



JUPITER AVIONICS
C O R P O R A T I O N

JA95-060 Audio Controller Five Transceiver - Expander



Installation and Operating Manual

Rev A

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JA95-060 Audio Controller - Five Transceiver - Expander

SECTION 1 - DESCRIPTION

1.1 System Overview

The JA95-060 Audio Controller - Five Transceiver - Expander is a compact, lightweight panel that allows connection of up to 4 additional radios to the aircraft audio system. The JA95-060 is compatible with the transceiver connections of any of Jupiter's JA9x series of audio controllers as well as any civil aviation audio controller.

The JA95-060 is set up on a per-installation basis using a configuration cable and a PC running the product configuration tool to download system configuration settings via the configuration connector (io) without the necessity of removing the unit from the panel. To facilitate future customizations and certification, no software or complex electronic devices are used in the JA95-060 design.

1.2 Features Overview

Many of the JA95-060 input and output levels are adjustable, and several audio paths are selectable.

A configuration connector is provided on the faceplate of the JA95-060 for configuration of audio levels and routing.

The JA95-060 has two modes of operation: Normal Mode and Emergency Mode.

The JA95-060 supports up to five transceivers, each selectable from a rotary switch.

The JA95-060 allows transmit access for one audio panel.

1.3 Inputs and Outputs

Refer to the JA95-060 [connector maps](#) for the mating connector designators and pin assignments for the input and output signals.

1.3.1 Inputs

| Name | Qty | Type |
|---------------------|-----|---|
| CONFIG DATA TO JA95 | 1 | Data signal |
| LIGHTS INPUT | 1 | Analog control signal |
| TX MIC HI/LO | 1 | Audio signal |
| MODE SELECT | 1 | Multi format signal |
| TX PTT INPUT | 1 | Active low discrete (Feature selected from ProCS) |
| POWER INPUT | 1 | 14 to 28 Vdc power supply |
| RX HI/LO | 5 | Audio signal |

1.3.2 Outputs

| Name | Qty | Type |
|-----------------------|-----|---|
| CONFIG DATA FROM JA95 | 1 | Data signal |
| MIC HI/LO | 5 | Audio signal |
| TX PTT | 5 | Active low discrete (PA PTT feature selected from ProCS) |
| RX OUTPUT HI/LO | 1 | Audio signal (Feature selected from ProCS) |



1.4 Specifications

1.4.1 Electrical Specifications

Power Input

| | |
|---------------------------|--------------|
| Primary nominal voltage | 28 Vdc |
| Secondary nominal voltage | 14 Vdc |
| Maximum voltage | 32.2 Vdc |
| Minimum voltage | 10.2 Vdc |
| Emergency voltage | 9.0 Vdc |
| Input current at 28 Vdc | ≤ 0.7 A |
| Input current at 14 Vdc | ≤ 1.4 A |
| Input current at 9 Vdc | ≤ 2.4 A |

1.4.1.1 Audio Performance

Rated Input Level

| | |
|------------------------|----------------------|
| Microphone input level | 250 mVrms $\pm 10\%$ |
|------------------------|----------------------|

Rated Output Level

| | |
|--|----------------------|
| RX rated output | 7.75 Vrms $\pm 10\%$ |
| RX rated output, in emergency mode or with power input ≤ 6 Vdc | 2.10 Vrms $\pm 10\%$ |
| Microphone rated output | 250 mVrms $\pm 10\%$ |

Audio Frequency Response

| | |
|---------------------------------------|---------------------------------|
| Audio output audio frequency response | ≤ 3 dB from 300 to 6000 Hz |
|---------------------------------------|---------------------------------|

Spurious Responses

| | |
|--|--------------|
| Audio output spurious response attenuation | ≥ 50 dB |
|--|--------------|

Distortion Characteristics

| | |
|--|-------------|
| Audio output distortion at rated power | $\leq 10\%$ |
|--|-------------|

Input Impedance

| | |
|-------------------------------|--------------------------|
| Microphone input Impedance | 150 Ω $\pm 10\%$ |
| Receive Audio input Impedance | 1000 Ω $\pm 10\%$ |

Output Impedance

| | |
|---|--------------------|
| RX output Impedance | ≤ 60 Ω |
| Transceiver Microphone output Impedance | ≤ 80 Ω |

Output Load

| | |
|-----------------------------|-------------------------|
| RX Output load | 600 Ω $\pm 10\%$ |
| Transceiver Microphone load | 150 Ω $\pm 10\%$ |

Input to output Crosstalk and Bleed-through Level

| | |
|---------------------------|--------------|
| Input to Output crosstalk | ≤ 55 dB |
|---------------------------|--------------|

Input to Input Crosstalk Level

| | |
|--------------------------|--------------|
| Input to Input crosstalk | ≤ 60 dB |
|--------------------------|--------------|



Input to Microphone Output Crosstalk.

| | |
|--------------------------------------|---------|
| Input to Microphone Output crosstalk | ≤1.0 mV |
|--------------------------------------|---------|

Audio Noise Level without Signal

| | |
|------------------------------------|--------|
| Noise level below the rated output | ≥60 dB |
|------------------------------------|--------|

Listening Test

Loud and Clear

1.4.1.2 Audio Performance, Other

| | |
|---|--------------|
| RECEIVE AUDIO input circuitry type | differential |
| RX output HI / LO output circuitry type | single ended |
| MIC output circuitry type | differential |

1.4.1.3 Discrete Signals

| | |
|---|---------------------------|
| Active low control input, active signal level | ≤ +3 Vdc |
| Active low control input, inactive signal level | ≥ +10 Vdc |
| Active low control input, active signal level | 0.1 to 10 mA |
| Active low control input signals have | internal pull-up resistor |
| Active low control output, active output | ≤ +2 Vdc |
| Active low control output active signal sinks | ≤ 1 Adc |

1.4.1.4 Lights Input

| | |
|----------------------|---------------------------------|
| LIGHTS INPUT ranges | 0 to 28, 0 to 14 and 0 to 5 Vdc |
| LIGHTS INPUT current | 10 mA max. |

1.4.2 Mechanical Specifications

| | |
|------------------------------|--|
| Height | 1.875 in [47.6 mm] max |
| Behind panel depth | 5.48 in [139 mm] max |
| Faceplate width | 5.75 in [146 mm]max |
| Behind panel width | 5.00 in [127 mm]max |
| Weight | 1.64 lb [0.74 kg] max |
| Material | brushed aluminum with conversion coating |
| Connectors (4): | J1 One 37-pin D-Sub male |
| | J2 One 50-pin D-Sub male |
| | J3 One 4 pole 3.5mm stereo jack |
| | J4 One 4-40 stud, 0.5 in max |
| Mounting | 4 Dzus fasteners |
| Bonding | ≤ 2.5 mΩ |
| Installation kit part number | INST-JA95 |

1.4.3 Configuration Connector

The JA95-060 configuration connector communication standard for CONFIG DATA TO JA95 data input signal and CONFIG DATA FROM JA95 data output signal is RS-232.



1.4.4 Product Configuration Software Version

Configuration of the JA95-060 requires the Product Configuration Software (ProCS) version v0.61.0 or later. Refer to the release notes from <http://www.jupiteravionics.com/productsoftware.php> or contact Jupiter Avionics to ensure the correct version is used.

1.4.5 Flammability of Materials

The JA95-060 complies with the requirements of RTCA/DO-160G Sec 26.3.3 "Flammability", through equivalent flammability testing of materials and the Small Parts Exemption.

1.4.6 Environmental Specifications

The JA95-060 Audio Controller - Five Transceiver - Expander has been qualified to the environmental conditions listed below. Environmental categories for which TSO compliance has been demonstrated are listed in the [Environmental Qualification Form](#) in Appendix B of this manual.

Temperature:

| | |
|---------------------|---------------------|
| Operating | -45 °C to +70 °C |
| Ground Survival | -55 °C to +85 °C |
| Altitude | 50,000 ft |
| Humidity | Cat A (48 hours) |
| Shock, Crash Safety | 6 g, 20 g for 11 ms |



SECTION 2 – INSTALLATION

2.1 Introduction

This section contains unpacking and inspection procedures, installation information, and post-installation checks.

2.2 Continued Airworthiness

Maintenance of the JA95-060 is on condition only. Scheduled inspection and/or periodic maintenance of this unit is not required.

2.3 Unpacking and Inspecting Equipment

Unpack the equipment carefully. Check for shipping damage and report any problems to the relevant carrier. Confirm that the Authorized Release Certificate or Certificate of Conformance is included. Complete the on-line warranty card from the Jupiter Avionics Corporation (JAC) website - www.jupiteravionics.com/warranty

2.3.1 Warranty

This product manufactured by JAC is warranted to be free of defects in workmanship or performance for 2 years from the date of installation by an approved JAC dealer or agency. This warranty covers the cost of all materials and labour to repair or replace the unit, but does not include the cost of transporting the defective unit to and from JAC or its designated warranty repair centre, or of removing and replacing the defective unit in the aircraft. This warranty does not cover failures due to abuse, misuse, accident, or unauthorized alteration or repairs.

THIS WARRANTY IS VOID IF THE PRODUCT IS NOT INSTALLED BY AN AUTHORIZED JAC DEALER. If the on-line warranty card is not completed, the product will be warranted from the date of manufacture.

Contact JAC for return authorization, and for any questions regarding this warranty and how it applies to your unit(s). JAC is the final arbiter concerning warranty issues.

2.4 Installation Procedures



WARNING: Loud noise can cause hearing damage. Set the headset volume to minimum before conducting tests, and slowly increase the volume to a comfortable listening level.



CAUTION: The power input circuitry of the unit may be damaged if the installation does not conform to the wiring instructions in this manual.

2.4.1 Installation Limitations

The conditions and tests for CAN TSO approval of the JA95-060 are minimum performance standards. Those installing the JA95-060, on or in a specific type or class of aircraft, must determine that the aircraft installation conditions are within TSO standards. The JA95-060 may be installed only by following the applicable airworthiness requirements.

2.4.2 Cabling and Wiring

All wire shall be selected in accordance with the original aircraft manufacturer's maintenance instructions, or AC43.13-1B Change 1, Paragraphs 11-76 through 11-78. Unshielded wire types shall qualify to MIL-W-22759 as specified in AC43.13-1B Change 1, Paragraphs 11-85, 11-86, and listed in Table 11-11. For shielded wire applications, use Tefzel MIL-C-27500 shielded wire with tag ring or equivalent (for shield terminations) to make the most compact and easily terminated interconnect. Follow the Connector Map in Appendix A of this manual.



