-3712	3.2.4.2.2.0-2	b(3)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-186	3.2.4.3.1.0-1	(U) The FCR shall perform configuration checks during FCR initialization.	Demonstration	FCR	SIL
FCR-188	3.2.4.3.2.0-1	(U) The FCR shall pass all configuration checks prior to transitioning to an operational mode.	Demonstration	FCR	SIL, Pelham
FCR-190	3.2.4.3.3.0-1	(U) The FCR shall accept and implement commands overriding the automatic configuration checks.	Demonstration	FCR	SIL
FCR-192	3.2.4.3.4.0-1	(U) The FCR shall include a configuration log which includes the results of the configuration checks.	Demonstration	FCR	SIL
FCR-197	3.2.5.1.1.1.0-1	(U) The FCR in an appropriate operational mode shall meet the performance specified in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* during exposure to an ambient temperature range from -40°C to +49°C (Mean Sea Level). Temperature as a function of altitude is provided in Appendix F of the JLENS System Specification.	Analysis, Test	Major Component	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-199	3.2.5.1.1.2.0-1	(U) The FCR in the appropriate operational mode shall meet the performance specified in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to an ambient temperature range from -46°C to +71°C while in the storage and movement configuration, with the allowance of environmental kits and procedures for temperature extremes.	Analysis, Test	Major Component	Engineering
FCR-201	3.2.5.1.2.1.0-1	(U) The FCR, in an appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* during exposure to a relative humidity range from 3 to 100% non-condensing.	Analysis	FCR	Engineering
FCR-3539	3.2.5.1.2.2.0-1	(U) The FCR, in an appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure, while in the deployment, storage, and movement configurations, to a relative humidity range from 3 to 100% non-condensing.	Analysis	FCR	Engineering
FCR-205	3.2.5.1.3.1.0-1	b(3)	Analysis	FCR	Engineering
FCR-210	3.2.5.1.3.2.0-1	b(3)	Analysis	FCR	Engineering
FCR-215	3.2.5.1.4.0-1	(U) The FCR airborne equipment outside the windscreen shall survive during exposure to hail up to one-half inch (1.27 cm) in diameter while in the appropriate operational mode.	Analysis	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-220	3.2.5.1.5.0-1	(U) The FCR, in the appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* except sensor performance, which can degrade, during exposure up to 10.2 cm (4 inches) of snow accumulation on ground equipment surfaces where the snow has a density of 0.3 gram per cubic centimeter.	Analysis	FCR	Engineering
FCR-3484	3.2.5.1.5.0-2	(U) The FCR, in the appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* except sensor performance, which can degrade, during a snow falling rate of up to 2.54 cm/hour (1 inch/hour). Note: The falling snow does not accumulate on the aerostat.	Analysis	FCR	Engineering
FCR-224	3.2.5.1.6.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance specifications in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* when exposed to a salt atmosphere in sea locations and coastal regions.	Analysis	FCR	Engineering
FCR-225	3.2.5.1.6.0-2	(U) The FCR, in the appropriate operational mode, shall meet performance specifications in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to a salt atmosphere in sea locations and coastal regions while in a non-operational mode.	Analysis	FCR	Engineering
FCR-229	3.2.5.1.7.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance in 3.2.1 *Fire Control Radar Performance* (degraded sensor performance during operation is permitted) and 3.2.4 *Subsystem Quality Factors* when exposed to blowing dust (up to 149 μm diameter in concentrations of up to 10 ± 7 g/m^3 (0.3 ± 0.2 g/ft^3) for velocities up to 8.9 m/s (17.3 knots) (32.04 km/hr).	Analysis	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3485	3.2.5.1.7.0-2	(U) The FCR, in the appropriate operational mode, shall meet performance in 3.2.1 Fire Control Radar Performance (degraded sensor performance during operation is permitted) and 3.2.4 Subsystem Quality Factors when surface equipment is exposed to blowing sand for diameters in the range of 150 to 850 µm diameter in concentrations of up to 1.1 ± 0.3 g/m^3 (0.033 ± 0.0075 g/ft^3) for velocities up to 29.0 m/s (56.4 knots) (104.5 km/hr).	Analysis	FCR	Engineering
FCR-3486	3.2.5.1.7.0-3	(U) The FCR, in the appropriate operational mode, shall meet performance in 3.2.1 Fire Control Radar Performance (degraded sensor performance during operation is permitted) and 3.2.4 Subsystem Quality Factors when airborne equipment is exposed to blowing sand for diameters in the range of 150 to 850 µm diameter in concentrations of up to 0.18 -0.0/+0.2 g/m^3 (0.005 -0.0/+0.0057 g/ft^3) for velocities up to 29.0 m/s (56.4 knots) (104.5 km/hr). Note: for the Tactical Mode, blowing sand does not reach operational altitude.	Analysis	FCR	Engineering
FCR-233	3.2.5.1.8.0-1	(U) The FCR shall be either composed of materials that inhibit the fungus growth or composed of materials which are protected from environments that would encourage fungus growth.	Analysis	FCR	Engineering
FCR-236	3.2.5.1.9.1.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1. *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* while being subjected to winds up to 73 km/hr (40 knots) with turbulence of 1.98 m/s rms (6.5 fps) for 10% of the operational time, and winds of (Flight 46) for the remaining 90% of the operational time. [redacted] b(3)	Analysis, Test	FCR	Engineering, Pelham
FCR-239	3.2.5.1.9.2.1.0-1	(U) The FCR, when assembled into the FCS which is either moored or at altitude, whether operational or non-operational, shall survive an exposure to steady state winds of up 148 km/hr (80 knots) with turbulence of 3.05 m/s (10 fps) rms.	Analysis	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-241	3.2.5.1.9.2.2.0-1	(U) The FCR, in the storage, movement, or operations configurations, shall survive an exposure to steady state winds of up to 185 km/hr (100 knots).	Analysis	FCR	Engineering
FCR-244	3.2.5.1.10.1.0-1	(U) The FCR ground equipment, in the Operations State, Movement State, or Storage State, shall be protected from direct and indirect lightning, including LEMP, in accordance with the lightning requirements of MIL-STD-464. Relevant sections of MIL-HDBK-419A and NFPA-780 can be used for guidance. In the Movement or Storage State all FCR equipment is protected by the shipping containers.	Test	FCR	Eglin
FCR-246	3.2.5.1.10.2.0-1	(U) The FCR airborne equipment, when in the operations configuration, shall survive direct or indirect lightning strikes to the aerostat lightning cage, which produces a maximum induced current of 145 kA including LEMP. Relevant sections of MIL-HDBK-419A and NFPA-780 can be used for guidance.	Analysis, Test	FCR	Engineering, Eglin
FCR-248	3.2.5.1.10.3.0-1	(U) The FCR shall return to the state and mode existing prior to a near lightning strike after a controlled restart not requiring repair. By definition, a nearby lightning strike does not cause equipment damage. A controlled restart is according to procedures.	Test	FCR	Eglin
FCR-252	3.2.5.2.1.1.0-1	(U) The FCR, in the Tactical Mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* while being subjected to vibration levels caused by operation.	Analysis, Demonstration	FCR, Major Component	Engineering, Dugway
FCR-254	3.2.5.2.1.2.0-1	(U) The FCR, in the appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and *3.2.4 Subsystem Quality Factors* following exposure to vibration levels caused by normal transportation, maintenance, or storage. Transportation includes, air, ground (both road and b(3) and sea.	Analysis	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-257	3.2.5.2.2.1.0-1	(U) The FCR, while in an operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* applicable to that operational mode, while being subjected to shock levels caused during normal operation of that mode.	Analysis	FCR, Major Component	Engineering
FCR-259	3.2.5.2.2.2.0-1	(U) The FCR LRUs shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after the LRUs are subjected to drop shock static equivalent loads NGT 5.0 g longitudinal, 5.0 g vertical, and 5.0 g lateral at the center of gravity of the container, while packaged in their transit containers according to the applicable technical documentation.	Analysis	Major Component	Engineering
FCR-4134	3.2.5.2.2.3.1.0-1	(U) After assembly to an operational configuration and while in the appropriate operational mode, the FCR components, which are packaged for the Movement State in ISO containers or ISO shelters, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 System Quality Factors after exposure to a [b(3)redacted] while the FCR equipment is mounted in the designated ISO shelters or ISO containers for that equipment and while the JLENS equipment is in the transport configuration.	Analysis	Major Component	Engineering
FCR-4135	3.2.5.2.2.3.2.0-1	(U) After assembly to an operational configuration and while in the appropriate operational mode, the FCR non-fragile components, see 6.2, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 System Quality Factors after exposure to a [b(3)redacted] while the FCR equipment is mounted in the designated ISO shelters or ISO containers for that equipment and while the JLENS equipment is in the transport configuration.	Analysis	Major Component	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-261	3.2.5.2.2.3.3.0-1	(U) After assembly to an operational configuration and while in the appropriate operational mode, the FCR fragile components, see 6.2, which are packaged for the Movement State in ISO containers or ISO shelters, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 System Quality Factors after exposure b(3) while the FCR equipment is mounted in the designated ISO shelters or ISO containers for that equipment and while the JLENS equipment is in the transport configuration.	Analysis	FCR, Major Component	Engineering
FCR-4136	3.2.5.2.2.3.6.0-1	(U) Each FCR unique transportation fixture onto which fragile hardware is mounted shall be marked with special handling procedures using MIL-STD-129P as guidance.	Inspection	Major Component	Pelham
FCR-3200	3.2.5.2.3.0-1	(U) The FCR shall contain no electrically initiated devices (EID) or electro-explosive devices (EED).	Inspection	Major Component	Engineering
FCR-269	3.2.5.2.4.1.1.0-1	(U) The FCR shall control unintentional emissions using MIL-STD-461E, RE102-4 Army curve as a guide.	Analysis, Test	FCR	Engineering, NFR
FCR-3693	3.2.5.2.4.1.1.0-2	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of intra-system radiated and conducted emissions.	Analysis, Demonstration	FCR, FCS	Engineering, Dugway
FCR-3704	3.2.5.2.4.1.2.1.0-1	(U) The FCR airborne equipment excluding the IFF subsystem and the GPS, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of spurious in-band electromagnetic interference using MIL-STD-461E, b(3) b(3) as a guide. Note: It is assumed that the interference frequency will be b(3)	Analysis, Test	FCR	Engineering, Eglin

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3705	3.2.5.2.4.1.2.2.0-1	(U) The FCR airborne GPS equipment, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of spurious non-in-band electromagnetic interference, [redacted] b(3)	Test	Major Component	Vendor
FCR-270	3.2.5.2.4.1.2.2.0-2	(U) The FCR airborne equipment, excluding the IFF subsystem, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of spurious non-in-band (out of band) electromagnetic interference in accordance with Table IX.	Analysis, Test	FCR	Engineering, Eglin
FCR-3706	3.2.5.2.4.1.2.2.0-3	(U) The IFF subsystem which is part of the FCR airborne equipment, in the appropriate operational mode, shall meet performance requirements in 3.2.1.2.6 *Identification Friend or Foe (IFF)* and 3.2.4 *Subsystem Quality Factors* in the presence of [redacted] b(3)	Test	Major Component	Vendor
FCR-3707	3.2.5.2.4.1.3-1	(U) The FCR airborne GPS equipment shall be designed in accordance with MIL-STD-461E, [redacted] b(3)	Test	Major Component	Vendor
FCR-272	3.2.5.2.4.2.0-1	(U) Grounding and bonding on the FCR shall be implemented in accordance with the electrical bonding and external grounds requirements of MIL-STD-464A.	Test	FCR, Major Component	Pelham

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-274	3.2.5.2.5.0-1	[redacted] b(1)	Analysis, Test	FCR, Major Component	Engineering, Vendor
FCR-276	3.2.5.2.6.0-1	(U) The FCR LRUs or equipment cabinets as appropriate, except for GFE, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* following exposure to an electrostatic [redacted] b(3) (U) Note: ESD directly to connector pins is not included. This only includes ESD to the module external surfaces and the LRU external surfaces.	Analysis, Test	FCR, Major Component	Engineering, Eglin

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-278	3.2.5.2.7.0-1	b(1) b(3)	Analysis, Demonstration, Test	FCR	Engineering, SIL, Dugway
FCR-286	3.2.5.2.8.2.2.1.0-1		Analysis, Test	FCR, Major Component	Engineering
FCR-288	3.2.5.2.8.2.2.2.0-1		Analysis	FCR	Engineering
FCR-290	3.2.5.2.8.2.2.3.0-1	(U) The FCR, after subjection to worst case chemical and biological contamination, as specified herein, shall be restorable to an operational condition such that use of MOPP IV gear need not be continued, after being decontaminated using JLENS specific decontamination procedures.	Analysis	FCR	Engineering
FCR-292	3.2.5.2.8.2.2.4.0-1	(U) The FCR, in the Tactical Mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* during and following exposure to NBC contaminants.	Analysis	FCR	Engineering
FCR-294	3.2.5.2.8.2.2.5.0-1	(U) The FCR design shall be such that trained and acclimatized personnel can operate and maintain external mission critical equipment while wearing a full NBC protective ensemble MOPP IV gear without further contaminating the system. Neither equipment inside the windscreen nor the SDP is considered to be external.	Inspection, Analysis	FCR	Engineering
FCR-298	3.2.6.1.1.0-1	b(3)	Analysis	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-302	3.2.6.1.1.1.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to the Railroad Transportation vibrations NGT 0.488 g rms longitudinal, 0.488 g rms vertical, and 0.488 g rms lateral, incurred while in the movement configuration, as presented in Appendix E of the JLENS System Specification.	Analysis, Test	FCR, FCS	Engineering
FCR-304	3.2.6.1.1.2.0-1	(U) The FCR, while in the appropriate operational mode, shall meet performance requirements specified in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after being subjected to rail impact static equivalent loads NGT 5.0 g longitudinal, 3.0 g vertical and 3.0 g lateral, incurred while in the movement configuration as presented in Appendix E of the JLENS System Specification. Note: The accelerations provided here are applied to the center of mass of the ISO container. Accelerations on individual components will depend on packaging.	Analysis	FCR	Engineering
FCR-307	3.2.6.1.2.1.0-1	(U) The FCR, in the Transport Mode, shall be transportable on highways defined in MIL-STD-1366D including an allowance for special permits where the limits for load, vibration, and shock are presented in Appendix E of the JLENS System Specification.	Analysis	FCR	Engineering
FCR-309	3.2.6.1.2.2.0-1	(U) The FCR, in the transport configuration, shall be transportable on secondary roads where the limits for load, vibration, and shock are presented in Appendix E of the JLENS System Specification.	Analysis	FCR	Engineering
FCR-311	3.2.6.1.2.3.0-1	(U) The FCR, in the transport configuration, shall be transportable on unimproved roads where the limits for load, vibration, and shock are presented in Appendix E of the JLENS System Specification.	Analysis	FCR	Engineering
FCR-313	3.2.6.1.2.4.0-1	(U) The FCR, in the transport configuration, shall be transportable off-road for b(3)	Analysis	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3642	3.2.6.1.2.5.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 *Subsystem Quality Factors* after exposure to the Large Assembly Transport vibration where the vibration levels are NGT those represented by the Perryman Cross-Country Course No. 1 and the mobility profile for primary, secondary and unimproved roads given in Table X of the JLENS System Specification, in the transport configuration.	Analysis	FCR	Engineering
FCR-316	3.2.6.2.1.0-1	(U) The FCR, in the transport configuration, shall be marine transportable in accordance with MIL-STD-1366D section titled Water Transportation (Load on / Load off), where load limits and vibrations are presented in Appendix E of the JLENS System Specification.	Analysis	FCR	Engineering
FCR-318	3.2.6.2.2.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to the Ship Transportation vibrations NGT 0.315 g rms longitudinal, 0.315 g rms vertical, and 0.315 g rms lateral, incurred while in the transport configuration as presented in Appendix E of the JLENS System Specification.	Analysis	FCR	Engineering
FCR-321	3.2.6.3.1.0-1	(U) The FCR, in the transport configuration, shall be transportable on C-130 (except ISOs which differ from 8' x 8' x 20'), C-5 and C-17 aircraft. The shock and vibrations experienced during C-130, C-5, and C-17 aircraft transport are presented in Appendix E of the JLENS System Specification.	Analysis	FCR	Engineering
FCR-323	3.2.6.3.2.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to the aircraft random vibrations NGT 5.17 g rms longitudinal, 5.17 g rms vertical, and 5.17 g rms lateral, incurred while in the transport configuration, as presented in Appendix E of the JLENS System Specification.	Analysis	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3697	3.2.6.4.0-1	(U) Transportation enclosures which are non-GFE and delivered as part of the FCR shall be able to withstand contamination/decontamination described herein such that it protects the equipment contained within the enclosure.	Analysis	FCR	Engineering
FCR-331	3.3.1.2.0-1	(U) The FCR shall be designed such that components containing hazardous materials listed in the EPA-17 and Class I Ozone Depleting Substances are only utilized in compliance with the JLENS Hazardous Materials Management Plan (HMMP). Note: Appendix A of the JLENS System Specification contains the aforementioned lists.	Inspection	Major Component	Engineering
FCR-3593	3.3.1.2.0-2	(U) The FCR shall have no radioactive materials which are defined by the Nuclear Regulation Commission that have greater than 0.002 microcuries per gram or activity per item equals or exceeds 0.01 microcuries.	Inspection	Major Component	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-334	3.3.2.1.0-1	(U) The FCR shall have all equipment marked in accordance with MIL-STD-130L for unique identification with the following provisos and exceptions. (U) Provisos to this requirement are: a. Only hardware and software items with a unit acquisition cost NLT $5,000. b. All hardware items with a unit acquisition cost less than $5,000 when they are serially managed, mission critical, or controlled inventory items. (U) Exceptions to this requirement are as specified in MIL-STD-130L section titled Detailed Requirements subsection titled Exemptions: a. "COTS items marked with commercial identification (firm name, logo, part number, etc.), and which present no identification difficulty may be exempt from additional marking requirements. This exemption extends to COTS items identified on a VICD." b. "Parts within an assembly or a sub-assembly, that are not subject to removal, replacement, or repair or" c. "When parts are deemed too small for the application of complete marking in accordance with MIL-STD-130L section titled Machine-readable information (MRI) marking, a logo or other abbreviated marking [will] be substituted for the design activity identification."	Inspection	Major Component	Engineering, SIL

