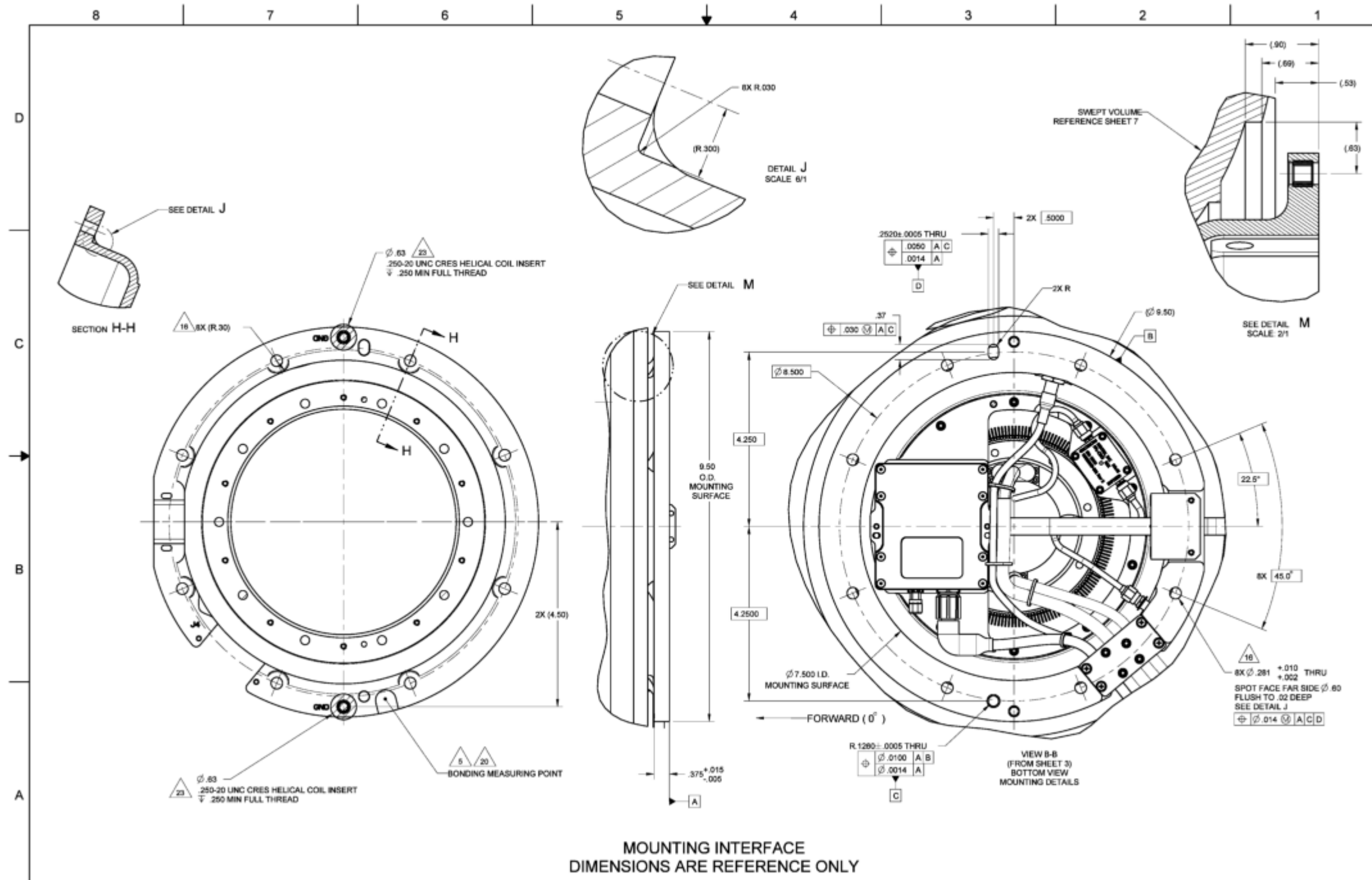


ICN-38473-0000786878-001-01

Figure 3-11. (Sheet 5 of 14) FMA Outline and Installation Drawing (90002609-001)



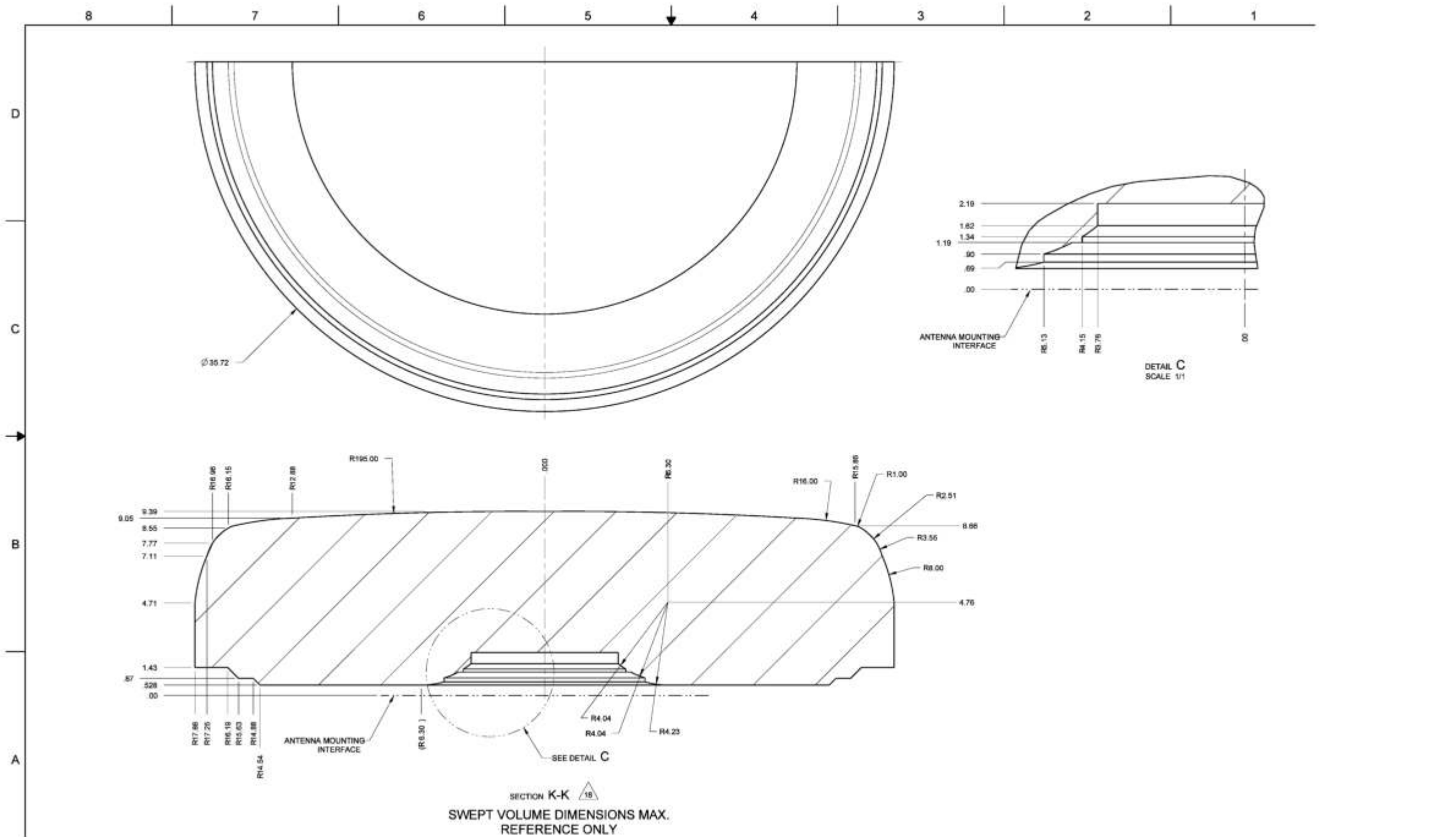
ICN-38473-0000786879-001-01

Figure 3-11. (Sheet 6 of 14) FMA Outline and Installation Drawing (90002609-001)

EFFECTIVITY
 ALL

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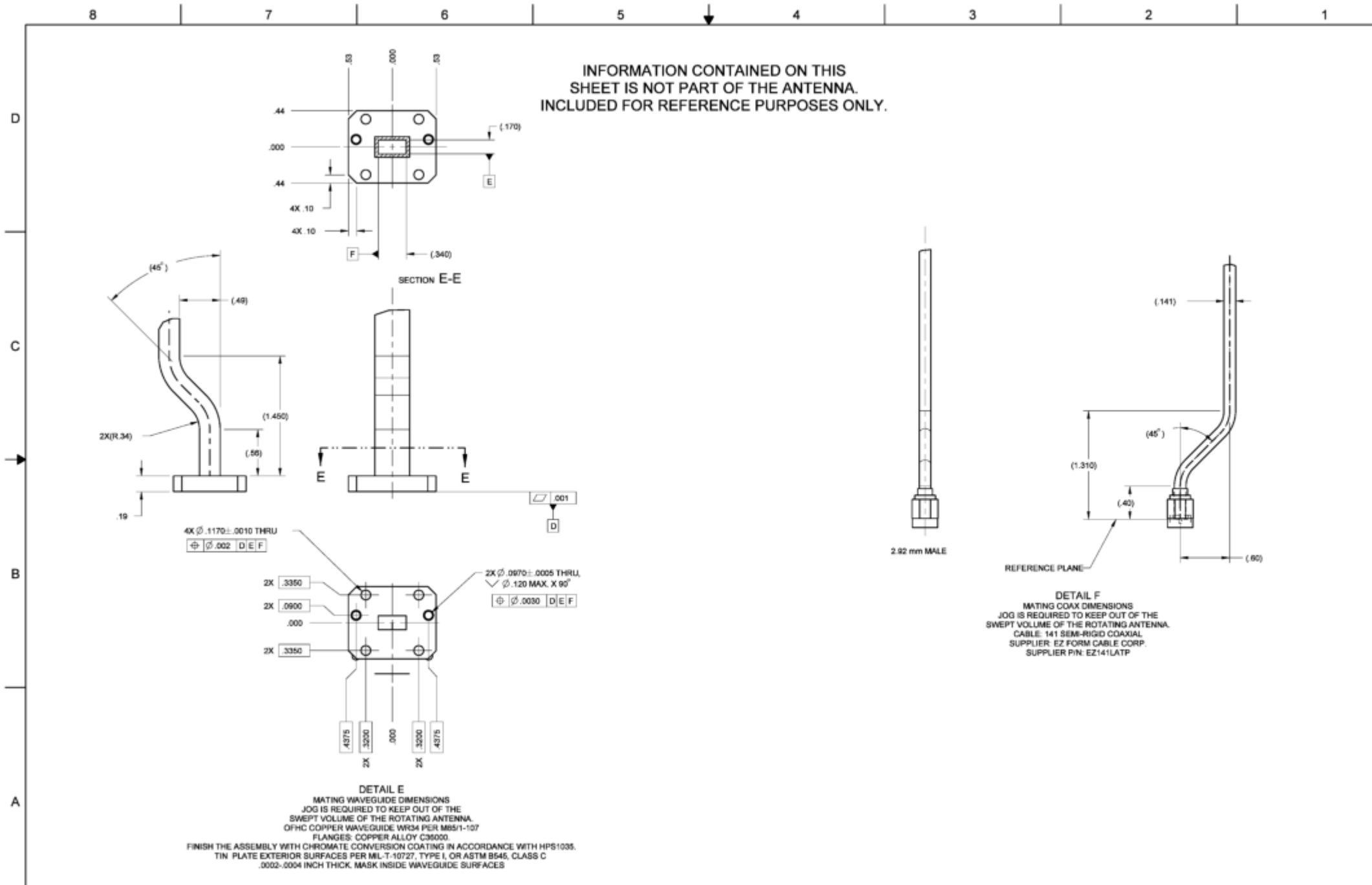
ICN-38473-0000786880-001-01

Figure 3-11. (Sheet 7 of 14) FMA Outline and Installation Drawing (90002609-001)

EFFECTIVITY
 ALL

23-15-84

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ICN-38473-0000786881-001-01

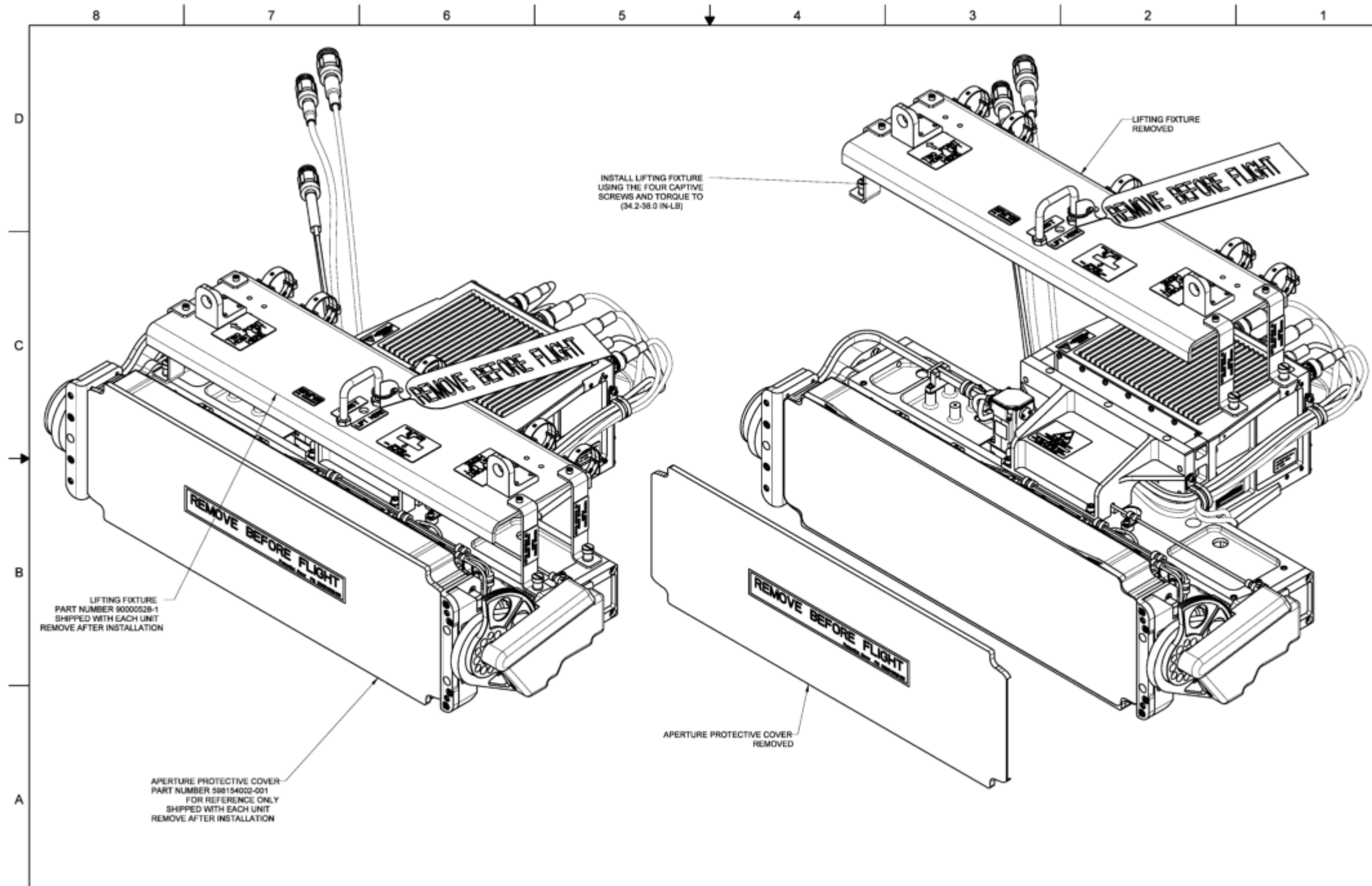
Figure 3-11. (Sheet 8 of 14) FMA Outline and Installation Drawing (90002609-001)

EFFECTIVITY

ALL

23-15-84

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 11 Nov 2020



ICN-38473-0000786882-001-01

Figure 3-11. (Sheet 9 of 14) FMA Outline and Installation Drawing (90002609-001)

EFFECTIVITY

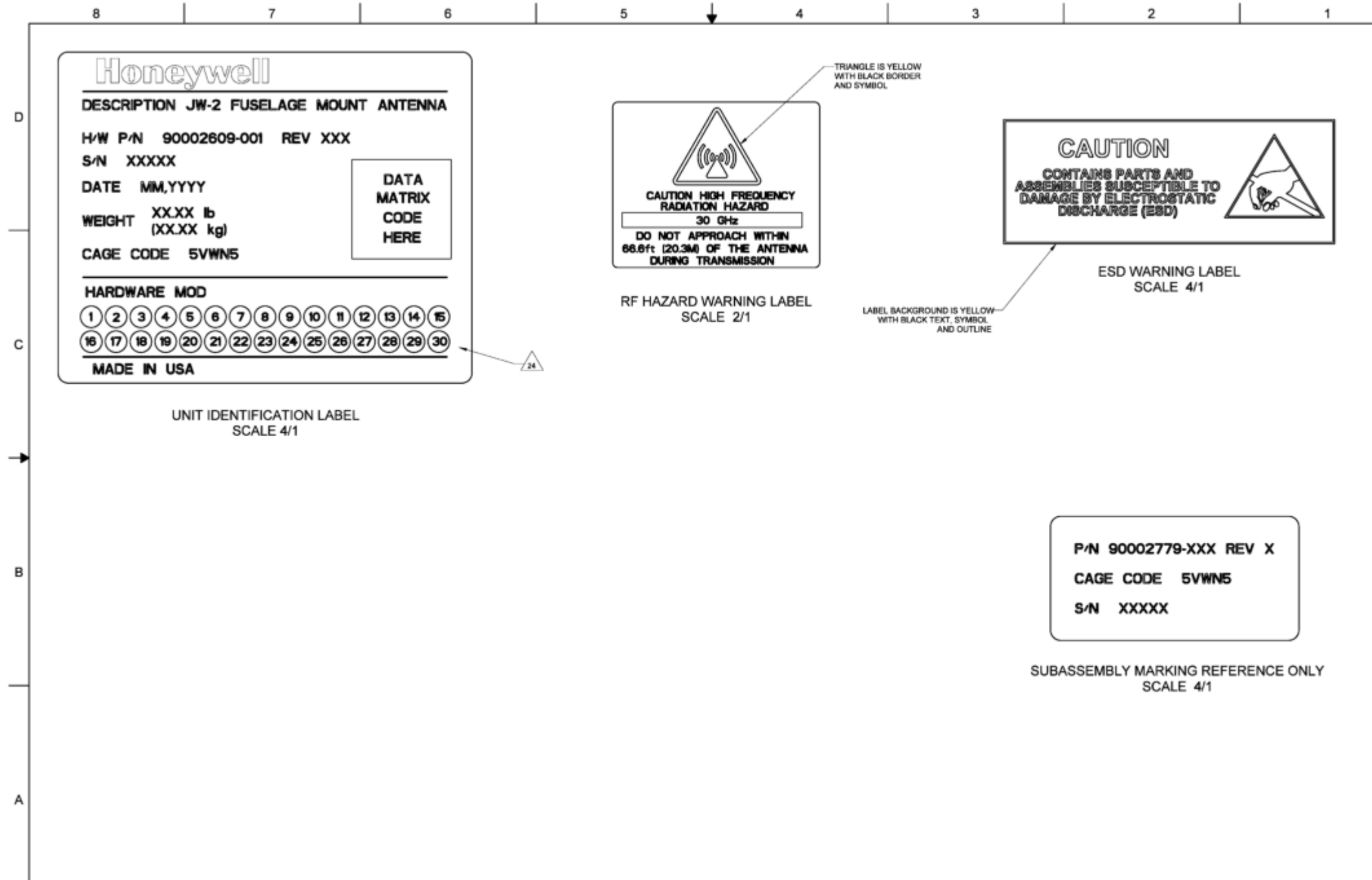
ALL

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL
 JetWave™ MCS-8562 Terminal



ICN-38473-0000786883-001-01

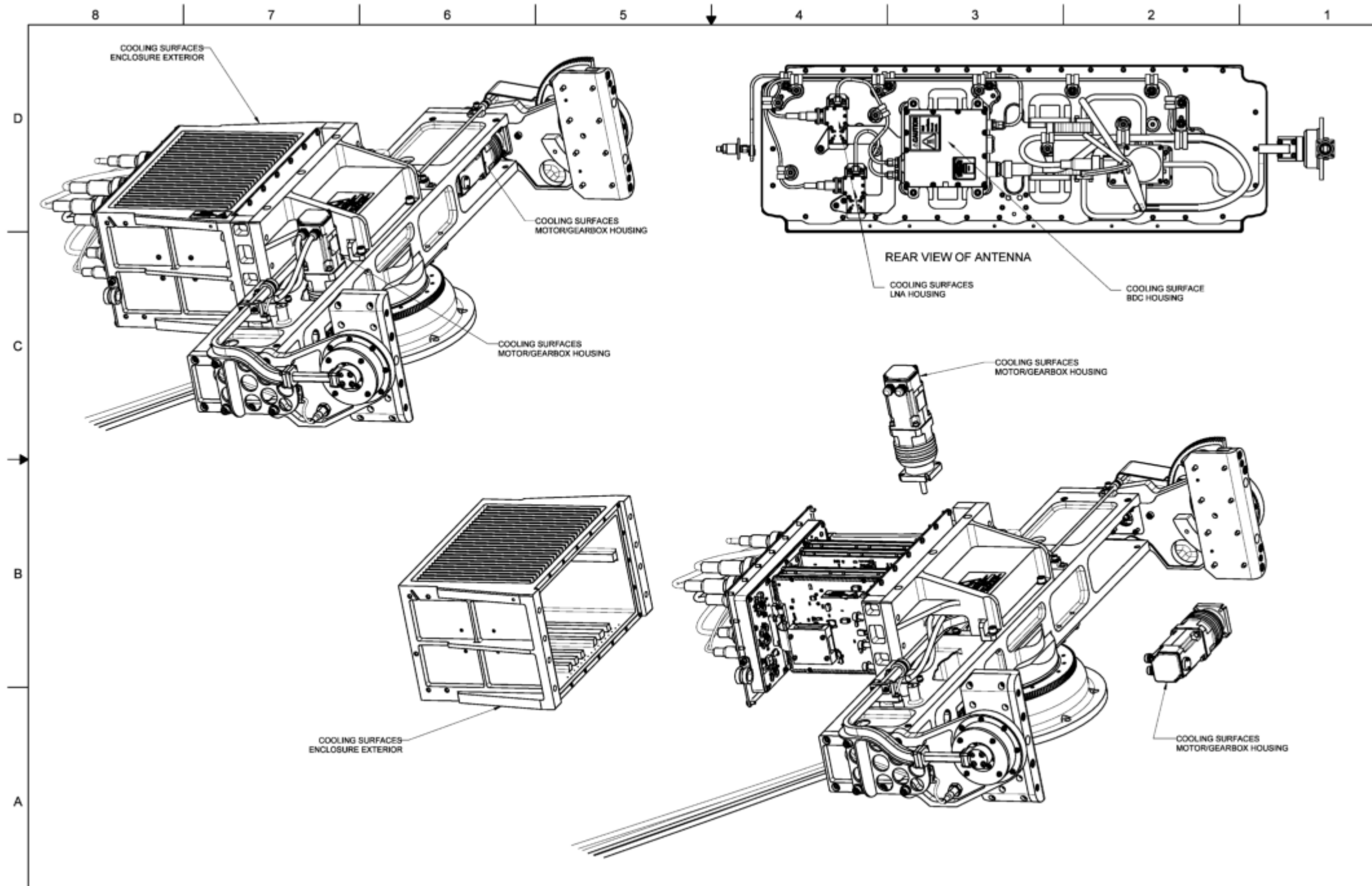
Figure 3-11. (Sheet 10 of 14) FMA Outline and Installation Drawing (90002609-001)