Allow 3" from the end of the shielded wiring to the shield termination to allow the connector hood to be easily installed. Refer to the Interconnect drawing in Appendix A of this manual for shield termination details. Note that this unit has a 'clamshell' hood that is installed after the wiring is complete.

Maintain wire segregation and route wiring in accordance with the original aircraft manufacturer's maintenance instructions.

Unless otherwise noted, all wiring shall be a minimum of 24 AWG, except power and ground lines, which shall be a minimum of 22 AWG. Refer to the Interconnect drawing for additional specifications. Check that the ground connection is clean and well secured, and that it shares no path with any electrically noisy aircraft accessories such as blowers, turn-and-bank instruments, or similar loads.

2.4.3 Mechanical Installation

The JA95-060 can be mounted in any attitude and location with adequate space for the front panel and sufficient clearance for the connector and wiring harness. It requires no direct cooling.

2.4.4 Legend Replacement

The JA95-060 illuminated legends are field replaceable. For further information, refer to the '[Legend Replacement](#)' document in Appendix A of this manual.

2.4.5 Post Installation Checks

2.4.5.1 Voltage/Resistance checks.

Do not attach this unit until the following conditions are met:

- a) Check P1 pin **19** for lights buss voltage.
- b) Check P2 pin **17** for +28 Vdc or +14 Vdc relative to ground.
- c) Check P2 pin **34** for continuity to ground (less than 0.5 Ω).
- d) Check all pins for shorts to ground or adjacent pins.

2.4.5.2 Configuration

Ensure that the JA95-060 contains the correct configuration settings. This may be done at the factory, on the maintenance bench or in the aircraft before the power on checks are performed. Refer to section 2.5.1.

2.4.5.3 Power on Checks.

Power up the aircraft's systems and confirm normal operation of all functions of the JA95-060. Refer to Section 3 (Operation) for specific operational details.

- a) Confirm radio operation for both receive and transmit. Check yoke or cyclic switch action. Check the radio selection and inputs. Do not proceed until the radios are functioning correctly.
- b) Unusual buzzes, hums or other background audio are symptomatic of multiple grounds, or noisy external systems such as blowers or pumps sharing wiring with the audio system. If a transmitter fails to key or correctly modulate it is often the result of not connecting all required grounds to the radio or external audio system.
- c) Check the Emergency operation.
- d) Check that all configurations settings are correct.

When all performance checks are satisfied, complete the necessary regulatory documentation before releasing the aircraft for service. Refer to [Appendix B](#).

2.5 Adjustments and Configuration using ProCS™

All the JA95-060 internal adjustments are set from the [Product Configuration Software ProCS™](#). Configuration data is sent to the JA95-060 via the front panel connector (io), using the Configuration Cables and a computer running the ProCS™ software. For configuration requirements, see section 2.5.1.



For full information on the configuration process, and for installation of ProCS™ on your computer, refer to the [ProCS™ manual](http://www.jupiteravionics.com/productsoftware) on the Jupiter Avionics website - www.jupiteravionics.com/productsoftware.

2.5.1 Configuration Cabling Requirements

To configure the JA95-060, it is necessary to load the [Product Configuration Software ProCS™](#) onto a Windows-based computer as described in the [ProCS™ manual](#).

The cables required to configure the JA95-060 are not included with the unit.

Cabling option 1:

| Quantity | Description | JA95-060 |
|----------|----------------------------|--------------|
| 1 | USB A to RS232 9-Pin Cable | CAB-USB-0002 |
| 1 | Configuration Cable | JA99-001 |

Cabling option 2:

| Quantity | Description | JA95-060 |
|----------|--------------------------------|--------------|
| 1 | USB A Male to RS232 3.5mm Plug | CAB-USB-0006 |

2.5.2 ProCS™ Setup



The ProCS™ JA95-060 menu item 'ProCS Setup' provides Setup drawings showing the cabling arrangement for connecting the JA95-060 to a computer running the ProCS™.

2.5.3 Configurable Settings

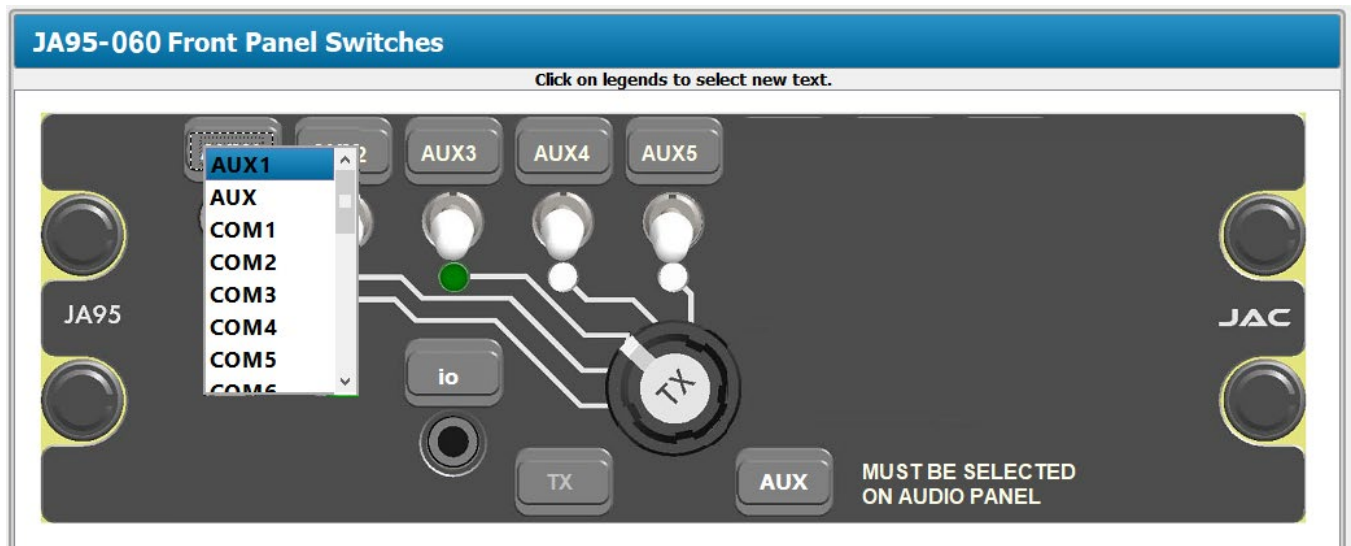
A standard unit is shipped from the factory with all internal adjustments configured to the default levels. At installation, it may be desirable to change some of these settings to suit the local operating environment.



Note: To properly configure the JA95-060, power must be applied to the unit.

Within ProCS™, the configurable settings are grouped together into the following sections:

2.5.3.1 Front Panel Switches



The Front Panel Switches window is used to specify the text for each legend.



2.5.3.2 Radios

JA95-060 Radios

The Radios window is used to define the radios for the transceivers.

Radio Assignments

Transceivers Radios List

| | | |
|-------|---|---|
| AUX1: | Default Transceiver [Rx Level = 7.75 Vrms, Tx Level = 0.250 Vrms] | ▼ |
| AUX2: | Default Transceiver [Rx Level = 7.75 Vrms, Tx Level = 0.250 Vrms] | ▼ |
| AUX3: | Default Transceiver [Rx Level = 7.75 Vrms, Tx Level = 0.250 Vrms] | ▼ |
| AUX4: | Default Transceiver [Rx Level = 7.75 Vrms, Tx Level = 0.250 Vrms] | ▼ |
| AUX5: | Default Transceiver [Rx Level = 7.75 Vrms, Tx Level = 0.250 Vrms] | ▼ |

2.5.3.3 Receive Levels

JA95-060 Receive Levels

The receive level of each of the RX inputs can be adjusted from 1 to 10 Vrms. **(Default 7.75 Vrms)**

Input Levels

| | | | | | | |
|-------|-----------------------|-----------|-----------------------|------------|--------------------|---------------|
| AUX1: | Default Transceiver : | 1.00 Vrms | <input type="range"/> | 10.00 Vrms | [7.75 Vrms] | Default Level |
| AUX2: | Default Transceiver : | 1.00 Vrms | <input type="range"/> | 10.00 Vrms | [7.75 Vrms] | Default Level |
| AUX3: | Default Transceiver : | 1.00 Vrms | <input type="range"/> | 10.00 Vrms | [7.75 Vrms] | Default Level |
| AUX4: | Default Transceiver : | 1.00 Vrms | <input type="range"/> | 10.00 Vrms | [7.75 Vrms] | Default Level |
| AUX5: | Default Transceiver : | 1.00 Vrms | <input type="range"/> | 10.00 Vrms | [7.75 Vrms] | Default Level |

Receive Audio Detector

0dB = Rated Input Level

Level: -12 dB -36 dB **[-24 dB]**

2.5.3.4 Transmit Levels

JA95-060 Transmit Levels

The Transceiver MIC output signals can be adjusted from 0.010 to 1.000 Vrms. **(Default 250 mVrms)**

Rated Load Impedance = 150 Ohms

Transmit Levels

| | | | | | | |
|------|-----------------------|------------|-----------------------|------------|---------------------|---------------|
| AUX1 | Default Transceiver : | 0.010 Vrms | <input type="range"/> | 1.000 Vrms | [0.250 Vrms] | Default Level |
| AUX2 | Default Transceiver : | 0.010 Vrms | <input type="range"/> | 1.000 Vrms | [0.250 Vrms] | Default Level |
| AUX3 | Default Transceiver : | 0.010 Vrms | <input type="range"/> | 1.000 Vrms | [0.250 Vrms] | Default Level |
| AUX4 | Default Transceiver : | 0.010 Vrms | <input type="range"/> | 1.000 Vrms | [0.250 Vrms] | Default Level |
| AUX5 | Default Transceiver : | 0.010 Vrms | <input type="range"/> | 1.000 Vrms | [0.250 Vrms] | Default Level |



When the Transmit Timeout check box is checked the transmit time-out is enabled (**Default not checked**)

When the AUX5 Duplex check box is checked the AUX5 radio is set to duplex operation (**Default not checked**) (see [section 3.4.4](#))

Transmit Settings

☐ Transmit Time-out (90 Sec.)

