



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

**JA95-002**

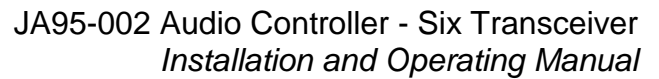
## **Audio Controller - Six Transceiver**



## **Installation and Operating Manual**

**Rev D**

**Jupiter Avionics Corporation**  
1959 Kirschner Road  
Kelowna BC  
Canada V1Y 4N7  
Tel: +1 778 478 2232  
Toll-Free: 1 855 478 2232  
[www.jupiteravionics.com](http://www.jupiteravionics.com)



**All rights reserved**

[www.jupiteravionics.com](http://www.jupiteravionics.com)

JAC  
09-27-18  
MQS



## Table of Contents

<b>SECTION 1 - DESCRIPTION</b>	<b>1</b>
1.1 System Overview	1
1.2 Features Overview	1
1.3 Inputs and Outputs	2
1.3.1 Inputs	2
1.3.2 Outputs	2
1.3.3 Bi-directional Ports	2
1.4 Specifications	3
1.4.1 Electrical Specifications	3
1.4.2 Mechanical Specifications	5
1.4.3 Configuration Connector	5
1.4.4 Product Configuration Software Version	5
1.4.5 Flammability of Materials	5
<b>SECTION 2 – INSTALLATION</b>	<b>6</b>
2.1 Introduction	6
2.2 Continued Airworthiness	6
2.3 Unpacking and Inspecting Equipment	6
2.3.1 Warranty	6
2.4 Installation Procedures	6
2.4.1 Installation Limitations	6
2.4.2 Cabling and Wiring	6
2.4.3 Mechanical Installation	7
2.4.4 In-Line PTT Cordsets	7
2.4.5 Legend Replacement	7
2.4.6 Post Installation Checks	7
2.5 Adjustments and Configuration using ProCS™	8
2.5.1 Configuration Cabling Requirements	8
2.5.2 ProCS™ Setup	8
2.5.3 Configurable Settings	8
2.5.4 Other Configuration Features	15
2.6 Installation Kit	15
2.6.1 Recommended Crimp tools	15
2.7 Installation Drawings	16
2.7.1 Generation of Custom Drawings	16
<b>SECTION 3 – OPERATION</b>	<b>17</b>
3.1 Introduction	17
3.2 Front Panel Controls	17
(1) Transceiver Switches	18
(2) Receiver Switches	18
(3) Receive Volume Control	18
(4) Mode Switch	18
(5) Multi-function (Transmit/ICS) Switch	19
(6) Music/Configuration Connector (♫/io)	19
(7) Transmit Annunciator - TX	19
(8) Transmit Selector	19
(9) VOX Threshold Control	20
(10) CALL Annunciator	20
(11) ICS Volume Control	20
3.3 Normal Operation Mode	21
3.3.1 Panel Lighting	21
3.3.2 Receiving	21
3.3.3 Transmitting (Transmit Operation)	21
3.3.4 FM2 PTT Operation	21
3.3.5 VOX Operation	21
3.3.6 ICS Operation	21
3.3.7 Multi-Function (XMIT / ICS) Switch Operation	22



3.3.8	Music Operation.....	22
3.4	Emergency Operation Mode.....	22
3.4.1	Auto Emergency Mode .....	22
3.4.2	Selected Emergency Mode.....	22
<b>Appendix A - Installation Drawings .....</b>		<b>A1</b>
A1	Introduction .....	A1
A2	Installation Drawings.....	A1
<b>Appendix B - Certification Documents.....</b>		<b>B1</b>
B1	Airworthiness Approval.....	B2
B2	Instructions for Continued Airworthiness .....	B2
B3	Environmental Qualification Form .....	B3

## **JA95-002 Audio Controller – Six Transceiver**

### **SECTION 1 - DESCRIPTION**

#### **1.1 System Overview**

The JA95-002 audio controller is a centralized audio management system that distributes and controls all transceiver, receiver and alert audio in an aircraft. It enables the selected transmission of microphone audio to a transceiver and distributes all intercom audio.

The JA95-002 audio controller can be used in a standalone configuration or a star configuration to prevent the loss of the entire system due to the failure of one controller. It provides a passive emergency mode that directs the primary user (pilot) to the COM1 transceiver, NAV1 receiver and Direct Audio 1 & 2.

The JA95-002 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 front panel music / configuration connector (J10) 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 JA95-002 design.

#### **1.2 Features Overview**

The JA95-002 features a 37-pin D-Sub connector, which interfaces with the radio receive audio and crew phones, a 50-pin D-Sub connector which interfaces with the power and passenger headset connections. This layout minimizes crosstalk and follows industry standard interconnect for multi-user Audio Controllers.

Many of the input and output levels are adjustable, several audio paths are selectable, and alert audio analog waveforms can be loaded using the configuration program ProCS™ (**P**roduct **C**onfiguration **S**oftware) to write configuration commands via the JA95-001 configuration cable to the front panel music / configuration connector. The audio waveforms are stored in non-volatile devices. The alert audio feature is intended for use as a secondary alerting system where another device provides the primary annunciation.

The JA95 provides intercom functions for up to seven users. It supports up to 6 transceivers, each selectable from a rotary switch, and up to 5 receivers (2 on one toggle switch and 3 on the other).

The JA95 features individual VOX gating, and supports two Direct Audio inputs to provide audio at a fixed level to the users.

The JA95 has a CVR output and a two channel Alert Generator. Each alert has a separate key input.

The JA95 allows transmit access for three crew members (Pilot, Co-pilot and Passenger 1).

A Music / Configuration connector is provided on the faceplate of the JA95 for configuration of audio levels and routing. The port can also be used as a music input and is compatible with most music players.

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



## 1.3 Inputs and Outputs

Refer to the JA95-002 [connector maps](#) for the mating connector designators and pin assignments for the input and output signals.

### 1.3.1 Inputs

Name	Qty	Type
ALERT ENABLE	1	Active high discrete
ALERT KEY	2	Active low discrete (Feature selected from ProCS)
CALL	1	Active low discrete (Feature selected from ProCS)
CONFIG DATA TO JA95	1	Data signal
DIRECT AUDIO	2	Audio signal (one selected from ProCS)
FRONT PANEL MUSIC	2	Audio signal
LIGHTS INPUT	1	Analog control signal
MIC HI/LO	6	Audio signal
MODE SELECT / CONFIG AUDIO	1	Multi format signal
MUSIC	2	Audio signal
PAX 1 ICS PTT	1	Active low discrete (Feature selected from ProCS)
PAX 1 TX PTT	1	Active low discrete (Feature selected from ProCS)
PILOT and COPILOT ICS PTT	2	Active low discrete
PILOT and COPILOT TX PTT	2	Active low discrete
POWER INPUT	1	14 to 28 Vdc power supply
RX HI/LO AUDIO	11	Audio signal (6 Com TX, 5 Nav RX)

### 1.3.2 Outputs

Name	Qty	Type
CVR	1	Audio signal (Feature selected from ProCS)
CONFIG DATA FROM JA95	1	Data signal
PHONES	7	Audio signal Note: There are 6 outputs for driving 7 phones.
MF SW (Multifunction Switch)	2	Active low discrete (Feature selected from ProCS)
MIC	6	Audio signal (transceiver MIC)
Transmit PTT	6	Active low discrete
RX COMP OUT	1	Audio signal (Feature selected from ProCS)

### 1.3.3 Bi-directional Ports

Name	Qty	Type
ICS TIE	1	Audio signal
DIGITAL TIE IN & OUT	1	Not implemented



## **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	$\leq 0.7 \text{ A}$
Input current at 14 Vdc	$\leq 1.4 \text{ A}$

#### **1.4.1.1 Audio Performance**

##### Rated Input Level

Receive audio rated input level	7.75 Vrms $\pm 10\%$
Direct audio 1 rated input level	7.75 Vrms $\pm 10\%$
Direct audio 2 rated input level	2.50 Vrms $\pm 10\%$
Music rated input level	400 mVrms $\pm 10\%$
Microphone input level	250 mVrms $\pm 10\%$
Intercom Tie Line type 1 input level	340 mVrms $\pm 10\%$
Intercom Tie Line type 2 input level	1.20 Vrms $\pm 10\%$
CONFIG AUDIO input level	400 mVrms $\pm 10\%$