EFFECTIVITY

ALL

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 11 Nov 2020



ICN-38473-0000786884-001-01

Figure 3-11. (Sheet 11 of 14) FMA Outline and Installation Drawing (90002609-001)

EFFECTIVITY

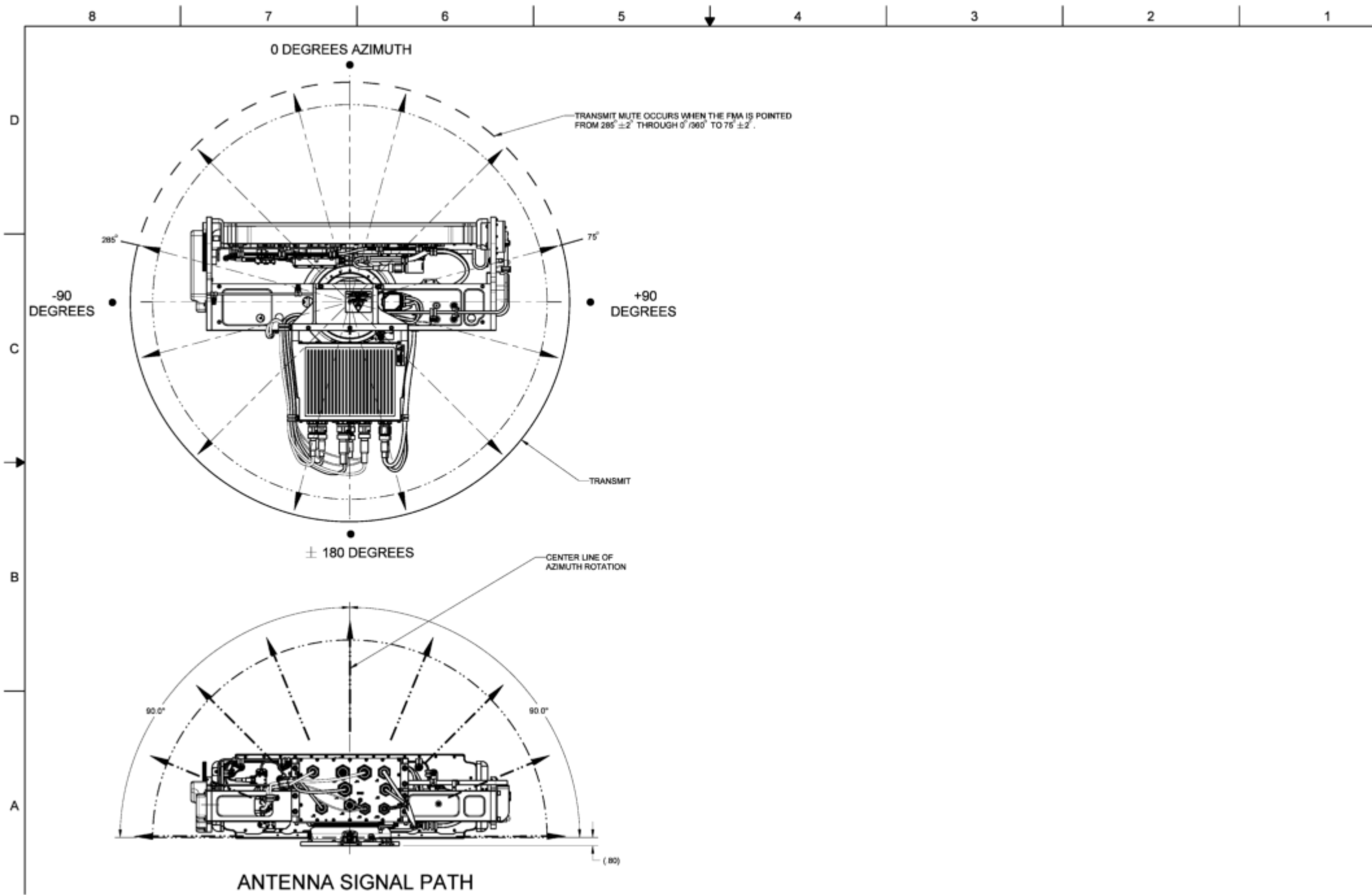
ALL

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ICN-38473-0000786885-001-01

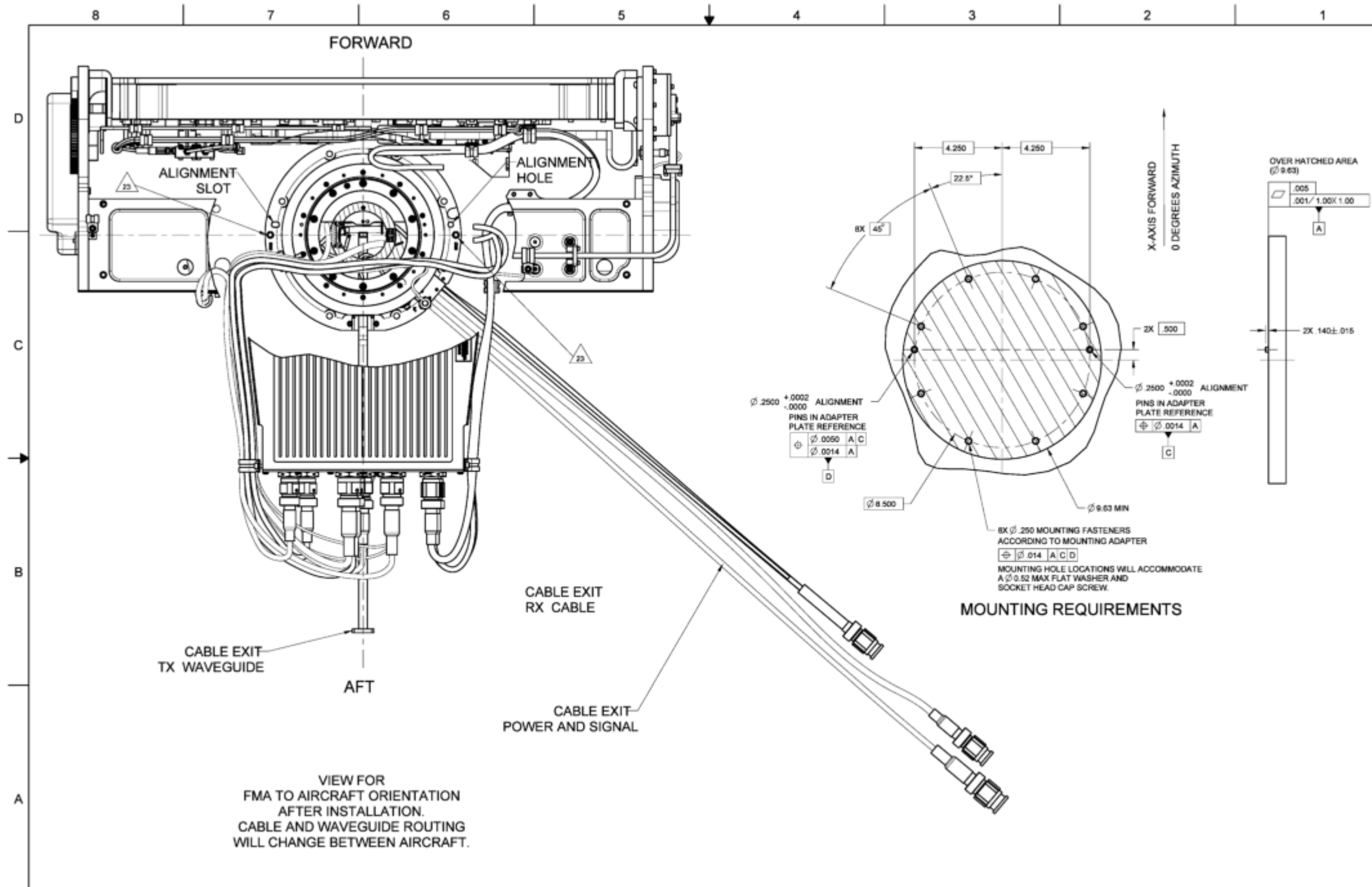
Figure 3-11. (Sheet 12 of 14) FMA Outline and Installation Drawing (90002609-001)

EFFECTIVITY

ALL

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11 Nov 2020



ICN-38473-0000786886-001-01

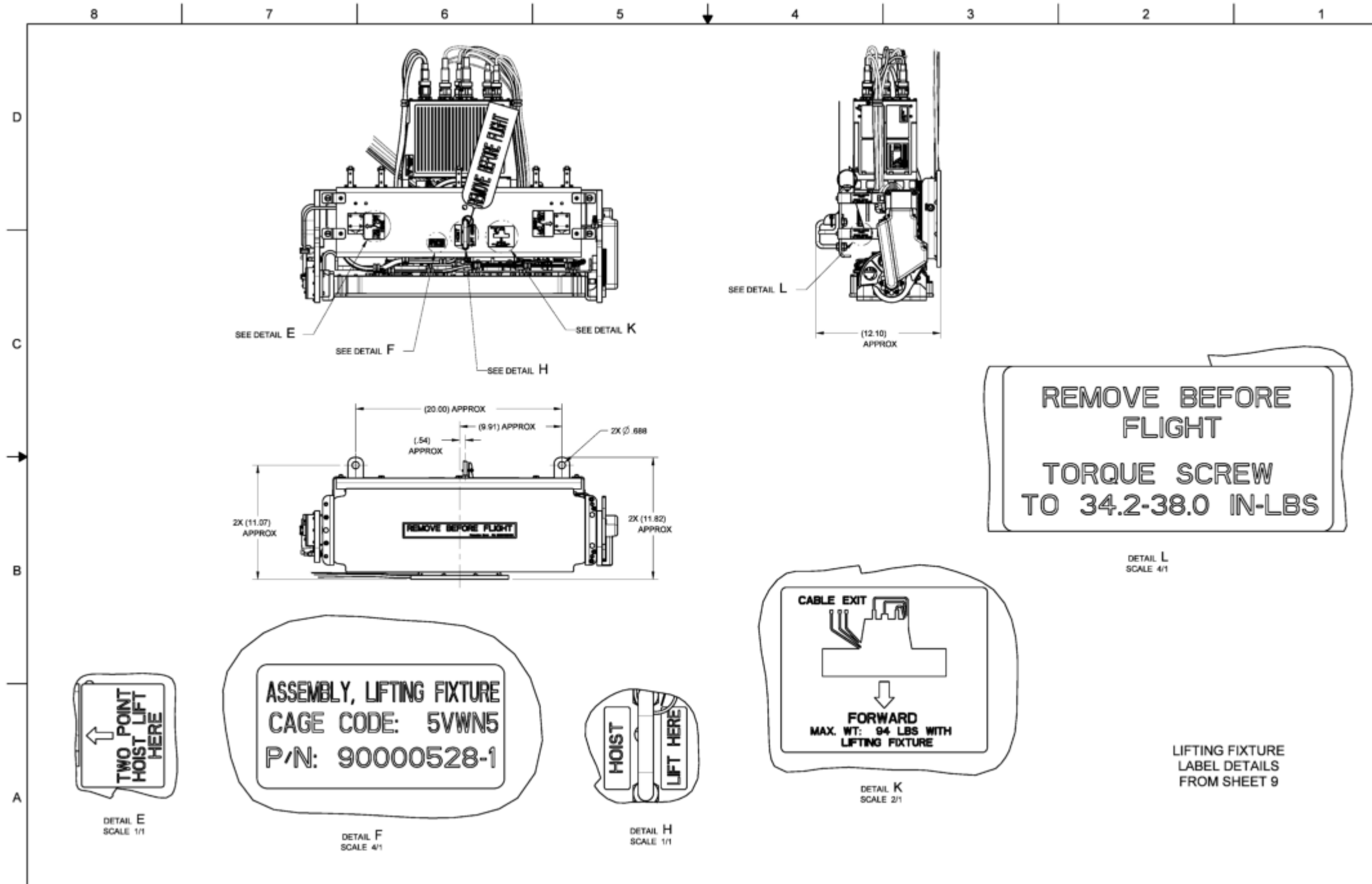
Figure 3-11. (Sheet 13 of 14) FMA Outline and Installation Drawing (90002609-001)

EFFECTIVITY

ALL

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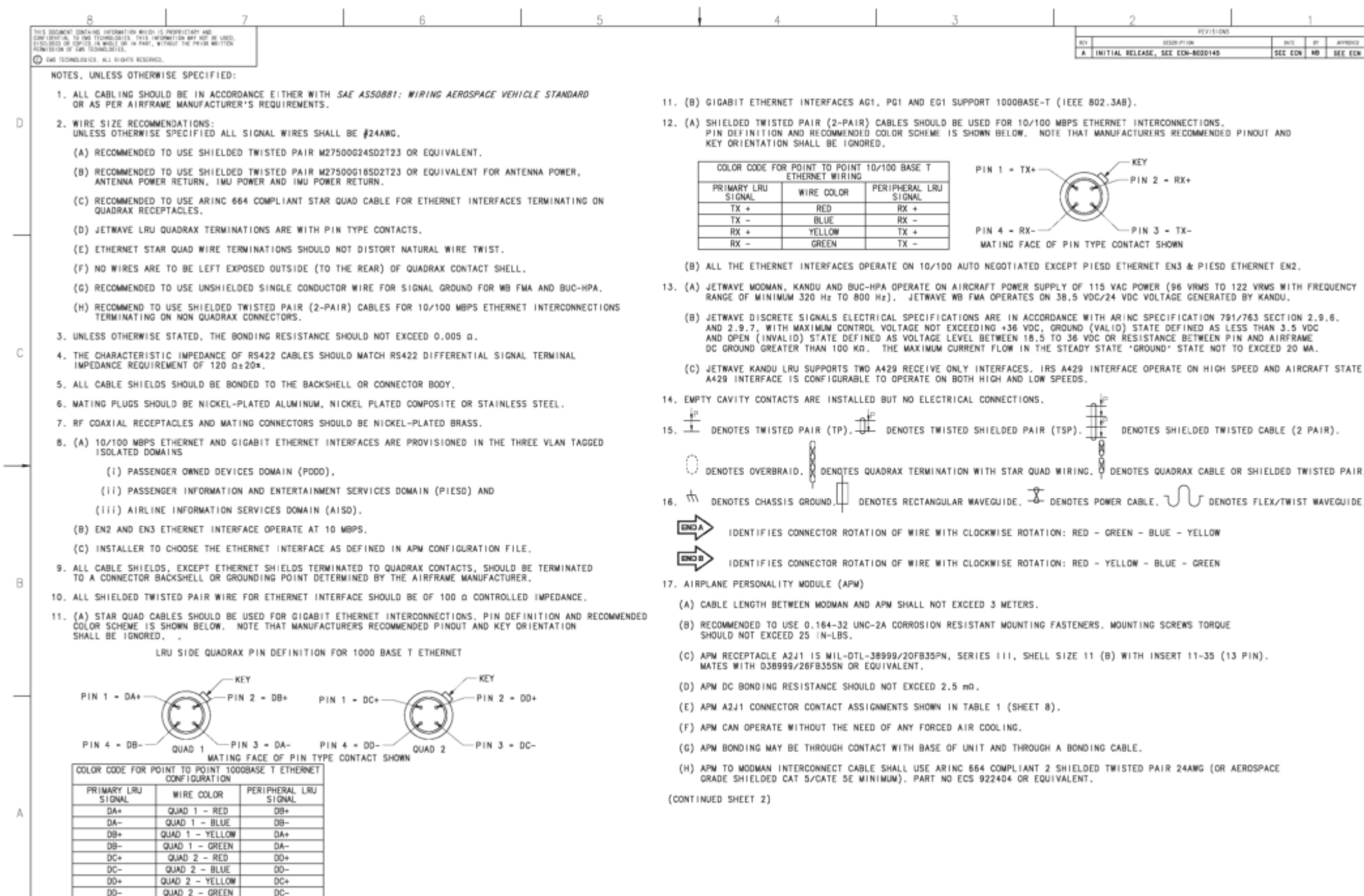


ICN-38473-0000786887-001-01

Figure 3-11. (Sheet 14 of 14) FMA Outline and Installation Drawing (90002609-001)

EFFECTIVITY
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ICN-38473-0000781471-001-01

Figure 3-12. (Sheet 1 of 9) JetWave™ MCS-8562 Terminal Interconnect Diagram - (90410870)

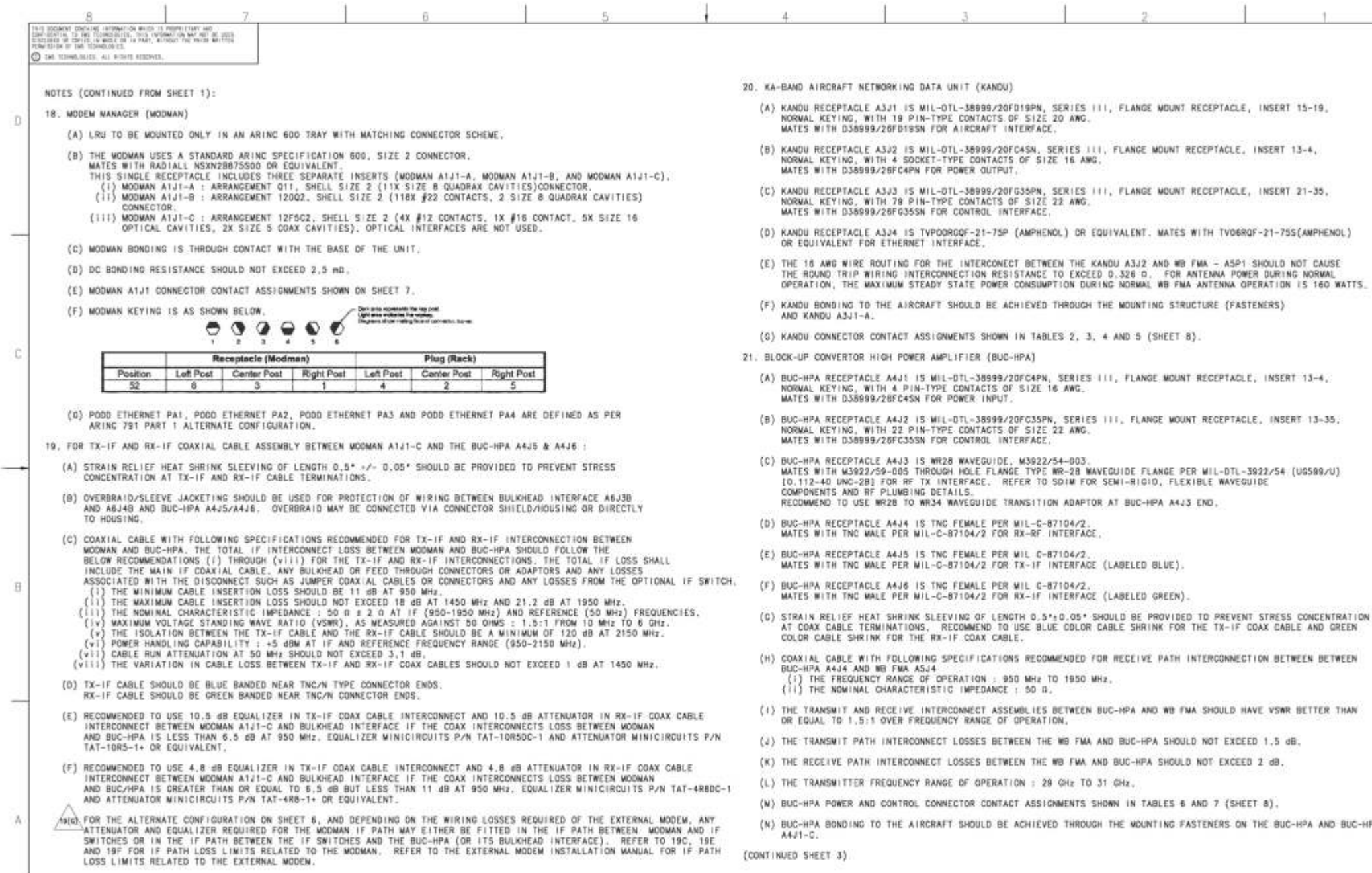


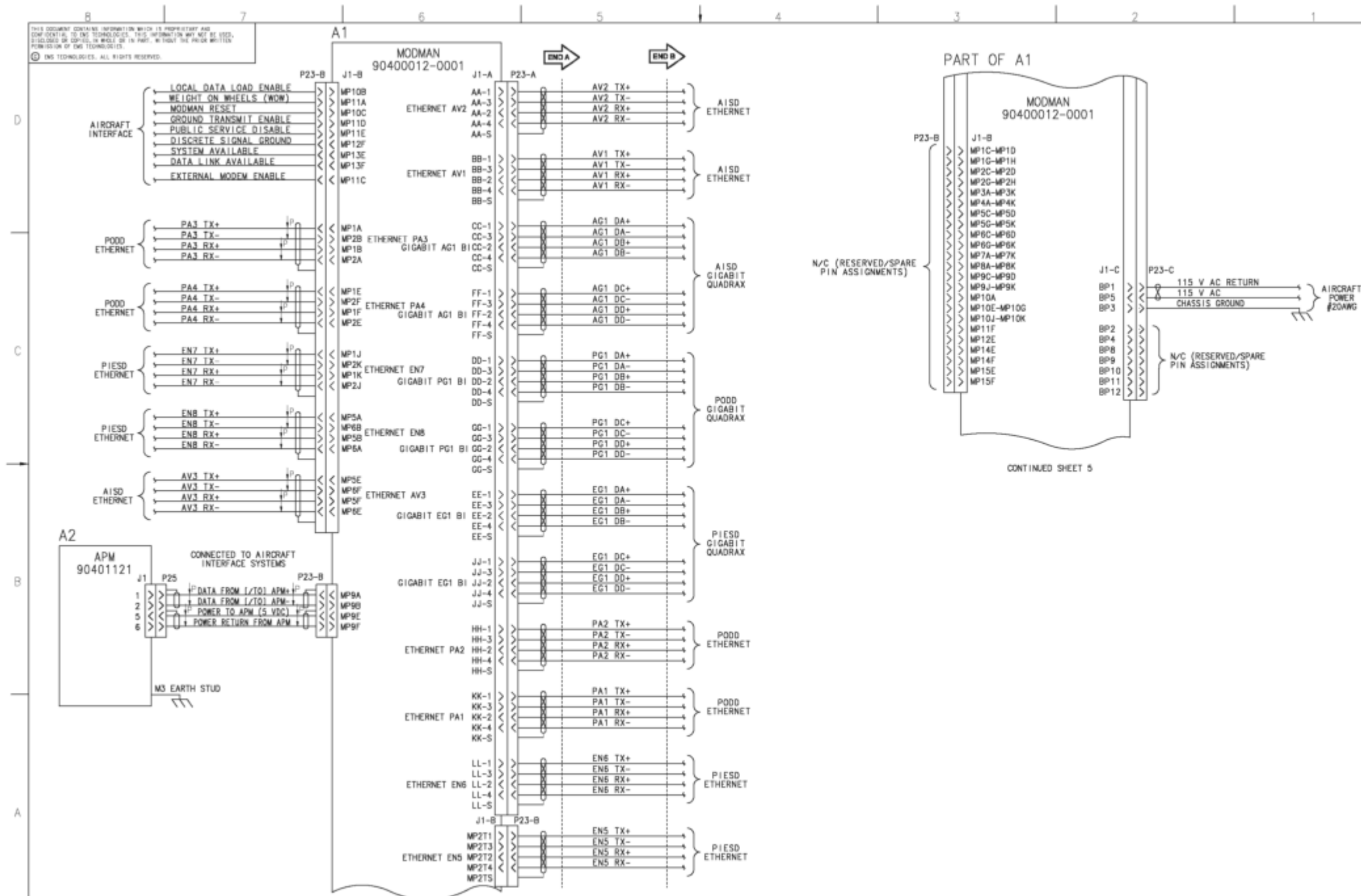
Figure 3-12. (Sheet 2 of 9) JetWave™ MCS-8562 Terminal Interconnect Diagram - (90410870)