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-2344	3.3.2.2.0-1	(U) The FCR shall have danger, caution, signs, labels, tags, and markings to warn of specific voltages, current, thermal, or physical hazards including: 1. Color code per ANSI Z535.1 2. For potentials between 70 and 500 Volts, display "WARNING" sign and list maximum voltage. 3. For potentials in excess of 500 Volts, display the "DANGER" and "HIGH VOLTAGE" signs and list maximum voltage. 4. Microwave of RF Radiation warning signs, labels, or tags should be in accordance with ANSI Z535.3, ANSI Z535.4, or ANSI Z535.5. 5. Indicate the number of persons needed to lift the item and how many pounds it weighs.	Inspection	FCR	Pelham
FCR-3421	3.3.3.0-1	(U) The ground based FCR equipment shall provide a local emergency power shutdown capability.	Demonstration	FCR	Pelham
FCR-2331	3.3.3.0-2	(U) The FCR shall comply with the applicable portions of MIL-HDBK-454A Guidelines on Personnel Hazards, Flammability, and Electrical Overload Protection.	Analysis	FCR	Engineering
FCR-3444	3.3.3.0-3	(U) The FCR shall limit personnel exposure to acoustic noise levels in accordance with MIL-STD-1474D, Steady-State Noise, Personnel Occupied Areas and MIL-STD-1472F, Acoustical Noise. Hearing protection or electronic communication may be used.	Test	FCR	Pelham
FCR-2335	3.3.3.0-4	(U) The FCR shall have catastrophic hazards mitigated by at least three barriers derived from independent sources, one of which must be a fail-safe device. Fail-safe device, barrier, and critical hazard are defined in "JLENS SSPP".	Inspection, Analysis	FCR, Major Component	Engineering, SIL, Pelham
FCR-2336	3.3.3.0-5	(U) The FCR shall have critical hazards mitigated by at least two barriers one of which must be a fail-safe device. Fail-safe device, barrier, and critical hazard are defined in "JLENS SSPP".	Inspection, Analysis	FCR, Major Component	Engineering, SIL, Pelham

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-361	3.3.3.1.0-1	(U) The FCR shall have hardware safety interlocks which cannot be overridden by software.	Inspection	FCR	Engineering
FCR-3598	3.3.3.1.0-2	(U) The FCR shall have lift points that are clearly labeled.	Inspection	FCR	Engineering, Pelham
FCR-3597	3.3.3.1.0-3	(U) The FCR shall have a configuration that prevents equipment from tipping over or falling on personnel performing operations, maintenance, or training tasks.	Inspection	FCR	Engineering, Pelham
FCR-2305	3.3.3.1.0-4	(U) The FCR shall have a maintenance platform which has built in safety features to mitigate falling hazards.	Inspection	FCR	Engineering
FCR-3596	3.3.3.1.0-5	(U) The FCR shall have floor surfaces and stair and step treads that provide non-slip characteristics.	Inspection	FCR	Engineering, Pelham
FCR-3605	3.3.3.1.0-6	(U) As a guideline, the FCR will use Commercial Off the Shelf (COTS) equipment that has been listed or certified to an appropriate commercial standard by a Nationally Recognized Test Laboratory (NRTL). Note: Examples of NRTLs are Underwriters Laboratories (UL), Canadian Standards (CSA) or TUV Rheinland (TUV). Any COTS equipment that has this certification **shall** be considered as having met the provisions of this requirement and will be accepted for use without any further modification. For any modified COTS, recertification by a NRTL will be required unless the modifications are only minor and do not alter its form, fit, or functional characteristics.	Inspection	Major Component	Engineering
FCR-2296	3.3.3.1.1.0-1	(U)The FCR shall have failsafe means to inhibit radiation if worst case radiation levels on the ground would exceed the permissible levels (controlled and uncontrolled) as specified in IEEE C95.1-2005.	Analysis, Test	FCR	Engineering, Pelham
FCR-2301	3.3.3.1.1.0-2	(U) The FCR shall cancel any transmit action that is commanded by a data path if the integrity of the data path is lost.	Analysis, Demonstration, Test	FCR	Engineering, SIL, Pelham
FCR-2302	3.3.3.1.1.0-3	(U) The FCR shall reinitialize to a non-radiating state after a safety critical hardware fault/failure.	Analysis, Demonstration	FCR	Engineering, Pelham

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-2341	3.3.3.1.2.0-1	(U) The FCR shall have physical guards to prevent inadvertent exposure of personnel to surface temperatures outside the maximum/minimum (Reference MIL-STD-1472F, section titled Thermal Contact Hazards Table XXI, or less than 0 degrees Celsius) except for surface temperatures induced by climatic environment.	Inspection, Test	FCR, Major Component	Engineering, Pelham
FCR-2307	3.3.3.1.2.0-2	(U) The FCR shall have a failsafe interlock which disables mechanical motion of the radar when maintenance is being performed on the FCR payload.	Demonstration	FCR	Pelham
FCR-2334	3.3.3.1.2.0-3	(U) The FCR equipment shall have connectors which preclude the mismating of cables in a manner which would cause malfunction, damage to equipment or hazard to personnel. Where design considerations require plug and receptacles of similar configuration in close proximity, the mating plugs and receptacles should be suitably coded or marked to clearly indicate the mating connectors.	Inspection	FCR	Engineering, Pelham
FCR-2315	3.3.3.1.2.0-4	(U) The FCR shall use self sealing connectors for coolant lines to reduce the likelihood of coolant leakage during FCR operation and maintenance as appropriate.	Inspection	FCR	Engineering
FCR-3600	3.3.3.1.2.0-5	(U) The FCR interlocks shall be fail-safe.	Analysis, Demonstration	FCR, Major Component	Engineering, Pelham
FCR-2321	3.3.3.1.2.0-6	(U) The FCR interlocks shall be self-resetting.	Demonstration	FCR	Pelham
FCR-2316	3.3.3.1.2.0-7	(U) The FCR shall mitigate overheating hazards that result in damage to equipment.	Inspection, Analysis, Test	FCR	Engineering, SIL, Pelham
FCR-2312	3.3.3.1.2.0-8	(U) The FCR shall vent battery enclosures to prevent the buildup of flammable gas, as appropriate.	Inspection	FCR	Engineering
FCR-3599	3.3.3.1.2.0-9	(U) The FCR equipment shall have door or hinged covers that are provided with stops to hold them open as appropriate.	Inspection	FCR	Pelham
FCR-2310	3.3.3.1.2.0-10	(U) The FCR shall have a combination of procedures, guards and safety devices to preclude contact with moving mechanical parts such as gears, fans, and belts during operation and maintenance.	Inspection	FCR	Engineering, Pelham

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3604	3.3.3.1.3.0-1	(U) The FCR shall have external conductive surfaces of equipment housing hazardous voltages grounded to a common static and safety ground point.	Inspection	FCR	Engineering
FCR-3603	3.3.3.1.3.0-2	(U) The FCR shall have a means to reduce the voltage at test points to less than 300V if the potential to be measured is in excess of 300V peak.	Inspection	FCR	Engineering
FCR-2325	3.3.3.1.3.0-3	(U) The FCR shall ensure that powered ends of connectors are protected from accidental contact.	Inspection	FCR	Engineering
FCR-3602	3.3.3.1.3.0-4	(U) The FCR high voltage circuits containing capacitors which store more than 0.25 joules shall have discharging devices unless they discharge to 30V or less within 2 seconds after power removal for maintenance purposes. Note: This does not apply to batteries.	Inspection, Analysis, Test	Major Component	Engineering, NFR, SIL, Pelham
FCR-2326	3.3.3.1.3.0-5	(U) The FCR shall have Ground Fault Circuit Interruptors (GFCI) for all external outlets.	Inspection	FCR	Engineering
FCR-2328	3.3.3.1.3.0-6	(U) The FCR shall have visible markings for LRUs sensitive to Electrostatic Discharge (ESD).	Inspection	Major Component	Engineering, NFR, SIL
FCR-3601	3.3.3.1.3.0-7	(U) The FCR assemblies which contain circuits operating at potentials in excess of 500 volts shall be completely enclosed with any access covers and plates equipped with non-bypassable interlocks that activate to shutdown power.	Inspection	FCR	Engineering
FCR-2324	3.3.3.1.3.0-8	(U) The FCR shall prevent shorting of circuits carrying more than 25A. Appropriate means may include guards and warning labels.	Inspection	FCR	Engineering
FCR-2319	3.3.3.1.3.0-9	(U) The FCR shall have at least 3 barriers, to preclude accidental contact under all conditions of operation and maintenance, for all potentials between 30V and 500V.	Inspection	FCR	Engineering, Pelham
FCR-2333	3.3.3.1.3.0-10	(U) The FCR equipment shall have exposed external metallic parts, surfaces, and shields, exclusive of antenna and transmission line terminals, at ground potential during normal operation as suggested in MIL-HDBK-454A, General Guidelines for Electronic Equipment, Guideline 1, Ground.	Inspection, Test	FCR	Engineering, Pelham

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-2332	3.3.3.1.3.0-11	(U) The FCR shall have a point on all electrically conductive chassis that will serve as the common tie point for static and safety grounds as suggested in MIL-HDBK-454A, General Guidelines for Electronic Equipment, Guideline 1, Ground.	Inspection	FCR	Engineering
FCR-357	3.3.3.2.1.0-1	(U) The FCR shall initialize (power-up) into a non-radiating state.	Test	FCR	Pelham
FCR-3187	3.3.3.2.1.0-2	(U) The FCR shall validate the contents of operational software executables and data files prior to execution or use.	Demonstration	Major Component	SIL
FCR-359	3.3.3.2.2.0-1	(U) The FCR shall allow the system to perform a function which inherently increases Mishap Probability only if either of the following conditions are satisfied: a. All relevant pre-requisite safety checks are passed prior to performing the potentially hazardous function. b. The overridable safety checks have been explicitly over-ridden.	Analysis	FCR	Engineering
FCR-3190	3.3.3.2.2.0-2	(U) The FCR shall execute safety critical functions to completion, barring loss of power. Exiting a safety critical function gracefully may be considered executing to completion.	Analysis, Test	FCR	Engineering, Pelham
FCR-363	3.3.3.2.3.0-1	(U) The FCR software shall provide safety critical alerts to the CPG.	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-3615	3.3.3.2.3.0-2	(U) The FCR software shall provide hazardous condition alerts to the CPG.	Analysis, Test	FCR	Engineering, SIL
FCR-3284	3.3.3.2.3.0-3	(U) The FCR shall verify correct transfer of safety critical messages. Verification may include providing acknowledgements, performing cyclic redundancy checks, or checking message protocol formats.	Analysis, Test	FCR	Engineering, SIL
FCR-3184	3.3.3.2.3.0-4	(U) The FCR software shall provide safety critical alerts that are distinct from routine alerts.	Analysis, Demonstration	FCR, Major Component	Engineering, SIL
FCR-367	3.3.3.2.4.0-1	(U) The FCR shall provide for a safe shutdown when so commanded by the associated CPG.	Analysis, Demonstration, Test	FCR, Major Component	NFR, SIL, Pelham

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-2264	3.3.4.0-1	(U) The FCR shall have spacing of connectors and controls external to the windscreen that is compatible with maintenance in cold weather/MOPP IV protective clothing as specified in MIL-STD-1472F, section titled Spacing.	Inspection	Major Component	Engineering
FCR-2266	3.3.4.0-2	(U) The FCR shall have controls using the guidance of MIL-STD-1472F, section titled Controls.	Inspection	Major Component	Engineering
FCR-3590	3.3.4.0-3	(U) The FCR shall present visual signals using the guidance of MIL-STD-1472F, section titled Visual Displays.	Inspection	Major Component	Engineering
FCR-2268	3.3.4.1.0-1	(U) The FCR shall have reach access for inserting, adjusting, and/or removing a unit or assembly as specified in MIL-STD-1472F, section titled Physical Access.	Inspection	FCR	Engineering
FCR-2269	3.3.4.1.0-2	(U) The FCR replacement units, assemblies, and connectors shall meet the insertion, removal, and grip force requirements in MIL-STD-1472F, section titled Design for Maintainer.	Inspection	Major Component	Engineering
FCR-2270	3.3.4.1.0-3	(U) The FCR shall have visual access for corrective and preventative maintenance tasks as specified in MIL-STD-1472F, section titled Visual Access.	Inspection	Major Component	Engineering
FCR-2271	3.3.4.1.0-4	(U) The FCR shall have access openings and clearance dimensions for inserting, adjusting, and/or removing a unit or assembly as specified in MIL-STD-1472F, section titled Physical Access.	Inspection	Major Component	Engineering
FCR-2272	3.3.4.1.0-5	(U) The FCR units and assemblies shall be configured for removal, carry, and replacement as specified in MIL-STD-1472F, section titled Weight.	Inspection	Major Component	Engineering
FCR-2273	3.3.4.1.0-6	(U) The FCR shall have interchangeable line replacement units as specified in MIL-STD-1472F, section titled Design for Maintainer.	Inspection	Major Component	Engineering
FCR-3715	3.3.4.1.0-7	(U) The FCR shall have spacing of connectors and controls internal to the windscreen that is compatible with maintenance in cold weather gear as specified in MIL-STD-1472F, section titled Spacing.	Inspection	Major Component	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3714	3.3.4.1.0-8	(U) The FCR hardware internal to the windscreen shall be maintainable and supportable by the 5th to 95th percentile of Army personnel while wearing combat gear and protective clothing (cold weather gear) in accordance with MIL-STD-1472F, sections titled Physical Accommodation and Workspace Design.	Inspection	FCR	Engineering
FCR-3713	3.3.4.1.0-9	(U) The FCR hardware external to the windscreen shall be maintainable and supportable by the 5th to 95th percentile Army personnel while wearing combat gear and protective clothing (cold weather gear, Mission Oriented Protective Posture (MOPP) IV gear) in accordance with MIL-STD-1472F, sections titled Physical Accommodation and Workspace Design.	Inspection	FCR	Engineering
FCR-375	3.3.5.1.1.0-1	(U) The FCR shall use approved IA products or IA-enabled products for all information system security functions.	Inspection	FCR	Engineering
FCR-4069	3.3.5.1.1.0-2	b(3)	Analysis, Test	FCR	Engineering, Pelham
FCR-4068	3.3.5.1.1.0-3	b(3)	Analysis, Test	FCR	Engineering, Pelham
FCR-377	3.3.5.1.1.0-4	b(3)	Inspection	FCS	Pelham
FCR-379	3.3.5.1.1.0-5	b(3)	Inspection	FCS	Pelham
FCR-381	3.3.5.1.1.0-6	(U) The FCR shall only use binary or machine executable public domain software products or other software products, such as those commonly known as freeware of shareware, that have been assessed for information assurance impacts or which have been approved by the DAA.	Inspection	FCS	Pelham

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-4070	3.3.5.1.1.0-7	(U) The security support structure of the FCR shall be isolated. Means of isolation may include the use of partitions and/or domains that control of, access to, and integrity of hardware, software, and firmware that perform security functions.	Inspection, Test	FCR	Pelham
FCR-4071	3.3.5.1.2.0-1	b(3)	Inspection, Demonstration	FCR	Pelham
FCR-385	3.3.5.1.2.0-2	b(3)	Inspection	FCR	Pelham
FCR-398	3.3.5.1.2.0-3	b(3)	Analysis	Major Component	Engineering
FCR-390	3.3.5.1.2.0-4	(U) The FCR shall implement virus protection for all servers, workstations, and mobile computing devices.	Inspection, Analysis, Test	FCR	Pelham
FCR-402	3.3.5.2.0-1	b(3)	Inspection	FCR	Engineering
FCR-404	3.3.5.3.0-1	b(3)	Analysis, Test	Major Component	Engineering, Pelham
FCR-409	3.5.2.1.1.0-1	b(3)	Analysis	FCR	Engineering
FCR-411	3.5.2.2.0-1	b(3)	Analysis	FCR	Engineering
FCR-416	3.5.4.0-1	(U) The FCR shall be designed to use military lifting and handling equipment, unless the government approves justification for non-military equipment.	Analysis	FCR	Engineering
FCR-417	3.5.4.0-2	(U) The FCR shall be designed such that standard military vehicles can be used for handling.	Inspection	FCR	Engineering

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-420	3.5.5.1.0-1	b(3)	Analysis	FCR	Engineering
FCR-422	3.5.5.2.0-1	b(3)	Analysis	FCR	Engineering
FCR-3288	3.7.1.0-1	b(3)	Test	FCR, Major Component	NFR, SIL, Pelham
FCR-967	3.7.1.0-2	b(1)	Test	Major Component	NFR, SIL
FCR-4037	3.7.1.0-3	b(3)	Test	Major Component	NFR, SIL
FCR-3438	3.7.1.0-4	b(3)	Test	FCR, Major Component	SIL
FCR-3437	3.7.1.0-5	b(3)	Analysis, Test	Major Component	NFR, SIL
FCR-3717	3.7.1.0-5.0-1	b(1)	Analysis, Test	FCR, Major Component	Engineering, NFR

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~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3716	3.7.1.0-6	b(1)	Analysis	FCR	Engineering
FCR-1109	3.7.1.1.1.0-1	(U) The AEU requirements shall apply in the operating environment of the aerostat, including the windscreen, confluence lines, and lightning cage.	Analysis	Major Component, FCS	Engineering
FCR-975	3.7.1.1.2.0-1	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-976	3.7.1.1.2.0-2	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-977	3.7.1.1.2.0-3	b(1)	Analysis	Major Component	Engineering
FCR-978	3.7.1.1.2.0-4	b(1)	Analysis	Major Component	Engineering
FCR-980	3.7.1.1.3.0-1	b(3)	Analysis, Test	Major Component	Engineering, NFR
FCR-981	3.7.1.1.3.0-2	b(3)	Analysis, Test	Major Component	Engineering, NFR

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~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-983	3.7.1.1.3.0-5	b(3)	Analysis, Test	Major Component	Engineering, NFR
FCR-984	3.7.1.1.3.0-6	b(3)	Analysis, Test	Major Component	Engineering, NFR
FCR-986	3.7.1.1.3.0-7	b(3)	Analysis, Test	Major Component	Engineering, NFR
FCR-987	3.7.1.1.3.0-8	b(3)	Analysis, Test	Major Component	Engineering, NFR
FCR-990	3.7.1.1.4.0-1	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-3296	3.7.1.1.5.0-2	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-3313	3.7.1.1.5.0-3	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-3297	3.7.1.1.5.0-4	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-3314	3.7.1.1.5.0-5	b(1)	Analysis, Test	Major Component	Engineering, NFR, SIL
FCR-994	3.7.1.1.6.1.0-1	b(3)	Analysis, Test	Major Component	Engineering, NFR
FCR-1013	3.7.1.1.7.1.0-1	b(3)	Analysis, Test	Major Component	Engineering, NFR