##### Rated Output Level

Phone rated output	7.75 Vrms $\pm 10\%$
Pilot Phone rated output, in emergency mode or with power input $\leq 6 \text{ Vdc}$	2.20 Vrms $\pm 10\%$
Phone rated output power, with MUSIC input	3.88 Vrms $\pm 10\%$
Pilot Phone rated output with Direct audio 2 input	130 mVrms $\pm 20\%$
Pilot Phone rated output in emergency mode with Direct audio 2 input	1.64 Vrms $\pm 20\%$
Microphone rated output	250 mVrms $\pm 10\%$
CVR rated output	500 mVrms $\pm 10\%$
CVR rated output with input as MUSIC	250 mVrms $\pm 10\%$
CVR rated output with input as PILOT MIC	1.00 Vrms $\pm 10\%$
CVR rated output, in emergency mode,	500 mVrms $\pm 10\%$
Receive Composite rated output	2.5 Vrms $\pm 10\%$
Intercom Tie Line type 1 rated output	340 mVrms $\pm 10\%$
Intercom Tie Line type 2 rated output	1.2 Vrms $\pm 10\%$

##### Audio Frequency Response

Audio output audio frequency response	$\leq 3\text{dB}$ from 300 to 6000 Hz
Alert audio output audio frequency response	$\leq 3\text{dB}$ from 300 to 3000 Hz

##### Distortion Characteristics

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

##### Input Impedance

Microphone input Impedance	150 $\Omega \pm 10\%$
Direct Audio 1 input Impedance	1000 $\Omega \pm 10\%$
Direct Audio 2 input Impedance	100 $\Omega \pm 10\%$
Receive Audio input Impedance	1000 $\Omega \pm 10\%$



#### Output Load

Phone load	600 $\Omega$ $\pm$ 10%
Transceiver Microphone load	150 $\Omega$ $\pm$ 10%
CVR load	5000 $\Omega$ $\pm$ 10%
Receive Composite Audio load	600 $\Omega$ $\pm$ 10%
Intercom Tie Line type 1 rated load	2000 $\Omega$ $\pm$ 10%
Intercom Tie Line type 2 rated load	2000 $\Omega$ $\pm$ 10%
Intercom Tie Line type 1 maximum load	666 $\Omega$ max (3 loads)
Intercom Tie Line type 2 maximum load	285 $\Omega$ max (7 loads)

#### Volume Controls

Receive Audio control variation	32 $\pm$ 3dB
ICS Audio control variation	42 $\pm$ 3dB

#### Input to output Crosstalk and Bleed-through Level

Input to Output crosstalk	$\leq$ 55 dB
---------------------------	--------------

#### Input to Input Crosstalk Level<sup>1</sup>

Input to Input crosstalk	$\leq$ 60 dB
--------------------------	--------------

#### Audio Noise Level without Signal

Noise level below the rated output	$\geq$ 60 dB
------------------------------------	--------------

#### **1.4.1.2 Audio Performance, Other**

CVR HI / LO output circuitry type (Normal)	differential
CVR HI / LO output circuitry type (Emergency)	single ended
Microphone inputs designed for MIC type	amplified dynamic
Microphone inputs circuitry type	single ended
MUSIC LEFT / RIGHT HI / LO audio input circuitry type	differential
FRONT MUSIC LEFT / RIGHT audio input circuitry type:	single ended
RECEIVE AUDIO input circuitry type	differential
PHN HI / LO output circuitry type	single ended
MIC output circuitry type	differential
RX Composite Audio output circuitry type	differential
ICS TIE HI / LO Circuitry Type	differential
DIRECT AUDIO 2 HI to PILOT PHN HI connection	100 $\Omega$

#### **1.4.1.3 Discrete Signals**

Active low control output, active, current	$\leq$ 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.

<sup>1</sup> Input to DIR AUDIO 2 crosstalk is not applicable



#### 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 lbs. (0.74 kg) max
Connectors (3):	One 4 pole 3.5mm stereo jack One 37-pin D-Sub male One 50-pin D-Sub male
Mounting	4 Dzus fasteners
Installation kit part number	INST-JA95

#### 1.4.3 Configuration Connector

The JA95-002 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 JA95-002 requires the Product Configuration Software (ProCS) version v0.50.3 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 JA95-002 complies with the requirements of RTCA/DO-160G Sec 26.3.3 "Flammability", through equivalent flammability testing of materials and the Small Parts Exemption.

## **JA95-002 Audio Controller – Six Transceiver**

### **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 JA95-002 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/warrantyregistration](http://www.jupiteravionics.com/warrantyregistration).

##### **2.3.1 Warranty**

All products manufactured by JAC are 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 are minimum performance standards. Those installing the JA95, on or in a specific type or class of aircraft, must determine that the aircraft installation conditions are within TSO standards. The JA95 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 JA95-002 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 In-Line PTT Cordsets

If in-line PTT cordsets (drop cords) are used, be aware that incorrectly configured or improperly shielded in-line PTT cordsets can lead to significant audio problems.

### 2.4.5 Legend Replacement

The JA95-002 illuminated legends are field replaceable. For further information, refer to the '[Legend Replacement](#)' document in Appendix A of this manual.

### 2.4.6 Post Installation Checks

#### 2.4.6.1 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  $\Omega$ ).
- d) Check P2 pins **6 thru 13** for continuity to ground (less than 0.5  $\Omega$ ) when the relevant switch is closed.
- e) Check all pins for shorts to ground or adjacent pins.

#### 2.4.6.2 Configuration

Ensure that the JA95 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.

#### 2.4.6.3 Power on Checks.

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

- a) Begin with only the pilot's headset attached. Confirm correct ICS and 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) If there is a music source in the system, turn it on and check for proper mute operation.
- c) 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.
- d) Check the ICS operation and Emergency operation.
- e) Plug in the co-pilot's headset. Check for correct ICS operation. Check yoke or cyclic switch functions.



- f) Plug in any remaining headsets, and check for correct ICS operation. Note that an incorrect cordset (drop cord) or improper jack wiring may cause a wide range of problems, from loss of audio to a tone heard in the headset.
- g) 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 JA95-002 internal adjustments are set from the [Product Configuration Software ProCS™](#). Configuration data is sent to the JA95-002 via the front panel connector (J10), 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](#) on the Jupiter Avionics website - [www.jupiteravionics.com/productsoftware](http://www.jupiteravionics.com/productsoftware).

### **2.5.1 Configuration Cabling Requirements**

To configure the JA95-002, 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 JA95-002 are not included with the unit.

#### **Cabling option 1:**

<b>Quantity</b>	<b>Description</b>	<b>JAC Part #</b>
1	USB A to RS232 9-Pin Cable	CAB-USB-0002
1	Configuration Cable	JA99-001

#### **Cabling option 2:**

<b>Quantity</b>	<b>Description</b>	<b>JAC Part #</b>
1	USB A Male to RS232 3.5mm Plug	CAB-USB-0006

### **2.5.2 ProCS™ Setup**



The ProCS™ JA95-002 menu item 'ProCS Setup' provides Setup drawings showing the cabling arrangement for connecting the JA95-002 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.

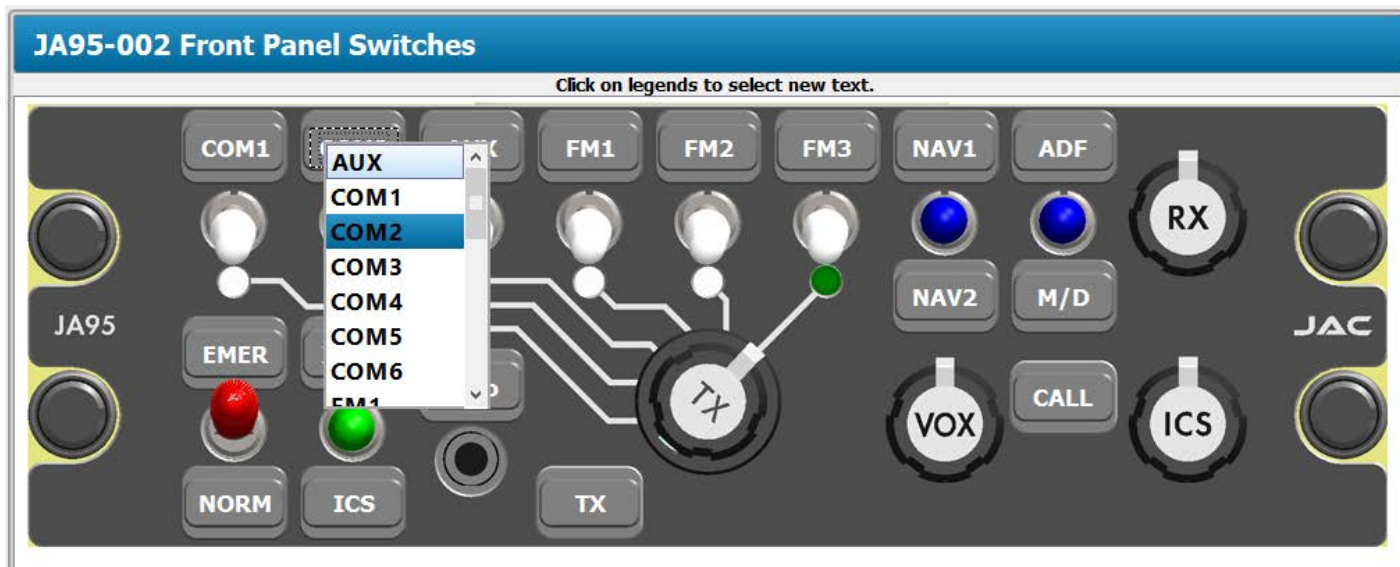


Note: To properly configure the JA95-002, power must be applied to the unit, and the mode (EMER/NORM) switch must be in the NORM position

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.