ICN-38473-0000781472-001-01



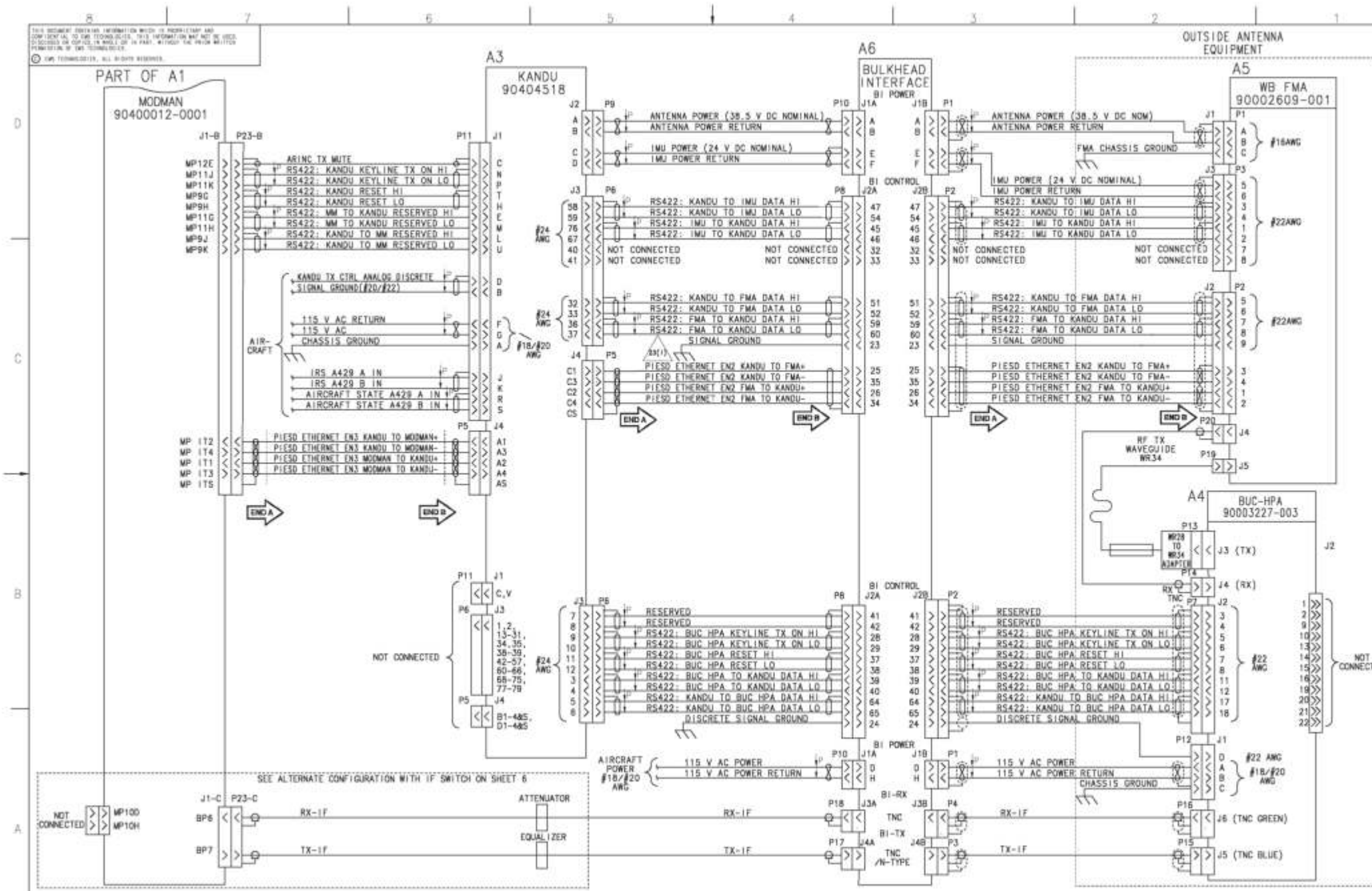
ICN-38473-0000781473-001-01

Figure 3-12. (Sheet 3 of 9) JetWave™ MCS-8562 Terminal Interconnect Diagram - (90410870)



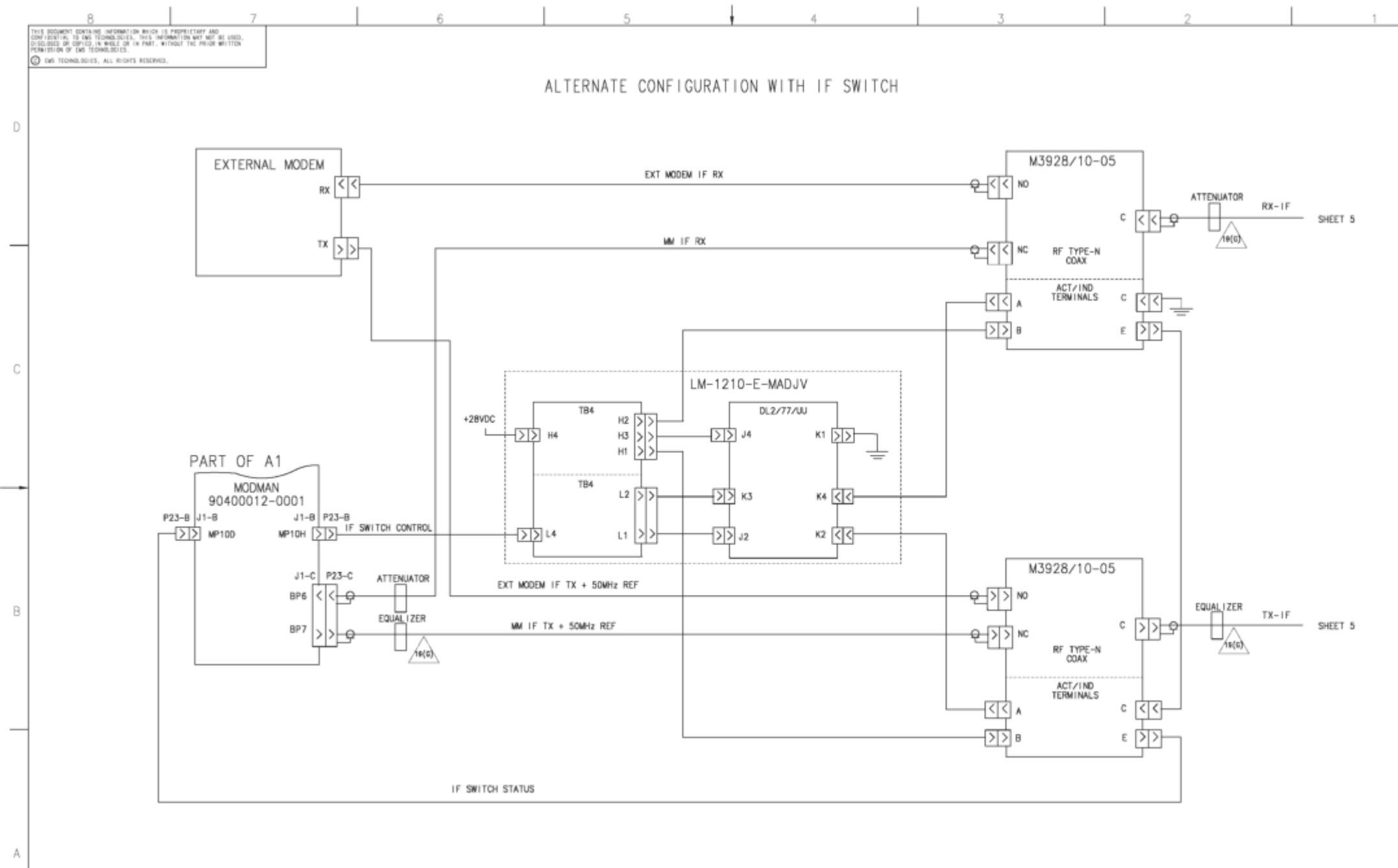
ICN-38473-0000781474-001-01

Figure 3-12. (Sheet 4 of 9) JetWave™ MCS-8562 Terminal Interconnect Diagram - (90410870)



ICN-38473-0000781475-001-01

Figure 3-12. (Sheet 5 of 9) JetWave™ MCS-8562 Terminal Interconnect Diagram - (90410870)



ICN-38473-0000781476-001-01

Figure 3-12. (Sheet 6 of 9) JetWave™ MCS-8562 Terminal Interconnect Diagram - (90410870)

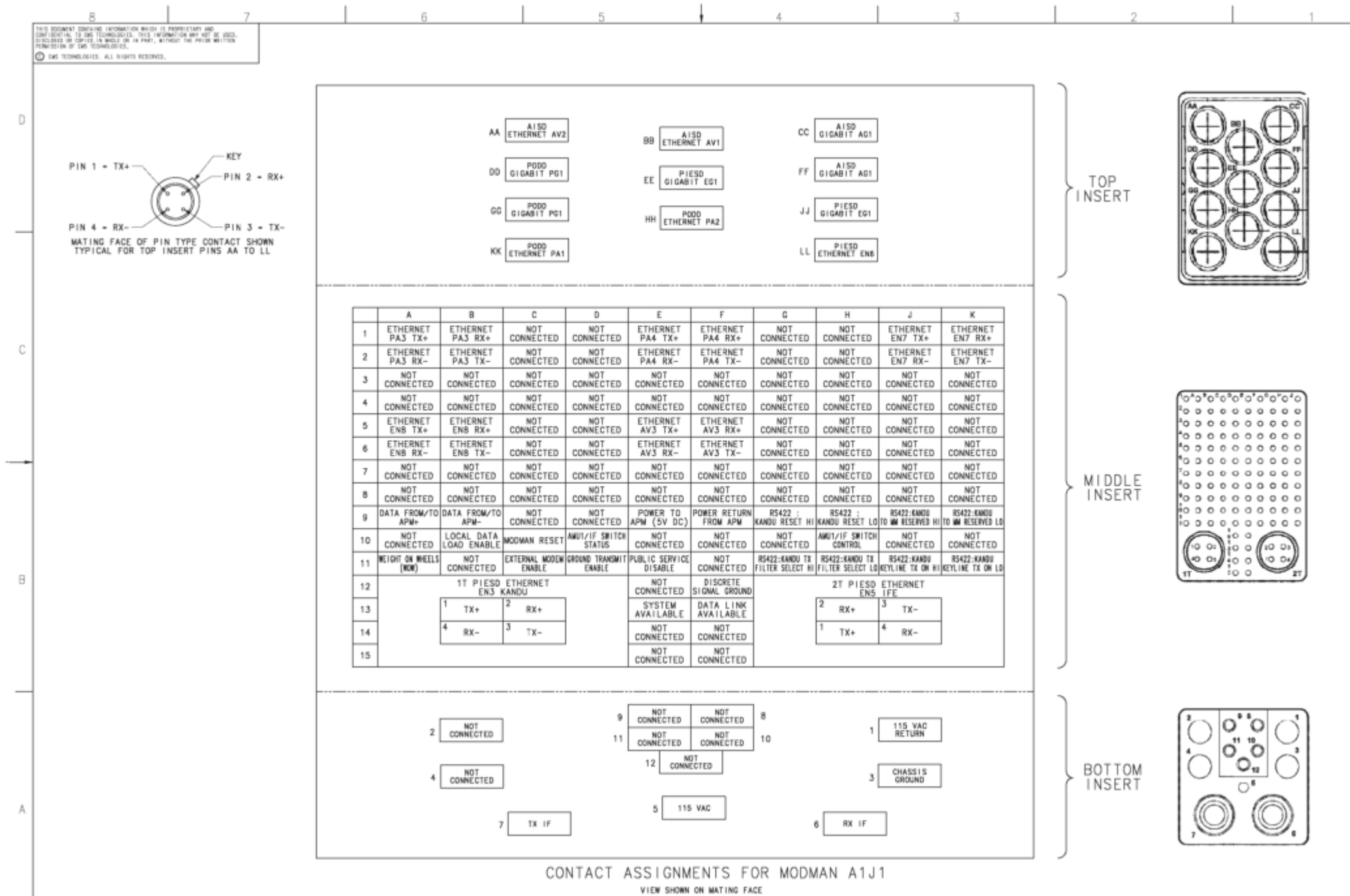
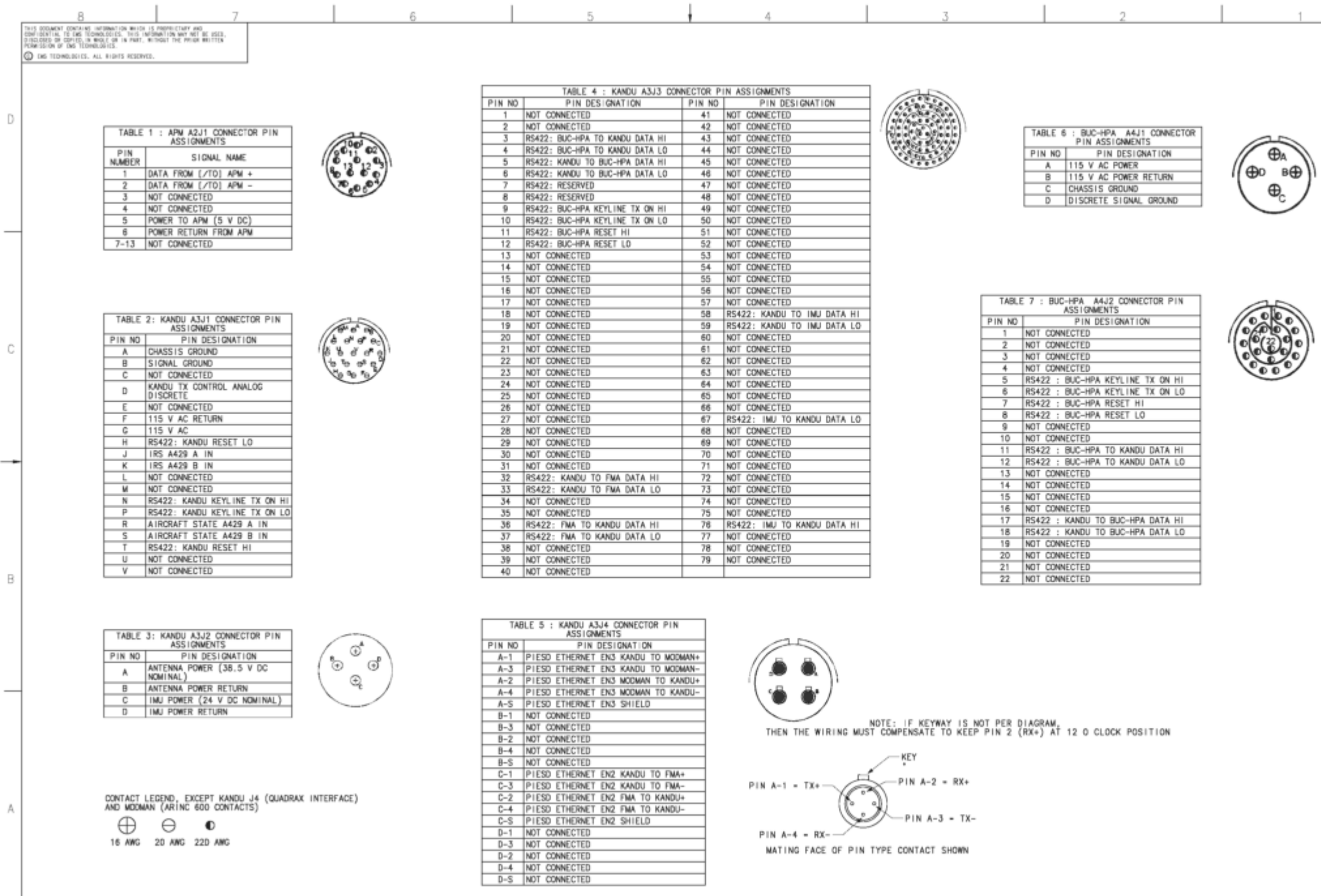


Figure 3-12. (Sheet 7 of 9) JetWave™ MCS-8562 Terminal Interconnect Diagram - (90410870)

ICN-38473-0000781477-001-01



ICN-38473-0000781478-001-01

Figure 3-12. (Sheet 8 of 9) JetWave™ MCS-8562 Terminal Interconnect Diagram - (90410870)

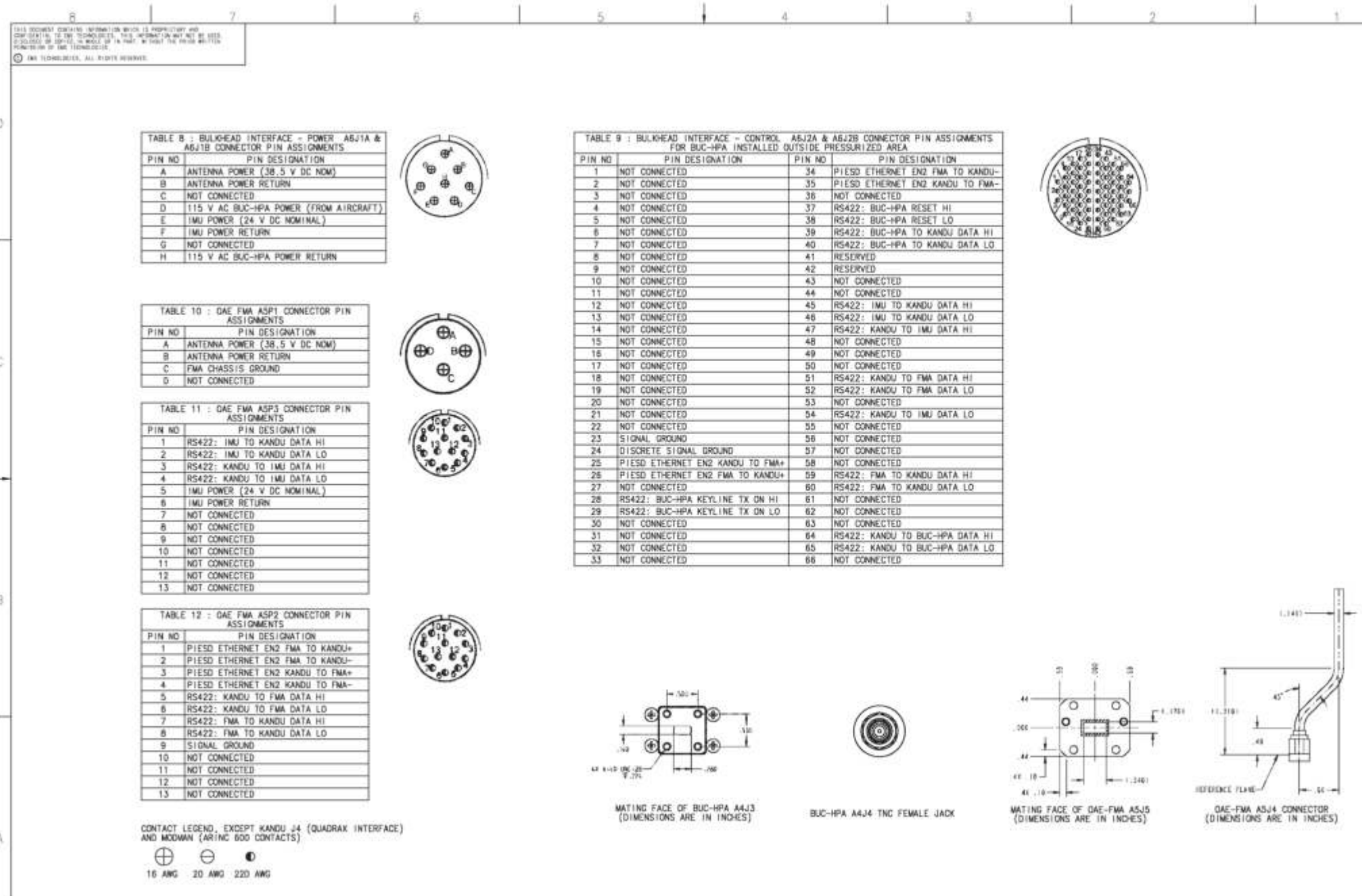


Figure 3-12. (Sheet 9 of 9) JetWave™ MCS-8562 Terminal Interconnect Diagram - (90410870)

SECTION 4 – SOFTWARE CONFIGURATION

1. ARINC 615A Software Data Load Process

A. Introduction

As a minimum, APM system configuration files need to be loaded onto the JetWave™ MCS-8562 Terminal.

The JetWave™ MCS-8562 Terminal LRUs are preloaded with a full software load and there may be a need to perform a field data load under normal conditions during installation. If a new software release is desired by means of a Service Bulletin, or if all of the LRUs are not at the same software release level, then a new data load will be required.

On completion of physical installation and interconnection of JetWave™ MCS-8562 Terminal LRUs in the aircraft, it is to be verified that the appropriate version of the JetWave™ LRU operational data and APM configuration file is data loaded onto the JetWave™ LRUs.

Whenever an LRU is exchanged in a JetWave™ MCS-8562 Terminal, confirmation is required to make sure that the replacement LRU contains software that is compatible with the software configuration of the other boxes. The software upgrade procedures must be rerun for that particular LRU each time an LRU is replaced, to make sure there is compatibility within the JetWave™ MCS-8562 Terminal.

The JetWave™ MCS-8562 Terminal does not allow for any mix of Honeywell and non-Honeywell furnished LRUs.

The JetWave™ MCS-8562 Terminal LRU operational data files are available from the Honeywell Portal. The software data load can be carried out when the data load files are issued separately along with Service Bulletins for any in-service system updates.

Only Honeywell approved software is loadable onto JetWave™ MCS-8562 Terminal LRUs.

This section of the document supplies information on how to accomplish ARINC 615A data loading of JetWave™ MCS-8562 Terminal in the field.

The data loading of JetWave™ MCS-8562 Terminal is done while the aircraft is on ground. During the data load, there will not be any RF transmission.

B. System Requirements

For data load, the data loader is to be interfaced with Modman through the ARINC 600 Modman AV1 Ethernet port unless APM configuration does specify other port / IPs settings. The AES JetWave™ MCS-8562 Terminal Modman is designed to enter into data load mode when the discrete signal interface for Data load Enable is asserted (grounded) by ARINC 615A compliant data loading utility. The discrete input electrical specification is in accordance with the specification in ARINC 763 Section 2.9.6.

It is recommended that the Modman AV1 Maintenance port and Modman Data Load Enable discrete interface be wired for JetWave™ MCS-8562 Terminal AES data load and AES log extraction.