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ID	Paragraph	FCR Text	Verification Method	Verification Level	Verification Location
FCR-1017	3.7.1.1.7.2.0-1	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-3298	3.7.1.1.7.2.0-2	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-1018	3.7.1.1.7.2.0-3	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-3299	3.7.1.1.7.2.0-4	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-1020	3.7.1.1.7.3.0-1	b(1)	Analysis	Major Component	Engineering
FCR-1021	3.7.1.1.7.3.0-2	b(1)	Analysis	Major Component	Engineering
FCR-1023	3.7.1.1.7.4.0-1	b(1)	Analysis, Test	Major Component	Engineering, NFR

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3708	3.7.1.1.7.4.0-2	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-1024	3.7.1.1.7.4.0-3	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-3711	3.7.1.1.7.4.0-4	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-1026	3.7.1.1.7.4.0-5	b(1)	Analysis, Test	Major Component	Engineering, NFR

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3709	3.7.1.1.7.4.0-6	b(1) b(3) b(3)	Analysis, Test	Major Component	Engineering, NFR
FCR-1029	3.7.1.1.7.5.0-1		Inspection	FCR	Engineering
FCR-1031	3.7.1.1.7.6.0-1		Analysis, Test	Major Component	Engineering, NFR
FCR-1033	3.7.1.1.7.7.0-1	(U) The AEU pointing errors, relative to the array face, shall be as defined in Table XV.	Analysis, Test	Major Component	Engineering, NFR
FCR-1037	3.7.1.1.7.8.0-1	b(1) b(1) b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-1038	3.7.1.1.7.8.0-2		Analysis, Test	Major Component	Engineering, NFR
FCR-1040	3.7.1.1.7.9.0-1		Analysis, Test	Major Component	Engineering, NFR

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3710	3.7.1.1.7.9.0-1.0-1	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-1041	3.7.1.1.7.9.0-2	b(1)	Analysis, Test	Major Component	Engineering, NFR
FCR-1043	3.7.1.1.7.10.0-1	b(1)	Analysis	Major Component	Engineering
FCR-1072	3.7.1.2.1.1.0-1	b(3)	Test	Major Component	SIL
FCR-1112	3.7.1.2.1.1.0-3	b(1)	Test	Major Component	SIL
FCR-1080	3.7.1.2.2.1.0-1	b(1)	Test	Major Component	SIL
FCR-1081	3.7.1.2.2.1.0-2	b(1)	Test	Major Component	SIL

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-1083	3.7.1.2.2.2.0-1	b(1) b(3)	Test	Major Component	SIL
FCR-1088	3.7.1.2.2.3.0-1		Test	Major Component	SIL
FCR-1092	3.7.1.2.3.1.0-1	b(1)	Test	Major Component	SIL
FCR-1094	3.7.1.2.3.2.0-1	b(1)	Test	Major Component	SIL
FCR-4092	3.7.1.2.4.0-1	b(1)	Analysis	Major Component	Engineering
FCR-946	3.7.1.3.1.0-1	b(3)	Test	Major Component	Pelham
FCR-948	3.7.1.3.1.0-2	b(3)	Test	Major Component	Pelham
FCR-950	3.7.1.3.2.0-1	b(3)	Test	Major Component	Pelham
FCR-952	3.7.1.3.2.0-2	b(3)	Analysis, Test	Major Component	Engineering, Pelham

~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-953	3.7.1.3.2.0-3	(U) Limit switches shall be provided to prevent damage to the elevation drive due to overtravel.	Test	Major Component	Pelham
FCR-954	3.7.1.3.2.0-4	(U) Mechanical stops shall be provided to prevent damage to the elevation drive due to overtravel.	Test	Major Component	Pelham
FCR-958	3.7.1.3.3.0-1	(U) The Gimbal and damper assembly shall restrict the motion of the FCR payload to prevent damage to the platform in winds up to 148 km/hr (80 knots) and 3.05 m/s (10 fps) turbulence	Analysis, Test	Major Component	Engineering, Pelham
FCR-3319	3.7.1.4.0-1	(U) The INS shall provide position and orientation data.	Test	Major Component	Vendor
FCR-933	3.7.1.4.0-2	(U) The INS shall provide attitude data b(3)	Test	Major Component	Vendor
FCR-934	3.7.1.4.0-3	(U) The INS shall be capable of alignment in b(3)	Test	Major Component	Vendor
FCR-935	3.7.1.4.0-4	(U) The INS determination of the three Euler angles (or, equivalently, the pitch, roll and yaw angles) of the receive antenna reference plane shall be as shown in Table XIX after INS alignment. b(3)	Analysis, Test	FCR, Major Component	Engineering, NFR, Dugway, Vendor
FCR-3575	3.7.1.5.0-1	(U) The GPS shall provide measurements with a position error b(3)	Analysis, Test	Major Component	Engineering, Vendor
FCR-3320	3.7.1.6.0-1	(U) The IFF Interrogator's field of view shall be aligned with the field of view of the radar.	Inspection, Analysis, Demonstration	FCR	Engineering, Pelham, Dugway
FCR-3321	3.7.1.6.0-2	(U) The IFF Interrogator's azimuth coverage shall be b(3)	Analysis, Demonstration	Major Component, FCS	Dugway, Vendor
FCR-3441	3.7.1.6.0-3	(U) The IFF Interrogator's elevation coverage shall be b(3)	Analysis	Major Component	Vendor
FCR-3324	3.7.1.7.0-1	(U) The LPM shall provide b(3) currents caused by lightning strikes.	Analysis, Test	FCR, Major Component	Engineering, Vendor

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3195	3.7.1.8.1.0-1	(U) The REG PDU shall provide power to all airborne FCR hardware components.	Inspection	FCR	Engineering
FCR-3327	3.7.1.8.3.0-2	(U) The SCU shall provide stable azimuth loop compensator characteristics when commanded by the SDP.	Demonstration, Test	FCR, Major Component	Pelham
FCR-3329	3.7.1.8.3.0-3	(U) The SCU shall provide continuous stable elevation loop compensator characteristics for the operational wind conditions.	Demonstration, Test	FCR, Major Component	Pelham
FCR-3328	3.7.1.8.3.0-4	(U) The SCU shall provide azimuth and elevation motor brake control.	Test	FCR	Pelham
FCR-908	3.7.1.9.0-1	(U) The HEU shall regulate the operating temperature of the b(3) and REG.	Test	FCR	Pelham
FCR-914	3.7.1.9.0-2	(U) The HEU, when the FCR is operating in the tactical mode or during calibration shall have an outlet temperature between 30°C and 40°C	Analysis, Demonstration, Test	FCR, Major Component	Engineering, Dugway, Vendor
FCR-918	3.7.1.9.0-3	(U) The HEU shall provide a heating element capable of heating the REG and b(3 to operational temperature from an ambient temperature of b(3) . Above 0°C the b(3 and REG are powered to provide additional heating to meet this requirement.	Analysis	Major Component	Engineering
FCR-3443	3.7.1.9.0-4	(U) The HEU shall provide a cooling element to assist in cooling the REG and b(3) to operational temperature from an ambient temperature of b(3) Note: the FCS Platform chiller assists in cooling the equipment.	Analysis	Major Component	Engineering
FCR-3488	3.7.1.10.0-1	(U) The SDP shall include multiple CPUs, thereby enabling parallel processing.	Inspection	Major Component	Engineering
FCR-3489	3.7.1.10.0-2	(U) The SDP shall include removable disk drives.	Inspection	Major Component	Engineering
FCR-3490	3.7.1.10.0-3	(U) The SDP shall include a tape drive.	Inspection	Major Component	Engineering
FCR-3491	3.7.1.10.0-4	(U) The SDP shall provide the capability to transfer data from disk to tape.	Demonstration	FCR	SIL

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ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3492	3.7.1.10.0-5	b(3)	Analysis	FCR	Engineering
FCR-3493	3.7.1.10.0-6	b(3)	Analysis	Major Component	Engineering
FCR-3494	3.7.1.10.0-7	b(3)	Inspection	Major Component	Engineering
FCR-3461	3.7.2.1.0-1	(U) The BSG software shall compute beam steering coefficients in response to radar pointing and beam definition commands.	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-3463	3.7.2.2.0-1	(U) The CCP software shall provide the interface between the FCR and the FCS CPG in accordance with the JLENS System IRS.	Test	FCR	SIL
FCR-3464	3.7.2.3.0-1	(U) The DCA software shall have commandable levels of data recording which include a minimum level, a full test level, and a maximum of NLT two intermediate levels.	Test	FCR	SIL
FCR-3462	3.7.2.4.0-1	(U) The ESM software shall support calibration/alignment of the b(3)	Analysis, Test	FCR	Engineering, NFR
FCR-3465	3.7.2.4.0-2	(U) The ESM software shall perform FCR software state control.	Test	Major Component	SIL
FCR-3498	3.7.2.4.0-3	(U) The ESM software shall determine b(3) non-functional and send status to MAP.	Test	FCR	Pelham
FCR-3499	3.7.2.4.0-4	(U) The ESM software shall determine b(3) non-functional.	Test	FCR	Pelham
FCR-3501	3.7.2.4.0-5	b(3)	Test	FCR	Pelham
FCR-1067	3.7.2.5.0-1	(U) The MAP software shall b(3) as commanded by the CPG.	Test	Major Component	SIL

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~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-931	3.7.2.5.0-2	(U) The MAP software shall support [redacted] Note: The [redacted] will only be enabled if testing determines [redacted]	Test	Major Component	SIL
FCR-3439	3.7.2.5.0-3	(U) The MAP software shall translate an ECR state vector commanded in an IFF interrogation request from the CPG into IFF body coordinates for commanding the CIT to perform the interrogation.	Test	Major Component	SIL
FCR-3504	3.7.2.5.0-4	(U) The MAP shall have the capability to [redacted]	Test	Major Component	SIL
FCR-1066	3.7.2.5.0-5	[redacted]	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-1123	3.7.2.5.0-6	(U) The MAP software shall have the capability to [redacted]	Test	Major Component	SIL
FCR-3208	3.7.2.5.0-7	(U) The MAP software shall perform position and orientation estimation and data alignment / registration incorporating data from [redacted]	Test	Major Component	SIL
FCR-858	3.7.2.5.0-8	[redacted]	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-3505	3.7.2.5.0-9	(U) The MAP software shall have the capability [redacted]	Test	Major Component	SIL
FCR-3506	3.7.2.5.0-10	(U) The MAP software shall [redacted]	Test	Major Component	SIL

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~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-857	3.7.2.5.0-11	(U) The MAP software automatic [redacted] shall be dependent on the radar configuration as provided by the CPG.	Test	Major Component	SIL
FCR-3292	3.7.2.5.0-12	(U) The MAP software shall [redacted]	Test	Major Component	SIL
FCR-3293	3.7.2.5.0-13	(U) The MAP software shall command [redacted]	Test	Major Component	SIL
FCR-3427	3.7.2.5.0-14	[redacted]	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-3500	3.7.2.5.0-15	(U) The MAP software shall respond to [redacted]	Test	Major Component	SIL
FCR-3507	3.7.2.5.0-16	(U) The MAP software shall have the capability to support calibration/recalibration of the hardware.	Test	FCR	NFR, SIL
FCR-3467	3.7.2.6.0-1	[redacted]	Demonstration	FCR	Pelham
FCR-3468	3.7.2.6.0-2	[redacted]	Test	FCR	SIL
FCR-3469	3.7.2.6.0-3	[redacted]	Test	FCR	SIL
FCR-3581	3.7.2.6.0-4	[redacted]	Analysis, Test	FCR	Engineering, SIL, Pelham
FCR-3582	3.7.2.6.0-5	[redacted]	Analysis, Test	FCR	Engineering, SIL, Pelham

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~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3583	3.7.2.6.0-6	b(3)	Analysis, Test	FCR	Engineering, SIL, Pelham
FCR-3445	3.7.2.7.0-1	b(3)	Analysis, Test	Major Component	Engineering, SIL
FCR-3446	3.7.2.7.0-2	b(3)	Analysis, Test	Major Component	Engineering, SIL
FCR-3574	3.7.2.7.0-3	b(3)	Test	Major Component	SIL
FCR-3470	3.7.2.7.0-4	b(3)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-3471	3.7.2.7.0-5	b(3)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-3472	3.7.2.7.0-6	b(3)	Analysis, Test	FCR, Major Component	Engineering, SIL
FCR-3502	3.7.2.7.0-7	(U) The SPS software shall respond to a notification of a b(3) corresponding to the appropriate case. In the absence of such a condition, the SPS will use b(3)	Test	FCR	SIL
FCR-3509	3.7.2.7.0-8	b(1) b(3)	Analysis, Test	FCR, Major Component	Engineering, SIL

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~~SECRET/NOFORN~~					
ID	**Paragraph**	**FCR Text**	**Verification Method**	**Verification Level**	**Verification Location**
FCR-3508	3.7.2.7.0-9	(U) The SPS software shall have the capability to process calibration data.	Test	Major Component	SIL
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5 (U) Preparation for Delivery

(U) This section is not applicable to this document.

6 (U) Notes

6.1 (U) Acronyms

~~SECRET / NOFORN~~	
Acronym	Phrase/Term
[O]	Objective Requirements
A	Analysis
A	Ampere
ABCS	Army Battle Command System
ABT	Air Breathing Target
ADL	Advanced distributed learning or armistice demarcation line or XX (SL) routing
[redacted]	b(3)
AEU	Antenna Equipment Unit
AFB	Air force Base
AGL	Above Ground Level
AMA	Antenna Mount Assembly
AMDPCS	Air and Missile Defense Planning and Control Station
[redacted]	b(3) b(3) b(3)
Ao	Operational Availability
AR-25-2	Army Regulation 25-2
ARDD	Automatic Rapid Deflation Device
[redacted]	b(3) b(3)
A-Specification	System Specification
[redacted]	b(3) b(3)
BADGER	type of aircraft
[redacted]	b(3) b(3) b(3)
BM/C4I	Battle Management Command, Control Communication, Computers and Intelligence
BSG	Beam Steering Generator
C	Celsius
C2	Command and Control
C4I	Command, Control, Communications, Computers and Intelligence
CARC	Chemical Agent Resistant Coating
CCP	Communications and Control Processing

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CCS	Communications and Control Shelter
CDS	Cross Domain Solutions
CEC	Corporative Engagement Capability
CEP	Circular Error Probability
CHS	Common Hardware and Software
CID	Combat Identification
CIO	Chief Information Officer
cm	centimeter
COTS	Commercial Off-the-Shelf
[redacted] b(3)	
CPG	Communications and Processing Group (Prime Item)
CPG DPS	Communications and Processing Group Data Processing Shelter
D	Demonstration
dB	Decibels
dBsm	Decibels Referenced To One Square Meter
dBW	Decibel Watts
DCA	Data Collection & Analysis
DDU	Data Distribution Unit
deg	Degrees
DIS	Distributed Interactive Simulation
DISN	Defense Information Systems Network
DISR	Department of Defense Information Technology Standards Registry
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DOT	Department of Transportation
E3	Electromagnetic environment effects
EA	Electronic Attack
[redacted] b(3)	
EED	Electro explosive Device
EID	Electronically-Initiated Device
EMCON	Emission Control
EME	electromagnetic environment
EO/IR	Electro-Optical Infra-red
EOD	explosive ordnance disposal
[redacted] b(3)	
EPA-17	Environmental Protection Agency 17 Targeted Chemicals (selected for reduction or elimination)
ERP	Effective Radiated Power

~~SECRET / NOFORN~~	
ESD	electrostatic discharge
ESM	Equipment Status Monitor
EU	European Union
F	Frequency
FAA	Federal Aviation Administration
FCS	Fire Control System
FL	Florida
fps	feet per second
ft	foot/feet
GATM	Global Air Traffic Management
GBJ	ground-based jammers
GHz	Gigahertz
GPFU	Gas Particulate Filter Unit
GPS	Global Positioning System
Gs	gravities
GSE	Ground Support Equipment
[redacted]	b(3)
HEU	Heat Exchanger Unit
HLA	High Level Architecture
[redacted]	b(3)
HMMP	Hazardous Materials Management Plan
hr	hour
I	Inspection
IA	Information Assurance
IAW	In Accordance With
[redacted]	b(3)
IBS	Integrated Broadcast Systems
IBSI	Integrated Broadcast Systems Instruction
IDS	Intrusion Detection System
IETM	interactive electronic technical manuals
IFF	Identification Friend or Foe
INS	Inertial Navigation System
ISDN	integrated services digital network
ISO	International Standards Organization
[redacted]	b(1)
JLENS	Joint Land Attack Cruise Missile Defense Elevated Netted Sensor
JNN	Joint Network Node
JPS	JLENS Performance Specification
JRE	Joint Range Extension

~~SECRET / NOFORN~~	
b(3)	
kft	kilo-feet
km	kilometer
kVA	kilo-Volt-Amperes
LACM	Land Attach Cruise Missile
lb	pound
LCR	Large Caliber Rocket
LEMP	Lightning induced Electro-Magnetic Pulse
LO	Local Oscillator
LPE	Launch Point Estimates
LRU	Line Replaceable Unit
m	Meters
MAP	Mission Application Processing
MHz	Megahertz
MILSATCOM	Military Satellite Communications
MIL-STD	Military Standard
mm	millimeter
MMD	Mass Median Diameter
MSE	Mobile Subscriber Equipment
MSL	Mean Sea Level
MTBSA	Mean Time Between System Aborts
MTTR	Mean Time To Repair
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological and Chemical
NCI	Non-Coherent Integration
b(3)	
NDI	Non-Developmental Item
NFOV	Narrow Field of View
b(3)	
NGT	Not Greater Than
NISPOM	National Industrial Security Program Operating Manual
NIST	National Institute of Standards and Technology
NLT	Not Less Than
NM	New Mexico
NSA	National Security Agency
PAC-3	PATRIOT Advanced Capability - 3
Pd	Probability of Detection
PD	Probability of Detection, same as Pd.
b(3)	

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PE	Probability of Evaluation
Pfa	Probability of False Alarm
PIDS	Prime Item Development Specification
PMCS	Preventative Maintenance Checks and Services
POP	Performance Oriented Packaging
PPLI	Precise Position and Location Indicator
[redacted]	b(3) b(3)
RCS	Radar Cross Section
[redacted]	b(1) b(3) b(3)
RF	Radio Frequency
RMS	root mean square
RVM	Requirements Verification Matrix
S	Secret
s	second
S/NF	Secret No Foreign Nationals
[redacted]	b(3) b(7)(e) b(3)
SCU	Servo Control Unit
SDP	Signal Data Processor
SHF	Super High Frequency
SINR	signal-to-interference plus noise ratio
SIPRNET	Secure Internet Protocol Router Network
[redacted]	b(3) b(3) b(3)
SMT	Surface Moving Target
SOJ	Stand Off Jamming
[redacted]	b(3)
SPS	Signal Processing
[redacted]	b(3)
STAR	System Threat Assessment Report
SATCOM	Satellite Communications
[redacted]	b(3)
STE	Secure Telephone Equipment
STU	Secure Telephone Unit

~~SECRET / NOFORN~~	
b(3)	
T	Test
TACSAT	tactical satellite
TADIL J	Tactical Data Information Link J
TBM	Tactical Ballistic Missile
TBR	to be refined
TEMPEST	Transient Electromagnetic Pulse Surveillance Technology
TIDP	Tactical Interface Description Product
TLE	Target Location Error
b(3)	
TTP	Tactics, Techniques and Procedures
b(3)	
U	Unclassified
UHF	Ultra High Frequency
UPS	Uninterruptible Power Supply
USMCEB	U.S. Military Communications-Electronics Board
USMTF	United States Message Text Format
UT	Utah
V	volts
VCID	Virtual Channel Identifier
VFR	Visual Flight Rules
VMF	Variable Message Format
b(1)	
WFOV	Wide Field of View

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6.2 (U) Glossary of Definitions

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Term	Definition/Meaning
50% reserve	It means that the system can use 66 2/3% for each computer leaving 33 1/3% as the reserve.
accept	The term 'accept' is used in the context of a software interface to indicate that the software item that receives the message ('the receiver') acknowledges receipt (to the 'sender') and processes the contents of the message.
Act upon	The receiving prime item will acknowledge the receipt of a command/message and either place the item into its time line or respond that it will not comply.