☐ AUX5 Duplex

2.5.3.5 Sidetone Levels

JA95-060 Sidetone Levels

Receive Sidetone Level

AUX1 thru AUX5 RX input Level on PHN output : 0 dB -12 dB **[-6 dB]**

The Receive Sidetone Level can be adjusted from 0 to -12 dB of the rated phone Level. (**Default -6 dB**)

2.5.3.6 Audio Muting

JA95-060 Audio Muting

Audio Muting During Transmit

☒ Mute RX Audio

To select Audio Muting during Transmit, check the box as shown.

2.5.3.7 Lighting Voltage Selection

JA95-060 Lighting Voltage

Lighting Voltage

Rated Input Level: ☐ +5 Vdc ☐ +14 Vdc ☒ +28 Vdc

The lights input may be +5 Vdc, +14 Vdc or +28Vdc (**Default +28 Vdc**).

2.5.4 Other Configuration Features

In the JA95-060 Product Information Window, the model number, serial number and check sum of the JA95-060 Audio Controller - Five Transceiver - Expander can be viewed.

2.6 Installation Kit

The kit required to install this unit is not included with the unit.

The installation kit (Part # INST-JA95) consists of the following:

| Quantity | Description | JAC Part # |
|----------|--|---------------|
| 2 | TAG ring | CON-5500-0625 |
| 1 | D-Sub 37-pin connector, hood and 37 crimp pins | CON-3420-0037 |
| 1 | D-Sub 50-pin connector, hood and 50 crimp pins | CON-3420-0050 |
| 2 | Heat Shrink Tubing | WIR-HTSK-1000 |

2.6.1 Recommended Crimp Tools

| Standard D-Sub Crimp Tool Chart | | | |
|---------------------------------|--------------------|-------------|--------------------------|
| Tool Type | Hand crimping tool | Positioner | Insertion/extractor tool |
| POSITRONIC | 9507-0-0-0 | 9502-5-0-0 | 4711-2-0-0 |
| DANIELS | AFM 8 | K13-1 | 91067-2 |
| MIL-SPEC | M22520/2-01 | M22520/2-08 | M81969/1-02 |



2.7 **Installation Drawings**

The drawings and documents required for Installation can be found in [Appendix A](#) of this manual.

2.7.1 **Generation of Custom Drawings**

The interconnects and connector maps in Appendix A of this manual are generic drawings based on the standard version of the JA95-060. However, if a unit has been configured using JAC's ProCS™ software to change switch legends or lighting voltages, the software can be used to generate fully customized interconnects and connector maps for use by the installer.

JA95-060 Audio Controller - Five Transceiver - Expander

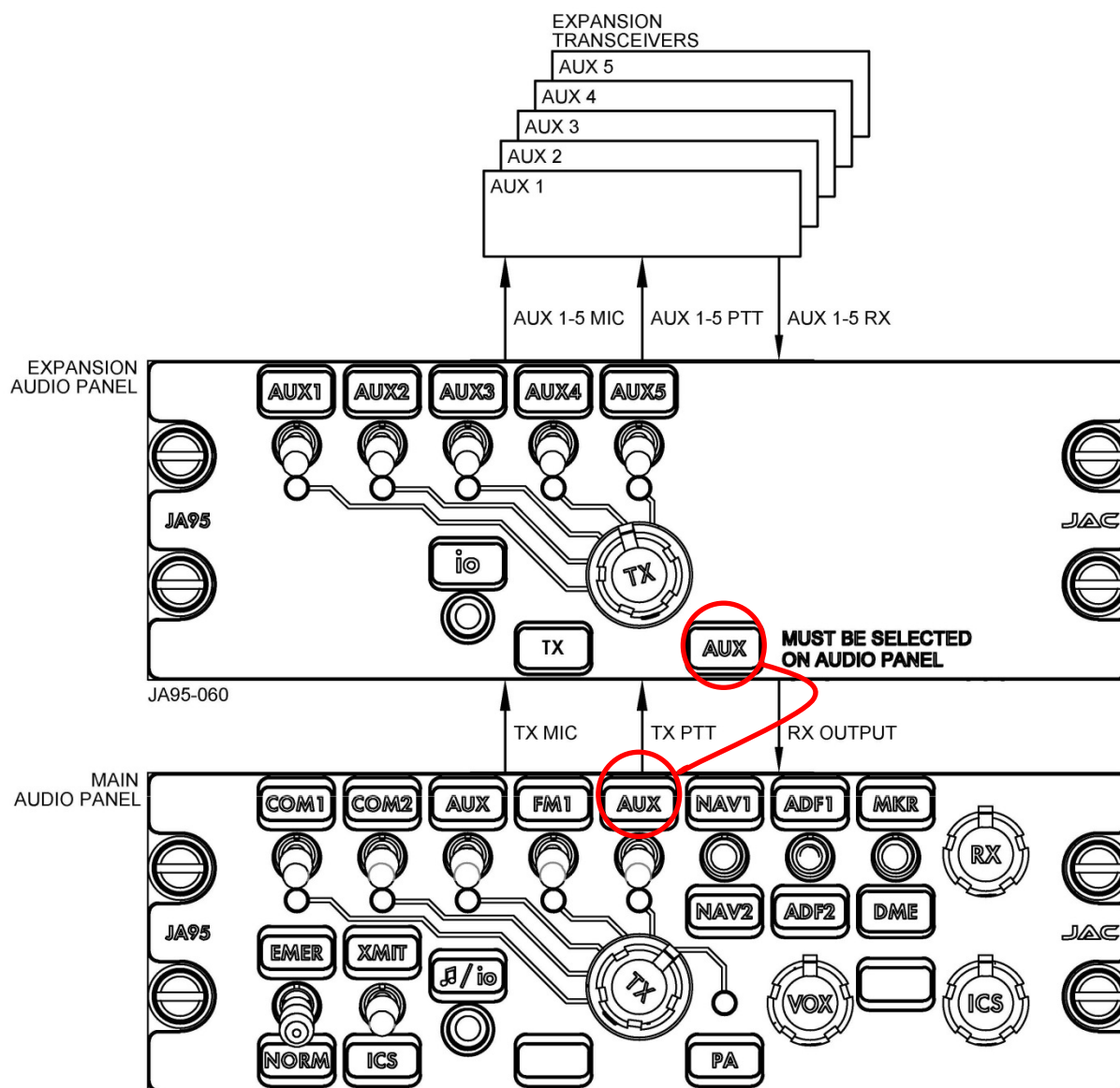
SECTION 3 – OPERATION

3.1 Introduction

This section contains the system diagram and operating instructions for the JA95-060.

3.2 System Diagram

The JA95-060 Audio Controller - Five Transceiver - Expander is a compact, lightweight panel that allows connection of up to 4 additional radios to the aircraft audio system. The JA95-060 is compatible with the transceiver connections of any of Jupiter's JA9x series of audio controllers as well as any civil aviation audio controller.



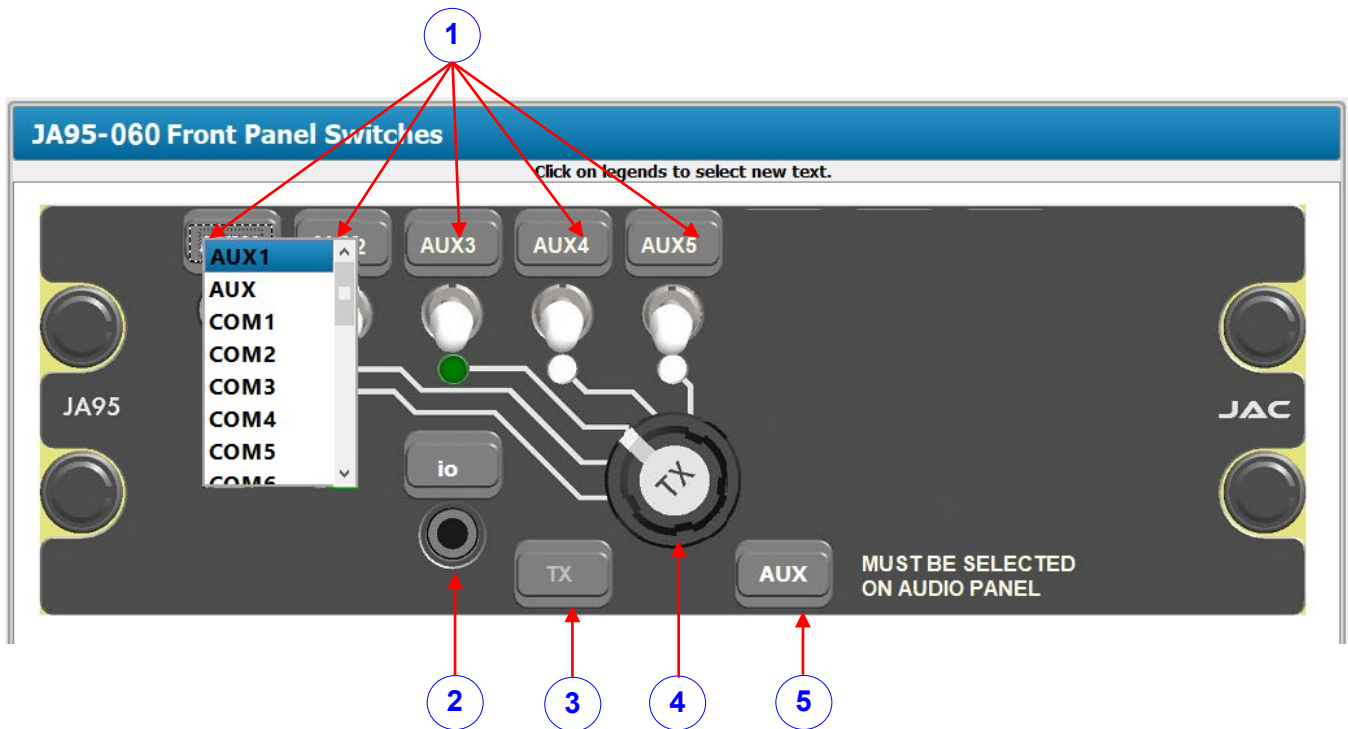
The text on the JA95-060 legend (shown here as AUX) should be selected to match the text on the main panel legend representing the expanded transceiver position.



3.3 Front Panel Controls



Note: The legends and deadfront annunciator are removable and may be replaced with custom ordered parts. The controls will be referred to by the default legend and annunciator names as shown below.