Note: If the name of a front panel switch is changed using this software, the change will be incorporated in every other section that refers to that switch name, including the connector maps, to give truly customized installation diagrams.

### 2.5.3.2 Radios





### 2.5.3.3 Receive Levels

#### JA95-002 Receive Levels

##### Input Levels

COM1	Default Transceiver :	1.00 Vrms	<div></div>	10.00 Vrms	[7.75 Vrms]	Default Level
COM2	Default Transceiver :	1.00 Vrms	<div></div>	10.00 Vrms	[7.75 Vrms]	Default Level
AUX	Default Transceiver :	1.00 Vrms	<div></div>	10.00 Vrms	[7.75 Vrms]	Default Level
FM1	Default Transceiver :	1.00 Vrms	<div></div>	10.00 Vrms	[7.75 Vrms]	Default Level
FM2	Default Transceiver :	The receive and direct audio input level of each of the eleven RX and the DIRECT AUDIO inputs can be adjusted from 1.00 to 10.00 Vrms. (Default 7.75				
FM3	Default Transceiver :	1.00 Vrms	<div></div>	10.00 Vrms	[7.75 Vrms]	Default Level
NAV1	Default Receiver :	1.00 Vrms	<div></div>	10.00 Vrms	[7.75 Vrms]	Default Level
ADF	Default Receiver :	1.00 Vrms	<div></div>	10.00 Vrms	[7.75 Vrms]	Default Level
M/D (MKR)	Default Receiver :	1.00 Vrms	<div></div>	10.00 Vrms	[7.75 Vrms]	Default Level
NAV2	Default Receiver :	1.00 Vrms	<div></div>	10.00 Vrms	[7.75 Vrms]	Default Level
M/D (DME)	Default Receiver :	1.00 Vrms	<div></div>	10.00 Vrms	[7.75 Vrms]	Default Level
DIRECT1	Default Receiver :	1.00 Vrms	<div></div>	10.00 Vrms	[7.75 Vrms]	Default Level
DIRECT2	Default Receiver :	Note: DIRECT 2 Rated Input Level is fixed (Not Adjustable)				

##### Receive Audio Detector

**0dB = Rated Input Level**

The Receive Audio Detector threshold can be adjusted from -36 to -12 dB of rated input level. (Default -24 dB)

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

##### Output Level

**Rated Load Impedance = 600 Ohms**

The level of the receive composite audio output (RX COMP OUT) can be adjusted from 0.25 to 2.5 Vrms. (Default 1.00 Vrms)

Receive Composite: 0.25 Vrms2.50 Vrms [1.00 Vrms]

Note: The Receive Composite pin is configured on the [Connector Pin Configuration](#) page.



### 2.5.3.4 Transmit Levels

### JA95-002 Transmit Levels

#### Transmit Levels

Rated Load Impedance = 150 Ohms

COM1	Default Transceiver :	0.010 Vrms	<input type="range"/>	1.000 Vrms	[0.250 Vrms]	Default Level
COM2	Default Transceiver :	0.010 Vrms	<input type="range"/>	1.000 Vrms	[0.250 Vrms]	Default Level
AUX	Default Transceiver :	0.010 Vrms	<input type="range"/>	1.000 Vrms	[0.250 Vrms]	Default Level
FM1	Default Transceiver :	0.010 Vrms	<input type="range"/>	1.000 Vrms	[0.250 Vrms]	Default Level
FM2	Default Transceiver :	0.010 Vrms	<input type="range"/>	1.000 Vrms	[0.250 Vrms]	Default Level
FM3	Default Transceiver :	0.010 Vrms	<input type="range"/>	1.000 Vrms	[0.250 Vrms]	Default Level

The level of each of the six Transceiver MIC output signals can be adjusted from 0.01 to 1 Vrms. **(Default 250 mVrms)**

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

When the FM2 Duplex check box is checked the COM5 (FM2) radio is set to duplex operation (**Default not checked**) (see [section 3.3.4](#))

### Transmit Settings

☐ Transmit Time-out (90 Sec.)

☐ FM2 Duplex

### 2.5.3.5 Sidetone Levels

### JA95-002 Sidetone Levels

#### Receive Sidetone Level

COM1 thru FM3 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 Connector Pin Configuration

#### Multi-Function Switch

The front panel multi-function switch is a green two-position momentary centre-off switch. Its default configuration is as the **pilot's PTT switch**, with 'XMIT' in the up position, and 'ICS' in the down position. However, it may be configured to provide a ground to operate different circuitry to suit the needs of the user, and an appropriate legend can be inserted.

### JA95-002 Connector Pin Configuration

#### Multi Function Switch

Switch Operation: ☒ PILOT TX and ICS PTT ☐ MF SW OUTPUT PINS



Several of the connector pins can be configured to meet the requirements of specific installations.  
Refer to JA95-002 [Interconnect sheets 5/6 of 6](#).

J1 Contacts Selection			
Pin 1/20:	<input checked="" type="radio"/> CVR HI/LO OUTPUT	<input type="radio"/> DIRECT AUDIO 2 HI/LO INPUT	
Pin 14/33:	<input checked="" type="radio"/> MUSIC LEFT HI/LO INPUT	<input type="radio"/> RX COMP HI/LO OUTPUT	
Pin 15/34:	<input checked="" type="radio"/> MUSIC RIGHT HI/LO INPUT	<input type="radio"/> DIGITAL TIE +/- INPUT	
Pin 16/35:	<input checked="" type="radio"/> ICS TIE HI/LO INPUT/OUTPUT	<input type="radio"/> DIGITAL TIE +/- OUTPUT	

J2 Contacts Selection			
Pin 6:	<input checked="" type="radio"/> PAX 1 TX PTT INPUT	<input type="radio"/> MF SW 2 OUTPUT (ICS)	
Pin 11:	<input checked="" type="radio"/> PAX 1 ICS PTT INPUT	<input type="radio"/> ALERT 1 KEY INPUT	<input type="radio"/> MF SW 1 OUTPUT (XMIT)
Pin 12:	<input checked="" type="radio"/> ALERT 2 KEY INPUT	<input type="radio"/> CALL INPUT	<input type="radio"/> PAX 2 TX PTT INPUT

### 2.5.3.7 Alerts



**Warning: The internal audio alerts are intended only to supplement, not replace, airframe alerts such as 'low rotor RPM', 'engine out' or 'decision height alerting'. The alert audio feature is intended for use as a secondary alerting system where another device provides the primary annunciation.**

#### Audio Files

The JA95-002 has standard audio signals for each of the two alerts, and the audio files window allows these signals to be customized with other recordings during the configuration process.

The default Alert signals loaded into the unit at the factory are:

JA95-002 Wav File (Sine 300Hz 10 sec) Rev A.WAV

JA95-002 Wav File (Sine 1000Hz 10 sec) Rev A.WAV

The screenshot shows the 'JA95-002 Alerts' window with the 'Audio Files' tab selected. It contains two rows for Alert 1 and Alert 2, each with a text field for the file path, 'Open...' and 'Clear' buttons, and a play button. A red arrow points from the 'Clear' button of Alert 1 to the 'Program JA95-002 Messages...' option in the 'Program' menu of the ProCs software window shown in the next block.