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Aerostat	The aerostat is an aerodynamically shaped, lighter-than-air vehicle that is buoyed aloft using helium as the lifting gas. The buoyant lift supports the total weight of the payload, the aerostat, electronics and tether. The aerostat is operated with sufficient lift to provide a margin of safety against precipitation consisting of rain and snow, and atmospheric turbulence.
	b(3)
Aerostat recovery	b(3)
	b(3)
	b(3)
	b(3)
Altitude	For the purposes of the JLENS Orbit, and it's components, altitude is considered to be the vertical distance measured from mean sea level, unless otherwise stated.
ambiguity group	A single ambiguity group is defined as no greater than five line replaceable units (LRUs).
appropriate operational mode	A mode of the system's operational state which is required for performing a function.
associated	When referring to a Prime Item or portion thereof, the term associated means that it is the configured into the same system (Surveillance or Fire Control). For example, in the Surveillance System, if the CPG is sending a message to the associated radar then the radar would be the SuR.
Asynchronous coherencies	b(3)
Availability	The state when data are in the place needed by the user, at the time the user needs them, and in the form needed by the user.
	b(3)
Barrier	Any mitigation technique which reduces the probability of a hazard or lessens the severity of a hazard. A mitigation technique can be a safety device (i.e. interlock), warning system, procedure, label, or training program.
Battle Management	Automated responses to command and control (C2) system control directives. Responses may include or incorporate fusion data from one or more sources or sensors, automated weapon tasking and information for summaries of performance assessment.
be protected	Equipment is packaged or assembled in a manner such that no repair is required to assemble and perform to specifications after this event.
benign weather	clear weather and air
	b(3)
	b(3)

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By-passable Interlock	A bypassable interlock is an automatic switch with a manually operated electrical bypass device to allow equipment maintenance operations on energized equipment.
Catastrophic hazard	Could result in death, permanent total disability, loss exceeding $1M, or irreversible severe environmental damage that violates law or regulation.
Classification	The process and result of determining the type of platform represented in a track through an analysis of target characteristics. A classification includes whether or not a target is manned or unmanned, fixed or rotary wing, Flogger or F-15, and tracked or wheeled vehicles. Note classification is not part of the IFF interrogations.
clear weather and air conditions	b(3)
Clutter Track	A track on any item defined in Appendix C.1 of the JLENS System Specification.
Combat Identification	b(3)
Command and Control	The exercise of authority and direction by a properly designated commander over assigned forces in the accomplishment of the mission.
Command, Control, Communications, Computers Node	The physical and functional grouping of communications and computer system that provide terminating, switching, and gateway access services to support information exchange.
Communications Connectivity	The degree to which communications can be maintained throughout the chain of command.
Condition Based Maintenance (CBM)	An estimation of Remaining Useful Life of a device based on information linked to the mission cricical failure mode(s) that represents the severity of the failure mode(s) as a function of time
configuration (for manual update)	The ability to modify mission profiles received from higher echelon.
Commercial or conventional aircraft	b(3)
Critical hazard	Could result in permanent partial disability, injuries or occupational illness that may result in hospitalization of at least three personnel, loss exceeding $200K but less than $1M, or reversible environmental damage causing a violation of law or regulation.
critical failures	Those failures which result in a system abort.
Cross Domain Solutions	An Information Assurance solution that provides the ability to manually and /or automatically access and/or transfer data between two or more differing security domains.
Cruise missile	Classification category for unmanned, low flying targets
DAA	(1) Designated Approving Authority (2) Designated Accrediting Authority (3) Delegated Accrediting Authority
Data Registration	A process whereby data developed in a fire unit / radar coordinate system is sent externally via Link 16 or other networks to a system (or systems) with different coordinate framework, thus introducing errors.

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Data Types	Initialization parameters, changed parameters, operator intervention, external messages, track data, status, CID-related products, b(3) voice communications, operator video screens/positions, organic weather data.
Day/Night Capabilities	Day capabilities require the ability to receive reflected energy. Night capabilities require the capability to receive radiated energy.
Defense in Depth	DiD encompasses a physical and logical structure that requires a layering of security policies, procedures, and technology mechanisms to protect network resources, from the desktop to the enterprise, within and across the enterprise architecture. Layered defenses include, but are not limited to, the installation of IA policy protections complementing the use of proxy services, firewalls, IDSs, implementation of Demilitarized Zones (DMZs), redundant filtering policies across devices, and access control and accountability.
Degradation	When radar windscreen and/or radiating elements are coated with dust, fungus, salt, sand, water or ice, radar performance degradations is permitted until the windscreen/radiating elements have been thoroughly cleaned and/or dried, and if appropriate evaluated.
Degrade	To make inferior to the normal condition, to damage. Denotes a reduction in inherent capabilities compared to those of the undegraded normal condition
Designated Track	b(3)
Detection	A process by which the sensor determines the existence and location of a target in sufficient detail to initiate a track without a priori knowledge of the target.
Discrimination	The process of determining whether a track is aerial or surface.
distributed evenly (in azimuth and elevation)	
Doctrine	Standard Tactics, techniques and procedures (TTP) defined for each branch of the joint armed forces, and within each.
Electromagnetic Environment Effects (E3)	The impact of electromagnetic environments on the operational capability of military forces, and equipment. This encompasses compatibility, interference, vulnerability, EMP, protection, personnel hazards, ordnance, volatile materials, and natural phenomenon.
Electronic Attack	A type of warfare employing electromagnetic, directed energy, to attack personnel, facilities or equipment
Enclave	A total network made up of all the interconnected computer systems, communication systems, and network components within some logical boundary, usually a boundary device such as a router or firewall.

b(3)

Erroneous Tracks	The combined number of false and stationary clutter tracks.
External	When related to NBC, external refers to areas outside of enclosures, the windscreen, etc. which are already contaminated.
Fail-safe	The design feature of a part, unit or equipment which allows the item to fail only into a non-hazardous mode.
Fail-Safe Safety Device	A safety device (i.e. by-passable interlock) which if fails, does not allow the system to be in a hazardous mode. A fail-safe safety device can be implemented by use of two independent redundant safety devices which have the ability to indicate that one is failed.
Failure	The loss of ability of a system, device or process to perform a required function. The manifestation of a fault.
Failure Isolation	The process of determining the location of a fault to the extent necessary to effect repair.

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False Tracks	A track which occurs when nothing exists.
Fault	A condition within a system, device or process which causes lack of ability to perform a required function. The root cause of a failure.
Field of Regard	The defined azimuth and elevation over which the JLENS Systems (SuS and FCS) can detect and track a target.
Fire Control Radar	Radar used to provide target information inputs to a weapon fire control system
Fire Control Support	Providing target location and trajectory information of sufficient quality to be used by the weapon system performing the engagement
frame time	The time period over which all beams covering a particular surveillance sector are to be executed.
Freeware	Computer software that is made available free of charge, but which is copyrighted by its developer, who retains the rights to control its distribution, modify it and sell it in the future. It is typically distributed without its source code, thus preventing modification by its users.
functionally operational	The FCS has been fully assembled and the FCR has been brought to the necessary temperature for ground testing, undergone ground tests, and is ready to launch provided ground test results are acceptable.
[redacted]	b(3)
ground support equipment	Equipment which is used on the ground to support the system functions. They include modules for power conversion, power distribution, cable storage, weather monitoring equipment, and special test equipment as a subset.
hardness	When applied to NBC, hardness is defined as the ability of a material to resist damaging effects from both chemical and biological agents and decontaminating chemicals and procedures. Hardness applies to the characteristics of a material essential to perform mission critical functions.
Hash	Value computed on data to detect error or manipulation.
Hazard	Any real or potential condition that can cause injury, illness, or death to personnel; damage to or loss of a system, equipment or property; or damage to the environment. Hazards are classified into Mishap Risk Categories by the System Safety Working Group voting members.
Hazardous Condition	a. Follows from the definition of *Hazard*, see 6.2 *Hazard* b. A condition which is the result of not being in a safe state
High Power Radar Actions	Any [redacted] b(3) in an NFOV or WFOV configuration, regardless of its duty factor
High Risk	(IA) If an observation or finding is evaluated as high risk, there is a strong need for corrective measures. An existing system may continue to operate, but a corrective action plan must be put in place as soon as possible.

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High-robustness	Robustness describes the strength of mechanism (e.g., the [redacted] and assurance properties (i.e., confidence measures taken eto ensure proper mechanism implementation) for an IA solution. The more robust a particular component is, the greater level of confidence in the protection provided to the security services it supports. High robustness security services and mechanisms provide, thorugh rigorous analysis, the most confidence in those security meachanisms. Generally, [redacted]
IA product	Product or technology whose primary purpose is to provide security services (for example, confidentiality, authentication, integrity, access control, or non-repudiation of data); correct known vulnerabilities; or provide layered defense against various categories of non-authorized or malicious penetrations of information systems or networks. Examples include such products as data/network encryptors, firewalls, and intrusion detection devices.
IA-enabled product	Product or technology whose primary role is not security, but which provides security services as an associated feature of its intended operating capabilities. Examples include such products as security-enabled web browsers, screening routers, trusted operating systems, and security-enabled messaging systems.
Information system	Any equipment or interconnected system or subsystems of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data and that includes computer software, firmware, and hardware. Included are computers, word processing systems, networks, or other electronic information handling systems and associated equipment.
In-band frequencies	In-band frequencies of JLENS antenna-connected equipment are as defined here: [redacted]
In-haul	In-haul is defined as the process of bringing down the aerostat from the time the winch starts pulling in the tether until the winch stops pulling in the tether so that the mooring process can commence. In-haul does not include securing the aerostat (mooring) to the mooring station.
[redacted]	
Integrated Broadcast Service	[redacted]
Integrity	The degree of protection for data from intentional or unintentional alteration or misuse.
Interchangeable	An item which function and physical characteristics are equivalent in performance, reliability, and maintainability, to another item with similar to identical purposes. Exchange of these items must not require alteration of themselves or adjoining items, except for adjustment.
Interlock	An interlock is an automatic switch which eliminates all power from the equipment when an access door, cover or plate is removed. See *By-passable Interlock*.

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Interoperability	1. The ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together.2. The condition achieved among communications/electronics systems or items of communications/electronics equipment when information or services can be exchanged directly and satisfactorily between them and/or their uses.
ISO Shelter/Containers	A Family of shelters built according to International Organization for Standardization specifications. These shelters can be vehicle mounted or stand-alone, and can have a variety of options depending on the intended use. The standardization facilitates handling and shipping by worldwide military and commercial carriers, shippers, charter companies, and using agencies.
JLENS Orbit	See Orbit.
Joint Data Network	The collection of near-real time communications and information system used primary at the coordination and execution levels. Family of Tactical Data Link networks where joint participants exchange situational awareness, command, and control data for joint operations.
JTAMD	Joint Theater Air and Missile Defense. The integration of joint force capabilities to destroy enemy theater aircraft and missile in flight or prior to launch or to otherwise disrupt the enemy's computers and intelligence sources.
Kill assessment data	Data derived from post-intercept radar target/debris suitable for a kill assessment determination. This includes a lost track report, providing the track was lost.
Kill assessment support	Collection and reporting of data which may aid in determining kill assessment.
Least privilege	Principle that requires that each subject be granted the most restrictive set of privileges needed for the performance of authorized tasks. This also applies to system privileges that might not be needed to perform their assigned job. NOTE: Application of this principle limits the damage that can result from errors, and accidental and unauthorized use of an IS.
LEMP - Lightning Electromagnetic Pulse	An Electromagnetic Pulse (EMP) generated by a lightning strike or in the vicinity (within approximately 1.5 kilometers) of a lightning event
Line-of-sight	An unobstructed path between sending and receiving antennas.
b(1)	b(1)
local emergency power shutdown	Power shutdown involving or affecting a restricted part of the system in the direct vicinity of the shutdown mechanism
Low	A height between five hundred and two thousand feet.
Low Risk	(IA) If an observation is described as low risk, the system's DAA must determine whether corrective actions are still required or decide to accept the risk.
Machine Executable Public Domain Software Products	Software not protected by copyright laws of any nation that carries no warranties or liabilities, and may be freely used without permission of or payment to the creator.
Man lift	Work platform, either scissors lift or boom lift (cherry picker).
Manual Update	See *Configuration for Manual Update*
Medium Range Resolution	Radar waveform with range resolution corresponding b(3)
Medium Risk	(IA) If an observation is rated as medium risk, corrective actions are needed and a plan must be developed to incorporate these actions within a reasonable period of time.
Mishap	An unplanned event or series of events resulting in death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment.

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Mishap Risk Category	A classification of the total risk of a hazard when considering the hazard's severity and probability together.
Mission	The primary activity for a system or Orbit. For JLENS, missions are defined for the Orbit and also for Surveillance System and for the Fire Control system.
Mission Critical Function	The mission essential functions of the JLENS Orbit are to: a. Send, receive and process sensor and command and control data to/from Link-16. For this function, b(3) [redacted] b. b(3) [redacted] specified in JLENS System Specification 3.2.1.3.1.1.3.1.5 b(3) [redacted]
Mission Critical Functions of the Communications and Processing Group	*a. Provide encoding and decoding of fiber-optic data, b. Provide communication capabilities between JLENS systems (SuS and FCS) and external nodes using Link-16 and CEC, c. Provide a controlled environment for system personnel, d. Provide control stations for Mission Operations and Mission Support, and e. Provide data and power interfaces to the radar SDP.*
Mission Critical Functions of the Fire Control Radar	a. Contribute to the Single Integrated Air Picture, b. Detection of ABTs, TBMs, LCRs, and/or SMTs at ranges commensurate with the target signature, c. Provide handover quality track data to weapon systems in order to support the required engagement ranges, and d. Provide Combat Identification data in order to support engagements.
Mission Critical Functions of the Platform	a. Platform Monitoring and Control, b. Lightning Protection, c. Electric Power Generation, Transmission and Distribution, d. Payload Attachment and Support, e. Launch, Operation, Retrieval and Mooring, f. Fiber Optic Data Transfer
Mission Critical Functions of the Surveillance Radar	a. Contribute to the Single Integrated Air Picture, b. Detection of ABTs, TBMs, LCRs, and/or SMTs at ranges commensurate with the target signature, c. Provide handover quality track data to the fire control system in order to support the required engagement ranges.
Mission Essential Functions	The mission essential functions are identical to the mission critical functions. i.e. The mission essential functions of the JLENS Orbit are to: a. Send, receive and process sensor and command and control data to/from Link-16. b. b(3) [redacted] as specified in 3.2.1.3.1.1.3.1.5 b(3) [redacted] b(3) [redacted]

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Mission Profile	The complete set of operating parameters for radar and communications systems to execute the assigned mission. Mission profile will include radar surveillance sectors, frequency exclusion, mission tracking priorities, network time slot allocations, doctrine, and etc.
Mobile Code	Software modules obtained from remote systems, transferred across a network, and then downloaded and executed on local systems without explicit installation or execution by the recipient. Examples of mobile code include scripts (JavaScript, VBScript), Java applets, ActiveX controls, Flash animations, Shockwave movies (and Xtras), and macros embedded within Office documents.
Mode	A second-level defined descriptive system status. The systems can be in more than one mode simultaneously.
Modular connectivity point	Any attachment point which uses standard connectors, for example a hole that can be used to attach something with a nut and bolt.
Mobile Mooring Station	A subsystem capable of launching and recovering the aerostat and securing it in a moored condition while weathervaning. The MMS provides the tether interfaces for power and communication. The MMS also provides the accessibility to the payloads for maintenance.
Moored	The aerostat is moored when the nose is latched and the close haul lines are attached and the operator announces that the mooring process is complete. [redacted] b(3) [redacted]
Moored configuration	The aerostat is in a moored condition (see above), the windscreen is closed, the blowers are on, and all maintenance hatches are closed.
Near (lightning) strike	A discharge of atmospheric electricity from one cloud to another or between a cloud and the earth that is greater than 1 km from the equipment and does not directly impact (strike) equipment but transfers energy to that equipment thru a third medium (air, ground, water, etc).
Node	In network topology, a terminal of any branch of a network or a terminal common to two or more branches of a network.
Non-bypassable Interlock	An interlock that cannot be bypassed.
Non-operate	Is defined to mean that, while non-operating, in its deployed or non-deployed state, or in transportation, the JLENS equipment will maintain its mechanical and electrical integrity without damage, deterioration or degradation of performance, reliability or maintainability.
non-overridable safety check	A safety check that provides the primary barrier for a Catastrophic or Serious Hazard as defined in MIL-STD-882D
Nuclear contamination	Refers to late time effects from fallout and prompt neutrons. The radiation levels are too low to be damaging to personnel and equipment.
Off Road	Consists of moderately smooth surface made up of small rocks, sand, dirt, chert, and may have some potholes approximately 6 inches deep.
Operate	Is defined to mean that, while in operation in its deployed state, the JLENS equipment maintains its mechanical and electrical integrity without damage, deterioration, or degradation of performance, reliability or maintainability, with the singular exception that performance degradation is permissible in rain.
Operational Availability	The probability that a JLENS System (SuS or FCS) is available at the start of its mission. It is a function of [redacted] b(3) [redacted]