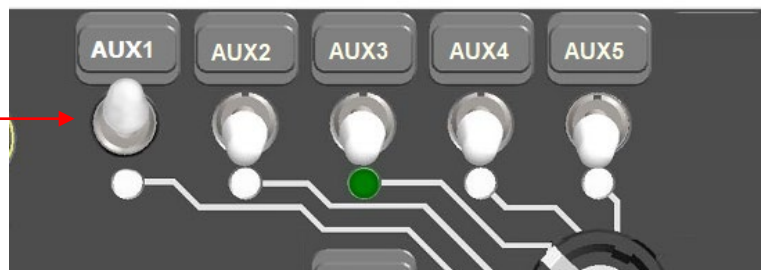


1. Transceiver switches and associated legends
2. Music/configuration input connector and legend
3. Transmit annunciator (deadfront)
4. Transmit selector
5. AUX Legend

(1) Transceiver Switches

These are five white two-position toggle switches. When a switch is set to the 'up' position, audio from the associated transceiver is routed to the phones.

The legends (above the switches) are interchangeable to allow customization. (Default – AUX1, AUX2, AUX3, AUX4, AUX5.)



(2) Configuration Connector (io)

This connector is used during installation to change configuration settings.



CAUTION: Attempting to connect an incompatible plug or device could damage the unit, the attached device, or both. If in doubt, check with your installing agency.



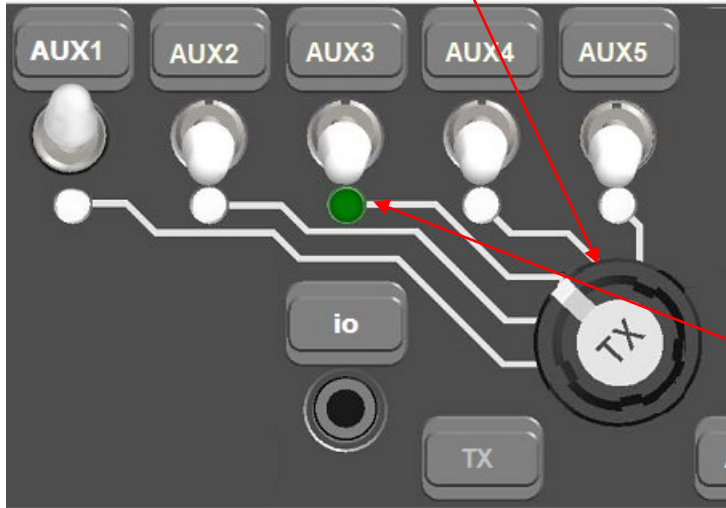
(3) Transmit Annunciator - TX

This is a deadfront annunciator that will illuminate when the JA95-060 is transmitting.

The default legend is 'TX', but it is interchangeable to allow customization.



(4) Transmit Selector



This is a rotary six-position control that is used to select transmission via one of the five transceivers.

Each of the transmit selector positions is linked by a white line to the corresponding transmit select annunciator, transceiver switch and legend.

The appropriate annunciator will light green to show which transceiver is selected for transmit – 'AUX3' in this example.

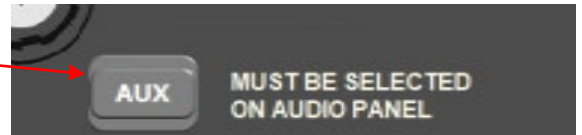


Note: Transmission on any of the transceivers linked to the JA95-060 is only possible if the designated transceiver (AUX in these examples) is selected on the main audio panel.

(5) AUX Legend

This is a customizable legend that is intended to remind the operator which transceiver on the main audio panel must be selected to allow transmission on the JA95-060 Expander Panel.

The default legend is 'AUX', but it is interchangeable to allow customization to match the legend on the main audio panel.



3.4 Normal Operation Mode



Note: Numbers in parentheses refer to the front panel controls shown in section 3.2.

The JA95-060 is in Normal mode when suitable electrical power is supplied to the unit.

3.4.1 Panel Lighting

The legends and annunciators will be illuminated (when appropriate) and dim through the aircraft lighting buss.

3.4.2 Receiving



Note: Transmission on any of the transceivers linked to the JA95-060 is only possible if the designated transceiver (AUX in these examples) is selected on the main audio panel.

When the JA95-060 receives an incoming transmission on a transceiver or receiver that has been selected, either by the white transceiver receive switches (1) or the transmit selector (4), the incoming audio will be directed to the user's phones.



3.4.3 Transmitting (Transmit Operation)



Note: Transmission on any of the transceivers linked to the JA95-060 is only possible if the designated transceiver (AUX in these examples) is selected on the main audio panel.

To select a transceiver, rotate the Transmit Select Switch until it aligns with the line leading to the Transceiver Select switch legend (see **1**) - default legends AUX1, AUX2, AUX3, AUX4, or AUX5. The corresponding Transmit Select annunciator will illuminate.

When the TX PTT input is activated, the unit will transmit on the selected transceiver, and the deadfront Transmit Annunciator (**3**) will illuminate 'TX'. All MIC and sidetone audio will be routed to the RX OUTPUT.

3.4.4 Transmit Operation, Duplex AUX5



Note: If the AUX5 transceiver has been configured as duplex, it can be used with a cellphone or sat-phone. Check your configuration with the installing agency.

If the unit has been configured for cellphone or sat-phone use and AUX5 has been selected for transmit, momentarily activating the TX PTT will keep AUX5 transmitting. A second momentary activation of the TX PTT, or moving the Transmit Selector away from AUX5, will stop the AUX5 from transmitting.

AUX5 Transmit timeout operation does not operate when AUX5 transmit mode is set to duplex.

3.5 Emergency Operation Mode

Emergency mode is entered automatically if power to the unit is lost.

3.5.1 Auto Emergency Mode

If the unit is in emergency mode because power has been lost to the unit, the AUX1 transceiver will be routed to the RX OUTPUT. The TX microphone and TX transmit key are connected to the AUX1 transceiver. No other function in the JA95-060 will operate when power is lost. All indicator LEDs, legends and annunciators will be dark.



Installation and Operating Manual

Appendix A - Installation Drawings

A1 **Introduction**

The drawings necessary for installation and troubleshooting of the JA95-060 Audio Controller - Five Transceiver - Expander are in this Appendix, as listed below.



Note: A fully customized set of Connector Maps and Interconnects can be created using the ProCS software. Refer to the [ProCS™ manual](#) for further information.

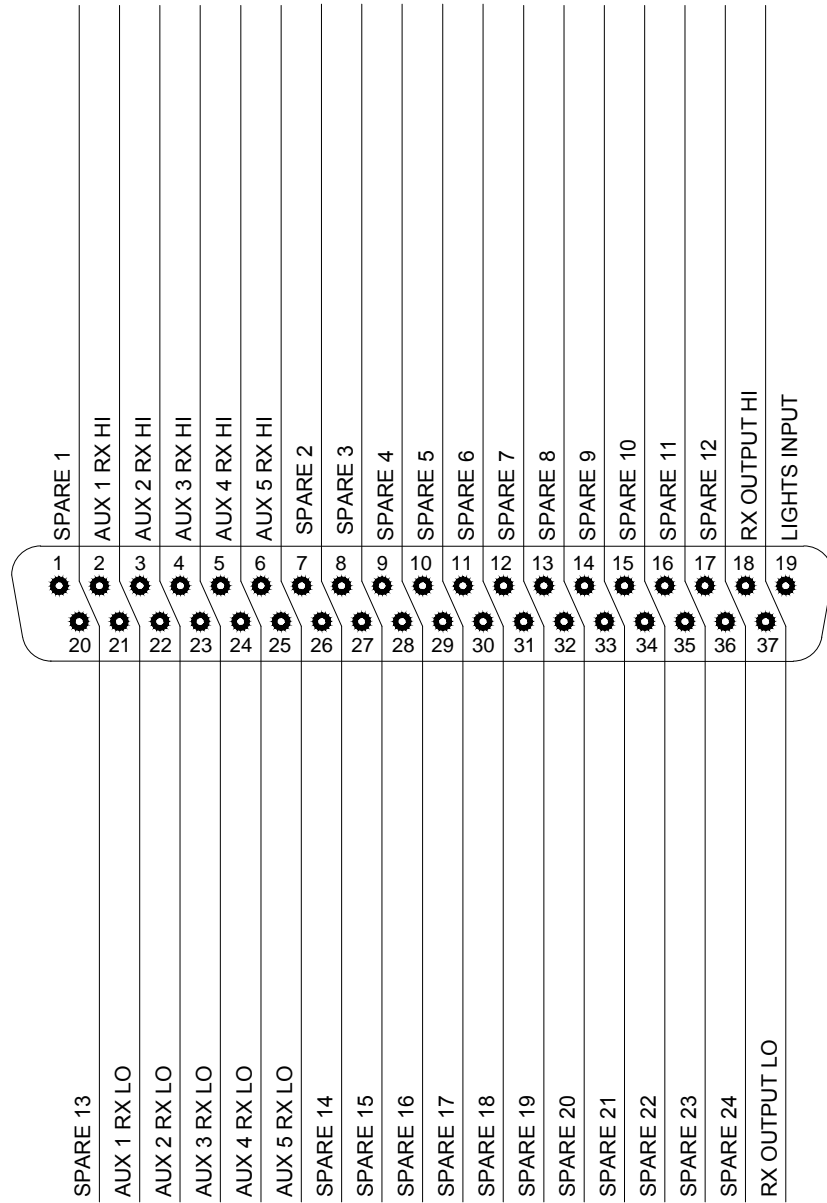
A2 **Installation Drawings**

| DOCUMENT | Rev |
|--|-------------------|
| JA95-060 Connector Map | A |
| JA95-060 Interconnect | A |
| JA95-060 Mechanical Installation | A |
| JA95-060 Equipment Block Diagram | A |
| | |


| Reference Documents | |
|--|-------------------|
| TOL-CUST-EXTR Legend Replacement | A |