An ARINC 615A compliant data loading utility is recommended to be used for JetWave™ AES data loading. The data loading software-based utility may be hosted on a PC architecture device such as an Electronic Flight Bag (EFB) or other portable computing device, an on-board portable device, or an avionics device. Since the Aircraft loading procedures can vary due to different type of uploading means, it is recommended to refer to the appropriate Aircraft Maintenance Manual before attempting data loading of JetWave™ MCS-8562 Terminal AES system.

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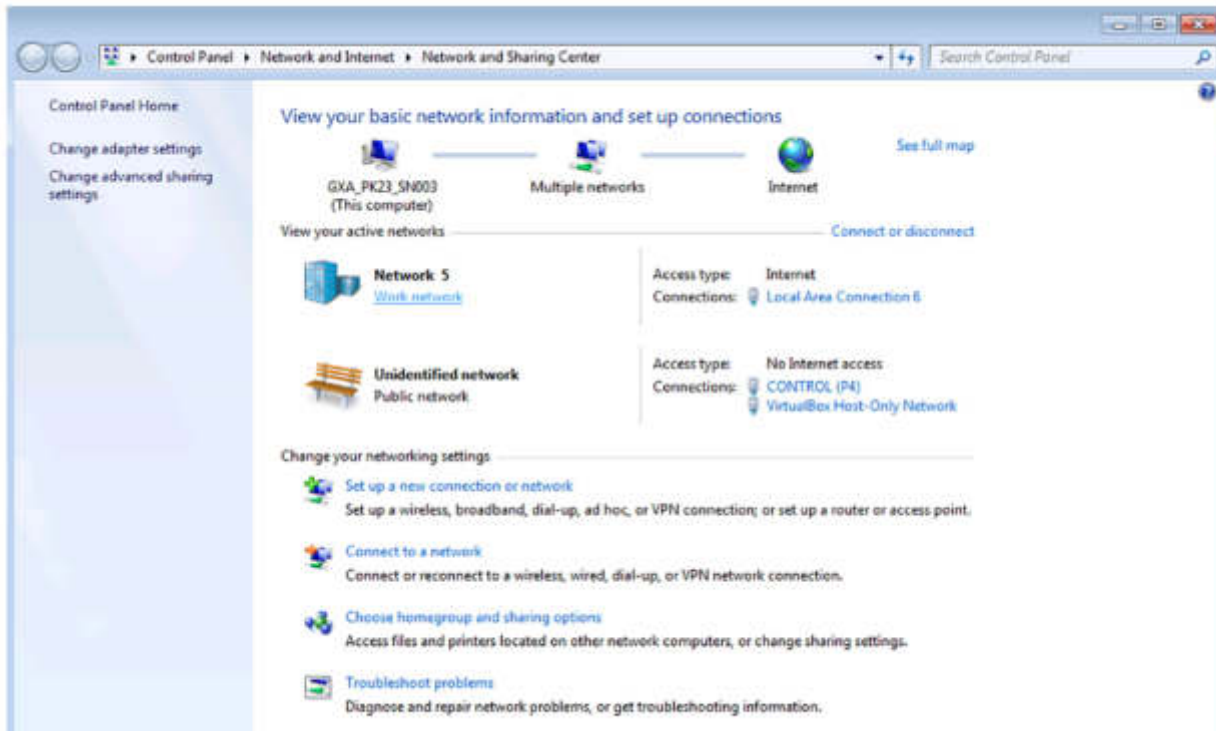
C. Windows PC IP Configuration for Data Load

On the data loader PC NIC (network interface controller) card, assign this static IP address and subnet address to the Ethernet port that will be connected to the Modman:

- IP address: 172.29.55.10
- Subnet address: 255.255.255.0.

NOTE: The above IP and subnet addresses are based on what is set in the Aircraft Services Configuration File in the APM. The IP can differ between customer specifications, but generally this IP layout is used. If in doubt, verify what data load IP is configured in the APM. The static IP assigned to the Ethernet port on the PC needs to be in the same subnet as the data load IP (i.e 172.29.55.X).

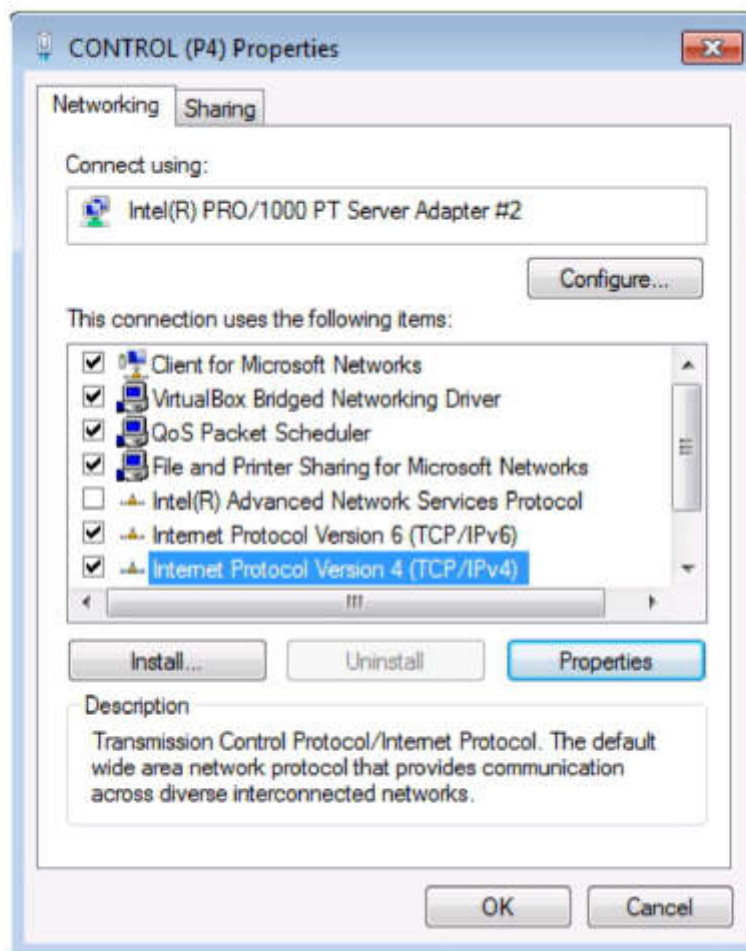
On a Windows PC, this can be done by navigating to Control Panel -> Network and Sharing Center, then selecting the Ethernet connection as shown in Figure 4-1. In Figure 4-1, the Ethernet connection from the Modman has been arbitrarily named "CONTROL" and it is in the P4 slot of the NIC card.



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Figure 4-1. Network Settings Page

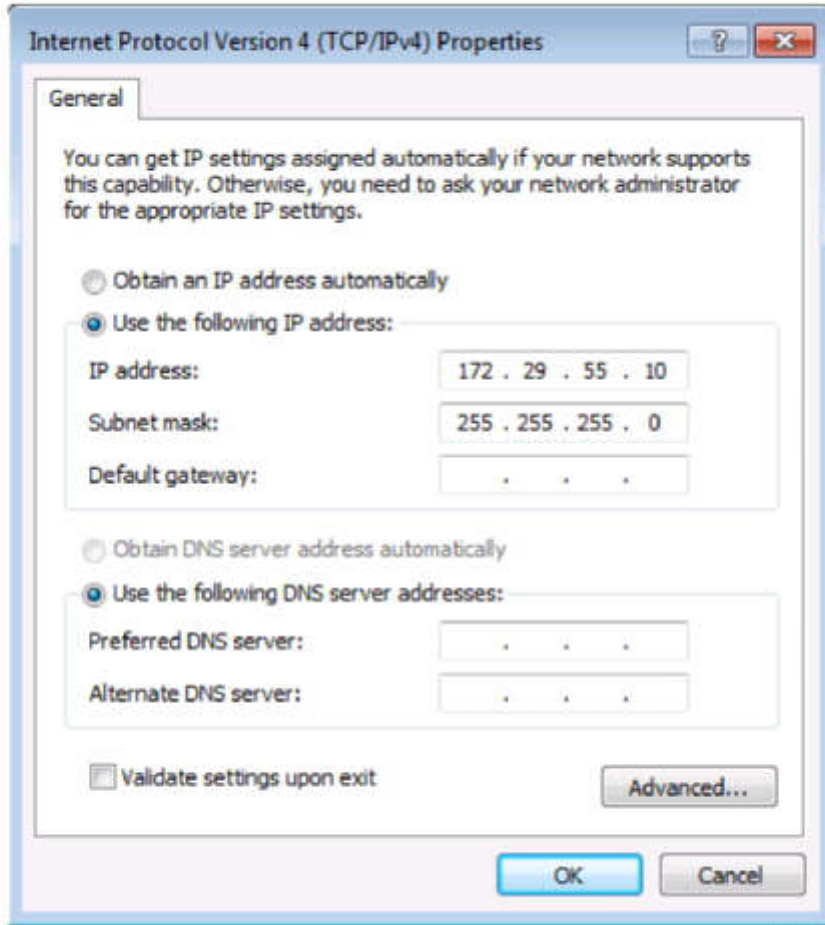
Once the Ethernet connection has been selected, it will open a Properties page. Select the "Internet Protocol Version 4 (TCP/IPv4)" item in the presented list, and click "Properties", as seen in Figure 4-2.



ICN-38473-0000256673-001-01

Figure 4-2. Control (P4) Properties

Set the static IP and subnet address as depicted in Figure 4-3. Press “OK” when done.



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Figure 4-3. Internet Protocol Version 4 (TCP/IPv4) Properties

Afterwards, open a Windows Command Prompt terminal and type “ipconfig”, which will print the list of network configurations on the PC. Find the name of the Ethernet adapter (ex. CONTROL (P4)) in which the Modman Ethernet is connected to, and verify that the IPv4 address and Subnet Mask match what was configured in the steps above.

D. Overview

This section contains the instructions for data loading of JetWave™ MCS-8562 Terminal software to any of the JetWave™ MCS-8562 Terminal LRUs through the Ethernet interface maintenance port of Modman. Data loading of JetWave™ MCS-8562 Terminal can be performed while:

- JetWave™ MCS-8562 Terminal is in normal operation

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- During system initialization
- When in AES Critical Fault Mode.

The maintenance operator is responsible for determining which loads are presented to the JetWave™ MCS-8562 Terminal AES system through the Modman for data load. JetWave™ MCS-8562 Terminal AES system in turn will determine the files required to meet the data load request.

The JetWave™ MCS-8562 Terminal AES system data loading of all LRUs including uploading of the AES configuration data can be performed through Modman. For data load purpose, Modman acts as a gateway to JetWave™ MCS-8562 Terminal LRUs and LRUs themselves do the data load. It is not recommended to attempt field data loading JetWave™ MCS-8562 Terminal LRUs other than through the Modman.

The system configuration files are stored in nonvolatile memory in the APM and does not lose its contents due to loss of APM power.

Upon transfer of the loaded software, the Modman makes sure that the software presented by the data loader has been loaded correctly before responding that the load is complete and will report part numbers of the loaded software.

For illustration purposes, snap shots of the Satcom Loader are included within this document.

(1) **Parts Needed:**

- Data load files from the Honeywell Portal.
 - (a) Go to: <https://aerospace.honeywell.com/>.
 - (b) Sign-in or create an account.
 - (c) Select the “Software & Data Services (ASDS)” option.
 - (d) Select VIEW under the “Custom Software and EMS” option.
 - (e) Select “SatCom, Gateways, In Flight Entertainment and Legacy EMS” option.
 - (f) Select “Download a Software Upgrade or Service Bulletin”.
 - (g) Select the “JETWAVE Family” button.
 - (h) Select the appropriate Service Bulletin for the MCS-8562 Terminal.

NOTE: The JetWave™ MCS-8562 Terminal AES loadable software part, part number varies for each release.

(2) **System Software/Database Updates**

Under normal circumstances, time required to carry out data load operation of all JetWave™ MCS-8562 Terminal AES LRUs can be performed within a total time of between 1.0 and 2.25 hours. This includes the Modman, APM, KANDU, BUC-HPA and antenna.

The data sets as shown in Table 4-1 can be transferred through the data load port of the Modman.

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Table 4-1. Data Sets

LRU	Data Set	Transfer Process
Modman	JetWave™ MCS-8562 Terminal Modman LRU Operational file	Upload only
APM	JetWave™ MCS-8562 Terminal APM LRU Operational file	Upload only through the Modman
KANDU	JetWave™ MCS-8562 Terminal KANDU LRU operational file	Upload only through the Modman
BUC-HPA	JetWave™ MCS-8562 Terminal BUC-HPA LRU operational file	Upload only through the Modman
FMA	JetWave™ MCS-8562 Terminal OAE LRU operational file	Upload only through the Modman

In the above listing, upload is defined as the transfer of a data set from the ARINC 615A data loader and a download is defined as the transfer of a data set from Modman to the ARINC 615A data loader.

The ARINC 665 data load set for the JetWave™ MCS-8562 Terminal comprises of:

- *.LUH is the load part index file
- *.LUP is the data file which contains compressed software image/images and manifest files.

During the data loading process, the respective LRU unzips the file and extracts the manifest file and the images. Each LRU identifies the part for itself from the manifest file.

The .LUP files that follow are included as part of ARINC665 data load file for different AES LRUs.

- Modman operational data
- AES configuration data
- BUC-HPA operational image
- KANDU operational image
- FMA operational image.

NOTE: More than one CONFIG sub parts may be present in a configuration load, one per AES configuration file type.

For the ARINC 615A data load operations, an A615A target connection must be defined. Target connection defines a TFTP client on the Modman and TFTP server on the data loader that will be used for file transfer.

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E. Load APM configuration files

- (1) The APM configuration files are install specific and should be loaded before the rest of the installation is performed. For instruction on obtaining the files, refer to Appendix D.

NOTE: The following procedure supports any ARINC 615A data loader that supports the ARINC 665-2 file format. If you do not have the ARINC 615 data loader tool, the Honeywell Satcom Loader has been made available. Refer to the Service Bulletin for instructions on setting up JetWave Loader or 615A dataloader for JetWave™ MCS8562 system

(a) Generic Load Procedure

NOTE: The IP address used to connect to the JETWAVE system may differ based on customer APM configuration. The following procedure is applicable to the default setting.

- 1 Power on the JETWAVE system.
- 2 Connect the data load PC to the JETWAVE system with an Ethernet connection enabled for data loading.

NOTE: Typically this connection will be the JETWAVE system AV1 port but may be different for each aircraft type.
- 3 On the data load PC, open a web browser and in the location bar enter IP address 172.29.55.1, and then press "Enter". This will open the AES GUI as shown in Figure 4-4.

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Figure 4-4. AES GUI Login Screen

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- 4 At the GUI login, enter the username “User” and click “Log in”. The password field should be left blank.
- 5 In the GUI STATUS INFO block, wait until all the LRUs indicate a status of “OK” before continuing. Refer to Figure 4-5. If the JETWAVE system mute reasons indicate “Initialization” or “Critical Fault” and all LRUs are at the same software version, the fault should be investigated before the data load process is started.

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Honeywell JetWave Access Center

STATUS INFO

Network Status	: In network	Software Version: MCS8562 v1.0.0 Valid	MCDMAN Health: OK
Satellite Info	: ISF11 on G2.0*, Spn 18		KAND11 Health: OK
Ground Status	: On Ground		BUC-FA Health: OK
Current Date & Time	: 20200802 21:15:27		Antenna Health: OK
Login Level	: Maintenance		APM1 Health: OK
			Interconnect Health: OK

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Figure 4-5. Status Info Screen

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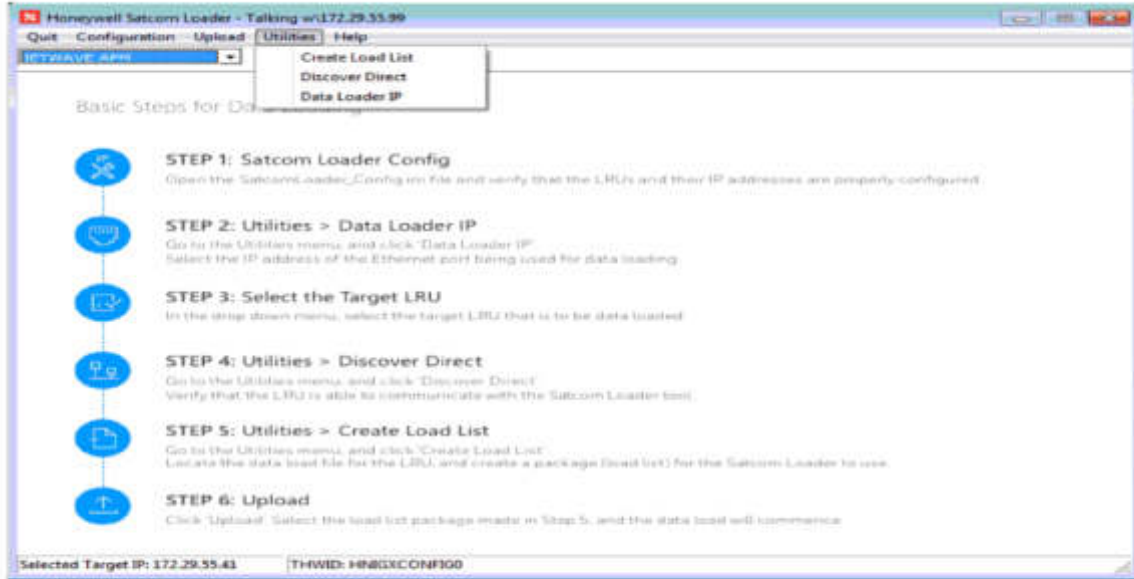
JetWave™ MCS-8562 Terminal

- 6 Assert the data load enable discrete noting that installations may connect this Modman input to a switch or to another aircraft subsystem.
- 7 Use the ARINC 615A data loader to discover the JETWAVE system data loadable LRUs including Modman, KANDU, BUC-HPA, APM, and FMA.
 - a APM Data Load
 - (1) Choose the desired APM file for the install. Refer to Appendix D for obtaining the file.
 - (2) Load the desired .luh file on the data loader.
 - (3) Start the data load of the APM.
 - (4) The progress reported by the LRU stays at 0 percent during file transfer. The progress will jump to 10 percent when the files are fully transferred and are being unzipped. Expect a total load time of up to 5 minutes for the APM.
 - (5) If the load fails, reboot the system by de-asserting the data load discrete. Wait 10 minutes, then re-assert the data loading discrete and restart the load for that unit. You may have to restart the data loader tool to re-establish communication with the LRU. If multiple data load failures are experienced, refer to JETWAVE-23-0006 for repair instructions.
 - (6) Data Load Completion

Once data loading all required LRU software releases are completed, switch the data load enable discrete to the disabled state, this will cause a system reboot.
 - (b) Loading with Satcom Loader
 - 1 Data Loading the APM LRU
 - a Select “JETWAVE APM” from the drop down menu of the main screen. Navigate to the “Utilities” tab as seen in Figure 4-6, and click “Discover Direct”. A window will pop up verifying that the LRU is communicating with the JetWave Loader tool. Acknowledge the window pop-up by clicking OK

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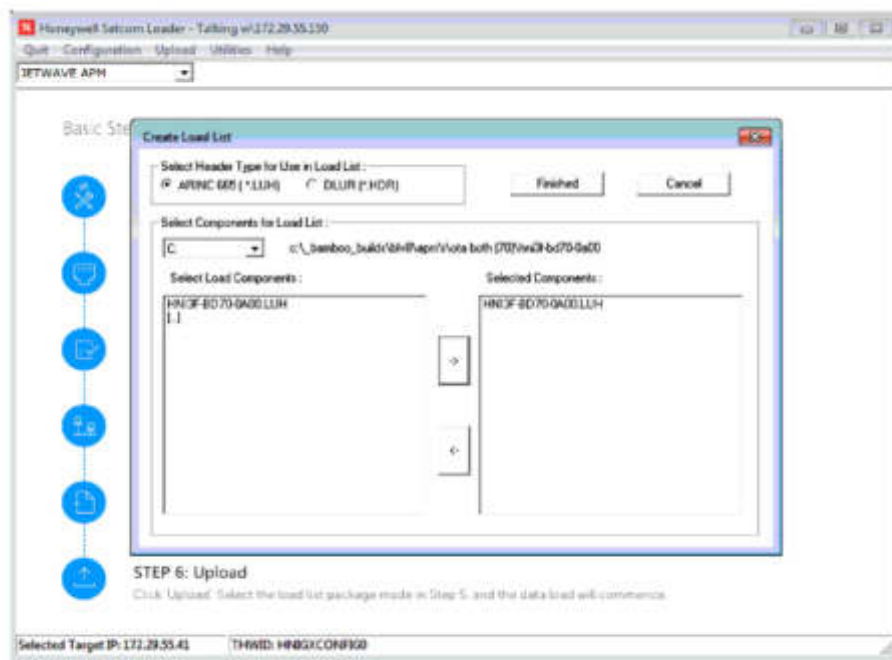
SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal



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Figure 4-6. JetWave APM Discover

- b Under the "Utilities" tab, select "Create Load List", which will open a new window as seen in Figure 4-7. In the "Select Load Components" box, locate the .luh dataload file for the APM on the data load PC. Select the file and click the top arrow to transfer the file to the "Selected Components" box as shown in Figure 4-7.



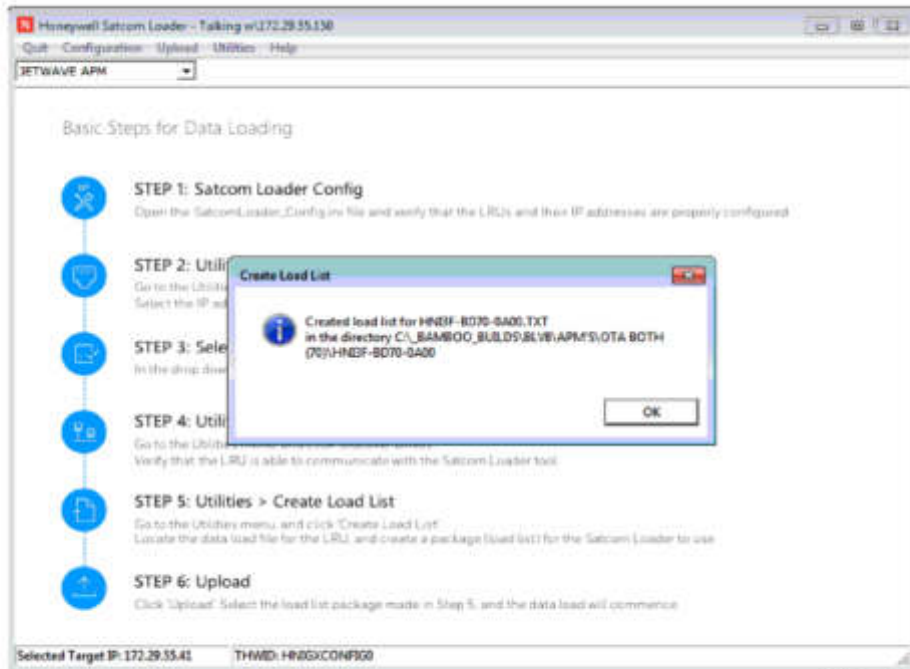
ICN-38473-0000786891-001-01

Figure 4-7. Create Load List

- c Select “OK” when the .luh dataload file has been selected. A window will open confirming that a load list has been created, as shown in Figure 4-8. Acknowledge the window pop-up by clicking OK.