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Orbit	It is comprised of the JLENS Surveillance System and the JLENS Fire Control System with no additional hardware or equipment. Also referred to as the JLENS Orbit.
organic (transportation)	Organic refers to the resources allocated to a unit of the military by its table of organization for the Army, Air Force and Marine Corps. For example, the crane that is required for deployment of the Orbit is "organic," while the C-130 that the Orbit is transported on, is "non-organic."
Other military aircraft	Classification category for threats excluded from commercial or conventional aircraft, but unable to be identified as cruise missiles, b(1) rotary wing aircraft, or UAVs
Out-haul	Out-haul is defined as the process of bringing the aerostat to the operational altitude from the time the winch starts releasing the tether until the winch stops releasing the tether. Out-haul does not include releasing the aerostat from the mooring station.
overridable safety check	A non-essential safety check that provides redundancy and can individually be overridden.
Payload	a. The load which the aerostat is designed to lift to an operation altitude under specified conditions of operation. b. The payload consists of a radar, an EO/IR sensor, and a communications payload. The sensors for the surveillance system are a surveillance radar and an IFF located on one of the aerostats. One aerostat houses the surveillance radar with a corresponding IFF, while the second aerostat houses the fire control radar with a corresponding IFF. The surveillance radar and fire control radar IFF electronics are of an identical design except for the beam forming network and the number of antennas required. There are two communications payloads, which are of identical design, with one being located on each aerostat.
Performance	Required performance is described in the JLENS System Specification.
Performance Degradation in b(3)	A permitted reduction in capability for a specified b(3) For JLENS, this is defined as a
Performance Specification	A specification that states requirements in term of the required results with criteria for verifying compliance, but without stating the methods for achieving the required results. A performance specification defines the functional requirements for the item, the environment in which it must operate, and interface and interchangeability characteristics. Both defense specifications and program-unique specification may be designated as a performance specification.
Periodic	Only operates non-continuously, often at a set interval.
Platform	The platform is a self-contained, rapidly deployable 71M class aerostat system that provides a platform for the sensor and communication payloads. There are four primary elements of the platform: a. Aerostat b. Mobile Mooring Station c. Tether d. Ground Support Equipment

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Platform	The Platform Prime Item elevates the sensor and communications payloads, as well as moors the aerostat to the ground station. The Platform Prime Item provides health and status data to the CPG. It is a self-contained, rapidly deployable 71M class aerostat system that provides a platform for the sensor and communication payloads. There are four primary elements of the platform: a. Aerostat b. Mobile Mooring Station c. Tether Subsystem d. Ground Support Equipment
POP	The Performance Oriented Packaging (POP) Program of the Defense Logistics Agency (DLA) is intended for use by DoD and other approved agencies of the United States Government and provides assistance to obtain DoD-tested packaging in which to ship hazardous materials. It provides functionality to make labels compatible in size and format with Title 49 CFR and United Nations requirements. The POP Program may be accessed via the Internet off the Defense Distribution Center (DDC) web page.
Power Converter Module (PCM)	As part of the Ground Support Equipment (GSE), is responsible for conditioning source power and distribution of 60 and 400 Hz power for the associated system equipment.
Precision track	A track resulting from Search-While-Track or Cued Acquisition detections that, after track initiation, is regularly updated by explicitly scheduling resources to do so. The update rate and track quality will vary depending on the category of precision track (e.g. Default, Engaged-midcourse, Engaged-Terminal, etc.)
Prepared Site	A site prepared to the following specifications: a. Each site will consist of a 700 feet diameter area that is free of obstacles (such as large rocks, debris, overhead lines or other obstructions) and vegetation greater than 1/2 inch in height. b. Soils at a depth of 6 inches on the site will have a minimum b(3) c. The site slope will be b(3) from the mooring station rotational bearing out to b(3) d. The site slope will be not greater b(3) e. An area from the b(3) f. Site location, in relation to buildings, hills, bluffs or mountainous terrain will be established based on a minimum ration of 10 to 1 distance from terrain features to height of terrain feature.
Primary Networks	Link-16 and CEC
Primary Road	Two or more lanes, all weather, maintained, hard surface (paved) roads with good driving visibility used for heavy and high density traffic. These roads have lanes with minimum width of 2.75 m (108 inches), road crown to 2 degrees and a legal maximum gross vehicle weight /gross combat weight (GVW/GCW) for the country or state is assumed for all bridges. The Munson Test Area High Speed Paved Road Course and the Perryman Area High Speed Road Course at Aberdeen Proving Ground (APG) are representative of primary roads.
Prime Item	The four Prime Items are the Platform, Surveillance Radar, Fire Control Radar, and the Communications and Processing Group.
Prime Item Design Specification (PIDS)	A document which defines requirements and design constraints for the Prime Items.

prime power	All prime power that is applied to a JLENS system (SuS or FCS) enters the system through the associated power module which is part of the platform ground support equipment. For flight safety and other reasons, an important aerostat action that can occur is an emergency in-haul. To assure with high likelihood that sufficient power is available in this emergency, provision is made for a backup generator if commercial power fails, and if prime power is obtained from a primary generator, provision is made for an emergency or secondary generator should the primary generator fail. These power sources, commercial power, the primary generator, and the secondary generator, enter the platform's power module through a transfer switch which permits the rapid transition among these power sources.
[redacted]	b(3)
[redacted]	b(3)
[redacted]	b(3)
Probability of Successful transfer	The probability that the JLENS Surveillance System will correctly provide data to the network and that the Fire Control System will correctly accept the data from the network, thereby completing a data transfer.
[redacted]	b(3)
[redacted]	b(3)
Protect	Measures that are taken to keep nuclear, biological, and chemical hazards from having an adverse effect on personnel, equipment, or critical assets and facilities. Protection consists of five groups of activities: hardening of positions, protection of personnel, assuming mission-oriented protective posture, using physical defense measures and reacting to attack.
Radar Cross Section estimate type	General target size estimation (Small/Medium/Large) based on radar measurements of a target while in firm track.
Radar Horizon	The locus of points at which the ray from a radar antenna become tangential to the Earth's surface. On the open sea this locus is horizontal but on land it varies according to the topographical features of the terrain.
radio silent mode	Mode where all RF radio communication devices are not transmitting. This includes any affiliation signaling for being part of an active network.
Reliability	The ability of a system and its parts to perform its intended function (mission) for a specified period of time under stated conditions without failure, degradation, or demand on the support system.
Reliability Centered Maintenance (RCM)	An estimation of Remaining Useful Life of a device based on measured and/or predicted time usage of the device and predicted device reliability.
Reserve Capacity	See *50% Reserve Capacity*
Road Hazard	See *hazard*
Road March Mode	When an individual or multiple prime item(s) is/are being re-located by standard military vehicles over primary and secondary roads to a designated emplacement site.

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Rotary wing aircraft	Classification category for manned aircraft identified as not jet-propelled
safe state	A safe state is any state in which the chance of an induced hazard is mitigated to an acceptable level.
Safety Critical Code	Safety Critical Code is any code that is used as part or all of a Safety Critical Function.
Safety Critical Data	Safety Critical Data is any data used in computations during a Safety Critical Function.
Safety Critical Function	A Safety critical function is any function that meets any of the following criteria: a. Exercises direct command and control over the condition or state of hardware. When not performed correctly could directly or indirectly cause or allow a hazardous condition b. Monitors the state of hardware components. When not performed correctly could provide data that results in erroneous decisions by human operators or companion systems that could cause a hazard. c. Safety critical functions are not only those functions that could cause hazards to exist, but they could prevent hazards by detecting the presence of a hazardous condition, providing notification that a hazardous condition exists, attempting to control or reduce the severity or probability of a hazardous condition, or returning the system to a non-hazardous condition.
Safety Device	Hardware or software, which is part of the JLENS Orbit which provides protection for personnel, the environment, military equipment or property as its primary or secondary purpose.

[redacted] b(3)

scan volume	The electrical scan extent which is specified in 3.7.1.1.3 AEU Scan Requirements
Secondary Networks	Networks which are not used for primary (CEC and Link-16) data dissemination. May include the following: 1. Defense Information Systems Network (DISN), 2. Military Satellite Communications (MILSATCOM), 3. Super High Frequency SATCOM, 4. Ultra High Frequency SATCOM, 5. Secure Telephone Unit-III (STU-III)/Secure Telephone Equipment, 6. Multiple Subscriber Equipment/Joint Network Node, and 7. Secure Internet Protocol Router Network.
Secondary Road	Two lanes, all weather, occasionally maintained, hard or loose surface, (e.g. large rock, paved, crushed rock, gravel) intended for medium-weight, low density traffic. These roads have lanes with minimum width of 2.5 m (98.5 inches) and no guarantee that the legal maximum GVW/GCW for the country or state is assured for all bridges. The Munson Test Area Improved Gravel Road Course and the Belgian Block Course, in addition to the Perryman Area Secondary Road, Course A and B at Aberdeen Proving Ground (APG) are representative of secondary roads
Secure state	A condition that does not enable access to information or information systems in an unauthorized manner.

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Security function	Any function executed in hardware, software, firmware, or procedure that protects the confidentiality, integrity, and availability of the information or equipment in an information system
Security Principle of Least Privilege	Users are only allowed to access the minimum information required to perform their duties. (Access control) Requires that in a particular abstraction layer of a computing environment, every module (such as a process, a user or a program on the basis of the layer being considered) must be able to access only such information and resources that are necessary to its legitimate purpose.
Shareware	see "freeware"
SIAP	b(3)
single point of failure	Any hardware or software that can, which is not compensated for redundancy or alternative operational procedure, whose failure would result in a mishap.
SMT	Any object moving on the surface with a b(3)
Snubbed	The condition of the aerostat that includes all moored requirements plus additional tie-downs such that the aerostat cannot move more than 2-3 feet. This additional stability is required for many maintenance actions.
b(3)	b(3) only during power-up and/or reset of a system, device or process.
State	A first-level defined system descriptive status. The system is always in a singular state.
state-of-the-art	To be defined at the time of Prime Item Critical Design Readiness Review.
Storage Configuration	A configuration of the items which comprise a system or prime item when packaged according to all technical documentation for safe storage. This includes all hardware being properly packed into their protective ISO containers with the exception of the MMS which is too large to fit into ISO containers.
Subsystem	A subsystem is a set of a functions performed by specified hardware and software, which cannot operate independently to accomplish system or system-of-system requirements.
b(3)	b(3)
Surveillance track	A track resulting from b(3)
Survivability	A. includes all aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy B. encompasses planning and locating position sites, designing adequate overhead cover, analyzing terrain conditions and construction materials, selecting excavation methods, and counter the effects of direct and indirect fire weapons. The capability of the system and crew to avoid or withstand a man-made hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission.

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Survive	1. When exposed to any one event which may impair the ability of a JLENS System (SuS or FCS) to perform Mission Critical Functions [b(3)] the system may need repairs. These [b(3)] This definition does not include the aerostat. 2. In the context of the Aerostat, "survive" means that when exposed to any single threatening event, the Aerostat can be recovered from flight albeit repairs to the structure and/or rigging may be needed before entering a new flight. Furthermore, any resulting damage can be repaired in the field without returning to the factory.
System	The JS2 consists of two systems: fire control system and surveillance system. Each system consists of 3 of the 4 prime items. Three of the prime items are interchangeable with added hardware, and the 3rd is the associated sensor payload.
System Abort	[b(3)]
System Specification	A type of program-unique specification which describes the requirements and verification of the requirements for a combination of elements that must function together to produce the capabilities required to fulfill a mission need, including hardware, equipment, software, or any combination thereof.
System-of-Systems	The JS2 Orbit is considered a system-of systems. The Orbit is comprised of the Fire Control System and the Surveillance System, each of which can be used independently. To meet certain requirements, it is necessary that the systems be assembled into an Orbit.
tactical power	Power from the local generator. Not commercial power.
Tending Toward Saturation	Industry used term to describe Relative Humidity in cold air since colder air has the capacity to hold less moisture than warm air
Test	Test is the verification method by which the operability, supportability, performance capability or other specified qualities of an item are verified when subjected to controlled conditions that are real or simulated. These verifications may require use of special test equipment and instrumentation that is not an integral part of the system being verified to obtain quantitative data for analysis, as well as qualitative data derived from displays and indicators inherent in the item(s) for monitor and control.
tether	It holds the aerostat in position and is the single mechanical link between the aerostat and the Mobile Mooring Subsystem. [b(3)] The braid provides a conducting path for lightning. The tether is considered to be airborne equipment.
Tether Jacketing	A semi-conducting material that drains charge from the aerostat.
Threat	Any entity with the means and motive to cause harm to personnel or vital resources. For air and missile defense systems threats are manned or unmanned fixed and rotary aircraft, land attack cruise missiles, and ballistic missiles. Threats could also encompass countermeasures which degrade the system and make it more vulnerable.

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Transmit Sample Monitoring	The SDP commands one (1) [redacted] b(3) [redacted]
Transport Configuration	A configuration of the items which comprise a system or prime item when packaged according to all technical documentation for safe transport. This includes all hardware being properly packed into their protective ISO containers with the exception of the MMS which is too large to fit into ISO containers.
Transport Mode	The Transport Mode is defined as mode when a system or multiple systems is configured to meet requirements when the being transported by land (including rail), sea or air.
Unintentional Emissions	Emissions from equipment that is not intended to produce radiation.
Unmanned aerial vehicle	Classification category for unmanned threats
Vulnerability	2. The characteristics of a system that cause it to suffer a definite degradation (incapability to perform the designated mission) as a result of having been subjected to a certain level of effects in an unnatural hostile environment. 3. In information operations, a weakness in information systems security design, procedures, implementation, or internal controls that could be exploited to gain unauthorized access to information or information system.
Windscreen	A streamlined air-filled compartment attached beneath the Aerostat to provide shelter to part of the sensor payloads from dust, wind and other environmental effects.

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6.3 (U) Requirements Allocation Matrix

TABLE XXI: *(U) Requirements Allocation Matrix*

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-13	3.2.1.1.1.1.0-1	(U) The FCR, while in the Tactical Mode, shall perform detection against the ABT threat defined in 3.1.3.1 Air Breathing Targets when operating in the environments defined in 3.1.3.5 b(3) and Appendix C of the JLENS System Specification.	Software	Hardware
FCR-553	3.2.1.1.1.1.0-2	b(1)	Software	
FCR-554	3.2.1.1.1.2.0-1	b(1)	Software	Hardware
FCR-15	3.2.1.1.1.3.0-1	(U) The FCR, while in the Tactical Mode, shall perform tracking of detected ABTs, which are defined in 3.1.3.1 *Air Breathing Targets* , when operating in the environments defined in 3.1.3.5 b(3) and Appendix C of the JLENS System Specification.	Software, MAP	Hardware

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-852	3.2.1.1.1.3.0-2	[redacted] b(1)	MAP, SPS	
FCR-552	3.2.1.1.1.4.0-1	[redacted] b(1)	MAP, SPS	
FCR-550	3.2.1.1.1.5.0-1	(U) The FCR, in the Tactical Mode and as commanded, [redacted] b(3)	Software, MAP	Hardware
FCR-570	3.2.1.1.1.6.0-1	[redacted] b(1)	MAP, SPS	Hardware, AEU, [redacted] b(3)
FCR-17	3.2.1.1.1.7.0-1	(U) While in the Tactical Mode, the FCR shall accept cues which are derived from the JLENS Surveillance System.	CCP, MAP	
FCR-18	3.2.1.1.1.7.0-2	(U) While in the Tactical Mode, the FCR shall accept cues which are derived from external sensors.	CCP, MAP	
FCR-19	3.2.1.1.1.7.0-3	(U) While in the Tactical Mode, the [redacted] b(3)	CCP, MAP	
FCR-542	3.2.1.1.1.8.0-1	[redacted] b(1)	MAP	
FCR-543	3.2.1.1.1.8.0-2	[redacted] b(1)	MAP	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-547	3.2.1.1.1.9.0-1	b(1)	MAP	Hardware
FCR-23	3.2.1.1.2.1.1.0-1	b(3)	Software	
FCR-572	3.2.1.1.2.1.2.0-1	b(3)	Software, MAP	
FCR-573	3.2.1.1.2.1.3.0-1	b(1)	Software, MAP	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-26	3.2.1.1.2.2.1.0-1	b(3)	Software	
FCR-575	3.2.1.1.2.2.2.0-1	b(3)	Software, MAP	
FCR-576	3.2.1.1.2.2.3.0-1	b(1)	Software, MAP	
FCR-585	3.2.1.1.2.3.1.0-1	b(1)	Software, MAP, SPS	Hardware
FCR-579	3.2.1.1.2.3.2.0-1	b(1)	Software, MAP	
FCR-581	3.2.1.1.2.3.3.0-1	b(1)	Software, MAP	Hardware

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-583	3.2.1.1.2.3.4.0-1	b(1)	MAP, SPS	Hardware
FCR-890	3.2.1.1.2.3.5.0-1	b(1)	Software, MAP	
FCR-30	3.2.1.1.3.0-1	b(3)	MAP	
FCR-8	3.2.1.2.1.0-1	(U) The FCR shall perform sector surveillance b(3)	MAP, SPS	
FCR-64	3.2.1.2.1.1.0-1	(U) The FCR, while in the Tactical Mode, shall provide commandable, 360° in azimuth, sectored azimuth coverage b(3)	Software, MAP	Hardware
FCR-513	3.2.1.2.1.1.0-2	(U) The FCR, in the Tactical Mode, shall act upon b(3)	MAP	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-561	3.2.1.2.1.2.1.1.0-1	[redacted] b(1)	Software, MAP, SPS	Hardware, AMA

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-563	3.2.1.2.1.2.1.2.0-1	[redacted] b(1)	Software, MAP, SPS	Hardware, AMA

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-566	3.2.1.2.1.2.2.1.0-1	b(1)	Software, MAP, SPS	Hardware, AMA