RECEIVE CONNECTOR

P1
37 PIN FEMALE DMIN
MATING CONNECTOR

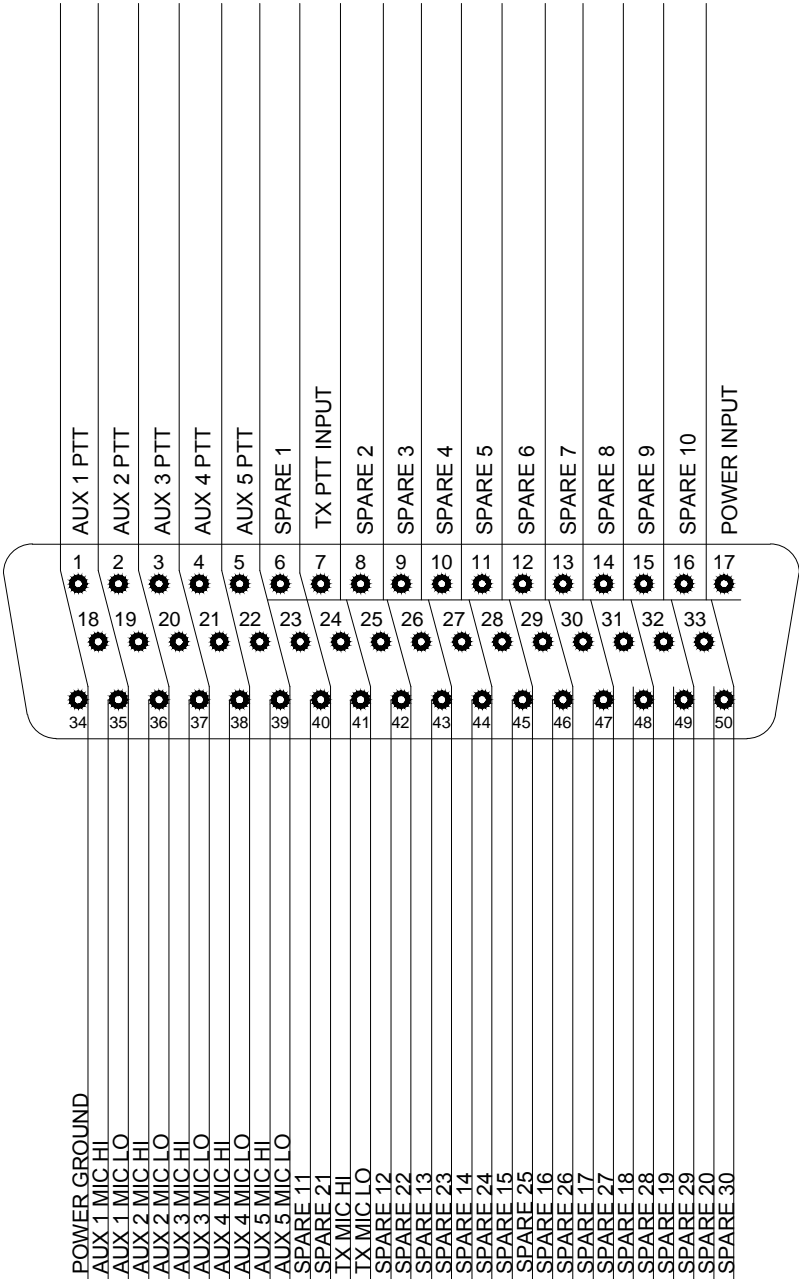


VIEW IS FROM REAR OF MATING CONNECTOR


| | | | | |
|---|----|---|----------------------|--------------|
| PREPARED | KV |  JUPITER AVIONICS CORPORATION | | |
| CHECKED | | | | |
| APPROVED | | TITLE Audio Controller - Five Transceiver - Expander P1 Connector Map | | |
| CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP. | | NCAGE CODE L00N3 | PART NO. JA95-060 | SHEET 1/4 |
| | | DOC NO. JA95-060 Connector Map Rev A | | |

TRANSMIT CONNECTOR

P2
50 PIN FEMALE DMIN
MATING CONNECTOR



VIEW IS FROM REAR OF MATING CONNECTOR

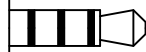
| | | | | |
|---|----|--|----------------------|--------------|
| PREPARED | KV |  | | |
| CHECKED | | | | |
| APPROVED | | TITLE | | |
| | | Audio Controller - Five Transceiver - Expander | | |
| | | P2 Connector Map | | |
| | | NCAGE CODE L00N3 | PART NO. JA95-060 | SHEET 2/4 |
| CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP. | | DOC NO. JA95-060 Connector Map Rev A | | |

FRONT PANEL CONFIGURATION CONNECTOR

P3

ACCEPTS THE FOLLOWING PLUG FORMATS

JA99 CONFIGURATION CABLE
4 POLE MALE 3.5MM STEREO




MATING PLUG NAMES

TIP: TX DATA
1ST RING: RX DATA
2ND RING: GROUND
3RD RING: CONFIG AUDIO

UNIT SIGNAL NAMES

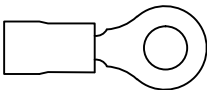
CONFIG DATA TO JA95
CONFIG DATA FROM JA95
GROUND
MODE SELECT


| | | | | |
|---|----|---|----------------------|--------------|
| PREPARED | KV |  JUPITER AVIONICS CORPORATION | | |
| CHECKED | | | | |
| APPROVED | | TITLE Audio Controller - Five Transceiver - Expander P3 Connector Map | | |
| | | NCAGE CODE L00N3 | PART NO. JA95-060 | SHEET 3/4 |
| CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP. | | DOC NO. JA95-060 Connector Map Rev A | | |

CHASSIS GROUND CONNECTOR

P4 CHASSIS GROUND CONNECTOR

#4 RING TERMINAL
MATING CONECTOR



| | | | | |
|---|----|--|----------------------|--------------|
| PREPARED | KV |  | | |
| CHECKED | | | | |
| APPROVED | | TITLE | | |
| | | Audio Controller - Five Transceiver - Expander | | |
| | | P4 Connector Map | | |
| | | NCAGE CODE L00N3 | PART NO. JA95-060 | SHEET 4/4 |
| CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP. | | DOC NO. JA95-060 Connector Map Rev A | | |

JA95-060 INTERCONNECT WIRING NOTES




NOTES

1. ALL WIRE SIZE SHOULD BE 24 AWG MIN UNLESS OTHERWISE SPECIFIED. UNSHIELDED WIRE SHOULD BE SELECTED PER FAA AC43.13-1B CHANGE 1 PARA 11-76 TO 11-78. WIRE TYPES SHOULD BE IN ACCORDANCE WITH MIL-W-22759 AS DESCRIBED IN FAA AC43.13-1B CHANGE 1 PARA 11-85 AND 11-86 AND LISTED IN TABLE 11-11 OR 11-12. ALL SHIELDED CABLE SHOULD BE IN ACCORDANCE WITH MIL-DTL-27500 (REVISION H OR LATER).
2. CONNECTION TO AIRFRAME GROUND SHOULD BE MADE WITH 20 AWG WIRE. LENGTH NOT TO EXCEED 3 FT (0.9 M).
3. CABLE SHIELDS AT THE JA95-060 CONNECTOR PINS SHOULD BE TERMINATED TO AIRFRAME GROUND USING A TAG RING P/N: MS27741-5 OR EQUIVALENT.
4. ONLY +28 VDC OR +14 VDC OR +5 VDC LIGHTS INPUT VOLTAGE MAY BE APPLIED AT ONE TIME.

CONNECTOR PIN LEGENDS

LEGEND

SPARE INTERNAL CIRCUITS MAY EXIST AND MAY BE ACTIVATED FOR FUTURE USE. NO EXTERNAL WIRE CONNECTION.

| | | | | |
|---|---|---|----------------------|--------------|
| PREPARED | TAT |  JUPITER AVIONICS CORPORATION | | |
| CHECKED |  | | | |
| APPROVED |  | TITLE Audio Controller - Five Transceiver - Expander Interconnect Notes | | |
| CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP. | | NCAGE CODE L00N3 | PART NO. JA95-060 | SHEET 1/4 |
| | | DOC NO. JA95-060 Interconnect Rev A.dwg | | |

JA95-060

J1

P1
37 PIN FEMALE DMIN
MATING CONNECTORAUX 1 RX HI
AUX 1 RX LO2
21AUX 2 RX HI
AUX 2 RX LO3
22AUX 3 RX HI
AUX 3 RX LO4
23AUX 4 RX HI
AUX 4 RX LO5
24AUX 5 RX HI
AUX 5 RX LO6
25SPARE 2
SPARE 147
26SPARE 3
SPARE 158
27SPARE 4
SPARE 169
28SPARE 5
SPARE 1710
29SPARE 6
SPARE 1811
30SPARE 7
SPARE 1912
31SPARE 8
SPARE 2013
32SPARE 1
SPARE 131
20SPARE 9
SPARE 2114
33SPARE 10
SPARE 2215
34SPARE 11
SPARE 2316
35SPARE 12
SPARE 2417
36RX OUTPUT HI
RX OUTPUT LO18
37