#### Saving new Audio Files

The screenshot shows the 'ProCs v0.50.4 (Jupiter Avionics Corporation)' software window with the 'Program' menu open. The menu options are: Read Product... (Ctrl+R), Write Product... (Ctrl+W), Program JA95-002 Messages..., Erase JA95-002 Messages..., Edit Product Properties..., and Reconnect to Product... A red arrow points from the 'Program JA95-002 Messages...' option to the text box on the right.

If a new audio file is selected, it may be played using the arrow to the right of the Message line.

It may be uploaded to the JA95-002 using the 'Program' menu and selecting 'Program JA95-002 Messages...'.  
Note that this pane will have different content if a JA95-002 is not connected.



### Audio Levels

**0dB = Rated Phones Output**

The levels of the two Alert Audio signals are individually adjustable from 0 to -40 dB of the rated phone level. (**Default -12 dB**)

Alert 1: 0 dB  -40 dB [-12 dB]

Alert 2: 0 dB  -40 dB [-12 dB]

**Note:** The alert inputs are configured on the [Connector Pin Configuration](#) page.

#### 2.5.3.8 Audio Muting

When the Mute RX Audio check box is checked the Receive Audio is muted during transmit (**Default checked**)

When the Mute ICS Audio check box is checked the ICS Audio is muted during transmit (**Default checked**)

When the Mute Alert Audio check box is checked the Alert Audio is muted during transmit (**Default not checked**)

The Mute Music Audio check box is always checked (i.e. Mute Music Audio is always enabled.)

### JA95-002 Audio Muting

#### Audio Muting During Transmit

☒ Mute RX Audio

☒ Mute ICS Audio

☐ Mute Alert Audio

☒ Mute Music Audio (Note: always enabled)

#### 2.5.3.9 CVR Level

### JA95-002 CVR Level

#### CVR Audio Output Levels

**Rated Load Impedance = 5 kOhms**

The output levels of the Cockpit Voice Recorder audio may be adjusted as shown.

Receive Only	Default CVR :	0.010 Vrms <input type="range"/> 1.000 Vrms	[0.500 Vrms]	Default Level
Pilot Mic Only	Default CVR :	0.020 Vrms <input type="range"/> 2.000 Vrms	[1.000 Vrms]	
Music Only	Default CVR :	0.005 Vrms <input type="range"/> 0.500 Vrms	[0.250 Vrms]	

**Note:**

1. All Inputs at rated level.
2. Where applicable, rated level on phones output.



### 2.5.3.10 Music Levels

#### Music Output Level

The music output level of the four Music input signals to the Phones audio can be adjusted from -40 to 0 dB of rated phone level (**Default 0 dB**).

The attenuation level during muting of the music signal can be adjusted from 0 to -40 dB (**Default -40 dB**).

### JA95-002 Music Levels

#### Music Output Level

**0dB = Rated Phone Level**

Output Level: 0 dB -40 dB [0 dB]

Attenuation Level (During Mute Function): 0 dB -40 dB [-40 dB]

#### Music Settings

☐ Configure M/D Switch as Rear Music Selector

When the 'Configure DME1 Switch as Music Selector' check box is checked the DME1 switch becomes a music select switch (**Default not checked**)

#### Music Input Level

Music Left (Front Panel & Rear Connector): 0.10 Vrms 1.00 Vrms [0.40 Vrms]

Music Right (Front Panel & Rear Connector): 0.10 Vrms 1.00 Vrms [0.40 Vrms]

The music Input levels can be adjusted from 0.10 to 1.00 Vrms (**Default 0.40 Vrms**)

### 2.5.3.11 ICS Tie Line

### JA95-002 ICS Tie Line

#### ICS TIE HI/LO Settings

**Rated Load Impedance = 2 kOhms**

Rated Input and Output Levels: ☐ Type 1 (NAT Original: 340 mVrms) ☒ Type 2 (NAT Super Tie: 1.2 Vrms)

Type 1 External Loads: ☒ 0 ☐ 1 ☐ 2 ☐ 3

Type 2 External Loads: ☒ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7

**Note:** External loads are the number of additional audio controllers connected to the tie line.

The rated input and output levels of the intercom tie line can be selected as Type 1 or Type 2 (**Default Type 2**).

The quantity of external loads for a type1 intercom tie line can be selected from 0 to 3 (**Default 0**).

The quantity of external loads for a type 2 intercom tie line can be selected from 0 to 7 (**Default 0**).



### 2.5.3.12 Lighting Voltage

The rated input level for the lighting voltage may be selected from

+5 Vdc, +14 Vdc or +28Vdc

(Default +28 Vdc).

The screenshot shows the 'JA95-002 Lighting Voltage' configuration window. It has a title bar 'JA95-002 Lighting Voltage' and a subtitle 'Lighting Voltage'. Below this, it says 'Rated Input Level:' followed by three radio buttons: '+5 Vdc', '+14 Vdc', and '+28 Vdc'. The '+28 Vdc' button is selected.

### 2.5.3.13 VOX

The screenshot shows the 'JA95-002 VOX' configuration window. It has a title bar 'JA95-002 VOX' and a subtitle 'VOX Delay'. Below this, it says 'VOX OFF Delay Time:' followed by a slider bar from '0.50 s' to '2.00 s'. The slider is set to '1.00 s'. To the right of the slider, it says '[1.00 s]'. Below the slider, there is a section 'PAX Drop Cord Mode' with a checkbox 'PAX Drop Cord Enable. (Sets VOX Threshold for passengers to a minimum level when VOX Pot is set to maximum.)'. Below this, there is a note: 'Note: The Drop Cord Mode can be made selectable when both PAX1 and PAX2 ICS PTT Inputs are not selected on the Connector Pin Configuration page.'

When the PAX Drop Cord Enable check box is checked, the VOX circuits for the passenger microphones are configured for use with drop cords (Default not checked)

### 2.5.3.14 Connector Maps

This section contains connector maps and interconnects that are automatically generated to show changes that affect the installation of the JA95-002, such as switch labels and voltages. See [section 2.7.1](#).

## 2.5.4 Other Configuration Features

The model number, serial number and check sum of the JA95-002 Audio Controller can be entered and viewed in the Comments pane of the JA95-002 Product Information Window for future reference.

## 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

Connector Type	Hand crimp tool	Positioner	Insertion/extraction tool
Positronic	9507	9502-3	M81969/1-04
Positronic	AFM8 (Daniels)	M22520/2.08 KB-1	



## **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 JA95-002. 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.

## JA95-002 Audio Controller – Six Transceiver

### SECTION 3 – OPERATION

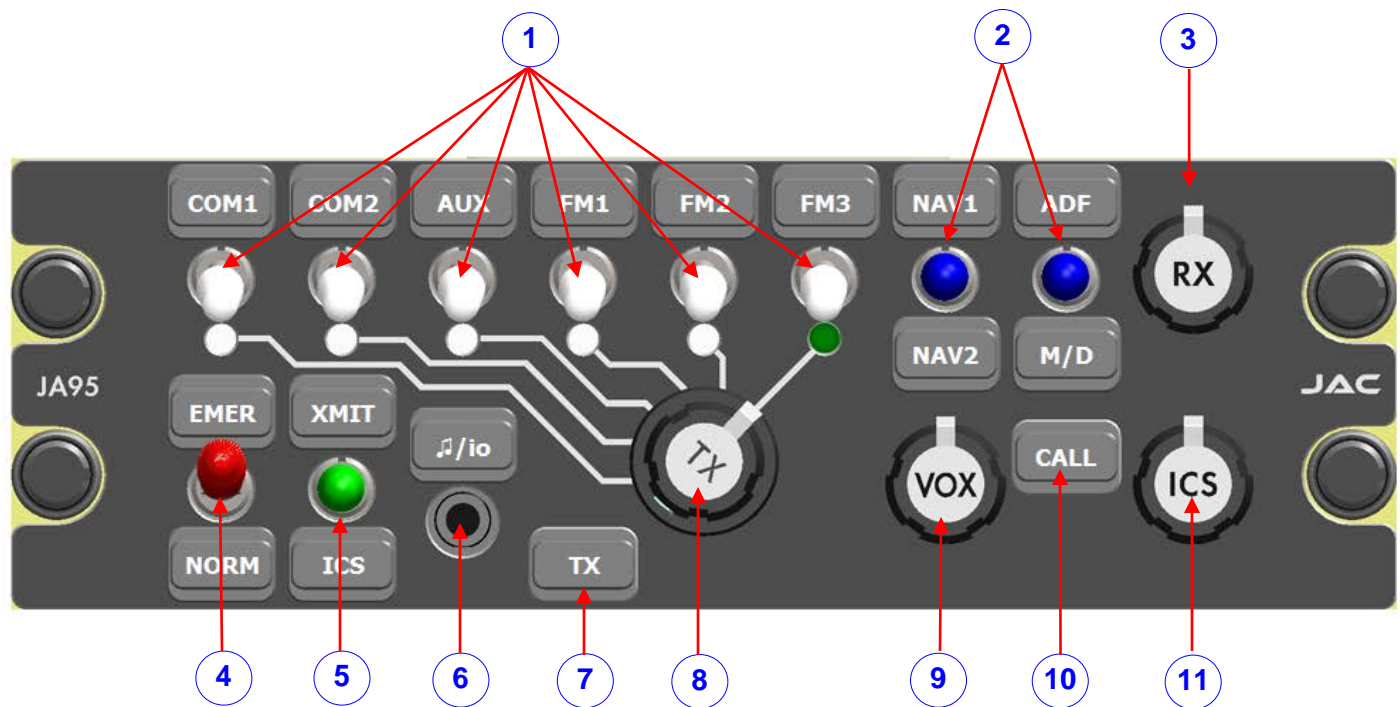
#### 3.1 Introduction

This section contains the operating instructions for the JA95-002.