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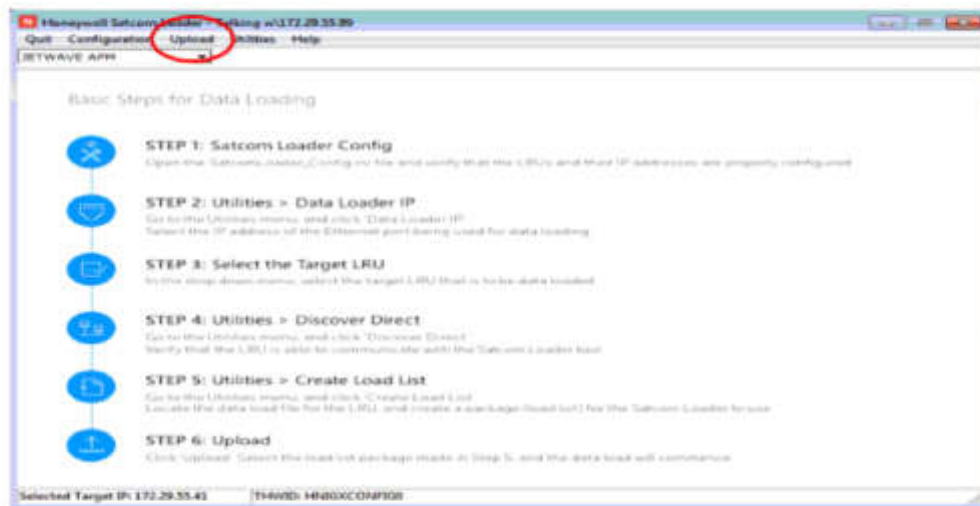
ICN-38473-0000786892-001-01

Figure 4-8. Load List Created

d Select the "Upload" tab, as shown in Figure 4-9.

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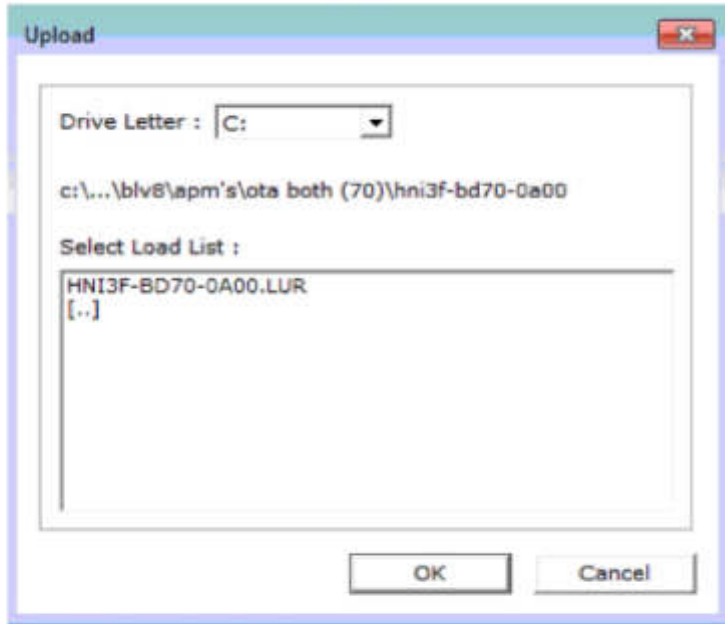
ICN-38473-0000786889-001-01

Figure 4-9. Upload Load List

- e A new window will open where the load list (.LUR) can be selected, as seen in Figure 4-10. The load list (.LUR) can be found in the same directory and with the same file name beginning as the .luh dataload file. Press “OK” to immediately begin the data load.

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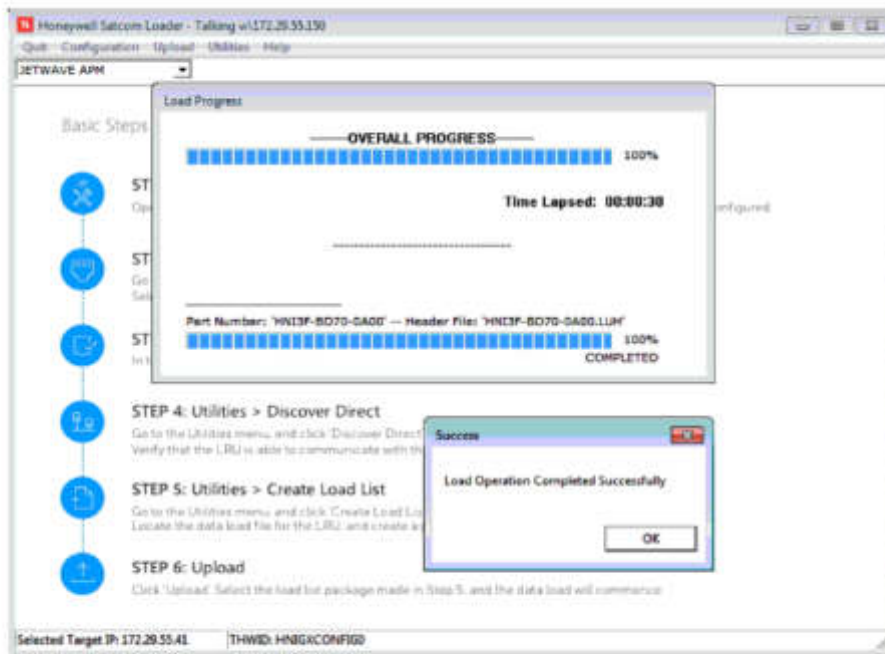
SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal



ICN-38473-0000786893-001-01

Figure 4-10. APM Load List Select

- f The Load Progress window will open.
- (1) The progress bar will stay at 0 percent during file transfer. The progress bar will jump to 10 percent when the files are fully transferred and are being unzipped.
 - (2) Expect a total load time of up to 5 minutes for the APM.
 - (3) If the load ends with a failed message, then carry out the following procedure:
 - Wait 10 minutes if another LRU also dataloaded
 - Reboot the system by de-asserting the data load discrete.
 - Wait 12 minutes
 - Re-assert the dataload discrete
 - Restart the data load.
- g When the data loader reports a successful load as shown in Figure 4-11, select "OK" and proceed with the next step.



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Figure 4-11. Load Operation Completed

WARNING: WAIT 12 MINUTES OF UNINTERRUPTED POWER-ON-TIME AFTER RELEASING THE DATA LOAD DISCRETE. THE SYSTEM FUNCTIONS AND GRAPHICAL USER INTERFACE MAY BE USED DURING THIS TIME.

h Once all LRUs are updated, de-assert the data load discrete to reset the system.

F. JetWave Load Procedure

- (1) 615A Data Load Setup
 - (a) Power on the JETWAVE system
 - (b) Connect the data load PC to the JETWAVE system with an Ethernet connection enabled for data loading

NOTE: Typically this connection will be the JETWAVE system AV1 port but may be different for each aircraft type.
 - (c) On the data load PC, open a web browser and in the location bar enter IP address 172.29.55.1, and then press “Enter”. This will open the AES GUI as shown in Figure 4-12.
 - (d) At the GUI login, enter the username “User” and click “Log in”. The password field should be left blank.

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Figure 4-12. AES GUI Login Screen

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- (e) In the GUI STATUS INFO block, wait until all the LRUs indicate a status of “OK” before continuing. Refer to Figure 4-13. If the JETWAVE system mute reasons indicate “Initialization” or “Critical Fault” and all LRUs are at the same software version, the fault should be investigated before the data load process is started.

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Honeywell JetWave Access Center

STATUS INFO

Network Status	: In network	Software Version: MCS8562 v1.0.0 Valid	MCDMAN Health: OK
Satellite Info	: ISF11 on G2.0*, Sprn 18		KAND11 Health: OK
Ground Status	: On Ground		BUC-FA Health: OK
Current Date & Time	: 2020/08/02 21:15:27		Antenna Health: OK
Login Level	: Maintenance		APM1 Health: OK
			Interconnect Health: OK

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Figure 4-13. Status Info Screen

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JetWave™ MCS-8562 Terminal

- (f) Assert the data load enable discrete noting that installations may connect this Modman input to a switch or to another aircraft subsystem.
- (g) Use the ARINC 615A data loader to discover the JETWAVE system data loadable LRUs including Modman, KANDU, and FMA.
- (h) Note that the subsequent sequence of LRU Data Load steps may be different depending on the combination of software on the LRUs and the specific software version being loaded. Refer to the sequence outlined in the specific Service Bulletin for the software that is being loaded.

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SECTION 5 – SYSTEM COMMISSIONING

1. Provisioning of User Services

Within the JetWave™ MCS-8562 Terminal, the Modman LRU is responsible for bringing satellite network IP access to onboard users through In-flight Entertainment Systems or through Onboard Network Systems. The Modman LRU coordinates with the Satellite Access Station (SAS) for modulation, demodulation, power control, terminal authentication, configuration, IP communication, QoS aspects and initiating tracking and beam switching for the JetWave™ MCS-8562 Terminal.

The commencement of RF transmission and reception of the JetWave™ MCS-8562 Terminal during normal operation is as follows:

- **Satellite Search:** The JetWave™ MCS-8562 Terminal is looking for the satellite in the closest longitude proximity. In this state, the JetWave™ MCS-8562 Terminal does not transmit.
- **The Global Signaling Channel** is used by the Inmarsat GX network to inform the JetWave™ system terminal of the current satellite configurations and location. Inmarsat satellite generates a global beam which illuminates the entire service region in the satellite's footprint. Global Signaling Channel makes the frequencies and locations of each spot beam known to the JetWave™ system and allows automatic network configuration and rapid network log-in.
- **Data Communication:** The JetWave™ MCS-8562 Terminal is logged into the network, and is sending and receiving data. In the data communication state, the JetWave™ MCS-8562 Terminal may be switched from one data carrier to another. This can occur for either load balancing reasons, or because of the JetWave™ MCS-8562 Terminal moved into a different spot beam. During this transition, the JetWave™ MCS-8562 Terminal continues transmitting normally. At some point, depending on the aircraft movements, directed satellite handover is used when the JetWave™ MCS-8562 Terminal needs to switch between the satellites. The antenna re-pointing is required. The frequency band of the transmissions shifts and the KANDU will track on the new carrier. During this satellite transition, there will be a momentary disruption to the IP data connectivity.

Satellite network IP services operate as a managed subscription service model and the services are provisioned through various service providers. To provision the user services, the Airline Operator need to associate the JetWave™ MCS-8562 Terminal with any of the service providers and subscribe to the desired services.

The actual throughputs achieved by the terminal are dependent on the Operator subscription. Each subscription will have a defined Committed Information Rate which is the minimum throughput guaranteed to each subscriber. The delivered services will be able to exceed those CIRs where the resources allow up to defined Maximum Information Rate. All instantaneous demand will be matched to provisioned CIRs for 95% of the time for every priority level before any remaining bandwidth is allocated to satisfy any provisioned Maximum Information Rates.

On initial power-up of the system, after uploading the JetWave™ MCS-8562 Terminal configuration files and entering the aircraft Tail Number, the JetWave™ MCS-8562 Terminal first gets associated to the Inmarsat network and the system is associated to the appropriate VAR/DP network, where the Service Level Agreements, the aircraft Tail Number and the pre-assigned JetWave™ system terminal ids are linked for billing and service.

A. Product Support Services

- (1) Customer Support Overview

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JetWave™ MCS-8562 Terminal

The JetWave™ MCS-8562 Terminal is manufactured by Honeywell. Honeywell manufactures and sells this hardware to end customers, as well as service providers.

(2) Customer Support Contacts:

If you purchased your JetWave™ MCS-8562 Terminal hardware from any of the service providers, please contact their customer support phone number for all JetWave™ MCS-8562 Terminal installation, integration, configuration, service activation, and troubleshooting issues.

If, however, you purchased your JetWave™ hardware directly from Honeywell, please contact Honeywell Customer Support according to the information provided at the time of your JetWave™ MCS-8562 Terminal MCS-8562 Terminal activation.

B. Terminal Activation

- (1) To activate the terminal with your service provider you need to provide the ACM TPK.
- (2) The TPK is written on the test report document delivered with the MODMAN.
- (3) The TPK may be viewed using the MODMAN GUI.

2. Certification and Approvals

All antenna installations must obtain the approval of the appropriate government air/radio authority, such as the FAA, EASA, CAAC, or Transport Canada. Contact the authorities when you begin planning your communication system in order to minimize approval and certification issues.

New configurations (If switches, control relay, changes to inter-LRU wiring losses, radome and/or IRS data sources) are subject to re-evaluation and must be coordinated through Honeywell.

3. Post Installation System Checkout Procedures

A. General Overview

This section supplies the information required to determine the operational readiness of the JetWave™ MCS-8562 Terminal, made up of the Modman, APM, BUC-HPA, KANDU, and FMA.

The installed LRUs require operational and diagnostic testing for one of the reasons listed below:

- Operational verification tests that verify the operational readiness of the unit after installation on an aircraft.
- Fault verification and diagnostics to verify that a fault exists and produce system reports for trouble shooting purposes
- Operational verification of repairs that verify the operational readiness of units that have been repaired before re-installation on an aircraft.

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B. System Health and Configuration

The JetWave™ MCS-8562 Terminal LRUs are shipped with the operational software preloaded. Refer to SECTION 4 SOFTWARE CONFIGURATION to verify that all of the LRUs are at the same software level, or if a software upgrade is required for any of the LRUs.

Make sure that the JetWave™ MCS-8562 Terminal LRUs are wired and all the receptacles are connected in accordance with applicable interconnection diagram.

Power up the JetWave™ MCS-8562 Terminal LRUs, close applicable aircraft circuit breakers to supply power. After 5 minutes, check the Modman front panel for the Modman status.

There are two LEDs on the front panel of Modman. One is for the power and the second one is for status. Use Table 5-1 to identify the current operating mode of Modman with the power LED indicating powered up status.

Table 5-1. Modman LED Status Indications

Status LED	Mode
Off	No electrical power/electrical power is supplied but prior to boot.
Flash green at a minimum of 10 seconds	Modman initialization
On - green	Modman in normal operation
On - red	Modman in Fault Mode

On completion of AES system installation activities, the installer can view and make sure that the JetWave™ MCS-8562 Terminal LRUs status, AES configuration settings, discrete input and output status, and antenna alignment status through the GUI as described in this section.

Once the Modman is powered up, the JetWave™ MCS-8562 Terminal GUI page can be accessed. The JetWave™ MCS-8562 Terminal GUI service is supported on AV1 10/100 Base T Ethernet interface. The Modman static IP address assigned is 172.29.55.1 and the port number for the AES GUI service is 80. The laptop's Ethernet port will need to be configured with a static IP address of 172.29.55.x, where x is 10 or above.

Connect a laptop to the AV1 port of Modman through aircraft Ethernet interface. It is recommended to use a laptop computer with the following minimum requirements:

- Intel i5 CPU
- 8 GB of RAM
- At least 500 MB of available hard drive space

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- An available 10/100/1000 Ethernet interface
- Windows 7 operating system.

On any of the Internet browser (Internet Explorer 8 compatible), enter 172.29.55.1 in the address bar. Login page will be presented as the root page, allowing entry of the user name and password. Figure 5-1 shows the login page.



Figure 5-1. AES GUI Login Page

- (1) The GUI is configured to have the login accounts that follow:
 - User interface with Username: "User" and Password: empty (no) password
 - Maintenance interface with Username: "Maintenance" and Password: "Earthbound".

On successful login, the AES Home page screen is shown. Refer to Figure 5-2.

The information supplied on the AES Home page is as follows:

- Network status
- Ground status
- Mute Reason
- Link start and end time
- Health status of the system LRUs.

The GUI AES Home page screen, as shown in Figure 5-2, lets the operator navigate to all applicable options depending on the access level.



Figure 5-2. AES Home and Status Info Page

This section describes the AES System configuration setting to be carried out on completion of LRU installation activities for updating the aircraft tail number.

To update the aircraft tail number in AES system, maintenance level access is required through the web based GUI. Refer to Accessing the Maintenance Interface.

The GUI AES status summary screen lets the maintainer navigate to all applicable options. At the maintenance level, the Other Information and Control has an option to display/update the current Aircraft ID stored in the AES Configuration data. Refer to Figure 5-3 to change the AES aircraft ID information.

NOTE: The maximum allowed length for Aircraft ID is 16 characters. The allowed characters are: upper-case alpha, lower case alpha, numerals, and '-' (dash) Spaces or other characters are allowed.

The GUI AES status summary screen lets the user navigate to all applicable options. At the User level, the Other Information & Control has an option to display the current Aircraft ID stored in AES Configuration data. Refer to Figure 5-3 for the AES aircraft ID information page.

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Aircraft Tail Number

Current Tail Number : C-F012
Enter new Tail Number :

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Figure 5-3. Aircraft ID Display/Update Information Page

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View and verify the AES configuration data, navigate to the "Configuration Files" information pages under the other information and control menu by referring to the APM Version and Manufacturing Info page to check against the recommended APM file for the particular STC.

The typical configuration file information page is shown in Figure 5-4. Check the part number of the configuration files under the APM tab against the STC.

The configuration data should be verified by going to the APM page in the Version and Manufacturing Information menu and verifying the part numbers for the APM configuration data.

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

Network Status	: In network	MCDMAN Health: OK	
Satellite Info	: ISF1, Lon 62.6 °, Spot 19	Software Version: MCS8562-v1.0.0 Valid	KANDU Health: OK
Ground Status	: On Ground	UUC-HAI Health: OK	
Current Date & Time	: 2020/09/02 22:27:29	Antenna Health: OK	
Login Level	: Maintenance	APM Health: OK	
		Interconnect Health: OK	

View Configuration Files

DISPLAY	AES System Configuration File
DISPLAY	Regulatory Log Configuration File
DISPLAY	Aircraft Service Configuration File
DISPLAY	AMU Configuration File
DISPLAY	Geographic Map Validity & Version

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Figure 5-4. (Sheet 1 of 6) View Configuration Files Page

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

View Configuration Files

- DISPLAY** AFS System Configuration File
- DISPLAY** Regulatory Log Configuration File
- DISPLAY** Aircraft Service Configuration File
- DISPLAY** AMU Configuration File
- DISPLAY** Geographic Map Validity & Version

Table [systemconfig_info]

Name	Date	Place	Tool
systemconfig_info	2016-05-11	Ottawa	AES Configuration Tool v2.0RC3

Table [systemconfig_data]

Item	LRU	Data	BData
Alignment Set 1	MODMAN	1972700000,162.5,10R	(nu I)
Alignment Set 2	MODMAN	1973700000, 65,10R	(nu I)
Alignment Set 3	MODMAN	1970700000,-179.8,10R	(nu I)
Alignment Set 4	MODMAN	0,0	(nu I)
Alignment Set 5	MODMAN	0,0	(nu I)
Alignment Set 6	MODMAN	0,0	(nu I)
Alignment Set 7	MODMAN	0,0	(nu I)
Alignment Set 8	MODMAN	0,0	(nu I)
WGW	MODMAN	A791 Discrete Ground State Indicates = On Circuit	(nu I)
GTC	MODMAN	A791 Discrete Ground State Indicates = Ground Transmit Enable	(nu I)
Modman Time	MODMAN	0,0,0	(nu I)
Modman Date	MODMAN	0,0,0	(nu I)
Modman GNSS Sensor Status	MODMAN	0,0,0	(nu I)
Modman Latitude	MODMAN	0,0,0	(nu I)
Modman Longitude	MODMAN	0,0,0	(nu I)
Modman Altitude Freq	MODMAN	0,0,0	(nu I)

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Figure 5-4. (Sheet 2 of 6) View Configuration Files Page

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View Configuration Files

- ACS System Configuration File
- Regulatory Log Configuration File
- Aircraft Service Configuration File
- AMU Configuration File
- Geographic Map Validity & Version

Table [reglog_info]

Name	Date	Place	Tool
reglog_info	2010-00-10	Tewkesbury	ACS Configuration Tool 1.2.0RC0

Table [reglog_data]

Item	IRU	Data	IRData
RegLog FTP Upload	MODMAN	ftp://regaviator.lib.eep.inmarsat.co.uk/mlogs	(nu)
RegLog FTP Ack	MODMAN	ftp://regaviator.lib.eep.inmarsat.co.uk/macks	(nu)
RegLog HTTP Upload Port	MODMAN	21	(nu)
RegLog FTP Ack Port	MODMAN	21	(nu)
RegLog Local IP	MODMAN	161.30.223.27	(nu)
RegLog Local Subnet Mask	MODMAN	255.255.255.248	(nu)
RegLog Gateway	MODMAN	161.30.223.25	(nu)
RegLog DNS Address	MODMAN	161.30.222.90	(nu)
RegLog Distreat Mode	MODMAN	FALSE	(nu)
RegLog Encryption Enable	MODMAN	TRUE	(nu)
RegLog Public Encryption Key	MODMAN	(null)	(nu)
GeoMap FTP Download	MODMAN	ftp://regaviator.lib.eep.inmarsat.co.uk/geomaps/updates	(nu)
GeoMap FTP Download Port	MODMAN	21	(nu)
GeoMap Distreat Mode	MODMAN	FALSE	(nu)
OTA Software Download Allowed	MODMAN	TRUE	(nu)

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Figure 5-4. (Sheet 3 of 6) View Configuration Files Page

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

View Configuration Files

- ABS System Configuration File
- Regulatory Log Configuration File
- Aircraft Service Configuration File
- AMU Configuration File
- Geographic Map Validity & Version

Table [aircraftservices_info]

Name	Date	Place	Tool
aircraftservices_info	2015-06-22	Ottawa	ABS Configuration Tool 1.0.0RC3

Table [aircraftservices_data]

Item	IRI	Data	OldData
User Port PA1 Data Load	MCDMAN	FALSE	(null)
User Port PA2 Data Load	MCDMAN	FALSE	(null)
User Port PA3 Data Load	MCDMAN	FALSE	(null)
User Port PA4 Data Load	MCDMAN	FALSE	(null)
User Port PC1 Data Load	MCDMAN	FALSE	(null)
User Port EN5 Data Load	MCDMAN	TRUE	(null)
User Port EN6 Data Load	MCDMAN	FALSE	(null)
User Port EN7 Data Load	MCDMAN	FALSE	(null)
User Port EN8 Data Load	MCDMAN	FALSE	(null)
User Port EN9 Data Load	MCDMAN	FALSE	(null)
User Port I-G1 Data Load	MCDMAN	FALSE	(null)
User Port AV1 Data Load	MCDMAN	TRUE	(null)
User Port AV2 Data Load	MCDMAN	FALSE	(null)
User Port AV3 Data Load	MCDMAN	FALSE	(null)
User Port AG1 Data Load	MCDMAN	TRUE	(null)
Data Load IP MCDMAN	MCDMAN	172.29.06.121	(null)
Data Load IP CANTEL	CANTEL	172.29.06.122	(null)
Data Load IP CAP	HMA/MA	172.29.06.123	(null)
User Port PA1 ABS Scripts	MCDMAN	DISABLED	(null)

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Figure 5-4. (Sheet 4 of 6) View Configuration Files Page

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

View Configuration Files

- DISPLAY AFS System Configuration File
- DISPLAY Regulatory Log Configuration File
- DISPLAY Aircraft Service Configuration File
- DISPLAY AMU Configuration File
- DISPLAY Geographic Map Validity & Version

Table [amu_info]

Name	Date	Place	Tool
spwb/2_info	2018-06-22	Ottawa	ABS Configuration Tool 1.0.0 RC3

Table [amu_data]