LIGHTS INPUT




19

RX
LO
AUX 1RX
LO
AUX 2RX
LO
AUX 3RX
LO
AUX 4RX
LO
AUX 5

AUDIO CONTROLLER

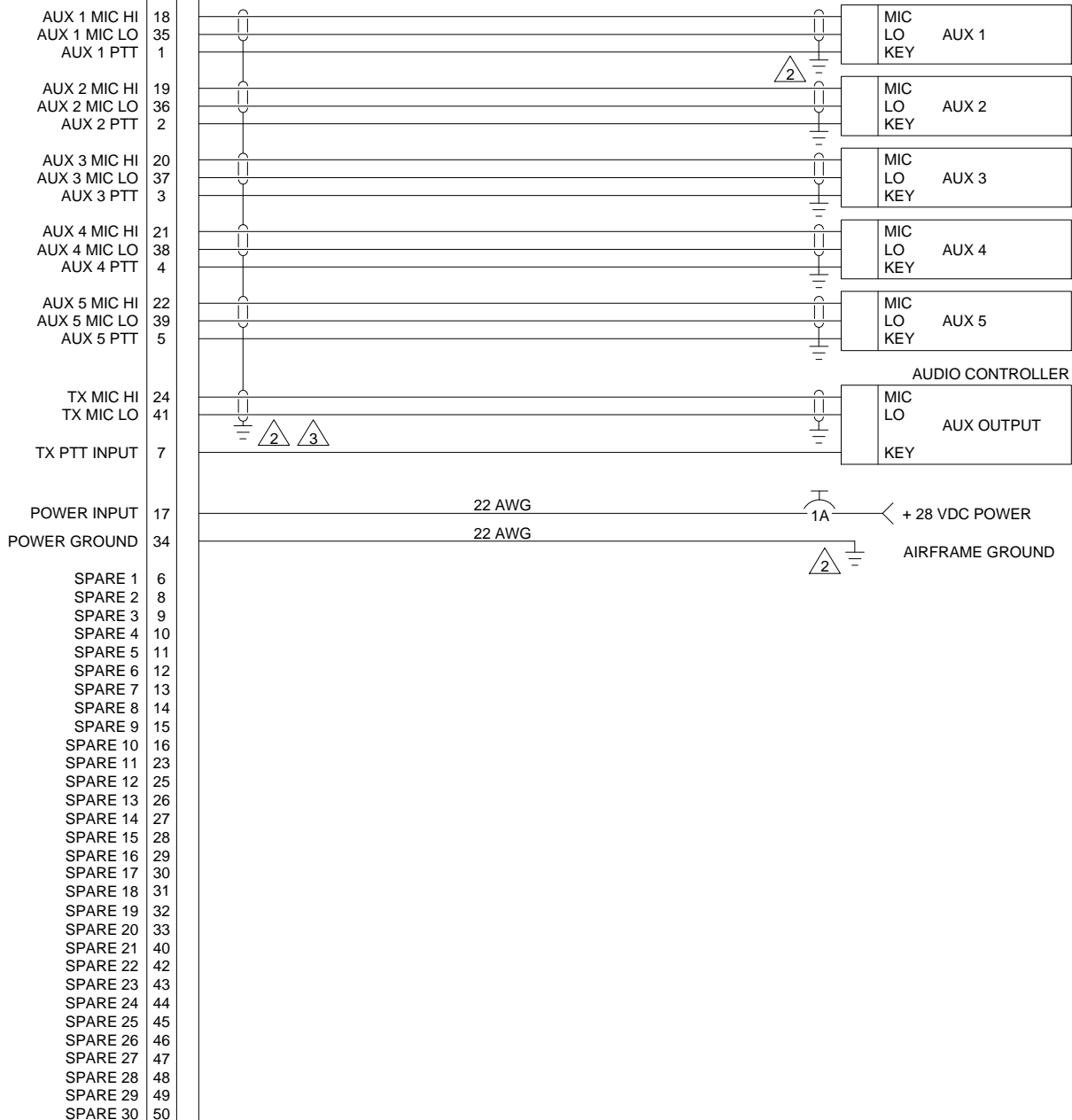
RX
LO
AUX INPUT




+ 28 VDC LIGHTS $\triangle 5$
+ 14 VDC LIGHTS $\triangle 5$
+ 5 VDC LIGHTS $\triangle 5$

| | | | | |
|---|---|---|----------------------|--------------|
| PREPARED | TAT |  JUPITER AVIONICS CORPORATION | | |
| CHECKED |  | | | |
| APPROVED |  | TITLE Audio Controller - Five Transceiver - Expander J1 Interconnect | | |
| CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP. | | NCAGE CODE L00N3 | PART NO. JA95-060 | SHEET 2/4 |
| | | DOC NO. JA95-060 Interconnect Rev A.dwg | | |

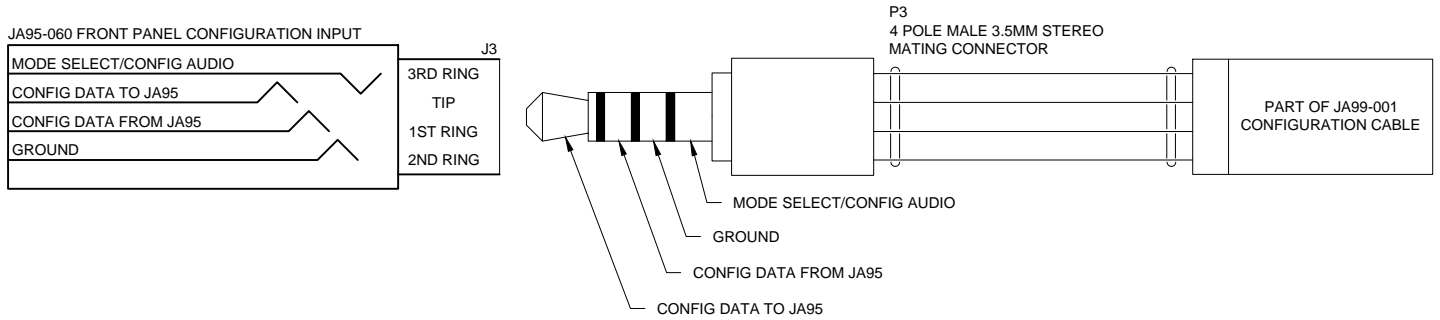
JA95-060

J2

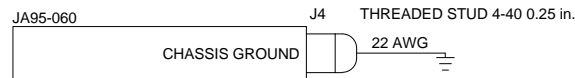
P2
50 PIN FEMALE DMIN
MATING CONNECTOR




| | | | | |
|---|---|---|----------------------|--------------|
| PREPARED | TAT |  JUPITER AVIONICS CORPORATION | | |
| CHECKED |  | | | |
| APPROVED |  | TITLE Audio Controller - Five Transceiver - Expander J2 Interconnect | | |
| CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP. | | NCAGE CODE L00N3 | PART NO. JA95-060 | SHEET 3/4 |
| | | DOC NO. JA95-060 Interconnect Rev A.dwg | | |

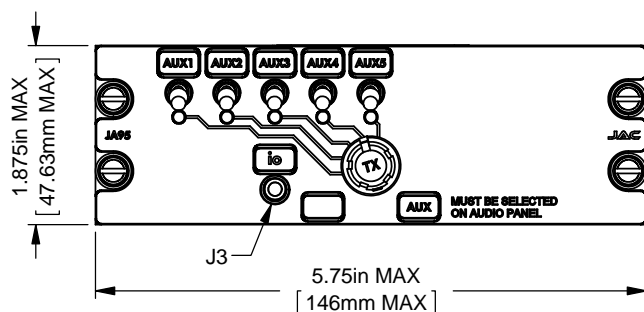
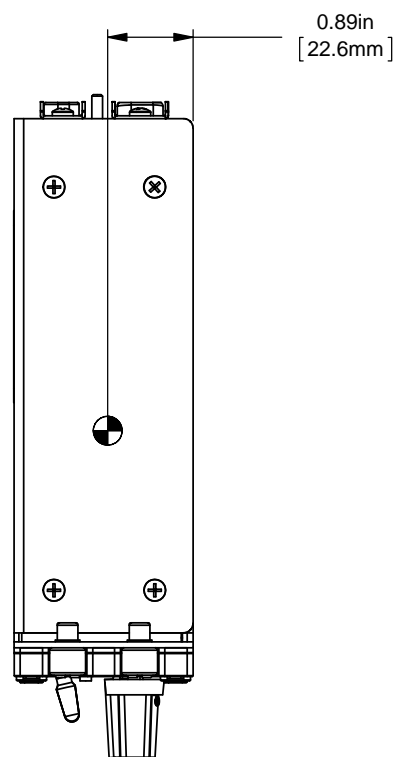
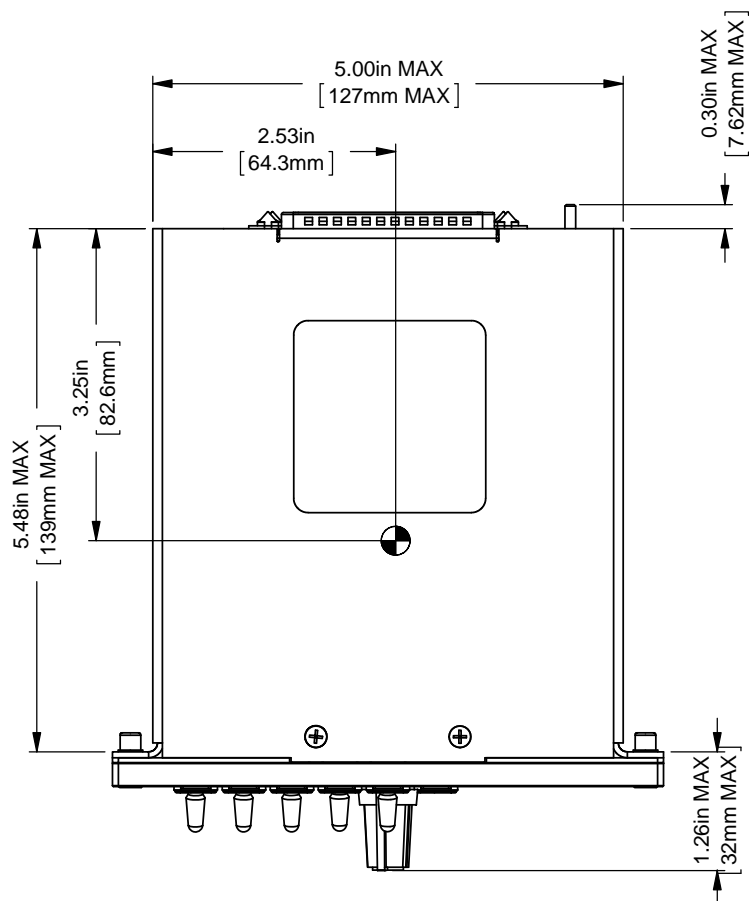
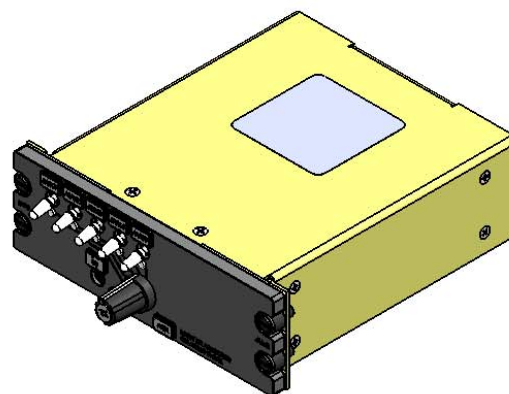
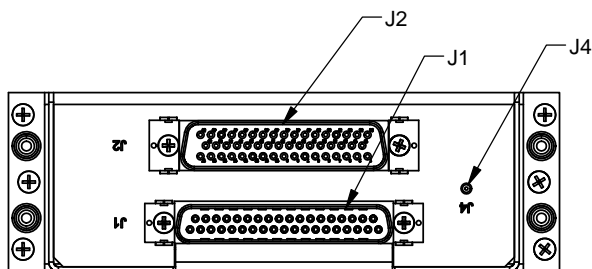
OPTION: PROGRAMMING FROM JA99-001



OPTION: CHASSIS GROUND



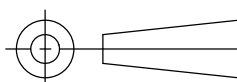
| | | | | |
|--|---|---|----------------------|--------------|
| PREPARED | TAT |  JUPITER AVIONICS CORPORATION | | |
| CHECKED |  | | | |
| APPROVED |  | TITLE Audio Controller - Five Transceiver - Expander Interconnect Options | | |
| CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP. | | NCAGE CODE L00N3 | PART NO. JA95-060 | SHEET 4/4 |
| | | DOC NO. JA95-060 Interconnect Rev A.dwg | | |