#### 3.2 Front Panel Controls



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



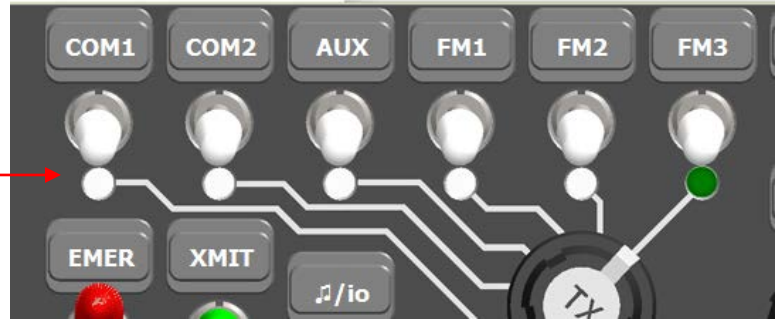
1. Transceiver switches and associated legends
2. Receiver switches and associated legends
3. Receive volume control
4. Mode switch
5. Pilot's Transmit/ICS (Multi-function) switch
6. Music/configuration input connector and legend
7. Transmit annunciator (deadfront)
8. Transmit selector
9. VOX threshold control
10. CALL annunciator (deadfront)
11. ICS volume control



### (1) Transceiver Switches

These are six 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 – COM1, COM2, AUX, FM1, FM2, FM3.)



### (2) Receiver Switches

These are two blue three-position centre-off toggle switches. When a switch is set to the 'up' or 'down' position audio from the selected receiver is routed to the phones.

The legends (two above and two below the switches) are interchangeable to allow customization. (Default – NAV1, NAV2, and ADF1, M/D.)



**Note:** When M/D is selected, both MKR and DME audio will be routed to the phones.



### (3) Receive Volume Control

This is a rotary knob that adjusts the phones volume of the receive audio from minimum (CCW) to maximum (CW). Individual radio volume controls should be set to a nominal level, and then adjusted for changing flight conditions using this control.

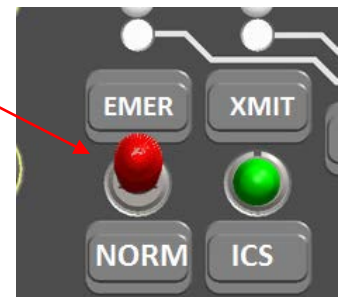


### (4) Mode Switch

This is a red two-position locking toggle switch. When set to the 'up' position, the unit is Emergency mode, and when set to the 'down' position, the unit is in Normal mode. The legends are interchangeable to allow customization. (Default – EMER, NORM.)

The switch is lockable to prevent accidental changing of the mode. The switch must be lifted to release the lock.

For full information on Emergency and Normal Mode operation, see sections 3.3 and 3.4 below.





### (5) Multi-function (Transmit/ICS) Switch

This is a green two-position centre-off momentary toggle switch.

When in the default XMIT/ICS configuration, this switch acts as the pilot's 'Press-to-talk' (PTT) button. The unit will transmit on the selected transceiver when the switch is held in the 'up' position, and when held in the 'down' position, it will transmit on the intercom.

See [section 3.3.7](#) below for Multi-function Switch operation.



Note: At installation, this switch may be configured to operate in default or alternative mode. Check with your installing agency for confirmation of the operation of this switch. The legends are interchangeable to allow customization.



### (6) Music/Configuration Connector (♫/io)

This is a music input that is compatible with most music players. It accepts a 3 pole 3.5mm stereo plug with a slim diameter connector housing.

(This connector is also used during installation to change configuration settings.)

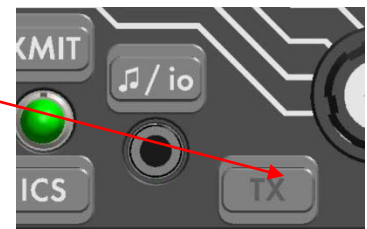


**CAUTION:** If an unapproved connector or cable is used, damage to the unit or to any attached device may occur. If in doubt, contact JAC for a list of approved cables, music sources and devices.

### (7) Transmit Annunciator - TX

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

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



### (8) Transmit Selector



This is a rotary six-position control that is used to select transmission via one of the six 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 - 'FM3' in this example.



### (9) VOX Threshold Control

This is a rotary knob that is used to select the VOX threshold of the unit. See below.

When rotated fully clockwise (cw), the threshold will be at maximum and VOX ICS operation is disabled and ICS PTT input is required for ICS operation.

When rotated fully counterclockwise (ccw), the threshold will be at minimum (almost live).

To adjust the unit for **VOX** (Voice activated) use, the VOX control should be set fully ccw and then slowly rotated cw to the point where no intercom audio can be heard. The VOX control should be adjusted for proper operation with ambient noise.



### (10) CALL Annunciator

This is a deadfront annunciator.

When enabled, it will illuminate when a ground is applied to the CALL input from another user's audio controller or by an external 'call' button.

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



Note: Check with your installing agency for confirmation of the operation of this annunciator. The legends are interchangeable to allow customization.

### (11) ICS Volume Control

This is a rotary control used to adjust the volume of all ICS audio to suit the ambient conditions. Rotating the control completely cw gives rated level, and completely ccw reduces the output to minimum level.





### 3.3 Normal Operation Mode



---

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

---

The JA95-002 is in Normal mode when the front panel EMER / NORM switch (4) is in the NORM position and suitable electrical power is supplied to the unit.

#### 3.3.1 Panel Lighting

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

#### 3.3.2 Receiving

When the JA95-002 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 (8), the incoming audio will be directed to the user's phones.

The audio level of incoming transmissions is set by the front panel RX volume control (3). It will be muted if the unit is transmitting and muting of receive audio during transmit is enabled.

#### 3.3.3 Transmitting (Transmit Operation)

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 COM 1, COM 2, AUX, FM 1, FM 2, or FM3. The corresponding Transmit Select annunciator will illuminate.

When the user's TX PTT is activated, the unit will transmit on the selected transceiver, and the deadfront Transmit Annunciator (7) will illuminate 'TX'. All MIC and sidetone audio will be routed to the user's phones, and any music will be muted for the duration of the transmission.

#### 3.3.4 FM2 PTT Operation



---

Note: If the FM2 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 FM2 has been selected for transmit, momentarily activating the TX PTT (either from the faceplate or by some other method) will keep the FM 2 transmitting. A second momentary activation of the TX PTT, or moving the Transmit Selector away from FM 2, will stop the FM 2 from transmitting.

#### 3.3.5 VOX Operation

A user's MIC audio is routed to the ICS when the MIC audio level exceeds the VOX threshold.

A user's MIC audio is disconnected from the ICS when the MIC audio level falls below the VOX threshold for 0.5 to 2 seconds.

#### 3.3.6 ICS Operation

ICS audio is the sum of all the MIC audio from users with ICS KEY active or with MIC audio level exceeding the VOX Threshold level.

The ICS audio also includes the audio input on the ICS TIE from other audio controllers.

The ICS audio is output on the phones of each user.

The ICS audio is muted during transmit.

The ICS audio level at the phones is controlled by the ICS volume control (12).



### **3.3.7 Multi-Function (XMIT / ICS) Switch Operation**



Note: At installation, this switch may be configured to operate in default or alternative mode. Check with your installing agency for confirmation of the operation of this switch.