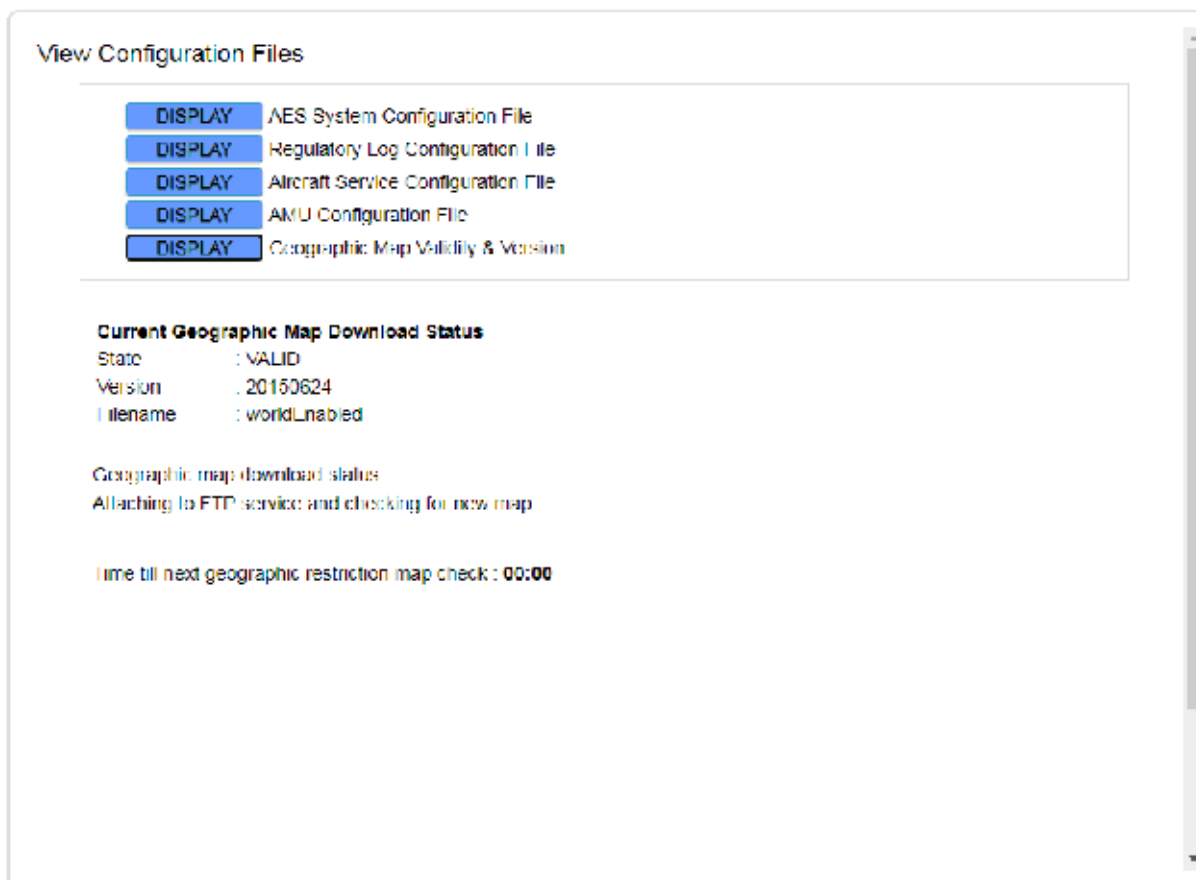
Item	LRU	Data	BData
External Modem	MCDMAN	Not Installed	(null)
AMU1/IF Switch Installed	MCDMAN	IF Switch	(null)
AMU2 Installed	MCDMAN	No	(null)
Discrete Enable	MCDMAN	J1-D Pin 11C, Ground State Internal	(null)
GUI Enable	MCDMAN	TRUE	(null)
AMU1/IF switch control Pin Config	MCDMAN	J1-D Pin 10K	(null)
AMU1/IF switch status Pin Config	MCDMAN	J1-B Pin 10D, Ground State asserted	(null)
AMU2 control Pin Config	MCDMAN	J1-B Pin 10J	(null)
AMU2 status Pin Config	MCDMAN	J1-D Pin 10C, Ground State asserted	(null)

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Figure 5-4. (Sheet 5 of 6) View Configuration Files Page

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal



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Figure 5-4. (Sheet 6 of 6) View Configuration Files Page

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JetWave™ MCS-8562 Terminal

To view the health status of the JetWave™ MCS-8562 Terminal, navigate to the “AES Summary” under the Health Statuses menu on the left.

This will allow you to view and make sure of the health status of the JetWave™ MCS-8562 Terminal.

The AES summary and interlink status are shown in Figure 5-5.

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

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STATUS INFO

Network Status : In network
 Satellite Info : GPS Lora 62.6 °, Spot 19
 Ground Status : On Ground
 Current Date & Time : 2020/05/11 21:53:23
 Login Level : Maintenance

Software Version: MCS8562 v1.0.0. Valid

MISSION Health: OK
 KAN DU Health: OK
 BU D PA Health: OK
 Antenna Health: OK
 ATM Health: OK
 Intranet Health: OK

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Health Status

AES Summary & Link Status

LRU	POST STATUS	CONTINUOUS BITE STATUS	LRU TEMPERATURE
UVA NDUYAN	Pass	Fail	31.0 °C
KAN DU	Pass	Pass	32.1 °C
BU D PA	Pass	Pass	32.5 °C
ATM	Pass	Pass	34.1 °C
APN	Pass	Pass	Not applicable

Intra Links Health Status

IntraLink	Status
Median KAN DU Phemex Bus	Pass
KAN DU HW Ethernet Bus	Pass
Median ATM Field Bus	Pass
KAN DU ONE Serial Control Bus	Pass
KAN DU ONE Serial MU Tap	Pass
KAN DU BU D PA Serial Bus	Pass
Median KAN DU Reserve Intranet	Pass
KAN DU BU D PA Reset	Pass
KAN DU ONE Reserve Intranet	Pass
Median KAN DU Reserve TX Intra	Pass
ONE BU D PA Reserve Bites	Unavailable
Median BU D PA Reserve TX	Pass
LRU BU D PA Reserve Bites	Unavailable
LRU BU D PA Reserve TX	Pass

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Figure 5-5. (Sheet 1 of 2) Health Statuses (excerpt), AES Summary and Link Statuses

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

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STATUS INFO

Network Status	In network	Software Version	MCS8562 v1.0.0: Valid	MODMAN Health	OK
Satellite Info	ISS1, Lon 026 °, Spot 19			KANDU Health	OK
Ground Status	On Ground			BUIC-PA Health	OK
Current Date & Time	2020/09/11 21:00:47			Antenna Health	OK
Login Level	Maintenance			APM Health	OK
				Interconnect Health	OK

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Module	Health
Modem KANDU Keyline Transmit	Pass
KANDU BUIC-PA Reset	Pass
KANDU BUIC-PA Keyline Transmit	Pass
Modem KANDU Keyline To Modem	Pass
QAE BUIC PA Modem RF Rx	Unavailable
Modem BUIC-PA Rx To	Pass
BUIC-PA To BUIC-PA Tx	Unavailable
BUIC-PA Tx	Pass

Last Five AES Failure Codes

FailNo	Time	L1 code	L2 code	L3 code	L4 code	L1 text	L2 text	L3 text	L4 text	Additional text
1	2012104	0x1	0x1	0x3	0x1000	Modem	Software Runtime	HEARTBEAT FAIL LITE	Fault Set Critical Fault-Continuous	
2	2013517	0x0	0x7	0x0	0x4201	System	Regulatory Logs	REGULATORY LOG UPLOAD FAIL	Event Ok/NA Warning-Fault-Continuous	
3	2015001	0x0	0x7	0x0	0x4201	System	Regulatory Logs	REGULATORY LOG UPLOAD FAIL	Event Ok/NA Warning-Fault-Continuous	
4	2109247	0x0	0x7	0x0	0x4201	System	Regulatory Logs	REGULATORY LOG UPLOAD FAIL	Event Ok/NA Warning-Fault-Continuous	
5	2113618	0x0	0x7	0x0	0x4201	System	Regulatory Logs	REGULATORY LOG UPLOAD FAIL	Event Ok/NA Warning-Fault-Continuous	

MODMAN Power ON Count : 2095
 MODMAN Power ON Time : 10110

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Figure 5-5. (Sheet 2 of 2) Health Statuses (excerpt), AES Summary and Link Statuses

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JetWave™ MCS-8562 Terminal

To see the AES LRUs hardware and software version and part number, navigate to the Version and Manufacturing Information menu. Figure 5-6 shows the typical Modman Version and Manufacturing Information page.

Make sure the version and manufacturing information are current for all the LRUs.

NOTE: Follow appropriate Jetwave Service Bulletin reference to validate the SW currently installed on the Jetwave system.

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STATUS INFO

Network Status	In network	Software Version	MCS8562-v1.0.0 Valid	MODMAN Health	OK
Serial No. Info	IS71J on 62.6 *5, Sep 19			KAN211 Health	OK
Ground Status	On Ground			RLC-PA Health	OK
Current Date & Time	2020/09/11 21:55:57			Access Health	OK
Login Level	Maintenance			ATM Health	OK
				Interconnect Health	OK

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Version & Manufacturing Information

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MODMAN Version & Manufacturing Information

Name of LRU	. 6XA MODMAN
OLM Hardware Part Number	. 9040012 0001
Serial Number	. 0040
Software Part number	. IIN32-RLS2 0000
Software Validity Flag	. Valid
OLM Identifier	. Honeywell

MODMAN Sub Part Information

Sub Part Number	. MOD 90403079 RLY 000
Sub CRC	. 321279432
Sub Part Number	. MOD 90402405 RLY 000
Sub CRC	. 000317190c
Sub Part Number	. MOD 90403099 RLY 000
Sub CRC	. UX/00 roots (ml 2.0.0.2 1774.plg)Active
Sub Part Number	. MOD 90402405 RLY 000
Sub CRC	. 1572992600

ACM Sub Part Information

DID	. 352202007
Model	. UX/00(147)
SN	. 1001
TRK	. 00VAC0M24M24M***
Partition 1	. UX/00 roots (ml 2.0.0.2 1774.plg)Active
Partition 2	. UX/00 roots (ml 2.0.0.2 1774.plg)Active

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Figure 5-6. AES Modman and Manufacturing Information Page

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C. Discrete Input Testing

- (1) If wired, activate the Modman Reset by toggling Modman reset switch on the JetWave™ MCS-8562 Terminal AES control panel.
- (2) If the Modman Reset is not wired, then reset the system from the GUI.
- (3) Monitor the “status” LED on the front of the Modman, progresses from red color to steady state green as seen during initial power-on.
- (4) Check the Aircraft Tail number page and make sure that the aircraft tail number page is updated with the aircraft Tail number.
- (5) Navigate to the Discrete Link Status page and scroll down to see the ARINC 791 Discrete input and output state of the JetWave™ MCS-8562 Terminal. Refer to Figure 5-7.
- (6) For illustration, the figure that follows shows the AES discrete signal state. Use the wired aircraft interfaces to toggle and see if the applicable discrete are asserted or de-asserted.

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

Network Status	: In network		MCDMAN Health: OK
Satellite Info	: I5T1J on 62.6 °, Spot 19	Software Version: MCS8562-v1 0.0 Valid	KANDU Health: OK
Ground Status	: On Ground		BUC PA Health: OK
Current Date & Time	: 2020/09/02 22:24:09		Antenna Health: OK
Login Level	: Maintenance		APM I Health: OK
			Interconnect Health: OK

AES Discrete Status

Discrete IO	I/O	State
WOW Functionality	Input	Asserted
Local Data Load Enable	Input	De-Asserted
Public Services Disable	Input	De-Asserted
Ground Transmit Enable	Input	Asserted
Modman Front Panel Enable	Input	Asserted
KANDU Tx Control	Input	De-Asserted
External Modem Enable	Input	Asserted
Modman KANDU Reset	Inter LRU	De-Asserted
KANDU BUC-PA Reset	Inter LRU	De-Asserted
Modman KANDU Keyline Transmit	Inter LRU	Asserted
KANDU BUC PA Keyline Transmit	Inter LRU	De-Asserted
Modman KANDU AIRINC Tx Mute	Inter LRU	De-Asserted
Modman IF Switch	Output	De-Asserted
Data Link Available	Output	Asserted
System Available	Output	Asserted

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Figure 5-7. Discrete I/O State

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

D. ARINC 429 Input Interface Testing

For the operation of the JetWave™ MCS-8562 Terminal, the aircraft must have a functional IRS providing ARINC 429 labels to the KANDU. Functional IRS is interfaced with the KANDU through Receive only ARINC 429 interface through which the required ARINC 429 labels as defined in the APM configuration file are made available.

Navigate to the Aircraft Status page and scroll down to see the aircraft status. Refer to Figure 5-8.

This page will be updated with current latitude and longitude position of the aircraft.

Once the JetWave™ MCS-8562 Terminal starts receiving the valid navigational input from aircraft IRS system, make sure that the values are correct as compared to the aircraft navigational system outputs.

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

Network Status	: In network		MODMAN Health: OK
Satellite Info	: I5F1, Lon 62.6 °, Spot 19	Software Version: MCS8562-v1 0.0. Valid	KANDU Health: OK
Ground Status	: On Ground		UUC-PA Health: OK
Current Date & Time	: 2020/09/02 22:20:13		Antenna Health: OK
Login Level	: Maintenance		APM Health: OK
			Interconnect Health: OK

Aircraft Status

Date(YYYY/MM/DD)	: 2020/09/02
Time(HH.MM.SS)	: 22.20.11
Latitude	: 61.46991730 °
Longitude	: -0.47000885 °
Altitude	: 2999 feet AMSL
True Heading	: 0.0 °
Ground Speed	: 0 Knots
Roll	: 0.0 °
Pitch	: 0.0 °
True Track	: 0.0 °
ARINC 429 Label Status	: OK

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Figure 5-8. (Sheet 1 of 2) Aircraft and Satellite Status

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

Network Status	: In network	Software Version: MCS8562 v1.0.0: Valid	MODMAN Health: OK
Satellite Info	: ISE1, I on 62.6°, Spor 19		KANDU Health: OK
Ground Status	: On Ground		BUC-FA Health: OK
Current Date & Time	: 2020/09/02 22:21:37		Antenna Health: OK
Login Level	: Maintenance		AFM Health: OK
			Interconnect Health: OK

Satellite Link Status

Link State : In network
Link Start Time : 2020/09/02 20:50:30
Link End Time : Link Up
Kilobytes Sent : 12043
Kilobytes Received : 29512
Link Signal Quality
C/N : 3.1 dB
Signal Level : -61.9 dBm
Eb/No : -1.2 dB
Transmit State : Un muted

RF status	Rx Channel	Frequency Band(BW)	Polarity
		19.200 - 19.725	LHCP
		29.000 - 30.000	RHCP

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Figure 5-8. (Sheet 2 of 2) Aircraft and Satellite Status

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JetWave™ MCS-8562 Terminal

E. Manual Steering of the Antenna

To do a commanded test to manually steer the antenna, navigate to "Manual Antenna Steering" under the commanded test menu. Monitor the antenna movement in accordance with the commanded test fed through the GUI tool. Refer to Figure 5-9.

NOTE: New Radomes should be checked for any possible interference with normal Antenna movement prior to activation. This can be accomplished many ways using manually steering the Antenna with the Radome/Tail Cap lightly attached to structure. Placing masking tape along critical paths inside the Radome and looking for breaks and removal in the tape after test is one method of detecting interference. If there is interference, it must be addressed prior to Radome installation.

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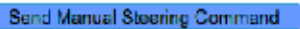

SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

Network Status	: In network	Software Version: MCS0062-v1.0.0: Valid	MODMAN Health: OK
Satellite Info	: IS-1, Lon 62.6°, Spot 19		KANDU Health: OK
Ground Status	: On Ground		BUC PA Health: OK
Current Date & Time	: 2020/09/02 22:35:05		Antenna Health: OK
Login Level	: Maintenance		APM Health: OK
			Interconnect Health: OK

Manual Antenna Steering Commanded Procedure

Current Antenna Azimuth Angle	: 111.8°	Link Signal Quality	
Current Antenna Elevation Angle	: 6.9°	CIN	: 13.2 dB
		RX Power Level	: -81.9 dBm
		RX RF Frequency	: 19010 MHz

Antenna Steering using Arrow Keys
Step Size Control: 0.1°

	Azimuth Angle	: 112.000°	
	Elevation Angle	: 6.900°	

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Figure 5-9. Manual Antenna Steering

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JetWave™ MCS-8562 Terminal

F. System Available (Cockpit Control Panel) Output

Once the JetWave™ MCS-8562 Terminal is powered up, if wired, monitor the “System Available” status discrete. Make sure that the discrete state agrees with the discrete output in the GUI. Refer to Figure 5-7.

4. Cable Calibration

The Modman will not transmit until it has been calibrated, with the transmit cable calibration. After the AES is physically installed and connected, the Modman will require cable calibration to be run.

Cable calibration can be initiated from the GUI during the initial system commissioning process or after Modman or BUC-HPA replacement. Cable calibration must be initiated using a GUI commanded test after Tx IF cable manipulation, connector re-seating and cable replacement.

The transmit cable calibration calibrates the terminal to allow accurate control of transmitter power, taking into account IF output loss, cable loss, and BUC-HPA (BUC) performance. During calibration, the system is transmitting. The antenna will be pointed to 45 degree elevation and due north when in the northern hemisphere and due south when in the southern hemisphere to avoid interference while maintaining safety to the installation crew.

When calibration is completed successfully, the modem proceeds to its configured mode of operation as if it had been restarted. When commissioning is not completed successfully, either due to an error condition or a user cancellation, the modem enters an inactive state.

Cable Calibration is available through the GUI Commanded Test - Calibrate Transmit Cable. The Cable Calibration procedure can take up to 30 minutes to perform.

To maintain a fully optimized Jetwave system, it is recommended to perform a single cable calibration in the 20 year service life, at around 8,000 to 12,000 hours of operation. This optimization will minimize minor effects of device aging in the transmit chain, and can be performed conveniently using the GUI to initiate the "Calibrate Transmit Cable" commanded test. The recommendation is not mandatory and Jetwave will continue to operate at a high level of performance over the service life.

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

Network Status	: In network	Software Version: MCS8562 v1.0.0. Valid	MCDMAN Health: OK
Satellite Info	: ISF1, Lon 62.6°, Spot 19		KANDU Health: OK
Ground Status	: On Ground		PLIC-PA Health: OK
Current Date & Time	: 2020/09/02 22:35:05		Antenna Health: OK
Login Level	: Maintenance		APM Health: OK
			Interconnect Health: OK

Calibrate Transmit Cable

WARNING: THE TERMINAL WILL BE RADIATING DURING THIS TEST.

SERVICE TECHNICIANS AND OPERATORS MUST EXERCISE CARE TO KEEP CLEAR OF THE ANTENNA'S BEAM WHILE PERFORMING OPERATIONAL TESTS OR INSTALLATION VERIFICATION PROCEDURES.

THIS TEST WILL TAKE 30 MINUTES TO COMPLETE.

THIS TEST MAY BE ABORTED BY REMOVING POWER FROM THE JETWAVE TERMINAL OR SELECTING THE GUI ABORT BUTTON ON THIS PAGE.

DURING THIS TEST THE JETWAVE TERMINAL WILL TRANSMIT IN AZ 0.0° EL 45° RELATIVE TO THE A/C AND AZ 0° TRUE NORTH/EL 45° RELATIVE TO ABSOLUTE HEADING.

Cable Calibration Status: Calibrated

Initiate

Calibration Procedure

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Figure 5-10. (Sheet 1 of 2) Calibrate Transmit Cable Status Page

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

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STATUS INFO

Network Status : In network
Serial Info : IS-1, Lon 02.9°, Spot 19 Software Version: MCS8562 v1.0.0: Valid
Ground Status : On Ground
Current Date & Time : 2020/09/11 21:50:19
Login Level : Maintenance

MCMANN Health: OK
KANDU Health: OK
DUC PA Health: OK
Antenna Health: OK
APM Health: OK
Interconnect Health: OK

WARNING: THE TERMINAL WILL BE RADIATING DURING THIS TEST.

SERVICE TECHNICIANS AND OPERATORS MUST EXERCISE CARE TO KEEP CLEAR OF THE ANTENNA'S BEAM WHILE PERFORMING OPERATIONAL TESTS OR INSTALLATION VERIFICATION PROCEDURES.

THIS TEST WILL TAKE 30 MINUTES TO COMPLETE.

THIS TEST MAY BE ABORTED BY REMOVING POWER FROM THE JETWAVE TERMINAL OR SELECTING THE GUI ABORT BUTTON ON THIS PAGE.

DURING THIS TEST THE JETWAVE TERMINAL WILL TRANSMIT IN AZ 0.0° EL 45° RELATIVE TO THE A/C AND AZ 0° TRUE NORTH/EL 45° RELATIVE TO ABSOLUTE HEADING.

Is the JetWave terminal located outside and 66.9ft (20.0m)* away from buildings and structures?

Are all personnel at least 66.9ft (20.0m)* away from the FMA before the test?

Cable Calibration Status: Calibrated

Calibration Procedure

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Figure 5-10. (Sheet 2 of 2) Calibrate Transmit Cable Status Page

5. FMA Antenna Alignment Procedure

A. Antenna Assembly Orientation

For the JetWave™ MCS-8562 Terminal to point to the servicing satellite correctly, it is important to align the antenna assembly after installation or replacement. The FMA assembly has a built in IMU and its orientation must be aligned with respect to the principal axes of the aircraft which is determined through aircraft IRS.

- (1) To do the automatic antenna alignment calibration, aircraft should have a functional IRS, interfaced with the KANDU through A429 interface, and should have the required ARINC 429 labels as defined in the APM configuration file.
- (2) During the physical installation, the IMU principal axes of the FMA must be aligned with those of the aircraft within $\pm 1^\circ$ on the pitch, roll, and yaw axis. The installation offsets, are then calculated by the KANDU automatically from data received from the aircraft Inertial Navigational System, the FMA IMU assembly and the satellite signal.
- (3) It is required to do the automatic antenna alignment calibration with the Radome installed. The antenna alignment process can be initiated through the GUI interface. The JetWave™ MCS-8562 Terminal GUI service is supported on AV1 10/100 Base T Ethernet interfaces (AV1 being default configuration, ports may vary depending on specific APM configuration).
- (4) Automatic Antenna Alignment

The antenna alignment should be performed only after completion of system power up. The health status of each LRU should be checked on the GUI, and there should be no display of system muting. Only then should the Initiate button be pressed on the Antenna Alignment GUI page. The JetWave™ MCS-8562 Terminal GUI service is supported on AV1 and AG1 10/100 Base T Ethernet interfaces.

- (5) On any Internet browser (Internet Explorer 8 compatible), enter 172.29.55.1 in the address bar. The Login page appears. Figure 5-11 shows the Login page.



Figure 5-11. GUI Login Page

- (6) Enter the username and password below to access the maintenance interface.
 - Username: "Maintenance" and Password: "Earthbound".

B. Positioning of Aircraft for Antenna Alignment

- (1) On the GUI Calibrate Antenna Alignment page, as shown in Figure 5-12. Press the Prepare button.