● CENTER OF GRAVITY
±0.03in [0.8mm]

WEIGHT: 1.64 lbs [0.74 kg] MAX.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
ANGLES ARE IN DEGREES
TOLERANCES:
1 DEC PLACE: ± 0.1
2 DEC PLACE: ± 0.01
3 DEC PLACE: ± 0.005
ANGLES: ± 0.5 DEG



MATERIAL: N/A
FINISH: N/A

PREPARED

TAT

CHECKED

JAC
12-03-18
AH

APPROVED

JAC
12-03-18
KDV

CONFIDENTIAL & PROPRIETARY
TO JUPITER AVIONICS CORP.
DRAWING NOT TO SCALE



JUPITER AVIONICS
CORPORATION

TITLE

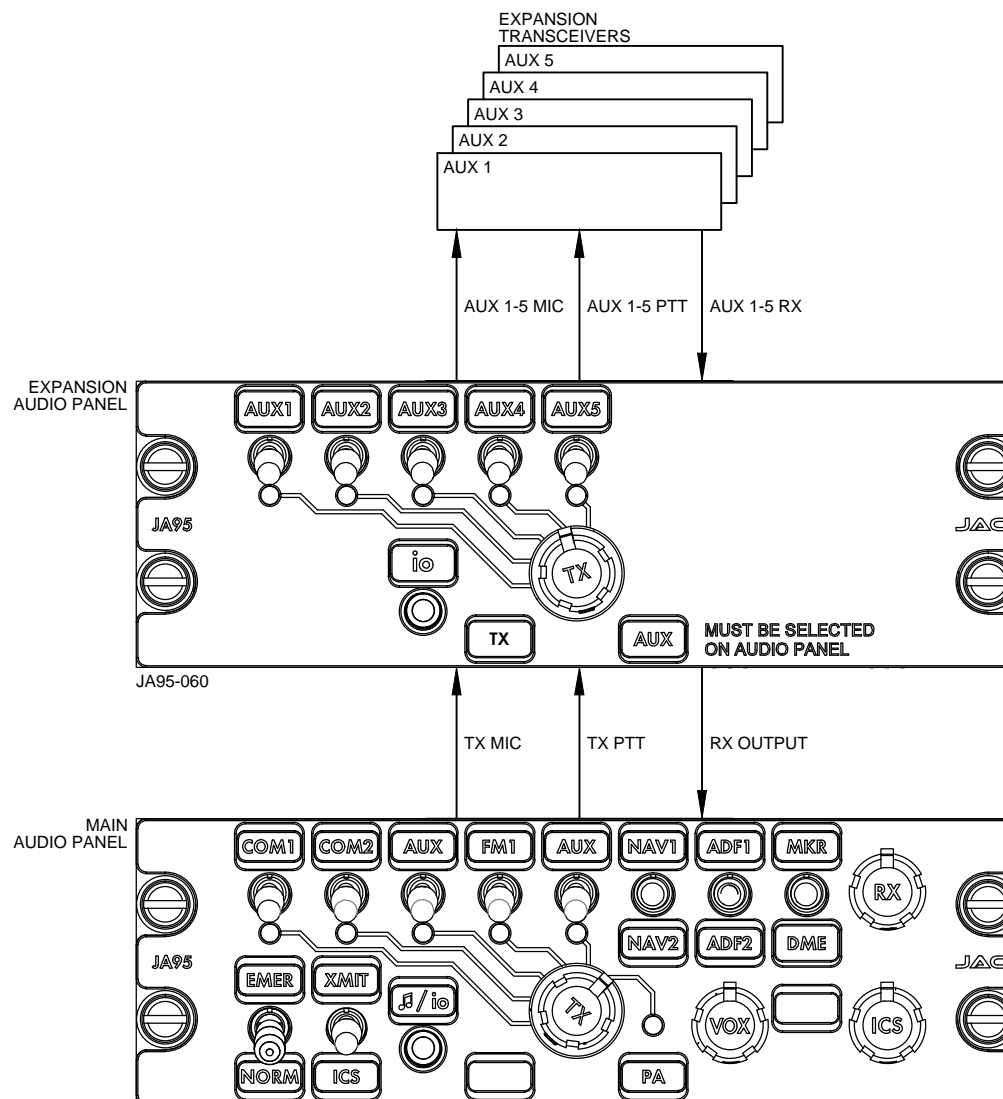
Audio Controller - Five Transceiver - Expander


NCAGE CODE
L00N3

PART NO.
JA95-060

SHEET
1/1

DOC. NO.
JA95-060 Mechanical Installation Rev A.SLDDRW



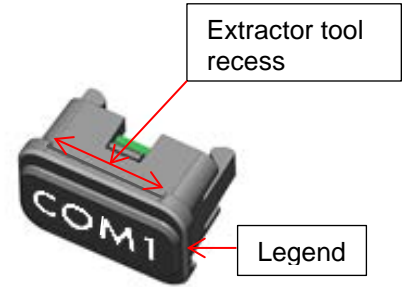
| | | | | |
|--|-------------------------------|---|----------------------|--------------|
| PREPARED | TAT |  | | |
| CHECKED | JAC 12-10-18 SRM | | | |
| APPROVED | JAC 12-10-18 KDV | TITLE Audio Controller - Five Transceiver - Expander Equipment Block Diagram | | |
| CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP. | | NCAGE CODE L00N3 | PART NO. JA95-060 | SHEET 1/1 |
| | | DOC NO. JA95-060 Equipment Block Diagram Rev A.dwg | | |



Field-Replaceable Legends

Jupiter Avionics Corporation (JAC) products have field-replaceable illuminated legends. This permits easy customization, and allows the same units to be used in multiple different configurations with only minimal changes.

The internal circuitry ensures that, although the legends are individually illuminated, the illumination is consistent and uniform throughout all legends, and never needs to be balanced. This means that if it is a requirement to change the labelling due to damage or for a different project, there is no need for costly and time-consuming illumination checks.



Legend Removal



Caution: Take care not to scratch or otherwise damage the faceplate or the legend.

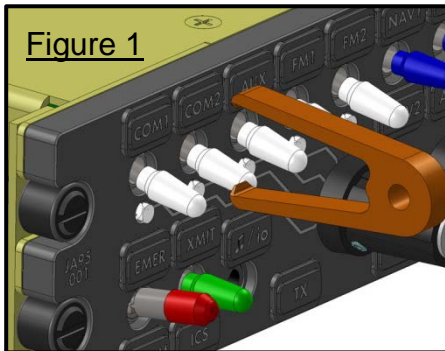


Figure 1

To facilitate legend removal, JAC provides a legend extractor tool - part # TOL-CUST-EXTR (figure 1) that fits into the recesses on the legend.

To remove a legend, hold the extractor firmly between the forefinger and thumb, and use a tweezer-like action to grip the legend (figure 2).

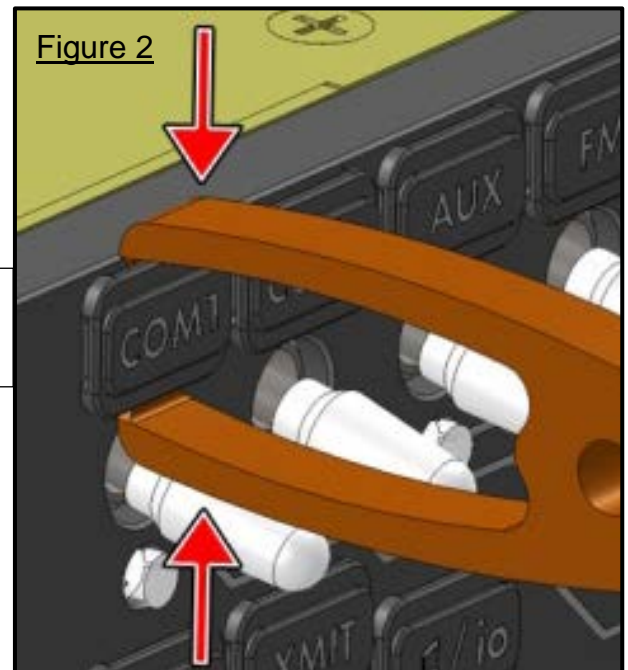


Figure 2

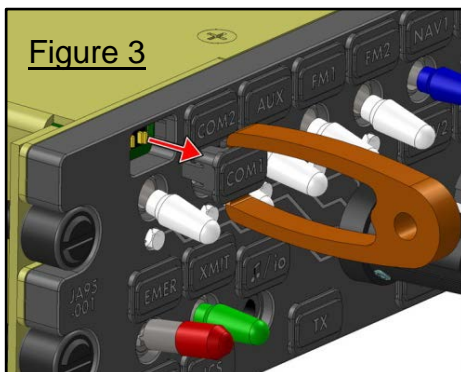


Figure 3

Pull the legend away from the faceplate as shown in figure 3.

Legend Replacement

To replace a legend, align the text correctly, and then apply gentle pressure until the body of the legend support seats firmly into the faceplate.

Once the new legend is in place, ensure that it has seated correctly by checking that it illuminates. The unit is now ready for use.



Installation and Operating Manual

Appendix B - Certification Documents



B1 Airworthiness Approval

Airworthiness approval of the JA95-060 may require completion of a TCCA Major Modification Report per CAR STD (AWM) 571 Appendix L, or a FAA Form 337. The sample wording for a description of the work is provided to assist the Installing Agency in preparing Instructions for Continued Airworthiness (ICA) when replacing an existing audio panel with a Jupiter Avionics JA95-060 Audio Controller - Five Transceiver - Expander. This sample may be modified appropriately for new installations. It is the installer's responsibility to determine the applicability of the method used. Installations performed outside Canada must follow the applicable aviation authority's regulations.

Sample Wording:

Removed the existing [model] audio panel and replaced with a Jupiter Avionics JA95-060 Audio Controller - Five Transceiver - Expander in [aircraft location].

The JA95-060 is approved to CAN-TSO-C139. The JA95-060 meets RTCA DO-160F environmental qualifications for this installation. See Section 1 of the JA95-060 Installation Manual.

Installed in accordance with the JA95-060 Installation Manual, Revision [], and AC 43.13-2, Chapters 2, and 3.

The JA95-060 interfaces with existing aircraft systems per the Installation Manual instructions.

The JA95-060 Installation Manual provides detailed installation instructions and wiring diagrams (Section 2, and Appendices A and B).