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-568	3.2.1.2.1.2.2.2.0-1	b(1)	Software, MAP, SPS	Hardware, AMA
FCR-3306	3.2.1.2.1.2.2.2.0-2	b(1)	MAP	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-67	3.2.1.2.2.1.0-1	b(1)	b(3)	
FCR-68	3.2.1.2.2.1.0-2	b(1)	b(3)	
FCR-75	3.2.1.2.2.3.0-2	b(1) (U) By definition, a "surface" target is a target which is located on the surface of the Earth. (U) In this context, "airborne" means non-surface.	MAP	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-3302	3.2.1.2.2.3.0-3	b(1) (U) By definition, a "surface" target is a target which is located on the surface of the Earth.	MAP	
FCR-36	3.2.1.2.4.1.0-1	b(3)	MAP, SPS	Hardware
FCR-38	3.2.1.2.4.2.0-1	b(3)	MAP, SPS	Hardware
FCR-40	3.2.1.2.4.3.0-1	b(3)	MAP, SPS	Hardware
FCR-90	3.2.1.2.5.0-1	b(3)	MAP	
FCR-555	3.2.1.2.5.0-2	b(3)	MAP	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-45	3.2.1.2.6.1.0-1	b(1)	MAP, b(3) DDU	Hardware, IFF
FCR-47	3.2.1.2.6.2.0-1	(U) The FCR shall include an on-board IFF system consisting of interrogator and transponder that supports modes 1, 2, 3/A, C, 4, 5 (level 1 and level 2), and S (transponder function only) and is compatible with DoD IFF systems.	MAP, b(3) DDU	IFF, REG
FCR-50	3.2.1.2.7.1.0-1	(U) The FCR shall incorporate a GPS-aided inertial navigation system for automatic positioning, orientation determination and data alignment / registration.	Software	Hardware
FCR-53	3.2.1.2.7.2.1.0-1	(U) The GPS receivers which are part of the FCR shall be equipped with the b(3)		INS/GPS
FCR-57	3.2.1.2.7.2.3.0-1	(U) The FCR shall perform system initialization and synchronization b(3)	Software	INS/GPS
FCR-59	3.2.1.2.8.0-1	b(3)	CCP, MAP	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-62	3.2.1.3.1.0-1	(U) The FCR SDP, upon power application, shall automatically initialize to a point where it can accept configuration commands from the FCS CPG.	BSG, CCP, DCA, ESM, MAP, SPS, b(3)	SDP
FCR-77	3.2.1.3.2.0-1	(U) The FCR shall execute an EMCON command from the FCS CPG which reduces all radiated energy in b(3) compliance with MIL-STD-464A, Section titled Emission control (EMCON), see Appendix H of the JLENS System Specification, which can be b(3)	CCP, ESM, MAP, DDU	
FCR-3692	3.2.1.3.2.0-2	b(3) b(3)	CCP, ESM, MAP, DDU	IFF
FCR-79	3.2.1.3.3.0-1	(U) The FCR, with the exception of the signal processor, shall be designed such that there is an inherent 50% reserve of computer memory and computer throughput for data processing.	Software	REG, SDP
FCR-84	3.2.1.3.4.2.0-1	(U) The FCR shall be designed such that all classified data storage media including floppy disks, hard disks, compact disks, and tapes are easily removed from the computer with the use of standard tools or standard equipment.		Hardware, SDP
FCR-86	3.2.1.3.4.3.0-1	(U) The FCR shall provide non-volatile data storage devices with removable media.		Hardware
FCR-467	3.2.1.3.5.1.0-1	b(3)	DCA	Hardware
FCR-469	3.2.1.3.5.2.0-1	b(3)	CCP, DCA	Hardware

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-471	3.2.1.3.5.3.0-1	(U) The FCR, in the appropriate operational mode, shall record all data types listed herein while meeting the operational performance requirements. Data types include: a. initialization parameters, b. b(3) c. status, and d. b(3)	DCA	Hardware
FCR-473	3.2.1.3.6.0-1	b(3)	MAP	
FCR-475	3.2.1.3.7.0-1	(U) While in the Tactical Mode, the FCR shall execute cues, which may require a volume search, from the FCS CPG, given sufficient radar resources.	Software, MAP	
FCR-477	3.2.1.3.8.0-1	b(3)	Software, MAP	
FCR-478	3.2.1.3.8.0-2	b(3)	Software, MAP	
FCR-481	3.2.1.3.9.1.0-1	(U) The FCR, in the Tactical Mode, shall track ABTs operating above the radar horizon at ranges commensurate with their signature and location within the electronic field of view of the FCR.	Software	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-484	3.2.1.3.9.2.1.0-1	b(1)	MAP	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-486	3.2.1.3.9.2.2.0-1	b(1)	MAP	
FCR-488	3.2.1.3.9.3.0-1	(U) The FCR shall provide automatic track initiation of detected targets.	MAP	
FCR-490	3.2.1.3.9.4.0-1	(U) The FCR, in the Tactical Mode, shall update tracks to maintain accuracy unless the update rate is specified by the associated CPG.	MAP	
FCR-491	3.2.1.3.9.4.0-2	(U) The FCR, in the Tactical Mode, shall act upon track update rate commands from the FCS CPG.	CCP, MAP	
FCR-492	3.2.1.3.9.4.0-3	b(3)	MAP	
FCR-557	3.2.1.3.9.4.0-4	(U) The FCR, in the Tactical Mode, shall act upon track update rate commands from the CPG for tracks which are part of an engagement.	MAP	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-494	3.2.1.3.9.5.0-1	(U) The FCR, in the Tactical Mode, shall act upon a command from the FCS CPG to drop track by dropping the identified track.	MAP	
FCR-498	3.2.1.3.9.6.0-1	b(3)	MAP	
FCR-501	3.2.1.3.10.1.0-1	b(1)	Software, MAP, SPS	Hardware
FCR-503	3.2.1.3.10.2.0-1	b(1)	Software, MAP, SPS	Hardware
FCR-505	3.2.1.3.10.3.0-1	b(1)	Software, MAP, SPS	Hardware, AEU, b(3)
FCR-507	3.2.1.3.10.4.0-1	b(1)	Software, MAP, SPS	Hardware

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-509	3.2.1.3.11.0-1	b(1) b(3)	CCP, MAP, b(3) DDU, SPS	AEU, b(3) SDP
FCR-512	3.2.1.3.12.1.0-1	(U) The FCR shall have b(3) b(3)		Hardware
FCR-515	3.2.1.3.12.2.0-1	(U) The FCR shall have b(3) b(3)		AMA
FCR-516	3.2.1.3.12.2.0-2	(U) The FCR shall have a 360° b(3)		AMA, REG
FCR-518	3.2.1.3.13.0-1	(U) The FCR shall act upon configuration commands, including priority, from the FCS CPG.	MAP	
FCR-519	3.2.1.3.13.0-2	(U) The FCR shall act upon ABT, TBM, LCR and SMT mission commands (priority and sector) from the FCS CPG.	MAP	
FCR-523	3.2.1.3.14.1.1.0-1	(U) The FCR, in the Tactical Mode shall act upon b(3) commands from the FCS CPG.	MAP, b(3)	
FCR-4140	3.2.1.3.14.1.1.0-2	b(1)	b(3)	
FCR-4141	3.2.1.3.14.1.1.0-3	b(1)	b(3)	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-4142	3.2.1.3.14.1.1.1.0-1	b(1)	MAP, SPS, b(3)	
FCR-527	3.2.1.3.14.1.1.1.0-2	b(1)	BSG, MAP, b(3) DDU, SPS, b(3)	
FCR-528	3.2.1.3.14.1.1.1.0-3	b(1)	SPS	Hardware
FCR-529	3.2.1.3.14.1.1.1.0-4	b(1)		Hardware
FCR-531	3.2.1.3.14.1.1.2.0-1	b(1)	MAP, b(3) DDU, SPS, b(3)	Hardware
FCR-533	3.2.1.3.14.1.1.3.0-1	b(1)	BSG, MAP, b(3) DDU, SPS, b(3)	AEU, b(3)
FCR-525	3.2.1.3.14.1.2.0-1	b(3)	MAP	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-4072	3.2.1.3.14.1.2.0-2	b(3)	CCP, MAP	
FCR-535	3.2.1.3.14.2.0-1	(U) The FCR in the Tactical Mode shall act upon a command to perform an IFF interrogation on a designated track from the FCS CPG.	Software	IFF
FCR-3430	3.2.1.4.1.0-1	(U) All FCR airborne equipment which is to be installed within the windscreen shall fit within the volume shown in Figure 2.		AMA, AEU, IFF, INS/GPS, b(3)
FCR-438	3.2.1.4.2.0-1	(U) The FCR payload shall draw a maximum average of 62 kVA total, where: b(3) d. The radar loads on the three phases should be balanced.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3)
FCR-441	3.2.1.4.3.1.0-1	(U) The FCR, when the FCS is in the moored configuration, shall be functionally operational b(3)		Hardware, AMA, AEU, IFF, REG, b(3)
FCR-443	3.2.1.4.3.2.0-1	(U) The FCR, when the FCS is in the moored configuration, shall be functionally operational b(3) Note: The Platform's chiller is needed for the radar to meet this system level requirement.		IFF, REG
FCR-445	3.2.1.4.3.3.0-1	(U) For maintenance or emplacement, the FCR, when the FCS is in the moored configuration, shall be brought to the necessary temperature for ground functionality testing. See 3.2.5.1.1.1 Temperature, Operations.	ESM, b(3) DDU	AMA, AEU, HEU, b(3)

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-447	3.2.1.4.3.4.0-1	(U) For commonality, the coolant used in the FCR shall be H308499 Coolant, Glycol Based, Organic Acid Salt Inhibited.		HEU
FCR-449	3.2.1.4.4.0-1	b(3)	Software, ESM	AEU, HEU, REG, b(3) SDP
FCR-3207	3.2.1.4.4.0-2	(U) If a receiver channel fails, the FCR shall reconfigure the operating channels in order to preserve the b(3)	Software	
FCR-453	3.2.1.4.5.0-1	(U) The FCR shall be designed to be certifiable by the U.S. Military Communications-Electronics Board (USMCEB) to operate in frequency bands in accordance with The Manual of Regulations and Procedures for Federal Radio Frequency Management, chapter titled Allocations, Allotments and Plans, dated May 2003, revised January 2006. GFE and COTS are, by definition, already USMCEB certifiable. This includes all all IFF sub-systems and GPS sub-systems which are part of the FCR.		AEU, b(3)
FCR-456	3.2.1.4.6.1.0-1	b(1)		Hardware
FCR-457	3.2.1.4.6.1.0-2	(U) The FCR, while in the appropriate mode, shall execute a command for frequency band utilization from the FCS CPG.	ESM, MAP, b(3) DDU	
FCR-459	3.2.1.4.6.2.0-1	b(1)	Software	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-460	3.2.1.4.6.2.0-2	b(1)	Software	
FCR-462	3.2.1.4.7.0-1	b(3)	MAP, b(3) DDU, SPS	
FCR-537	3.2.1.4.8.0-1	b(1)	Software, MAP, SPS	AEU, b(3)

~~SECRET/NOFORN~~				
ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-539	3.2.1.4.9.0-1	(U) The FCR detection range, detection accuracy [redacted] and tracking requirements shall be met in the Clutter and Multipath environments defined in Appendix C of the JLENS System Specification, when configured into the FCS and in an operational mode.	Software, MAP, SPS	Hardware, [redacted]
FCR-3646	3.2.1.4.9.0-2	(U) The FCR [redacted] in the Clutter and Multipath environments defined in Appendix C of the JLENS System Specification, when configured into the FCS and in the tactical mode.	Software	Hardware
FCR-94	3.2.1.5.0-1	(U) The FCR shall act upon configuration commands from the CPG for selecting data recording details in addition to the automatic level.	Software	
FCR-4090	3.2.2.1.0-1	(U) The FCR **shall** have external interfaces in accordance with the JLENS System Internal IRS.	Software	Hardware
FCR-4132	3.2.2.1.0-2	(U) The FCR **shall** have external interfaces in accordance with the JLENS System External IRS.		INS/GPS
FCR-154	3.2.3.1.0-1	(U) All exterior surfaces of airborne equipment external to the windscreen **shall** be painted with Chemical Agent Resistant Coating (CARC), in accordance with H372287, with exterior topcoat 383 Green (color 34094 of Fed-Std-595).		HEU, REG
FCR-4133	3.2.3.1.0-2	(U) All exterior surfaces of any FCR components of the Hull Measurement System which are exterior to the aerostat shall be painted with Chemical Agent Resistant Coating (CARC), in accordance with H372287, with exterior topcoat white (color 37875 of Fed-Std-595).		Hardware

~~SECRET/NOFORN~~				
ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-4088	3.2.3.1.0-3	(U) All exterior surfaces of FCR airborne equipment internal to the windscreen which are visible when the windscreen is unfurled shall be painted with exterior topcoat 383 Green (color 34094 of Fed-Std-595, this is non-CARC paint), except for COTS hardware or where paint interferes with function such as when electrical conductivity is needed.		AMA, AEU, b(3)
FCR-156	3.2.3.2.0-1	(U) FCR enclosures which are mounted on the aerostat, exterior to the windscreen, and have the purpose to protect the equipment interior from NBC shall protect internal equipment from contamination, see 6.2, caused by an NBC event as described in 3.2.5.2.8.1 *Nuclear, Biological, and Chemical, Definitions.*		HEU, REG
FCR-158	3.2.3.3.0-1	b(3)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-428	3.2.4.1.1.1.0-1	b(3)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-430	3.2.4.1.1.2.0-1	b(3)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3)
FCR-432	3.2.4.1.2.0-1	b(3)		AMA, AEU, HEU, IFF, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-167	3.2.4.2.1.1.0-1	(U) While in an operational mode, the FCR shall continually monitor its operational status. Operational status is provided to the FCS CPG.	BSG, CCP, DCA, ESM, MAP, b(3) DDU, SPS, b(3)	AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-169	3.2.4.2.1.2.0-1	(U) The FCR shall store the detected faults either in non-volatile memory or on removable data storage media.	DCA, ESM	SDP
FCR-171	3.2.4.2.1.3.0-1	(U) The FCR shall detect all radar failures that will result in system critical failures using a combination of b(3)	BSG, CCP, ESM	AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-172	3.2.4.2.1.3.0-2	b(3)	CCP, ESM	AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-174	3.2.4.2.1.4.0-1	(U) While in the appropriate operational mode, the operational performance of the FCR shall meet the performance requirements in 3.2.1 *Fire Control Radar Performance* b(3)	Software	AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-176	3.2.4.2.1.5.0-1	b(3)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-177	3.2.4.2.1.5.0-2	b(3)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-179	3.2.4.2.1.6.0-1	(U) Where standard b(3) cannot be used, the contractor shall obtain government approval prior to FCR CDR.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-181	3.2.4.2.1.7.0-1	b(3)	ESM	AMA, AEU, IFF, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-183	3.2.4.2.1.8.0-1	b(3)	ESM	AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-434	3.2.4.2.2.0-1	b(3)	ESM	AMA, AEU, REG, b(3) SDP
FCR-3712	3.2.4.2.2.0-2	b(3)	CCP, ESM	AMA, AEU, REG, b(3) SDP
FCR-186	3.2.4.3.1.0-1	(U) The FCR shall perform configuration checks during FCR initialization.	ESM	HEU
FCR-188	3.2.4.3.2.0-1	(U) The FCR shall pass all configuration checks prior to transitioning to an operational mode.	ESM	
FCR-190	3.2.4.3.3.0-1	(U) The FCR shall accept and implement commands overriding the automatic configuration checks.	Software	
FCR-192	3.2.4.3.4.0-1	(U) The FCR shall include a configuration log which includes the results of the configuration checks.	CCP, DCA, ESM	
FCR-197	3.2.5.1.1.1.0-1	(U) The FCR in an appropriate operational mode shall meet the performance specified in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* during exposure to an ambient temperature range from -40°C to +49°C (Mean Sea Level). Temperature as a function of altitude is provided in Appendix F of the JLENS System Specification.		AMA, AEU, HEU, INS/GPS, REG, b(3)
FCR-199	3.2.5.1.1.2.0-1	(U) The FCR in the appropriate operational mode shall meet the performance specified in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to an ambient temperature range from -46°C to +71°C while in the storage and movement configuration, with the allowance of environmental kits and procedures for temperature extremes.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-201	3.2.5.1.2.1.0-1	(U) The FCR, in an appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* during exposure to a relative humidity range from 3 to 100% non-condensing.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3)
FCR-3539	3.2.5.1.2.2.0-1	(U) The FCR, in an appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure, while in the deployment, storage, and movement configurations, to a relative humidity range from 3 to 100% non-condensing.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3)
FCR-205	3.2.5.1.3.1.0-1	b(3)	Software	HEU, REG
FCR-210	3.2.5.1.3.2.0-1	b(3)		HEU, REG
FCR-215	3.2.5.1.4.0-1	(U) The FCR airborne equipment outside the windscreen shall survive during exposure to hail up to one-half inch (1.27 cm) in diameter while in the appropriate operational mode.		HEU, REG

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-220	3.2.5.1.5.0-1	(U) The FCR, in the appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* except sensor performance, which can degrade, during exposure up to 10.2 cm (4 inches) of snow accumulation on ground equipment surfaces where the snow has a density of 0.3 gram per cubic centimeter.		HEU, REG
FCR-3484	3.2.5.1.5.0-2	(U) The FCR, in the appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* except sensor performance, which can degrade, during a snow falling rate of up to 2.54 cm/hour (1 inch/hour). Note: The falling snow does not accumulate on the aerostat.		HEU, REG
FCR-224	3.2.5.1.6.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance specifications in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* when exposed to a salt atmosphere in sea locations and coastal regions.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3)
FCR-225	3.2.5.1.6.0-2	(U) The FCR, in the appropriate operational mode, shall meet performance specifications in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to a salt atmosphere in sea locations and coastal regions while in a non-operational mode.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3)
FCR-229	3.2.5.1.7.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance in 3.2.1 *Fire Control Radar Performance* (degraded sensor performance during operation is permitted) and 3.2.4 *Subsystem Quality Factors* when exposed to blowing dust (up to 149 μm diameter in concentrations of up to 10 ± 7 g/m^3 (0.3 ± 0.2 g/ft^3) for velocities up to 8.9 m/s (17.3 knots) (32.04 km/hr).		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3)

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-3486	3.2.5.1.7.0-3	(U) The FCR, in the appropriate operational mode, shall meet performance in 3.2.1 Fire Control Radar Performance (degraded sensor performance during operation is permitted) and 3.2.4 Subsystem Quality Factors when airborne equipment is exposed to blowing sand for diameters in the range of 150 to 850 μm diameter in concentrations of up to 0.18 -0.0/+0.2 g/m^3 (0.005 - 0.0/+0.0057 g/ft^3) for velocities up to 29.0 m/s (56.4 knots) (104.5 km/hr). Note: for the Tactical Mode, blowing sand does not reach operational altitude.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3)
FCR-233	3.2.5.1.8.0-1	(U) The FCR shall be either composed of materials that inhibit the fungus growth or composed of materials which are protected from environments that would encourage fungus growth.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-236	3.2.5.1.9.1.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1. *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* while being subjected to winds up to 73 km/hr (40 knots) with turbulence of 1.98 m/s rms (6.5 fps) for 10% of the operational time, and winds of (Flight 46) for the remaining 90% of the operational time. [redacted] b(3)	Software	AMA, INS/GPS, REG
FCR-239	3.2.5.1.9.2.1.0-1	(U) The FCR, when assembled into the FCS which is either moored or at altitude, whether operational or non-operational, shall survive an exposure to steady state winds of up 148 km/hr (80 knots) with turbulence of 3.05 m/s (10 fps) rms.		Hardware