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

Network Status	: In network	Software Version: MCS8562 v1.0.0-Valid	MODMAN Health: OK
Satellite Info	: 15F1J on 62.6 °, Spot 19		KANDU Health: OK
Ground Status	: On Ground		BUC-PA Health: OK
Current Date & Time	: 2020/09/02 22:35:05		Antenna Health: OK
Login Level	: Maintenance		APM Health: OK
			Interconnect Health: OK

Calibrate Antenna Alignment

Prepare | for Antenna Alignment Calibration Procedure

ALS reset is required once Prepare button is pressed

Aircraft Status		Previous Calibration Status	
Latitude	: 51.4698 °	Last Calibration on	2020/08/31 08:03:21
Longitude	: -0.4700 °	Antenna Rotation Angles	
Altitude	: 2999 feet	Heading	: 0.069 °
True Heading	: 0 °	Pitch	: 0.026 °
ARINC 429 Label Status	: OK	Roll	: 0.080 °

Calibration Status : Not Started

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Figure 5-12. GUI Calibrate Antenna Alignment Page

- (2) The location of aircraft in terms of latitude and longitude is indicated along with the selection of the servicing Geo stationary satellite used for the antenna alignment.

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- (3) For the automatic antenna alignment calibration, it is recommended to tow and put the aircraft in an open area away from aircraft hangars such that there is a clear view towards the satellite being used for the connection with the true heading (not magnetic heading) of the aircraft pointed in one of four recommended aircraft true heading values displayed on the GUI antenna calibration page.

SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

Honeywell JetWave Access Center

STATUS INFO

Network Status	: In network	Software Version	: MCS8562 v1.0.0.0 Vard	MOCMAN Health	: OK
Satellite Info	: BFT-Low 52.6 °, Spd: 19			KYNDU Health	: OK
Ground Status	: On Ground			BJC-PA Health	: OK
Current Date & Time	: 2020/09/11 19:34:29			Aircraft Health	: OK
Login Level	: Maintenance			A/TM Health	: OK
				Interconnect Health	: OK

Calibrate Antenna Alignment

Satellite Status

Current Satellite: AOR (Recommended)
 Select new Satellite: [AOR] v

Advanced
 Press Advanced tab for more options

Aircraft Status

Latitude: 40.99 °
 Longitude: -84.700 °
 Altitude: 0 feet
 True Heading: 0 °
 ARINC 429 Case Status: OK

Previous Calibration Status

Last Calibration on 2020/09/02 20:10:14
 Antenna Rotation Angles
 Heading: 0.000 °
 Pitch: 0.020 °
 Roll: 0.000 °

Current Calibration Status

Azimuth: 111.466 °
 Elevation: 7.465 °
 RSSI Signal Strength: -8058

For Antenna Calibration, rotate the Aircraft to align the aircraft's heading to any of the following recommended Headings:
 (a) 266° (b) 215° (c) 396° (d) 126°
 Initiate tab will be active once Aircraft True Heading is aligned to within +/- 5.000 degrees of the selected heading and the system is ready for calibration.

Calibration Status: Not Started

Ready to **Initiate** Calibration Procedure

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Figure 5-13. Antenna Alignment

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JetWave™ MCS-8562 Terminal

- (4) The automatic antenna alignment calibration can be carried out at up to four different aircraft headings. Out of the available headings, it is required to do only one automatic alignment calibration while the aircraft true heading is toward one of the preferred directions.

NOTE: The values displayed in Figure 5-13 will change depending on the location and attitude of the aircraft.

- (5) The recommended values are dependent on the radome and these values are calculated by the KANDU based on the input from the aircraft IRS and the selected satellite coordinates and the APM configuration data. The Auto Alignment application automatically presents the four true headings to the operator when a target satellite is selected from the “recommended” target which is also location dependent. There is a recommended tolerance range for these headings which is dependent on the radome and configured in the APM configuration data. The chosen recommended true headings are used so that the radome has consistent performance (i.e. no large changes in curvature) over the area being used during alignment.

NOTE: It is advised not to do the automatic antenna alignment during rains with heavily clouded sky.

- (a) The antenna alignment should be performed only after completion of system power up. The health status of each LRU should be checked on the GUI, and there should be no display of system muting due to Initialization. Only then should the Initiate button be pressed on the Antenna Alignment GUI page.

- (b) The JetWave™ MCS-8562 Terminal uses the following input parameters during the antenna alignment procedure:

- Aircraft IRS data
- OAE IMU data
- RSSI as reported from the Modman.

- (c) The GUI page indicates the status of the aircraft. In order to proceed with the antenna calibration process, all LRUs of the JetWave™ MCS-8562 Terminal need to be powered up with aircraft IRS system functioning and providing valid inputs. The GUI page indicates the IRS status.

- (d) Once the aircraft is aligned to within the tolerance range of any of the recommended aircraft heading, the grayed out on the “Initiate” button will be changed, indicating the system readiness to commence the antenna alignment process.

- (e) Watch the GUI Antenna Alignment Calibration progress status bar until complete.

- (f) On successful completion of the antenna calibration, the status changes to “Complete”.

NOTE: If for some reason the Calibration procedure fails, the operator will be given the opportunity to repeat the procedure. This may require several attempts to finalize and confirm the offsets.

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SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL

JetWave™ MCS-8562 Terminal

6. On-ground Testing and Commissioning

NOTE: There are restrictions to testing the JetWave™ MCS-8562 Terminal for the commissioning process. Each country has its own restrictions to on-ground testing and transmission. Verify regulations before testing the system. Particular attention must be observed the first time the system is turned on and able to transmit.

At this point the system will download a map detailing the areas where transmission is and is not allowed. This map will take effect on the next power-up. The specific details of the map and where transmission is restricted can be provided by the service provider.

A. **Testing and Commissioning Process with Restrictions**

- (1) The JetWave™ MCS-8562 Terminal under normal operating conditions mutes transmit and also disables the modem when the Air/Ground status in "On Ground".
- (2) The Air/Ground status will be set to "Air" when one of the conditions that follow are met (otherwise the Air/Ground status will be set to "On Ground"):
 - IF AES Configuration System KANDU Ground Speed is being received from the KANDU, and it has been received with non NULL value, and is indicating a ground speed of greater than 50 knots, or
 - If AES Configuration System WOW is configured to be connected and it is indicating it is in the air.
- (3) Ground transmission can be enabled by asserting the ground transmit enable discrete of the JetWave™ MCS-8562 Terminal.
 - (a) The ground operation depends on location and country of aircraft registration.
 - (b) The reason for restrictions on transmission from the current aircraft location can be accessed through the GUI Home page under text display "Reasons for Transmission Mute".
- (4) For the testing and commissioning process, the aircraft must be positioned so as to have a clear line of sight to the satellite.
- (5) To control the transmission of the terminal within certain locations and at different heights, the terminal stores and uses a geographical map. The map indicates regions around the globe where the terminal may legally transmit. The map is provided by Inmarsat and requested by the terminal when it first enters the network. The terminal will retrieve the map file from the Inmarsat server using the FTP protocol over the management VLAN. Make sure that this ground test procedure is being performed in a location that permits operation on the ground for the terminal's configured geographic map. This restriction only applies in internal modem submode. The specific details of the map and where transmission is restricted can be provided by the service provider.

B. **Data Link Available (Control Panel) Output**

Once the network connectivity is achieved, the "Datalink Available" discrete output on the ARINC 791 page will be asserted.

To see the "Datalink Available" discrete output, navigate to the Discrete Link Status page and scroll down to see the ARINC 791 page and make sure the discrete output status is asserted, Refer to the Discrete I/O state page Figure 5-7.

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Make sure the “Datalink Available” status is indicated in the control panel.

C. Mission Configuration Data

(1) General Overview:

(a) The Mission configuration data define the parameters required for operation with the External Modem. The Mission configuration data is stored in the Modman and the APM as an ASCII text file containing comma separated list of parameters. The parameter list is as follows:

- Version: Set the value as 1
- Satellite name: Enter the satellite name. This will be displayed on the AES GUI Satellite Info banner page
- Spot beam Id: Enter the spot beam Id. This will be displayed on the AES GUI Satellite Info banner page
- TX Frequency band: The available options are given in Table 5-2
- RX Frequency band: The available options are given in Table 5-3
- TX Polarity
- RX Polarity
- Minimum skew angle: This parameter represents the minimum skew of the transmit beam short axis to the geosynchronous arc, in degrees. It is used to determine the allowable Effectively Isotropic Radiated Power Spectral Density (EIRP SD) of the antenna per the spectral mask regulation. In the event of the skew angle becoming less than this minimum configuration, the antenna transmission is disabled. See the curves in Figure 5-14, Table 5-4, Figure 5-15 and Table 5-5 for the allowed maximum EIRP SD versus skew angle.
- Maximum skew angle: This parameter represents the maximum skew of the transmit beam short axis to the geosynchronous arc, in degrees. It is used to determine the allowable EIRP SD of the antenna per the spectral mask regulation. In the event of the skew angle becoming greater than this maximum configuration, the antenna transmission is disabled. See the curves in Figure 5-14, Table 5-4, Figure 5-15 and Table 5-5 for the allowed maximum EIRP SD versus skew angle.
- BDC Attenuation: This parameter provides a means to adjust the IF power level of the antenna receive path over the range of +0/-20dB in 0.5dB steps. The mission configuration parameters in the active Mission Config file are used by AES for operation with external modem.

Table 5-2. TX Frequency Band

Options (GHz)	RF Band Start (MHz)	RF Band Stop (MHz)	IF Band Start (MHz)	IF Band Stop (MHz)	LO (MHz)
29-30	29000	30000	950	1950	28050
30-31	30000	31000	1000	2000	29000

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Table 5-3. RX Frequency Band

Options (GHz)	RF Band Start (MHz)	RF Band Stop (MHz)	IF Band Start (MHz)	IF Band Stop (MHz)	LO (MHz)
19.2-19.725	19200	19725	950	1475	18250
19.7-20.225	19700	20225	950	1475	18750
20.2-20.725	20200	20725	950	1475	19250
20.7-21.225	20700	21225	950	1475	19750

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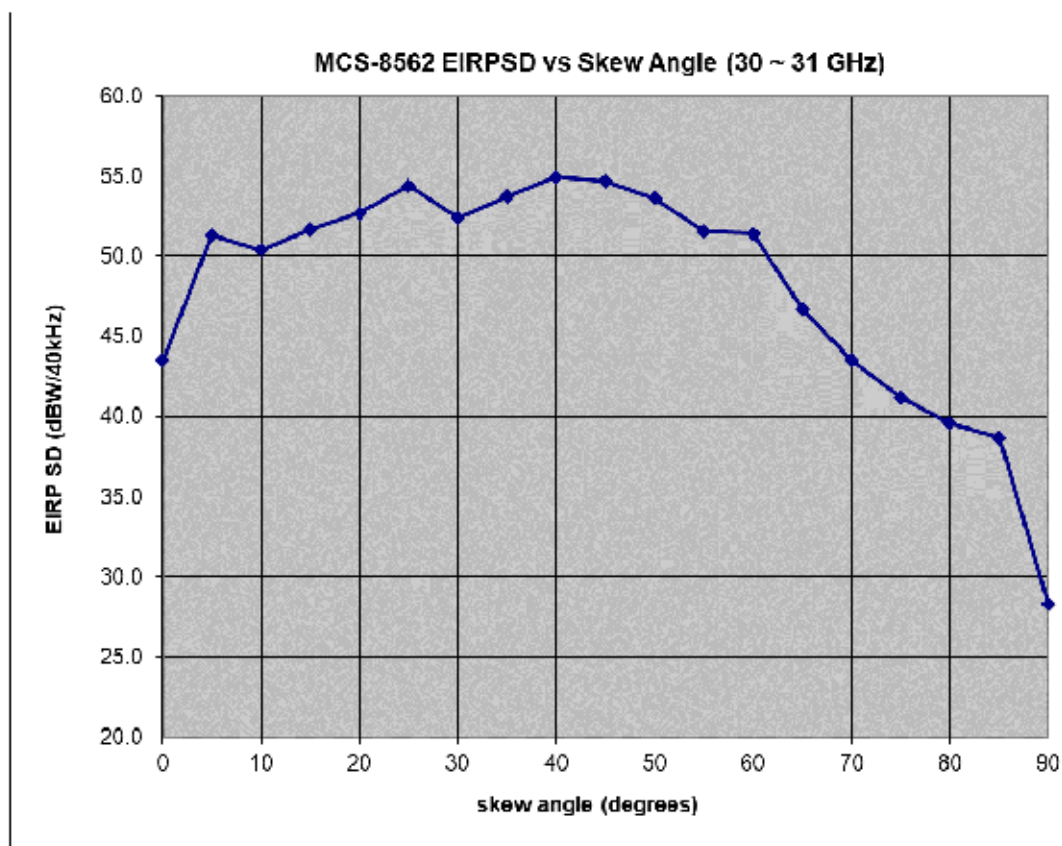
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Figure 5-14. JetWave™ MCS-8562 EIRP SD Vs Skew Angle (30 ~ 31 GHz)

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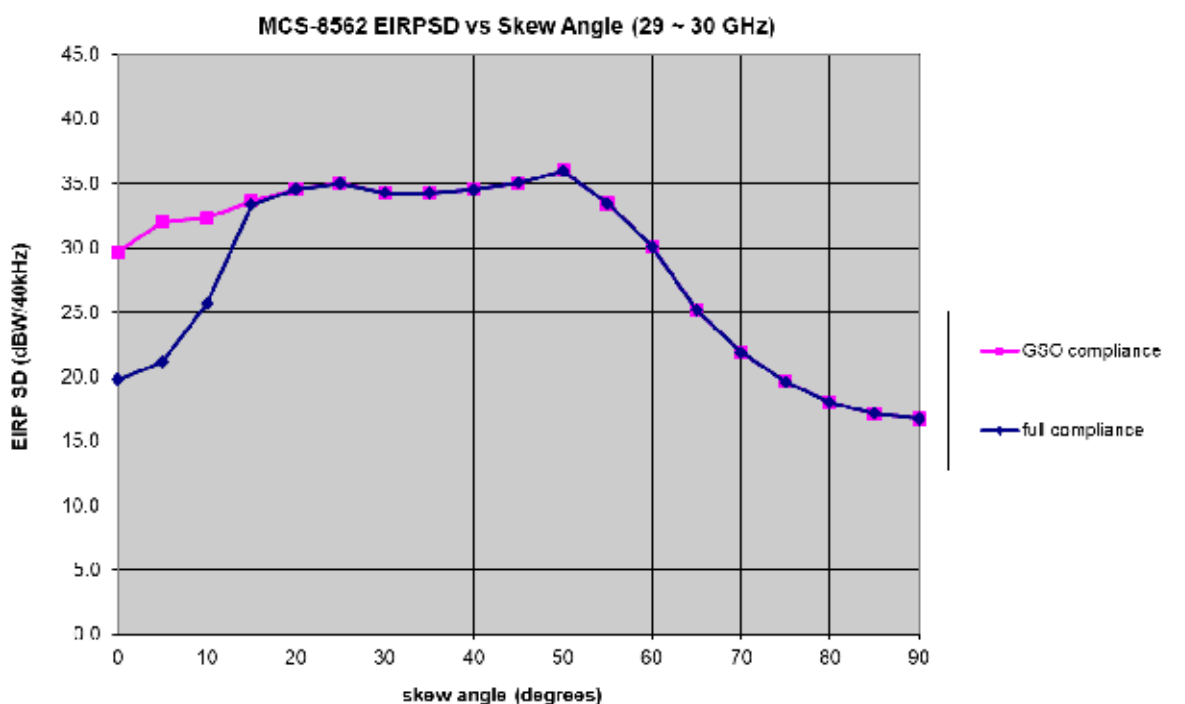
SYSTEM DESCRIPTION, INSTALLATION, AND MAINTENANCE MANUAL JetWave™ MCS-8562 Terminal

Table 5-4. JetWave™ MCS-8562 EIRP SD vs Skew Angle (30 ~ 31 GHz)

Skew angle (degrees)	EIRP SD (dBW/40KHz)
0	43.5
5	51.3
10	50.4
15	51.7
20	52.7
25	54.4
30	52.4
35	53.7
40	55.0
45	54.7
50	53.6
55	51.5
60	51.4
65	46.7
70	43.5
75	41.2
80	39.6
85	38.7
90	28.3

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Figure 5-15. JetWave™ MCS-8562 EIRP SD Vs Skew Angle (29 ~ 30 GHz)

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Table 5-5. JetWave™ MCS-8562 EIRP SD Vs Skew Angle (29 ~ 30 GHz)

Skew angle (degrees)	EIRP SD (dBW/40KHz)	EIRP SD (dBW/40KHz) For GSO only
0	19.8	29.7
5	21.2	32.0
10	25.7	32.3
15	33.4	33.7
20	34.6	34.6
25	35.0	35.0
30	34.3	34.3
35	34.3	34.3
40	34.5	34.5
45	35.1	35.1
50	36.0	36.0
55	33.4	33.4
60	30.1	30.1
65	25.2	25.2
70	21.9	21.9
75	19.6	19.6
80	18.0	18.0
85	17.1	17.1
90	16.8	16.8

(2) Mission Configuration file Upload/Create/Edit/View/Purge/Download:

- (a) The Mission configuration data is entered using the AES GUI Mission Configuration page. Mission Configuration GUI page will be available only if IF Switch is installed as indicated by the APM configuration parameter and with AES GUI access level of Maintenance.
- (b) Following operations are available with Mission Configuration files:
 - Upload from external PC, an offline created Mission Configuration file, using the UPLOAD button.
 - Generate a new Mission Configuration file using the CREATE button and upon entering the parameters press SAVE button. To revert to the previous page, press the EXIT button.
 - Edit or view an existing Mission Configuration file using the EDIT/VIEW button

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- Purge existing Mission Configuration file using the PURGE button.
- Download existing Mission Configuration file to external PC, using the DOWNLOAD button.

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Honeywell JetWave Access Center

STATUS INFO

Network Status : In network
Satellite Info : ICF1 Lon 62.6 °, Spst 28
Ground Status : In Air
Current Date & Time : 2020/03/03 07:50:45
Login Level : Maintenance

Software Version : MCS8562-r1 0.0 Invalid

MUOMAN Health: OK
KANDU Health: OK
EUC-HR Health: OK
Antenna Health: OK
APM Health: OK
Information Health: OK

Mission Configuration Files

Active Mission File: BRno_test.ovv

test_header_0007.ovv	Activate	Edit/View	Purge
test_header_0008.ovv	Activate	Edit/View	Purge
test_071.ovv	Activate	Edit/View	Purge
test_header.ovv	Activate	Edit/View	Purge
header_include_01inc.ovv	Activate	Edit/View	Purge
BRno_test.ovv	Active	Edit/View	Purge

Upload Create

Home

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System
MUOMAN
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Software Installation

Health Status

Ant-Summary

Other Information & Control

Aircraft Tail Number
Reset ACS
Aircraft Data
Satellite LNK Status
Uplink Status
Search Status
Configuration Files
Mission Configuration
Switch Modern Mode

NES Historical Logs

Usage Log
Operational Log
Failure Log
Warning Messages

Commanded Test

Calibrate Antenna Alignment
Manual Antenna Stop
Calibrate TitanIII Cable

Logout

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Figure 5-16. AES GUI Mission Configuration page:

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The screenshot displays the Honeywell JetWave Access Center interface. The top left shows the Honeywell logo and the text "JetWave Access Center". The main heading is "STATUS INFO".

Network Status: : In network
Satellite Info : ISF1_Lon G2.0 F_Spot 20
Ground Status : In Air
Current Date & Time : 2020/09/02 00:20:00
Login Level : Maintenance

Software Version: MCS8562-v1.0.0: Invalid

MCOMAN Health: OK
KANDU Health: OK
BUC-PA Health: OK
Antenna Health: OK
ATM Health: OK
Interconnect Health: OK

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Health Status
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Other Information & Control
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[Network Status](#)
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[Status Monitor Mode](#)

AFS Historical Logs
[Usage Log](#)
[Operational Log](#)
[Fault Log](#)
[Security Reserve](#)

Commanded Test
[Configure Antenna Alignment](#)
[Manual Antenna Alignment](#)
[Collect Terminal Code](#)

Logout

Mission Configuration Parameters

Name of the Mission File:
Version:
Satellite Name:
Spot Beam ID:
Satellite Target Longitude: degree
Tx Frequency Band: GHz
Rx Frequency Band: GHz
Tx Polarity:
Rx Polarity:
Minimum Skew Angle: degree
Maximum Skew Angle: degree
RNC Allowable: IR

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Figure 5-17. AES GUI Mission Configuration CREATE page:

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- (3) Mission Configuration file Activation:
- (a) Once the Mission Configuration files are loaded, they are displayed on the Mission Configuration page. Select the ACTIVATE button against the file to activate that file. Once active, the ACTIVATE button legend changes to Active. Only one file can be set as active at any given time.
- (4) Switching of Modem Mode:
- (a) The switch to the external modem mode is allowed only when the AES is in normal operation and IF Switch is installed and active Mission Configuration file is present. The switch is performed by using any of the following input methods and is based on its priority configured in APM:
- Modman discrete input External Modem Enable
 - AES GUI Switch Modem Mode page (Refer to Figure 5-18)
 - SNMP MIB honAkModemSelection (Refer to TN-90400224).
- (b) If the APM parameter Discrete Enable is configured as enabled, then switching occurs considering only the discrete input. If the APM parameter Discrete Enable is configured as disabled and the APM parameter GUI Enable configured as enabled, then switching occurs considering either the GUI or SNMP input. If both the APM parameters Discrete Enable and GUI Enable are configured as disabled, then switching occurs considering only the SNMP input.

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Honeywell JetWave Access Center

STATUS INFO

Network Status	In network	Software Version: MCS8562V01.0.0 Invalid	MODMAN Health: OK
Satellite Info	ISP-1, Lon 62.6 °, Spot 28		KANOU Health: OK
Ground Status	In Air		DUD-TA Health: OK
Current Date & Time	2020/09/03 07:52:13		Antenna Health: OK
Login Level	Maintenance		APM Health: OK
			Interconnect Health: OK

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- Version & Manufacturing Information
- System
- MODMAN
- KANOU
- WIC-BA
- Antenna
- APM
- Software Installer

Health Status

- ASE Summary

Other Information & Control

- Asset Information
- Reset APM
- Antenna Status
- Satellite Link Status
- Dicentric Status
- Network Status
- Emergency Alarm
- Modem Configuration
- Switch Modem Mode

ACS Historical Logs

- Usage Log
- Operational Log
- Fault Log
- Security Records

Commanded Test

- Calibrate Antenna Alignment
- Manual Antenna Steering
- Calibrate Termination Cable

Login

Switch Modem Mode

Current Modem Mode: Internal Modem

Switch mode to External

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Figure 5-18. AES GUI Switch Modem Mode page

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(5) BUC-HPA IF input level to produce Maximum Operational Power (MOP):

The following MOP output levels can be achieved depending on the modem power output, IF switch loss and the IF cable loss between the modem and BUC-HPA:

- BUC-HPA nominal input power of -22dBm for an EIRP of 46dBW for -20dBc Adjacent Channel Power Ratio (ACPR) in the frequency range of 29 -30 GHz
- BUC-HPA nominal input power of -24dBm for an EIRP of 44dBW for -30dBc spectral regrowth in the frequency range of 30 - 31 GHz.

(6) Receive Input Power Density:

(a) The terminal operates to the following receive input gain levels:

- With a maximum composite input PFD of -95dBW/m^2 and with 0dB BDC attenuation setting, the maximum composite power level over the 525 MHz bandwidth that can be expected at the BUC-HPA output is +5.7dBm
- When pointing to a cold sky at an elevation angle of not less than 30° , and with 0dB BDC attenuation setting, the receive chain absolute gain will raise the IF output composite noise power level to a minimum of -25 dBm at the output of the BUC-PA.