Power is supplied to the JA95-060 through an existing []-Amp circuit breaker that was previously used by the original audio panel. The net electrical load is unchanged.

Aircraft equipment list, weights and balance amended. Compass compensation checked and found to conform to applicable regulations.

B2 Instructions for Continued Airworthiness

Maintenance of the JA95-060 Audio Controller - Five Transceiver - Expander is "on condition" only. Refer to the JA95-060 Maintenance Manual. Periodic maintenance of the JA95-060 is not required.

The following sample Instructions for Continued Airworthiness (ICA) provides assistance in preparing ICA for the Jupiter Avionics JA95-060 unit installation as part of a Type Certificate (TC) or Supplemental Type Certificate (STC) project to comply with CAR STD (AWM) 523/527/525/529.1529 or FAR 23/25/27/29.1529 "Instructions for Continued Airworthiness".

Items that may vary by aircraft make and model are shown in brackets ("[]") and should be filled in as appropriate. Some of the checklist items do not apply, in which case they should be marked "N/A" (Not Applicable).

Instructions for Continued Airworthiness, Jupiter Avionics JA95-060 Audio Controller - Five Transceiver - Expander in an [Aircraft Make and Model]

1. Introduction

[Aircraft that has been altered: Registration number, Make, Model and Serial Number]

Content, Scope, Purpose and Arrangement: This document identifies the Instructions for Continued Airworthiness for a Jupiter Avionics JA95-060 installed in an [aircraft make and model].

Applicability: Applies to a Jupiter Avionics JA95-060 installed in an [aircraft make and model].

Definitions/Abbreviations: None, N/A.

Precautions: None, N/A.

Units of Measurement: None, N/A.

Referenced Publications: JA95-060 Installation and Operating Manual
JA95-060 Maintenance Manual
JA95-060 Operating Manual
STC/TC # [applicable STC/TC number for the specific aircraft installation]

Distribution: This document should be a permanent aircraft record.



2. Description of the System/Alteration

Jupiter Avionics JA95-060 Audio Controller - Five Transceiver - Expander with interface to external transceivers and [include other equipment/systems as appropriate]. Refer to Appendix A of this manual for interconnect information. Refer to aircraft manufacturer approved interconnect for actual installation.

3. Control, Operation Information

Refer to section 3 of this manual or to the Jupiter Avionics JA95-060 Operating Manual.

4. Servicing Information

N/A

5. Maintenance Instructions

Maintenance of the JA95-060 is 'on condition' only. Periodic maintenance is not required. Refer to the JA95-060 Maintenance Manual.

6. Troubleshooting Information

Refer to the JA95-060 Maintenance Manual.

7. Removal and Replacement Information

Refer to Section 2 of this manual - the JA95-060 Installation and Operating Manual. If the unit is removed and reinstalled, a functional check of the equipment should be conducted.

8. Diagrams

Refer to Appendix A of this manual - the JA95-060 Installation and Operating Manual - for installation drawings and interconnect examples.

9. Special Inspection Requirements

N/A

10. Application of Protective Treatments

N/A

11. Data: Relative to Structural Fasteners

JA95-060 and appropriate mounting hardware installation, removal and replacement should be in accordance with applicable provisions of AC 43.13-1B and AC 43.13-2A.

12. Special Tools

N/A

13. This Section is for Commuter Category Aircraft Only

A. **Electrical loads:** Refer to Section 1 of the JA95-060 Installation and Operating Manual.

B. **Methods of balancing flight controls:** N/A.

C. **Identification of primary and secondary structures:** N/A.

D. **Special repair methods applicable to the airplane:** N/A.

14. Overhaul Period

No additional overhaul time limitations.

15. Airworthiness Limitation Section

N/A

B3 Environmental Qualification Form

See next pages.



JA95-060 Audio Controller - Five Transceiver - Expander
Environmental Qualification Form

| | | |
|----------------------|---|--|
| Prepared: KDV | Checked:  | Approved:  |
|----------------------|---|--|

| | | | |
|--|--|----------------------|---|
| Nomenclature | Audio Controller - Five Transceiver - Expander | | |
| Type/Model/ Part No.: | JA95-060 | | |
| TSO No.: | CAN-TSO-C139; TSO-C139 | | |
| Manufacturer's Build Configuration: | JA95-060 Build Configuration Rev A ¹ | | |
| Manufacturer's Test Report: | JA95-001 Test Report (Qualification - Final) Rev B JA95-060 Test Report (Environmental - Vibration - 20181204) Rev A JA95-060 Test Report (Environmental - Operational Shock & Crash Safety - 20181206) Rev A JA95-060 CAN-TSO Design Change Assessment Rev A | | |
| Manufacturer's Specification and/or Other Applicable Specification: | JA95-001 Declaration of Design and Performance Rev D JA95-060 Derivative Declaration of Design and Performance Rev A | | |
| Manufacturer: | Jupiter Avionics Corporation | | |
| Address: | 1959 Kirschner Road, Kelowna, BC, Canada, V1Y 4N7 | | |
| Revision & Change No of DO-160: | Rev. F dated December 6, 2007 | Dates Tested: | Sept 28 to Dec 27, 2012 Dec 4 to Dec 7, 2018 |

| CONDITIONS | SECTION | DESCRIPTION OF TESTS CONDUCTED |
|---------------------------------------|---------|---|
| Temperature | 4.5 | Equipment tested to Category [C4] |
| Ground Survival Low Temperature | 4.5.1 | Equipment tested to Category C4, (-55 °C) |
| Short-Time Operating Low Temperature | 4.5.1 | Equipment tested to Category C4, (-45 °C) |
| Operating Low Temperature | 4.5.2 | Equipment tested to Category C4, (-45 °C) |
| Ground Survival High Temperature | 4.5.3 | Equipment tested to Category C4, (+85 °C) |
| Short-Time Operating High Temperature | 4.5.3 | Equipment tested to Category C4, (+70 °C) |
| Operating High Temperature | 4.5.4 | Equipment tested to Category C4, (+70 °C) |
| In-Flight Loss of Cooling | 4.5.5 | Equipment identified as Category X, no test performed |
| Altitude | 4.6 | Equipment tested to Category [(A1)(D1)] |
| Altitude | 4.6.1 | Equipment tested to Category D1, (50,000 ft) |
| Decompression | 4.6.2 | Equipment tested to Category A1, (8,000 to 50,000 ft) |
| Overpressure | 4.6.3 | Equipment tested to Category A1, (-15,000 ft) |
| Temperature Variation | 5.0 | Equipment tested to Category B (5 °C/min) |
| Humidity | 6.0 | Equipment tested to Category A (48 hours) |



| CONDITIONS | SECTION | DESCRIPTION OF TESTS CONDUCTED |
|---|--------------------------------|--|
| Operational Shock and Crash Safety Operational Shock Crash Safety (impulse) Crash Safety (sustained) | 7.0 7.2.2 7.3.2 7.3.3 | Equipment tested to Category B (6 g for 11 ms) Equipment tested to Category B (20 g for 11 ms) Equipment tested to Category B (20 g for 3 sec) |
| Vibration ² Fixed Wing - Sine Fixed Wing - Random Helicopter - Random, unknown | 8.0 | Equipment tested to Categories: SM SB U2FF1 |
| Explosive Atmosphere | 9.0 | Equipment identified as Category X, no test performed |
| Waterproofness | 10.0 | Equipment identified as Category X, no test performed |
| Fluids Susceptibility | 11.0 | Equipment identified as Category X, no test performed |
| Sand and Dust | 12.0 | Equipment identified as Category X, no test performed |
| Fungus | 13.0 | Equipment identified as Category X, no test performed |
| Salt Fog Test | 14.0 | Equipment identified as Category X, no test performed |
| Magnetic Effect | 15.0 | Equipment tested to Category Z ($0 < D < 0.3$ m) |
| Power Input DC Equipment DC Current Ripple DC Inrush | 16.0 | Equipment tested to Category: Z (+28 Vdc equipment), B (+14 Vdc and + 28 Vdc equipment) X, no test performed X, no test performed |
| Voltage Spike | 17.0 | Equipment tested to Category A (600Vp, 10 us) |
| Audio Frequency Susceptibility | 18.0 | Z (+28 Vdc equipment), B (+14 Vdc equipment) |
| Induced Signal Susceptibility Magnetic Fields into Equipment Magnetic Fields into Cables Electric Fields into Cables Voltage Spikes into Cables | 19.0 | Equipment tested to Category [ZC] 20 A at 400Hz 30 A-m at 400Hz 1800V-m at 400Hz L=3.0m |



| CONDITIONS | SECTION | DESCRIPTION OF TESTS CONDUCTED |
|--|---------|--|
| Radio Frequency Susceptibility ³ Radiated Conducted | 20.0 | Equipment tested to Category [RR] R (20 V/m CW&SW) and (150 V/m PM) R (30 mA) |
| Radio Frequency Emission ³ | 21.0 | Equipment tested to Category H |
| Lightning Induced Transient Susceptibility ³ Pin Injection Cable Bundle | 22.0 | Equipment tested to Category [A3J33] Waveform Set A, Test Level 3 Waveform Set J, Test Levels 33 |
| Lightning Direct Effects | 23.0 | Equipment identified as Category X, no test performed |
| Icing | 24.0 | Equipment identified as Category X, no test performed |
| Electrostatic Discharge | 25.0 | Equipment identified as Category X, no test performed |
| Fire, Flammability | 26.0 | Equipment identified as Category X, no test performed |
| Other Tests | N/A | N/A |

REMARKS

¹ This product is a derivative of the JA95-001. All tests were performed on a JA95-001 and JA95-060. A similarity analysis between the two products is detailed in the Jupiter Avionics Corp. document: *JA95-060 CAN-TSO Design Change Assessment Rev A*

² During exposure to vibration test conditions the following critical resonances changed frequency greater than 1.5%:

| Axis | Initial Freq. [Hz] | Final Freq. [Hz] |
|----------|--------------------|------------------|
| Lateral | 141.5 | 144.5 |
| | 191.3 | 199.8 |
| Vertical | 71.13 | 74.41 |
| | 86.97 | 82.28 |
| | 99.50 | 103.2 |

³ Testing of Radio Frequency Susceptibility, Radio Frequency Emission and Lightning Induced Transient Susceptibility was conducted at CKC Laboratories in Bothell, WA, USA.
Reference report: *JA95-001 Test Report (CKC Labs DO-160F Section 20, 21, 22 – 2012-11-26 to 30) Rev A*