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-241	3.2.5.1.9.2.2.0-1	(U) The FCR, in the storage, movement, or operations configurations, shall survive an exposure to steady state winds of up to 185 km/hr (100 knots).		HEU, REG
FCR-246	3.2.5.1.10.2.0-1	(U) The FCR airborne equipment, when in the operations configuration, shall survive direct or indirect lightning strikes to the aerostat lightning cage, which produces a maximum induced current of 145 kA including LEMP. Relevant sections of MIL-HDBK-419A and NFPA-780 can be used for guidance.		AMA, AEU, IFF, REG, b(3)
FCR-248	3.2.5.1.10.3.0-1	(U) The FCR shall return to the state and mode existing prior to a near lightning strike after a controlled restart not requiring repair. By definition, a nearby lightning strike does not cause equipment damage. A controlled restart is according to procedures.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-252	3.2.5.2.1.1.0-1	(U) The FCR, in the Tactical Mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* while being subjected to vibration levels caused by operation.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-254	3.2.5.2.1.2.0-1	(U) The FCR, in the appropriate operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and *3.2.4 Subsystem Quality Factors* following exposure to vibration levels caused by normal transportation, maintenance, or storage. Transportation includes air, ground (both road and b(3) and sea.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-257	3.2.5.2.2.1.0-1	(U) The FCR, while in an operational mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* applicable to that operational mode, while being subjected to shock levels caused during normal operation of that mode.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-259	3.2.5.2.2.2.0-1	(U) The FCR LRUs shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after the LRUs are subjected to drop shock static equivalent loads NGT 5.0 g longitudinal, 5.0 g vertical, and 5.0 g lateral at the center of gravity of the container, while packaged in their transit containers according to the applicable technical documentation.		AEU, IFF, INS/GPS, REG, b(3) SDP
FCR-4134	3.2.5.2.2.3.1.0-1	(U) After assembly to an operational configuration and while in the appropriate operational mode, the FCR components, which are packaged for the Movement State in ISO containers or ISO shelters, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 System Quality Factors after exposure to a b(3) while the FCR equipment is mounted in the designated ISO shelters or ISO containers for that equipment and while the JLENS equipment is in the transport configuration.		Hardware
FCR-4135	3.2.5.2.2.3.2.0-1	(U) After assembly to an operational configuration and while in the appropriate operational mode, the FCR non-fragile components, see 6.2, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 System Quality Factors after exposure to b(3) while the FCR equipment is mounted in the designated ISO shelters or ISO containers for that equipment and while the JLENS equipment is in the transport configuration.		Hardware

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-261	3.2.5.2.2.3.3.0-1	(U) After assembly to an operational configuration and while in the appropriate operational mode, the FCR fragile components, see 6.2, which are packaged for the Movement State in ISO containers or ISO shelters, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 System Quality Factors after exposure b(3) while the FCR equipment is mounted in the designated ISO shelters or ISO containers for that equipment and while the JLENS equipment is in the transport configuration.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-4136	3.2.5.2.2.3.6.0-1	(U) Each FCR unique transportation fixture onto which fragile hardware is mounted shall be marked with special handling procedures using MIL-STD-129P as guidance.		Hardware
FCR-3200	3.2.5.2.3.0-1	(U) The FCR shall contain no electrically initiated devices (EID) or electro-explosive devices (EED).		AMA, AEU, REG, b(3) SDP
FCR-269	3.2.5.2.4.1.1.0-1	(U) The FCR shall control unintentional emissions using MIL-STD-461E, RE102-4 Army curve as a guide.		AMA, AEU, IFF, REG, b(3)
FCR-3693	3.2.5.2.4.1.1.0-2	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of intra-system radiated and conducted emissions.		AEU, IFF, INS/GPS, REG, b(3)

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-3704	3.2.5.2.4.1.2.1.0-1	(U) The FCR airborne equipment excluding the IFF subsystem and the GPS, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of spurious in-band electromagnetic interference using MIL-STD-461E, b(3) as a guide. Note: It is assumed that the interference frequency will be b(3)		AMA, AEU, HEU, INS/GPS, REG, b(3)
FCR-3705	3.2.5.2.4.1.2.2.0-1	(U) The FCR airborne GPS equipment, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of spurious non-in-band electromagnetic interference. b(3)		INS/GPS
FCR-270	3.2.5.2.4.1.2.2.0-2	(U) The FCR airborne equipment, excluding the IFF subsystem, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* in the presence of spurious non-in-band (out of band) electromagnetic interference in accordance with Table IX.		AMA, AEU, INS/GPS, REG, b(3)
FCR-3706	3.2.5.2.4.1.2.2.0-3	(U) The IFF subsystem which is part of the FCR airborne equipment, in the appropriate operational mode, shall meet performance requirements in 3.2.1.2.6 *Identification Friend or Foe (IFF)* and 3.2.4 *Subsystem Quality Factors* in the presence of b(3)		IFF

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-3707	3.2.5.2.4.1.3-1	(U) The FCR airborne GPS equipment shall be designed in accordance with MIL-STD-461E, b(3)		INS/GPS
FCR-272	3.2.5.2.4.2.0-1	(U) Grounding and bonding on the FCR shall be implemented in accordance with the electrical bonding and external grounds requirements of MIL-STD-464A.		AMA, AEU, IFF, INS/GPS, REG, b(3), SDP
FCR-274	3.2.5.2.5.0-1	b(1)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3), SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-276	3.2.5.2.6.0-1	(U) The FCR LRUs or equipment cabinets as appropriate, except for GFE, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* following exposure to an electrostatic b(3) (U) Note: ESD directly to connector pins is not included. This only includes ESD to the module external surfaces and the LRU external surfaces.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-278	3.2.5.2.7.0-1	b(1)	SPS	AEU b(3)
FCR-286	3.2.5.2.8.2.2.1.0-1	b(3)		HEU, REG
FCR-290	3.2.5.2.8.2.2.3.0-1	(U) The FCR, after subjection to worst case chemical and biological contamination, as specified herein, shall be restorable to an operational condition such that use of MOPP IV gear need not be continued, after being decontaminated using JLENS specific decontamination procedures.		HEU, REG
FCR-292	3.2.5.2.8.2.2.4.0-1	(U) The FCR, in the Tactical Mode, shall meet all performance requirements in 3.2.1 *Fire Control Radar Performance* during and following exposure to NBC contaminants.		HEU, REG

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-294	3.2.5.2.8.2.2.5.0-1	(U) The FCR design shall be such that trained and acclimatized personnel can operate and maintain external mission critical equipment while wearing a full NBC protective ensemble MOPP IV gear without further contaminating the system. Neither equipment inside the windscreen nor the SDP is considered to be external.		HEU, REG
FCR-298	3.2.6.1.1.0-1	b(3)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-302	3.2.6.1.1.1.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to the Railroad Transportation vibrations NGT 0.488 g rms longitudinal, 0.488 g rms vertical, and 0.488 g rms lateral, incurred while in the movement configuration, as presented in Appendix E of the JLENS System Specification.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-304	3.2.6.1.1.2.0-1	(U) The FCR, while in the appropriate operational mode, shall meet performance requirements specified in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after being subjected to rail impact static equivalent loads NGT 5.0 g longitudinal, 3.0 g vertical and 3.0 g lateral, incurred while in the movement configuration as presented in Appendix E of the JLENS System Specification. Note: The accelerations provided here are applied to the center of mass of the ISO container. Accelerations on individual components will depend on packaging.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-307	3.2.6.1.2.1.0-1	(U) The FCR, in the Transport Mode, shall be transportable on highways defined in MIL-STD-1366D including an allowance for special permits where the limits for load, vibration, and shock are presented in Appendix E of the JLENS System Specification.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-309	3.2.6.1.2.2.0-1	(U) The FCR, in the transport configuration, shall be transportable on secondary roads where the limits for load, vibration, and shock are presented in Appendix E of the JLENS System Specification.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-311	3.2.6.1.2.3.0-1	(U) The FCR, in the transport configuration, shall be transportable on unimproved roads where the limits for load, vibration, and shock are presented in Appendix E of the JLENS System Specification.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-313	3.2.6.1.2.4.0-1	(U) The FCR, in the transport configuration, shall be transportable off-road for b(3)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-3642	3.2.6.1.2.5.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 Performance Characteristics and 3.2.4 *Subsystem Quality Factors* after exposure to the Large Assembly Transport vibration where the vibration levels are NGT those represented by the Perryman Cross-Country Course No. 1 and the mobility profile for primary, secondary and unimproved roads given in Table X of the JLENS System Specification, in the transport configuration.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-316	3.2.6.2.1.0-1	(U) The FCR, in the transport configuration, shall be marine transportable in accordance with MIL-STD-1366D section titled Water Transportation (Load on / Load off), where load limits and vibrations are presented in Appendix E of the JLENS System Specification.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-318	3.2.6.2.2.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to the Ship Transportation vibrations NGT 0.315 g rms longitudinal, 0.315 g rms vertical, and 0.315 g rms lateral, incurred while in the transport configuration as presented in Appendix E of the JLENS System Specification.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-321	3.2.6.3.1.0-1	(U) The FCR, in the transport configuration, shall be transportable on C-130 (except ISOs which differ from 8' x 8' x 20'), C-5 and C-17 aircraft. The shock and vibrations experienced during C-130, C-5, and C-17 aircraft transport are presented in Appendix E of the JLENS System Specification.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-323	3.2.6.3.2.0-1	(U) The FCR, in the appropriate operational mode, shall meet performance requirements in 3.2.1 *Fire Control Radar Performance* and 3.2.4 *Subsystem Quality Factors* after exposure to the aircraft random vibrations NGT 5.17 g rms longitudinal, 5.17 g rms vertical, and 5.17 g rms lateral, incurred while in the transport configuration, as presented in Appendix E of the JLENS System Specification.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-3697	3.2.6.4.0-1	(U) Transportation enclosures which are non-GFE and delivered as part of the FCR shall be able to withstand contamination/decontamination described herein such that it protects the equipment contained within the enclosure.		Hardware

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-331	3.3.1.2.0-1	(U) The FCR shall be designed such that components containing hazardous materials listed in the EPA-17 and Class I Ozone Depleting Substances are only utilized in compliance with the JLENS Hazardous Materials Management Plan (HMMP). Note: Appendix A of the JLENS System Specification contains the aforementioned lists.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-3593	3.3.1.2.0-2	(U) The FCR shall have no radioactive materials which are defined by the Nuclear Regulation Commission that have greater than 0.002 microcuries per gram or activity per item equals or exceeds 0.01 microcuries.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-334	3.3.2.1.0-1	(U) The FCR shall have all equipment marked in accordance with MIL-STD-130L for unique identification with the following provisos and exceptions. (U) Provisos to this requirement are: a. Only hardware and software items with a unit acquisition cost NLT $5,000. b. All hardware items with a unit acquisition cost less than $5,000 when they are serially managed, mission critical, or controlled inventory items. (U) Exceptions to this requirement are as specified in MIL-STD-130L section titled Detailed Requirements subsection titled Exemptions: a. "COTS items marked with commercial identification (firm name, logo, part number, etc.), and which present no identification difficulty may be exempt from additional marking requirements. This exemption extends to COTS items identified on a VICD." b. "Parts within an assembly or a sub-assembly, that are not subject to removal, replacement, or repair or" c. "When parts are deemed too small for the application of complete marking in accordance with MIL-STD-130L section titled Machine-readable information (MRI) marking, a logo or other abbreviated marking [will] be substituted for the design activity identification."		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-2344	3.3.2.2.0-1	(U) The FCR shall have danger, caution, signs, labels, tags, and markings to warn of specific voltages, current, thermal, or physical hazards including: 1. Color code per ANSI Z535.1 2. For potentials between 70 and 500 Volts, display "WARNING" sign and list maximum voltage. 3. For potentials in excess of 500 Volts, display the "DANGER" and "HIGH VOLTAGE" signs and list maximum voltage. 4. Microwave of RF Radiation warning signs, labels, or tags should be in accordance with ANSI Z535.3, ANSI Z535.4, or ANSI Z535.5. 5. Indicate the number of persons needed to lift the item and how many pounds it weighs.		AMA, AEU, HEU, IFF, REG, b(3) SDP
FCR-3421	3.3.3.0-1	(U) The ground based FCR equipment shall provide a local emergency power shutdown capability.		SDP
FCR-2331	3.3.3.0-2	(U) The FCR shall comply with the applicable portions of MIL-HDBK-454A Guidelines on Personnel Hazards, Flammability, and Electrical Overload Protection.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-3444	3.3.3.0-3	(U) The FCR shall limit personnel exposure to acoustic noise levels in accordance with MIL-STD-1474D, Steady-State Noise, Personnel Occupied Areas and MIL-STD-1472F, Acoustical Noise. Hearing protection or electronic communication may be used.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-2335	3.3.3.0-4	(U) The FCR shall have catastrophic hazards mitigated by at least three barriers derived from independent sources, one of which must be a fail-safe device. Fail-safe device, barrier, and critical hazard are defined in "JLENS SSPP".		AMA, AEU, HEU, REG, b(3)

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-2336	3.3.3.0-5	(U) The FCR shall have critical hazards mitigated by at least two barriers one of which must be a fail-safe device. Fail-safe device, barrier, and critical hazard are defined in "JLENS SSPP".		AMA, AEU, HEU, REG, b(3)
FCR-361	3.3.3.1.0-1	(U) The FCR shall have hardware safety interlocks which cannot be overridden by software.		AEU, REG, b(3)
FCR-3598	3.3.3.1.0-2	(U) The FCR shall have lift points that are clearly labeled.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-3597	3.3.3.1.0-3	(U) The FCR shall have a configuration that prevents equipment from tipping over or falling on personnel performing operations, maintenance, or training tasks.		AMA, AEU, HEU, INS/GPS, REG, b(3) SDP
FCR-2305	3.3.3.1.0-4	(U) The FCR shall have a maintenance platform which has built in safety features to mitigate falling hazards.		AEU
FCR-3596	3.3.3.1.0-5	(U) The FCR shall have floor surfaces and stair and step treads that provide non-slip characteristics.		AEU
FCR-3605	3.3.3.1.0-6	(U) As a guideline, the FCR will use Commercial Off the Shelf (COTS) equipment that has been listed or certified to an appropriate commercial standard by a Nationally Recognized Test Laboratory (NRTL). Note: Examples of NRTLs are Underwriters Laboratories (UL), Canadian Standards (CSA) or TUV Rheinland (TUV). Any COTS equipment that has this certification **shall** be considered as having met the provisions of this requirement and will be accepted for use without any further modification. For any modified COTS, recertification by a NRTL will be required unless the modifications are only minor and do not alter its form, fit, or functional characteristics.		AEU, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-2296	3.3.3.1.1.0-1	(U)The FCR shall have failsafe means to inhibit radiation if worst case radiation levels on the ground would exceed the permissible levels (controlled and uncontrolled) as specified in IEEE C95.1-2005.	BSG, ESM, MAP	
FCR-2301	3.3.3.1.1.0-2	(U) The FCR shall cancel any transmit action that is commanded by a data path if the integrity of the data path is lost.		AEU, b(3)
FCR-2302	3.3.3.1.1.0-3	(U) The FCR shall reinitialize to a non-radiating state after a safety critical hardware fault/failure.	CCP, ESM, MAP	
FCR-2341	3.3.3.1.2.0-1	(U) The FCR shall have physical guards to prevent inadvertent exposure of personnel to surface temperatures outside the maximum/minimum (Reference MIL-STD-1472F, section titled Thermal Contact Hazards Table XXI, or less than 0 degrees Celsius) except for surface temperatures induced by climatic environment.		AEU, HEU, REG
FCR-2307	3.3.3.1.2.0-2	(U) The FCR shall have a failsafe interlock which disables mechanical motion of the radar when maintenance is being performed on the FCR payload.		AMA
FCR-2334	3.3.3.1.2.0-3	(U) The FCR equipment shall have connectors which preclude the mismating of cables in a manner which would cause malfunction, damage to equipment or hazard to personnel. Where design considerations require plug and receptacles of similar configuration in close proximity, the mating plugs and receptacles should be suitably coded or marked to clearly indicate the mating connectors.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-2315	3.3.3.1.2.0-4	(U) The FCR shall use self sealing connectors for coolant lines to reduce the likelihood of coolant leakage during FCR operation and maintenance as appropriate.		AEU, HEU, REG, b(3)
FCR-3600	3.3.3.1.2.0-5	(U) The FCR interlocks shall be fail-safe.		AEU, REG, b(3)
FCR-2321	3.3.3.1.2.0-6	(U) The FCR interlocks shall be self-resetting.		AEU, REG, b(3)