---

#### **Default Operation**

When in the default XMIT/ICS configuration, this switch acts as the pilot's 'Press-to-talk (PTT) button. The unit will transmit on the selected transceiver when the switch is set to the 'up' position, and when set to the 'down' position, it will transmit on the intercom.

#### **Alternative Operation**

This switch may be configured to provide a ground signal to operate other equipment.

### **3.3.8 Music Operation**

Music to the phones will be muted by incoming audio (ICS, Receive, Direct or Alert Audio) or if the unit is transmitting. When the incoming audio has ended, the music will gradually return to the previous level.

## **3.4 Emergency Operation Mode**

Emergency mode can be selected by the Mode switch on the front panel, or entered automatically if power to the unit is lost.

### **3.4.1 Auto Emergency Mode**

If the unit is in emergency mode because power has been lost to the unit, the sum of the COM 1 transceiver, NAV 1 receive, and DIRECT AUDIO will be routed to the pilot's phones and the CVR. The pilot's microphone and transmit key are connected to the COM 1 transceiver. No other function in the JA95 will operate when power is lost. All indicator LEDs, legends and annunciators will be dark.

### **3.4.2 Selected Emergency Mode**

If the unit is in emergency mode because the EMER / NORM switch is in the EMER position and sufficient power is applied to the JA95, the sum of the COM 1 receive, NAV 1 receive, DIRECT AUDIO and Alert audio will be routed to the pilot's phones and the CVR. The pilot's microphone and transmit key are connected to the COM 1 transceiver. The pilot is disconnected from the ICS. The COM 1 transceiver and NAV 1 receiver and DIRECT AUDIO are not available to the other users. All other functions of the JA95 will operate. The LEDs, legends and annunciators will retain normal functionality.



# Installation and Operating Manual

## Appendix A - Installation Drawings

### A1 Introduction

The drawings necessary for installation and troubleshooting of the JA95-002 Audio Controller 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.

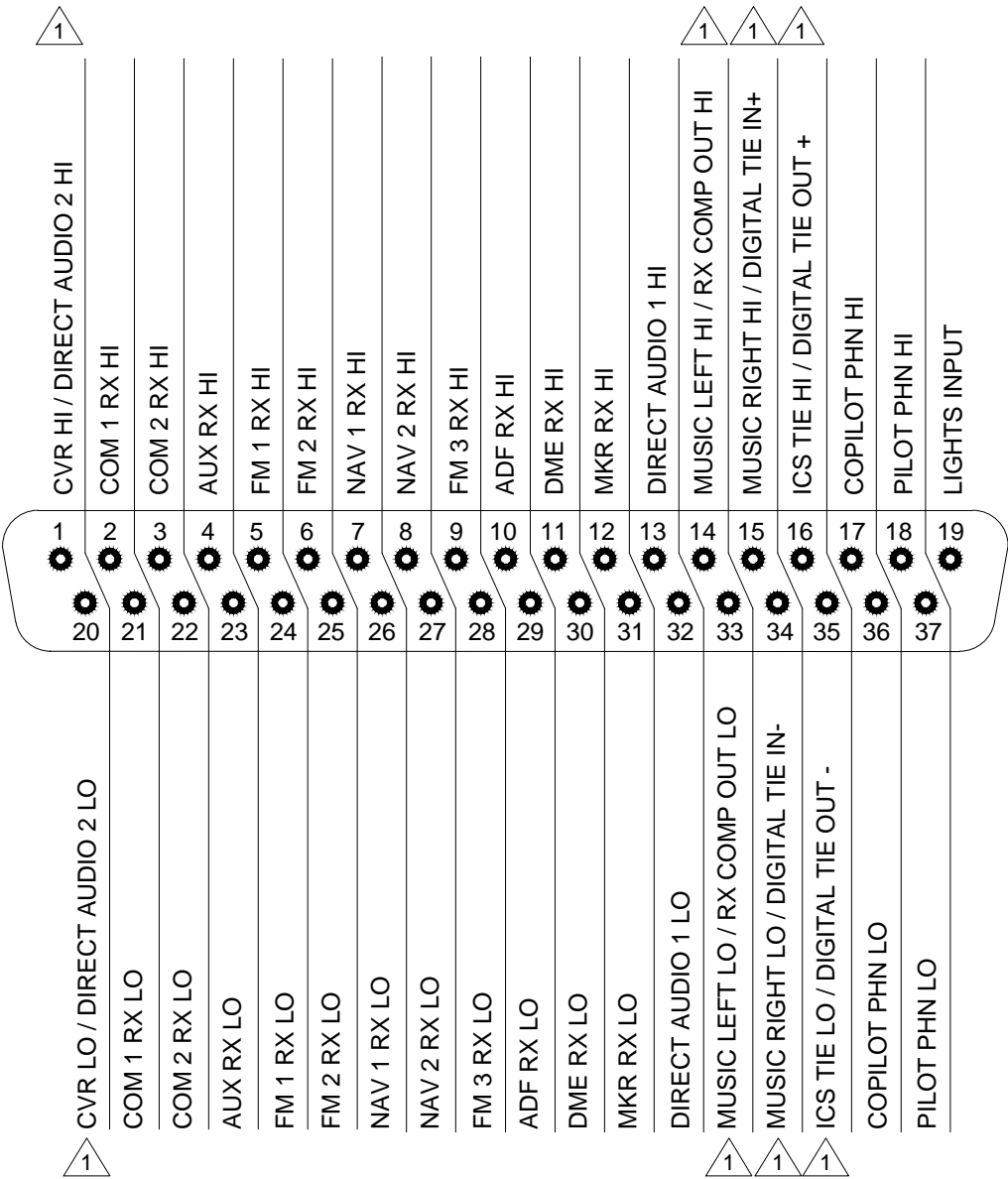
### A2 Installation Drawings

DOCUMENT	Rev
<a href="#">JA95-002 Connector Map</a>	<a href="#">A</a>
<a href="#">JA95-002 Interconnect</a>	<a href="#">A</a>
<a href="#">JA95-002 Mechanical Installation</a>	<a href="#">B</a>
<a href="#">JA95-002 Equipment Block Diagram</a>	<a href="#">A</a>

Reference Documents	
<a href="#">TOL-CUST-EXTR Legend Replacement</a>	<a href="#">A</a>

RECEIVE CONNECTOR

**P1**  
37 PIN FEMALE DMIN  
MATING CONNECTOR



VIEW IS FROM REAR OF MATING CONNECTOR

NOTE:

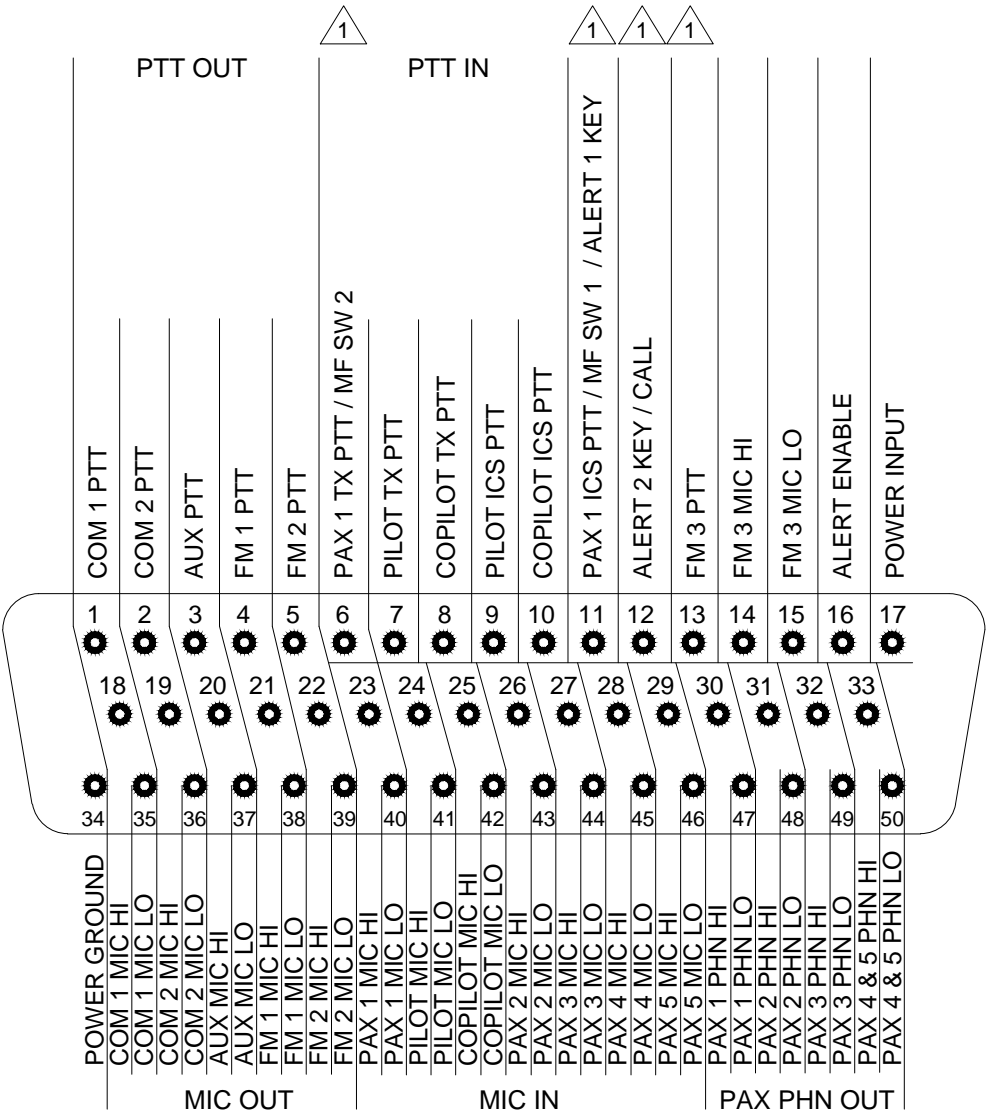
CONFIGURABLE CONTACT

PREPARED	TAT			
CHECKED	JAC 03-27-14 SRM			
APPROVED	JAC 03-28-14 KDV	TITLE Audio Controller - Six Transceiver P1 Connector Map		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA95-002	SHEET 1/3
		DOC NO. JA95-002 Connector Map Rev A.dwg		




TRANSMIT CONNECTOR

P2

50 PIN FEMALE DMIN  
MATING CONNECTOR



VIEW IS FROM REAR OF MATING CONNECTOR

PREPARED	TAT	 <b>JUPITER AVIONICS</b> CORPORATION		
CHECKED				
APPROVED		TITLE Audio Controller - Six Transceiver P2 Connector Map		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA95-002	SHEET 2/3
		DOC NO. JA95-002 Connector Map Rev A.dwg		

## FRONT PANEL MUSIC/CONFIGURATION CONNECTOR

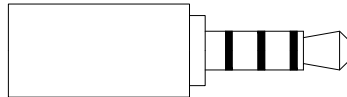
**P3**

ACCEPTS THE FOLLOWING PLUG FORMATS

MATING PLUG NAMES

JA95 SIGNAL NAMES

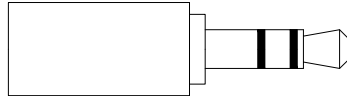
JA99 CONFIGURATION CABLE  
4 POLE MALE 3.5MM STEREO



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




CONFIG DATA TO JA95  
CONFIG DATA FROM JA95  
GROUND  
MODE SELECT / CONFIG AUDIO

MP3 STEREO PLAYER,  
IPHONE 3GS OR 4  
3 POLE MALE 3.5MM STEREO



TIP: LEFT MUSIC  
1ST RING: RIGHT MUSIC  
2ND RING: GROUND

FRONT PANEL MUSIC LEFT  
FRONT PANEL MUSIC RIGHT  
GROUND

PREPARED	TAT	 <b>JUPITER AVIONICS</b> CORPORATION		
CHECKED				
APPROVED		TITLE Audio Controller - Six Transceiver P3 Connector Map		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA95-002	SHEET 3/3
		DOC NO. JA95-002 Connector Map Rev A.dwg		

JA95-002 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 JA95-002 CONNECTOR PINS SHOULD BE TERMINATED TO AIRFRAME GROUND USING A TAG RING P/N: MS27741-5 OR EQUIVALENT.
4. CONNECTOR PIN HAS MORE THAN ONE FUNCTION. SEE THE OPTIONS SECTION OF THIS DRAWING FOR ALTERNATE INTERCONNECT WIRING.
5. ONLY +28 VDC OR +14 VDC OR +5 VDC LIGHTS INPUT VOLTAGE MAY BE APPLIED AT ONE TIME.
6. THE FRONT PANEL MUSIC INPUT SHALL NOT BE CONNECTED TO ANY OTHER AUDIO INPUT.
7. THE DIRECT AUDIO 2 SHALL NOT BE WIRED IN PARALLEL WITH ANY OTHER AUDIO INPUT. THE DIRECT AUDIO 2 INPUT IS BEST SUITED FOR AUDIO SIGNALS THAT ARE TO BE ROUTED TO THE PILOT PHONES WHEN IN EMERGENCY MODE.

CONNECTOR PIN LEGENDS

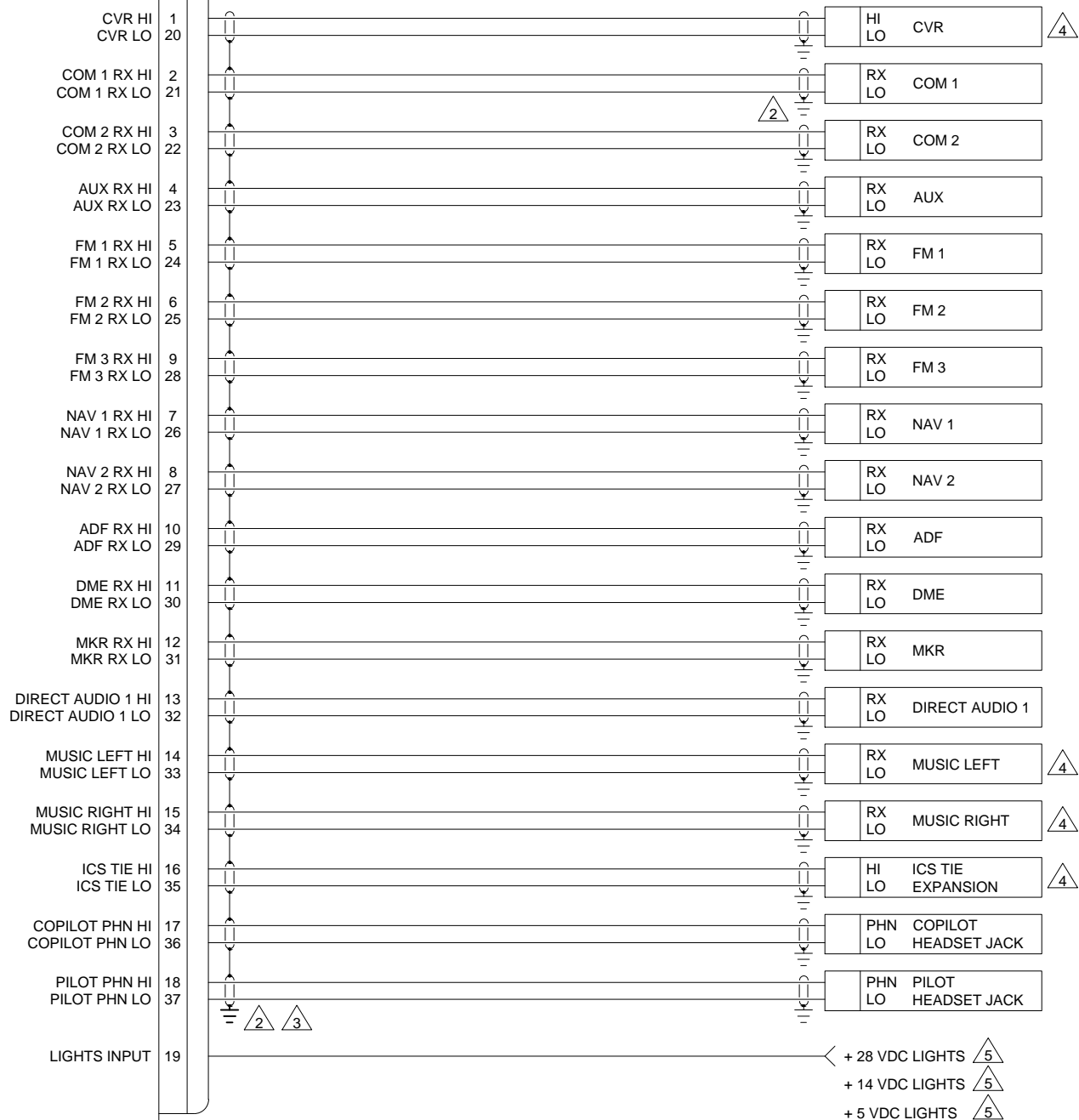
LEGEND


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

PREPARED	TAT	 <b>JUPITER AVIONICS</b> CORPORATION		
CHECKED				
APPROVED		TITLE Audio Controller - Six Transceiver Interconnect Notes		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA95-002	SHEET 1/5
		DOC NO. JA95-002 Interconnect Rev A.dwg		