7. Final System Checkout

A. Network Status

Navigate to the Network Status page and scroll down to see the Network status of the JetWave™ MCS-8562 Terminal.

An example of an AES network status is shown in Figure 5-19.

Make sure that the network connectivity is in accordance with the aircraft configuration plan.

With the use of another laptop, make sure that there is network connectivity on each active port once the data link available output is available.

Use the available internet connection to navigate. Monitor the Kilobytes sent and received fields on the home page.

Connect to each of the configured Ethernet ports to make sure there is data connectivity.

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Network Status	: In network		MODMAN Health: OK
Satellite Info	: ISF1, Lon 62.6 °, Spot 19	Software Version: MCS8562-v1 0.0. Valid	KANDU Health: OK
Ground Status	: On Ground		EUC-PA Health: OK
Current Date & Time	: 2020/09/02 22:26:46		Antenna Health: OK
Login Level	: Maintenance		APM Health: OK
			Interconnect Health: OK

Network Status

Port Name	User Data Enable State	Port Status	VLAN	Supported Flags							
				Data Load	ARINIC 781 SNMP	Engineering SNMP	Magic 039	AES Access Services	LRU Access Services	GUI	Development Services
PA1	InActive	InActive		-		-	-	-	-	-	-
PA2	InActive	InActive		-		-	-	-	-	-	-
PA3	InActive	InActive		-		-	-	-	-	-	-
PA4	InActive	InActive		-		-	-	-	-	-	-
PG1	InActive	InActive									
ENE	Active	Active	SE01	✓							
EN6	InActive	InActive									
EN7	InActive	InActive		-		-	-	-	-	-	-
EN8	InActive	InActive		-		-	-	-	-	-	-
EG1	InActive	InActive									
AG1	InActive	InActive		✓							
AG2	Active	Active	3:01	-		✓	-	✓	✓	✓	✓
AG3	InActive	InActive		-		-	-	-	-	-	-
AG4	InActive	InActive		✓		-	-	-	-	-	-

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Figure 5-19. Network Status

B. EMC Interference to Other Systems

- (1) Power up the system and let it acquire to the network.

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- (2) Begin a two way (Rx and Tx) video conference call with a tool such as Microsoft Lync or Skype.
- (3) Test the functioning of other systems with antennas installed adjacent to the FMA and observe for any mutual interference.
- (4) Monitor the link signal quality C/N and E_b/N_o parameters. These parameters are found under the Satellite Link Status page. Refer to Figure 5-8.
- (5) In case of any RF interference, there will be significant variation of the C/N and E_b/N_o parameters.

SECTION 6 – TROUBLESHOOTING

1. Post-installation Troubleshooting

This section supplies troubleshooting procedures for the JetWave™ MCS-8562 Terminal. Airline maintenance engineers can troubleshoot the JetWave™ MCS-8562 Terminal on the ground, with the health status information and Fault Details and Isolation assistance displayed on the AES GUI.

Only qualified avionics personnel who are knowledgeable in the technical and safety issues related to the troubleshooting of aircraft communications equipment should do the troubleshooting.

2. Accessing the Maintenance Interface

- A. For maintenance activities, the JetWave™ MCS-8562 Terminal can be accessed through a GUI.
 - B. Entry condition:
 - (1) JetWave™ MCS-8562 Terminal is installed and validated by installer for a system safe-to-turn-on. Installer performs system Power On of all JetWave components.
 - (2) Aircraft prepared for troubleshooting
 - C. Monitoring equipment:
 - (1) It is recommended to use a laptop computer with the following minimum requirements:
 - (a) Intel i5 CPU
 - (b) 4 GB of Ram
 - (c) 500 MB of available hard drive space
 - (d) An available 10/100/1000 Ethernet interface
 - (e) Windows 7 or newer operating system, 64-bit.
 - (2) Ethernet cable for laptop connection to the JetWave™ MCS-8562 Terminal maintenance port, typically Av1.
 - D. Monitoring equipment configuration:
 - (1) Configure monitoring laptop Ethernet adapter to match JetWave™ MCS-8562 Terminal IP address settings. Go to Windows/Control Panel/Network and Sharing Center/Change Adapter Settings/. Select Properties, within LAN properties select Internet protocol Version 4 (TCP/IPv4) and click button Properties. Select Use the following IP address radio button, fill in:
 - (a) IP address to be 172.29.55.10
 - (b) Subnet mask to be 255.255.255.0

NOTE: The proper IP address and subnet may depend upon the installation's APM configuration file settings.

 - (c) Press OK and close.
- E. Connecting Monitoring equipment to the JetWave™ MCS-8562 Terminal for a Normal Operation:
 - (1) Locate JetWave™ maintenance port. Connect Monitoring laptop via Ethernet cable to the JetWave™ MCS-8562 Terminal.

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- (2) Locate Data Load Enable switch. Make sure that the Data Load Mode Enable switch is in DISABLED position.
- (3) Locate the SATCOM power switch. Turn the SATCOM system on.
- (4) Wait for 2 minutes for the JetWave™ MCS-8562 Terminal to boot.
- (5) Open an Internet browser using Monitoring laptop. Type URL “172.29.55.1” or “http://172.29.55.1”.

NOTE: The proper IP address may depend upon the installation’s APM configuration file settings.

- (6) Use the applicable login account with well defined password in the login page for accessing the interface level required. The login for the maintenance interface and user interface is as follows:
 - Access maintenance interface with Username: “Maintenance” and Password: “Earthbound”.
 - Access the user interface with Username: “User” and no password.



Figure 6-1. AES GUI Login Page

- F. Connecting Monitoring equipment to the JetWave™ MCS-8562 Terminal for a Dataload Operation:
- (1) Locate JetWave™ maintenance port. Connect monitoring laptop via Ethernet cable to the JetWave™ MCS-8562 Terminal.
 - (2) Locate Data Load Enable switch. Make sure that the Data Load Mode Enable switch is in ENABLED position.
 - (3) Locate the SATCOM power switch. Turn the SATCOM system on.
 - (4) Wait for 2 minutes for the JetWave™ MCS-8562 Terminal to boot.
 - (5) Open an Internet browser using Monitoring laptop. Type URL “172.29.55.1” or “http://172.29.55.1”.

NOTE: The proper IP address may depend upon the installation’s APM configuration file settings

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- (6) Login page will be presented. Login at the maintenance operation level with Username: "Maintenance" and Password: "Earthbound".
 - (7) Access the user interface with Username: "User" and no password.
- G. User may press Log out button to log out. Upon logging off, log in page will be presented by default.
- H. Checking Status Information
- (1) The health status of the JetWave™ MCS-8562 Terminal can be monitored by viewing the status strip at the top of the GUI. Alternatively, Figure 6-2 shows the GUI page listing the health status of JetWave™ MCS-8562 Terminal LRUs.
 - (a) The JetWave™ MCS-8562 Terminal will enter into critical fault mode when a critical LRU fault is encountered or the AES Configuration data is missing or invalid once entered, only way to exit critical fault mode is reset.
 - (b) The JetWave™ MCS-8562 Terminal will be back to normal operation mode only when all the LRU critical faults are removed, receiving valid navigation information, a valid AES configuration data is supplied and a reset issued. Figure 6-2 shows the AES Summary page.

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The screenshot displays the Honeywell JetWave Access Center web interface. The main content area is titled "STATUS INFO" and includes a summary of system health and status. A sidebar on the left provides navigation options for various system components. The central "Health Status" section contains two tables: "AES Summary & Link Status" and "Intra Links Health Status".

STATUS INFO Summary:

- Network Status: In network
- Satellite Info: Iridium, Lon 62.67, Spot 19
- Ground Status: On Ground
- Current Date & Time: 2020/05/02 22:11:10
- Login Level: Maintenance
- Software Version: MCS8562 v1.0.0 Valid
- MCDMAN Health: OK
- KAN DU Health: OK
- BUC RA Health: OK
- Antenna Health: OK
- APM Health: OK
- Interconnect Health: OK

AES Summary & Link Status Table:

IDID	POST STATUS	COMMUNICATION STATUS	LINK HEALTH STATUS
COX MCDMAN	Pass	Pass	OK (C)
KAN DU	Pass	Pass	OK (C)
BUC RA	Pass	Pass	OK (C)
W34 MA	Pass	Pass	OK (C)
APM	Pass	Pass	Not Applicable

Intra Links Health Status Table:

Intralink	Status
Modem KAN DU Ethernet Bus	Pass
KAN DU RNA Ethernet Bus	Pass
Modem APM Serial Bus	Pass
KAN DU ONE Serial Control Bus	Pass
KAN DU ONE Serial IMU Bus	Pass
KAN DU BUC RA Serial Bus	Pass
Modem KAN DU Keying Transmit	Pass
KAN DU BUC RA Reset	Pass
KAN DU BUC RA Keying Transmit	Pass
Modem KAN DU RRND Tx Multi	Pass
ONE BUC RA Modem RF Rx	Pass
Modem BUC RA RF Tx	Pass
EM COM-HW BUC RA Tx	Unavailable
IF Switch	Fail

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Figure 6-2. JetWave™ MCS-8562 Terminal Summary Page

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I. Downloading AES Historical Logs

- (1) To view the historical fault logs, under the AES historical logs pane, select the "Fault Log". A screenshot of fault log page is shown in Figure 6-3.

NOTE: The JetWave™ MCS-8562 Terminal Usage log and the Operational log can be downloaded through GUI with User access level. For downloading the JetWave™ MCS-8562 Terminal Fault log and the Security records, the system must be accessed through the Maintenance access level on the GUI.

- (2) The log files can be viewed a number of ways. You can choose how many records as follows:
 - Since power on
 - Number of days and select actual number of days from the dropdown (not recommended)
 - Number of latest records and select the number of records form the dropdown
 - All records.

- (3) Select the record order by clicking on latest first or oldest first.

NOTE: If logs are being sent for analysis make sure to select all records.

- (4) Select the Apply button.

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Network Status	: In network	Software Version: MCS8562-v1.0.0: Valid	MODMAN Health: OK
Satellite Info	: I5F1J on 62.6 °, Spor 10		KANDU Health: OK
Ground Status	: On Ground		DUC-PA Health: OK
Current Date & Time	: 2020/09/02 22:34:30		Antenna Health: OK
Login Level	: Maintenance		APM Health: OK
			Interconnect Health: OK

AES Log - Fault

Choose the how many records to fetch

Since Power ON
 Number of Days 1
 Number of Latest Records 25
 All

Record Order

Latest First
 Oldest First

Current power on counter is 2181

recordid	record type	modman ticks	modman date	modman time	modman power on counter	modman flight cycle counter
27095	Fault	5493.77	2020/09/02	22:19:27	2181	22
27094	Fault	4494.48	2020/09/02	22:02:28	2181	22
27093	Fault	189.41	2020/09/02	20:51:43	2181	22
27092	Fault	183.30	1970/01/01	00:02:29	2181	22
27091	Fault	104.32	1970/01/01	00:02:10	2181	22
27090	Fault	108.96	1970/01/01	00:02:01	2181	22

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Figure 6-3. JetWave™ MCS-8562 Terminal Fault Log Download Page

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- (5) The fault log contains the details that follow:
 - LRU POST and BITE fault codes and texts
 - Location information, if available
 - LRU Recorded Temperature, if available
 - LRU Recorded Time, if available, if unavailable default time will be displayed
 - LRU Antenna pointing information, if applicable
 - Occurrence count.
- (6) To download the fault log data for analysis and trouble shooting, press the “Download” button. The window as shown in Figure 6-3 will come into view. Save to the computer to open and view the fault log in csv format.

J. System Data Load Failure

- (1) Make sure that the system is configured for ground operation.
- (2) Make sure that the local data load enable switch is closed.
- (3) Make sure that the ARINC 615A data loader is connected to the correct port:

NOTE: Port AV1 is by default the Modman Maintenance Port, but this may have been modified by the APM configuration loaded.

K. System Reset

The JetWave™ MCS-8562 Terminal can be reset with any of the methods that follow:

- GUI
- Through the SNMP for Maintenance level
- By grounding the Modman Reset Pin (MP10C).

NOTE: The maintenance technician can attempt to cycle power to the Modman in case the system fails to respond to the reset. If the problem persists, the respective AES sub assembly needs to be replaced. The operator’s JetWave Customer Support can be contacted for further support.

L. Electrical and Mechanical Inspection and Check

Periodic inspections of the mechanical and electrical interfaces of the JetWave™ MCS-8562 Terminal AES OAE assembly and LRUs to the aircraft should be completed as defined by the governing airworthiness body (such as Transport Canada, the FAA, or the JAA) Instructions for Continued Airworthiness for the installation.

For the general guidelines, refer to Visual Inspection and Check and Scheduled Maintenance and Inspections sections. GUI summary page contains an intra Links Health Status that provides a guidance on the health of the interconnection between LRUs.

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M. Visual Inspection and Check

Do the procedures that follow to examine the JetWave™ MCS-8562 Terminal AES OAE assembly and inter-connecting wiring and LRUs after installation of the unit onto the aircraft. Follow all approved safety standards and practices during the inspection.

WARNING: **FAILURE TO DISCONNECT CIRCUIT BREAKERS CAN LEAD TO INJURY TO THE OPERATOR AND DAMAGE TO THE EQUIPMENT.**

- (1) Disconnect all circuit breakers to the JetWave™ MCS-8562 Terminal AES OAE assembly, LRUs and associated systems.
- (2) Visually examine the FMA for any damage or defects. Please refer to the radome supplier's Structural Repair Manual (SRM) for the specific radome inspection and damage repair instructions.

N. JetWave™ MCS-8562 Terminal Fault Codes

(1) BITE Philosophy

(a) Description

- 1 The JetWave™ MCS-8562 Terminal AES consists of the Modman, KANDU, BUC-HPA, FMA LRUs, plus the APM.
- 2 The APM is a simple memory device with no software and performs no BITE by itself. Any BITE required for the APM is performed by the Modman. The APM is not shown in these diagrams.
- 3 The BITE system divides the responsibility for BITE and historical logs in a BITE hierarchy as illustrated in Figure 6-4.

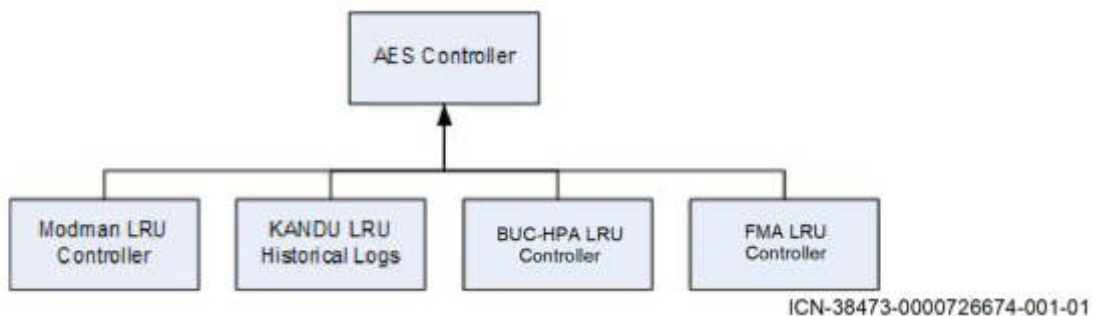


Figure 6-4. Bite Hierarchy

- 4 In charge of the JetWave™ MCS-8562 Terminal is the AES controller. This controller is in charge of the LRUs of the JetWave™ MCS-8562 Terminal, and it:
 - Maintains the overall state of the AES system
 - Controls the initialization and operation of the system
 - Generates BITE events applicable to the system level
 - Records BITE events reported by a LRU and itself in an AES historical log.

- 5 Each LRU has a LRU controller that:
- Maintains the state of the LRU
 - Generates BITE events applicable to the LRU
 - Sends relevant BITE events to the AES controller (for the AES controller to make a decision on overall AES state, and for it to record in its AES historical log).
 - Record BITE event generated from the LRU.
- 6 The diagram that follows is a detailed description of how the AES controller, the LRU controllers, the historical logs, and the means of access to those logs interact. Refer to Figure 6-5.

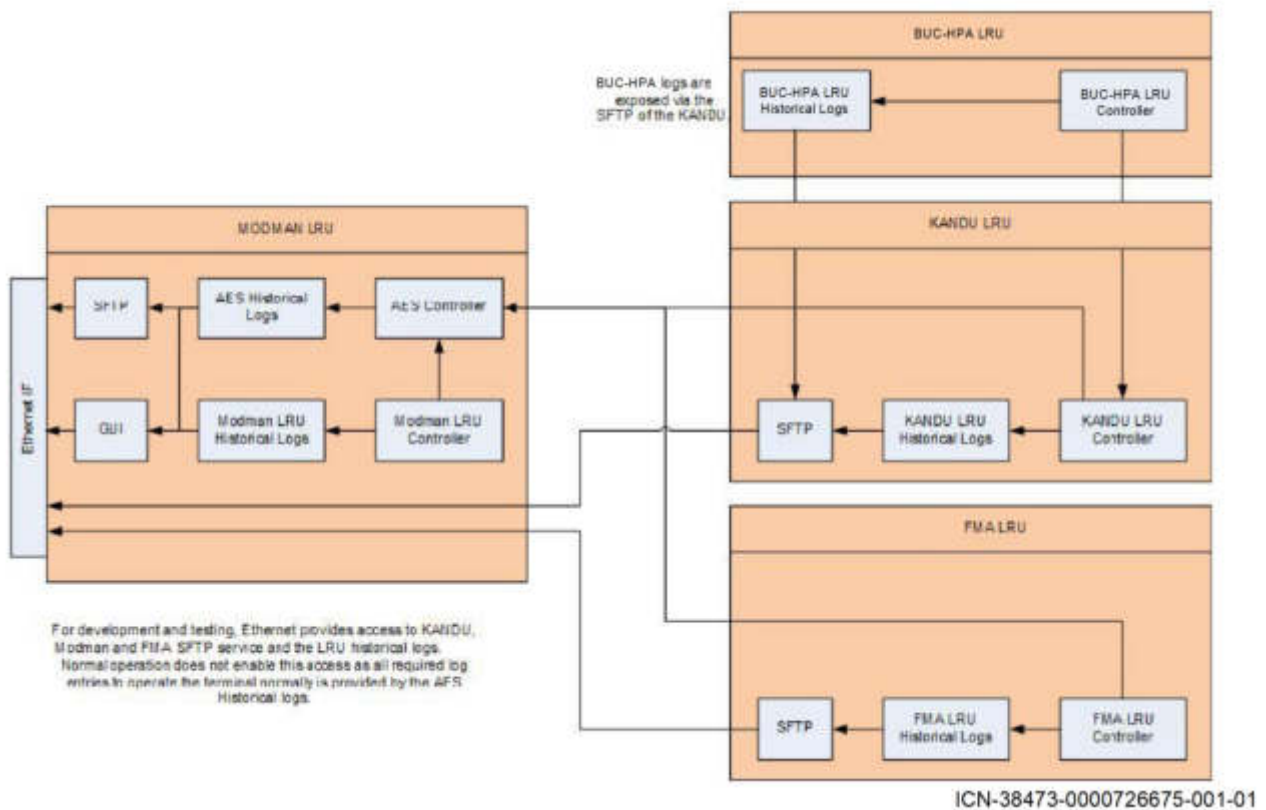


Figure 6-5. AES and LRU Controller Interaction

- 7 The AES Controller resides in the Modman LRU.
- 8 Each LRU Controller monitors the LRU for BITE events. BITE events are classified into two categories:
- Faults: These are BITE events which have a SET state (occurring) or CLEAR state (fault has disappeared).
 - Events: These are BITE events which occur but do not have a set or clear state.

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- 9 The LRU records the BITE event into a specific LRU log, dependent on the type of fault or event.
- NOTE:** Not all BITE events indicate an error situation. BITE events are also used for storing significant events in the historical logs, either on the LRU or in the AES controller, or for informing the AES controller of important system wide information.
- 10 BITE events are sent to the AES controller. The AES controller may react to an event by changing the overall state of the AES system. Actions include disabling the system, rebooting the system, etc.
- 11 The AES controller has a sub-part called the AES controller fault and event handler which is in charge of responding to BITE events reported by the AES controller or a LRU controller.
- 12 The AES controller has its own historical logs which allow it to record events about the whole system.
- 13 Included on the diagram are the Secure File Transport Protocol (SFTP) services and the GUI services which allow the users to access the AES and LRU historical logs.
- AES controller logs are available from the Modman LRU GUI or SFTP service, accessible through one of the Ethernet connections on the Modman.
 - Modman LRU logs are available from the Modman LRU SFTP service, accessible through one of the Ethernet connections on the Modman.
 - KANDU LRU Logs and BUC-HPA LRU Logs are available from the KANDU LRU SFTP service, accessible through one of the Ethernet connections on the Modman.
 - FMA LRU Logs are available from the FMA LRU SFTP service, accessible through one of the Ethernet connections on the Modman.
- 14 The LRU and AES remember information about BITE events that have occurred, in both non-volatile memory and volatile memory.
- 15 The historical logs are kept by the LRU and AES controller.
- 16 Each BITE event is described by an LRU code, encoded in three numbers (L1, L2 and L3) to uniquely identify the event.
- 17 Section 5 has more details on the format of this LRU code system.
- 18 The BITE events themselves have a description of the L1 thru L3 code and the additional text to be used for that event.

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- 19 Each BITE event is also associated with a reaction table which describes the confirmation actions, and event actions, the LRU should take when this BITE event occurs. For events that are reported to the AES controller, there is a reaction table describing what the AES controller should do when the event is reported to it.
- 20 Periodically download and retain the JetWave logs to meet any required security log retention policy.
- (b) Status Memory
- 1 The AES Controller remembers the following information:
- The AES Controller maintains an overall mode of operational state, of INITIALIZATION MODE (Default), DATA LOAD, CRITICAL FAULT, COMMANDED MODE, OPERATIONAL MODE.
 - The AES controller maintains an overall service state, of AVAILABLE (default) or UNAVAILABLE. This service state, when set to UNAVAILABLE, disables user service.
 - For each unique L1 thru L3 code, maintained across reset/power down, it records if the code has occurred (SET), cleared after occurring (CLEAR), or never seen (NO_ERROR).
 - For each unique L1 thru L3 code, maintained across reset/power down, it records the number of occurrences and the time of the last occurrence.
 - For every link in the system, it records the status: UNKNOWN (default after power on), DISABLED, INACTIVE, NO_LAYER_1 (when applicable), HIGH_PACKET_LOSS, ACTIVE (normal). It also records the time of the last report, and the long term link status: NOFAULT, FAULT.
 - For every ARINC 429 label the AES accepts on a per LRU basis, it records the status: DISABLED, UNKNOWN (default after power on), ACTIVE, SSMERROR, MISSING.
 - For every input discrete the AES LRUs possesses, it records the status: UNKNOWN (default after power on), ASSERTED, DEASSERTED.
 - For every temperature sensor on every LRU the AES controller records its status: NORMAL (default after power on), WARNING, CRITICAL.
 - For the Modman, BUC-HPA, KANDU, FMA the AES controller records it overall hardware state: NORMAL (default after power on), WARNING, FAILED.
 - The AES controller maintains in memory the mute state of each LRU, and the reason for mute. Default is "INITIALIZATION".
- 2 The LRUs remember the following information:
- For each unique L1 thru L3 code, maintained across reset/power down, it records if the code has occurred (SET), cleared after occurring (CLEAR), or never seen (NO_ERROR).