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-2316	3.3.3.1.2.0-7	(U) The FCR shall mitigate overheating hazards that result in damage to equipment.		HEU, REG, SDP
FCR-2312	3.3.3.1.2.0-8	(U) The FCR shall vent battery enclosures to prevent the buildup of flammable gas, as appropriate.		AEU, INS/GPS, REG
FCR-3599	3.3.3.1.2.0-9	(U) The FCR equipment shall have door or hinged covers that are provided with stops to hold them open as appropriate.		AMA, AEU, HEU, REG, b(3) SDP
FCR-2310	3.3.3.1.2.0-10	(U) The FCR shall have a combination of procedures, guards and safety devices to preclude contact with moving mechanical parts such as gears, fans, and belts during operation and maintenance.		AMA, AEU, HEU, IFF, REG, b(3) SDP
FCR-3604	3.3.3.1.3.0-1	(U) The FCR shall have external conductive surfaces of equipment housing hazardous voltages grounded to a common static and safety ground point.		AMA, AEU, IFF, INS/GPS, REG, b(3) SDP
FCR-3603	3.3.3.1.3.0-2	(U) The FCR shall have a means to reduce the voltage at test points to less than 300V if the potential to be measured is in excess of 300V peak.		AMA, AEU, HEU, REG, b(3) SDP
FCR-2325	3.3.3.1.3.0-3	(U) The FCR shall ensure that powered ends of connectors are protected from accidental contact.		AEU, REG, b(3)
FCR-3602	3.3.3.1.3.0-4	(U) The FCR high voltage circuits containing capacitors which store more than 0.25 joules shall have discharging devices unless they discharge to 30V or less within 2 seconds after power removal for maintenance purposes. Note: This does not apply to batteries.		AMA, AEU, HEU, IFF, REG, b(3) SDP
FCR-2328	3.3.3.1.3.0-6	(U) The FCR shall have visible markings for LRUs sensitive to Electrostatic Discharge (ESD).		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-3601	3.3.3.1.3.0-7	(U) The FCR assemblies which contain circuits operating at potentials in excess of 500 volts shall be completely enclosed with any access covers and plates equipped with non-bypassable interlocks that activate to shutdown power.		AMA, AEU, HEU, IFF, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-2324	3.3.3.1.3.0-8	(U) The FCR shall prevent shorting of circuits carrying more than 25A. Appropriate means may include guards and warning labels.		AMA, AEU, REG, b(3) SDP
FCR-2319	3.3.3.1.3.0-9	(U) The FCR shall have at least 3 barriers, to preclude accidental contact under all conditions of operation and maintenance, for all potentials between 30V and 500V.		AEU, HEU, IFF, REG, b(3)
FCR-2333	3.3.3.1.3.0-10	(U) The FCR equipment shall have exposed external metallic parts, surfaces, and shields, exclusive of antenna and transmission line terminals, at ground potential during normal operation as suggested in MIL-HDBK-454A, General Guidelines for Electronic Equipment, Guideline 1, Ground.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-2332	3.3.3.1.3.0-11	(U) The FCR shall have a point on all electrically conductive chassis that will serve as the common tie point for static and safety grounds as suggested in MIL-HDBK-454A, General Guidelines for Electronic Equipment, Guideline 1, Ground.		AMA, AEU, IFF, INS/GPS, REG, b(3) SDP
FCR-357	3.3.3.2.1.0-1	(U) The FCR shall initialize (power-up) into a non-radiating state.	BSG, CCP, DCA, ESM, MAP, b(3) DDU	AEU, IFF, REG, b(3)
FCR-3187	3.3.3.2.1.0-2	(U) The FCR shall validate the contents of operational software executables and data files prior to execution or use.	ESM	IFF
FCR-359	3.3.3.2.2.0-1	(U) The FCR shall allow the system to perform a function which inherently increases Mishap Probability only if either of the following conditions are satisfied: a. All relevant pre-requisite safety checks are passed prior to performing the potentially hazardous function. b. The overridable safety checks have been explicitly over-ridden.	ESM, MAP	

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-3190	3.3.3.2.2.0-2	(U) The FCR shall execute safety critical functions to completion, barring loss of power. Exiting a safety critical function gracefully may be considered executing to completion.	ESM	
FCR-363	3.3.3.2.3.0-1	(U) The FCR software shall provide safety critical alerts to the CPG.	CCP, DCP, ESM	
FCR-3615	3.3.3.2.3.0-2	(U) The FCR software shall provide hazardous condition alerts to the CPG.	CCP, DCP, ESM	
FCR-3284	3.3.3.2.3.0-3	(U) The FCR shall verify correct transfer of safety critical messages. Verification may include providing acknowledgements, performing cyclic redundancy checks, or checking message protocol formats.	CCP, ESM	AEU
FCR-3184	3.3.3.2.3.0-4	(U) The FCR software shall provide safety critical alerts that are distinct from routine alerts.	CCP, DCP, ESM	
FCR-367	3.3.3.2.4.0-1	(U) The FCR shall provide for a safe shutdown when so commanded by the associated CPG.	CCP, ESM, MAP	AEU, REG
FCR-2264	3.3.4.0-1	(U) The FCR shall have spacing of connectors and controls external to the windscreen that is compatible with maintenance in cold weather/MOPP IV protective clothing as specified in MIL-STD-1472F, section titled Spacing.		HEU, REG
FCR-2266	3.3.4.0-2	(U) The FCR shall have controls using the guidance of MIL-STD-1472F, section titled Controls.		AMA, AEU, REG
FCR-3590	3.3.4.0-3	(U) The FCR shall present visual signals using the guidance of MIL-STD-1472F, section titled Visual Displays.		REG
FCR-2268	3.3.4.1.0-1	(U) The FCR shall have reach access for inserting, adjusting, and/or removing a unit or assembly as specified in MIL-STD-1472F, section titled Physical Access.		AMA, AEU, HEU, INS/GPS, REG, b(3) SDP
FCR-2269	3.3.4.1.0-2	(U) The FCR replacement units, assemblies, and connectors shall meet the insertion, removal, and grip force requirements in MIL-STD-1472F, section titled Design for Maintainer.		AMA, AEU, HEU, INS/GPS, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-2270	3.3.4.1.0-3	(U) The FCR shall have visual access for corrective and preventative maintenance tasks as specified in MIL-STD-1472F, section titled Visual Access.		AMA, AEU, HEU, INS/GPS, REG, b(3) SDP
FCR-2271	3.3.4.1.0-4	(U) The FCR shall have access openings and clearance dimensions for inserting, adjusting, and/or removing a unit or assembly as specified in MIL-STD-1472F, section titled Physical Access.		AMA, AEU, HEU, INS/GPS, REG, b(3) SDP
FCR-2272	3.3.4.1.0-5	(U) The FCR units and assemblies shall be configured for removal, carry, and replacement as specified in MIL-STD-1472F, section titled Weight.		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-2273	3.3.4.1.0-6	(U) The FCR shall have interchangeable line replacement units as specified in MIL-STD-1472F, section titled Design for Maintainer.		AMA, AEU, HEU, INS/GPS, REG, b(3) SDP
FCR-3715	3.3.4.1.0-7	(U) The FCR shall have spacing of connectors and controls internal to the windscreen that is compatible with maintenance in cold weather gear as specified in MIL-STD-1472F, section titled Spacing.		AMA, AEU, IFF, INS/GPS, b(3)
FCR-3714	3.3.4.1.0-8	(U) The FCR hardware internal to the windscreen shall be maintainable and supportable by the 5th to 95th percentile of Army personnel while wearing combat gear and protective clothing (cold weather gear) in accordance with MIL-STD-1472F, sections titled Physical Accommodation and Workspace Design.		AMA, AEU, IFF, INS/GPS, b(3)
FCR-3713	3.3.4.1.0-9	(U) The FCR hardware external to the windscreen shall be maintainable and supportable by the 5th to 95th percentile Army personnel while wearing combat gear and protective clothing (cold weather gear, Mission Oriented Protective Posture (MOPP) IV gear) in accordance with MIL-STD-1472F, sections titled Physical Accommodation and Workspace Design.		HEU, REG, SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-375	3.3.5.1.1.0-1	(U) The FCR shall use approved IA products or IA-enabled products for all information system security functions.		SDP
FCR-4069	3.3.5.1.1.0-2	b(3)		SDP
FCR-4068	3.3.5.1.1.0-3	b(3)		SDP
FCR-377	3.3.5.1.1.0-4	b(3)		SDP
FCR-379	3.3.5.1.1.0-5	b(3)		REG, SDP
FCR-381	3.3.5.1.1.0-6	(U) The FCR shall only use binary or machine executable public domain software products or other software products, such as those commonly known as freeware of shareware, that have been assessed for information assurance impacts or which have been approved by the DAA.		REG, SDP
FCR-4070	3.3.5.1.1.0-7	(U) The security support structure of the FCR shall be isolated. Means of isolation may include the use of partitions and/or domains that control of, access to, and integrity of hardware, software, and firmware that perform security functions.		SDP
FCR-4071	3.3.5.1.2.0-1	b(3)		SDP
FCR-385	3.3.5.1.2.0-2	b(3)		SDP
FCR-398	3.3.5.1.2.0-3	b(3)		REG, SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-390	3.3.5.1.2.0-4	(U) The FCR shall implement virus protection for all servers, workstations, and mobile computing devices.		SDP
FCR-402	3.3.5.2.0-1	b(3)	Software	Hardware
FCR-404	3.3.5.3.0-1	b(3)	CCP, ESM	REG, SDP
FCR-409	3.5.2.1.1.0-1	b(3)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-411	3.5.2.2.0-1	b(3)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3)
FCR-416	3.5.4.0-1	(U) The FCR shall be designed to use military lifting and handling equipment, unless the government approves justification for non-military equipment.		AMA, AEU, HEU, IFF, REG, b(3) SDP
FCR-417	3.5.4.0-2	(U) The FCR shall be designed such that standard military vehicles can be used for handling.		AMA, AEU, IFF, REG, b(3) SDP
FCR-420	3.5.5.1.0-1	b(3)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-422	3.5.5.2.0-1	b(3)		AMA, AEU, HEU, IFF, INS/GPS, REG, b(3) SDP
FCR-3288	3.7.1.0-1	b(3)		AEU, REG, b(3)
FCR-967	3.7.1.0-2	b(1)		AEU, b(3)
FCR-4037	3.7.1.0-3	b(3)		AEU, b(3)
FCR-3438	3.7.1.0-4	b(3)		AEU, b(3)
FCR-3437	3.7.1.0-5	b(3)		AEU, REG, b(3)
FCR-3717	3.7.1.0-5.0-1	b(1)		Hardware

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-3716	3.7.1.0-6	b(1)		Hardware
FCR-1109	3.7.1.1.1.0-1	(U) The AEU requirements shall apply in the operating environment of the aerostat, including the windscreen, confluence lines, and lightning cage.		AEU
FCR-975	3.7.1.1.2.0-1	b(1)		AEU
FCR-976	3.7.1.1.2.0-2	b(1)		AEU
FCR-977	3.7.1.1.2.0-3	b(1)		AEU
FCR-978	3.7.1.1.2.0-4	b(1)		AEU
FCR-980	3.7.1.1.3.0-1	b(3)		AEU

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-981	3.7.1.1.3.0-2	b(3)		AEU
FCR-983	3.7.1.1.3.0-5	b(3)		AEU
FCR-984	3.7.1.1.3.0-6	b(3)		AEU
FCR-986	3.7.1.1.3.0-7	b(3)		AEU
FCR-987	3.7.1.1.3.0-8	b(3)		AEU
FCR-990	3.7.1.1.4.0-1	b(1)		AEU
FCR-3296	3.7.1.1.5.0-2	b(1)		AEU
FCR-3313	3.7.1.1.5.0-3	b(1)		AEU
FCR-3297	3.7.1.1.5.0-4	b(1)		AEU
FCR-3314	3.7.1.1.5.0-5	b(1)		AEU

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-994	3.7.1.1.6.1.0-1	b(3)		AEU
FCR-1013	3.7.1.1.7.1.0-1	b(3)		AEU
FCR-1017	3.7.1.1.7.2.0-1	b(1)		AEU
FCR-3298	3.7.1.1.7.2.0-2	b(1)		AEU
FCR-1018	3.7.1.1.7.2.0-3	b(1)		AEU
FCR-3299	3.7.1.1.7.2.0-4	b(1)		AEU
FCR-1020	3.7.1.1.7.3.0-1	b(1)		AEU
FCR-1021	3.7.1.1.7.3.0-2	b(1)		AEU

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-1023	3.7.1.1.7.4.0-1	b(1)		AEU
FCR-3708	3.7.1.1.7.4.0-2	b(1)		AEU
FCR-1024	3.7.1.1.7.4.0-3	b(1)		AEU

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-3711	3.7.1.1.7.4.0-4	b(1)		AEU
FCR-1026	3.7.1.1.7.4.0-5	b(1)		AEU
FCR-3709	3.7.1.1.7.4.0-6	b(1)		AEU
FCR-1029	3.7.1.1.7.5.0-1	b(3)		AEU
FCR-1031	3.7.1.1.7.6.0-1	(U) The AEU normalized monopulse slope after calibration shall be NLT the values listed in Table XIV.		AEU
FCR-1033	3.7.1.1.7.7.0-1	(U) The AEU pointing errors, relative to the array face, shall be as defined in Table XV.	BSG	AEU

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-1037	3.7.1.1.7.8.0-1	b(1)		AEU
FCR-1038	3.7.1.1.7.8.0-2	b(1)		AEU
FCR-1040	3.7.1.1.7.9.0-1	b(1)		AEU
FCR-3710	3.7.1.1.7.9.0-1.0-1	b(1)		AEU

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-1041	3.7.1.1.7.9.0-2	b(1)		AEU
FCR-1043	3.7.1.1.7.10.0-1	b(1)		AEU
FCR-1072	3.7.1.2.1.1.0-1	b(3)		b(3)
FCR-1112	3.7.1.2.1.1.0-3	b(1)		b(3)
FCR-1080	3.7.1.2.2.1.0-1	b(1)		b(3)
FCR-1081	3.7.1.2.2.1.0-2	b(1)		b(3)
FCR-1083	3.7.1.2.2.2.0-1	b(1)		b(3)
FCR-1088	3.7.1.2.2.3.0-1	b(3)		b(3)

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-1092	3.7.1.2.3.1.0-1	b(1)		b(3)
FCR-1094	3.7.1.2.3.2.0-1	b(1)		b(3)
FCR-4092	3.7.1.2.4.0-1	b(1)		b(3)
FCR-946	3.7.1.3.1.0-1	b(3)		AMA, REG
FCR-948	3.7.1.3.1.0-2	b(3)		AMA
FCR-950	3.7.1.3.2.0-1	b(3)		AMA, REG
FCR-952	3.7.1.3.2.0-2	b(3)		AMA, REG
FCR-953	3.7.1.3.2.0-3	(U) Limit switches shall be provided to prevent damage to the elevation drive due to overtravel.		AMA, REG
FCR-954	3.7.1.3.2.0-4	(U) Mechanical stops shall be provided to prevent damage to the elevation drive due to overtravel.		AMA

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ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-958	3.7.1.3.3.0-1	(U) The Gimbal and damper assembly shall restrict the motion of the FCR payload to prevent damage to the platform in winds up to 148 km/hr (80 knots) and 3.05 m/s (10 fps) turbulence		AMA
FCR-3319	3.7.1.4.0-1	(U) The INS shall provide position and orientation data.		INS/GPS
FCR-933	3.7.1.4.0-2	(U) The INS shall provide attitude data b(3)		INS/GPS, REG
FCR-934	3.7.1.4.0-3	(U) The INS shall be capable of alignment in b(3)		INS/GPS
FCR-935	3.7.1.4.0-4	(U) The INS determination of the three Euler angles (or, equivalently, the pitch, roll and yaw angles) of the receive antenna reference plane shall be as shown in Table XIX after INS alignment. b(3)		INS/GPS
FCR-3320	3.7.1.6.0-1	(U) The IFF Interrogator's field of view shall be aligned with the field of view of the radar.		IFF
FCR-3321	3.7.1.6.0-2	(U) The IFF Interrogator's azimuth coverage shall be b(3)		IFF
FCR-3441	3.7.1.6.0-3	(U) The IFF Interrogator's elevation coverage shall be b(3)		IFF
FCR-3195	3.7.1.8.1.0-1	(U) The REG PDU shall provide power to all airborne FCR hardware components.		REG
FCR-3327	3.7.1.8.3.0-2	(U) The SCU shall provide stable azimuth loop compensator characteristics when commanded by the SDP.		REG
FCR-3329	3.7.1.8.3.0-3	(U) The SCU shall provide continuous stable elevation loop compensator characteristics for the operational wind conditions.		REG
FCR-3328	3.7.1.8.3.0-4	(U) The SCU shall provide azimuth and elevation motor brake control.		REG
FCR-908	3.7.1.9.0-1	(U) The HEU shall regulate the operating temperature of the b(3) and REG.		AEU, HEU, REG, b(3)

~~SECRET/NOFORN~~				
ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-914	3.7.1.9.0-2	(U) The HEU, when the FCR is operating in the tactical mode or during calibration shall have an outlet temperature between 30°C and 40°C		AEU, HEU, REG, b(3)
FCR-918	3.7.1.9.0-3	(U) The HEU shall provide a heating element capable of heating the REG and b(3) to operational temperature from an ambient temperature of b(3) . Above 0°C the b(3) and REG are powered to provide additional heating to meet this requirement.		AEU, HEU, b(3)
FCR-3443	3.7.1.9.0-4	(U) The HEU shall provide a cooling element to assist in cooling the REG and b(3) to operational temperature from an ambient temperature of b(3) . Note: the FCS Platform chiller assists in cooling the equipment.		HEU
FCR-3488	3.7.1.10.0-1	(U) The SDP shall include multiple CPUs, thereby enabling parallel processing.		SDP
FCR-3489	3.7.1.10.0-2	(U) The SDP shall include removable disk drives.		SDP
FCR-3490	3.7.1.10.0-3	(U) The SDP shall include a tape drive.		SDP
FCR-3491	3.7.1.10.0-4	(U) The SDP shall provide the capability to transfer data from disk to tape.		SDP
FCR-3492	3.7.1.10.0-5	b(3)		SDP
FCR-3493	3.7.1.10.0-6	b(3)		SDP
FCR-3494	3.7.1.10.0-7	b(3)		SDP
FCR-3461	3.7.2.1.0-1	(U) The BSG software shall compute beam steering coefficients in response to radar pointing and beam definition commands.	BSG	

~~SECRET/NOFORN~~				
ID	**Object Number**	**Object Text**	**Software RAM**	**Hardware RAM**
FCR-3463	3.7.2.2.0-1	(U) The CCP software shall provide the interface between the FCR and the FCS CPG in accordance with the JLENS System IRS.	CCP	
FCR-3464	3.7.2.3.0-1	(U) The DCA software shall have commandable levels of data recording which include a minimum level, a full test level, and a maximum of NLT two intermediate levels.	DCA	
FCR-3462	3.7.2.4.0-1	(U) The ESM software shall support calibration/alignment of the b(3)	ESM	
FCR-3465	3.7.2.4.0-2	(U) The ESM software shall perform FCR software state control.	ESM	
FCR-3498	3.7.2.4.0-3	(U) The ESM software shall determine b(3) is non-functional and send status to MAP.	ESM	
FCR-3499	3.7.2.4.0-4	(U) The ESM software shall determine b(3) is non-functional.	ESM	
FCR-3501	3.7.2.4.0-5	b(3)	ESM	
FCR-1067	3.7.2.5.0-1	(U) The MAP software shall b(3) as commanded by the CPG.	MAP	
FCR-931	3.7.2.5.0-2	(U) The MAP software shall support b(3) Note: b(3) will only be enabled if testing determines that b(3)	MAP	
FCR-3439	3.7.2.5.0-3	(U) The MAP software shall translate an ECR state vector commanded in an IFF interrogation request from the CPG into IFF body coordinates for commanding the CIT to perform the interrogation.	MAP	