JA95-002

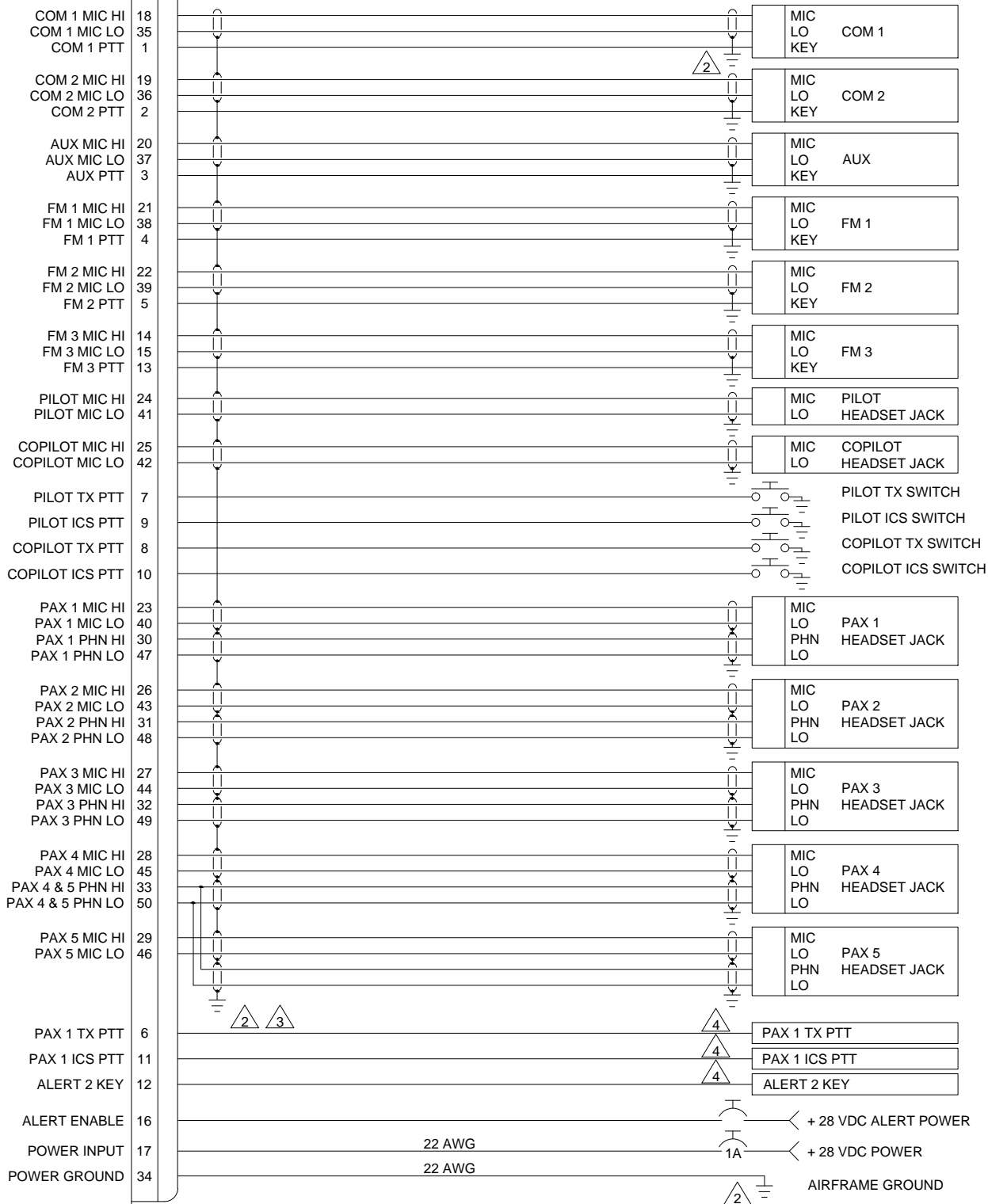
J1


P1  
37 PIN FEMALE DMIN  
MATING CONNECTOR

PREPARED	TAT	 <b>JUPITER AVIONICS</b> CORPORATION		
CHECKED	<b>JAC</b> 03-27-14 SRM			
		TITLE Audio Controller - Six Transceiver J1 Interconnect		
APPROVED	<b>JAC</b> 03-28-14 KDV	NCAGE CODE L00N3	PART NO. JA95-002	SHEET 2/5
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO. JA95-002 Interconnect Rev A.dwg		

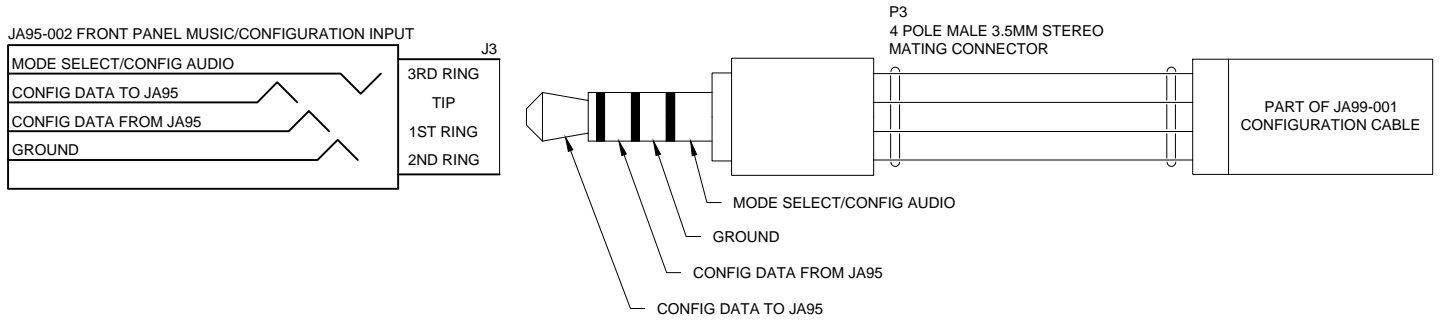
JA95-002

J2

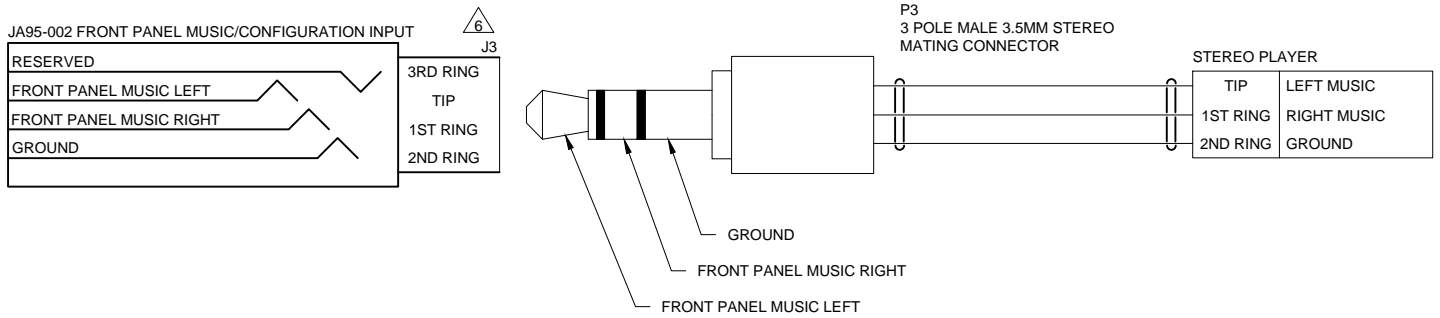
P2  
50 PIN FEMALE DMIN  
MATING CONNECTOR




PREPARED	TAT	 <b>JUPITER AVIONICS</b> CORPORATION		
CHECKED	<b>JAC</b> 03-27-14 SRM			
APPROVED	<b>JAC</b> 03-28-14 KDV	TITLE Audio Controller - Six Transceiver J2 Interconnect		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA95-002	SHEET 3/5
		DOC NO. JA95-002 Interconnect Rev A.dwg		

# OPTION: PROGRAMMING FROM JA99-001

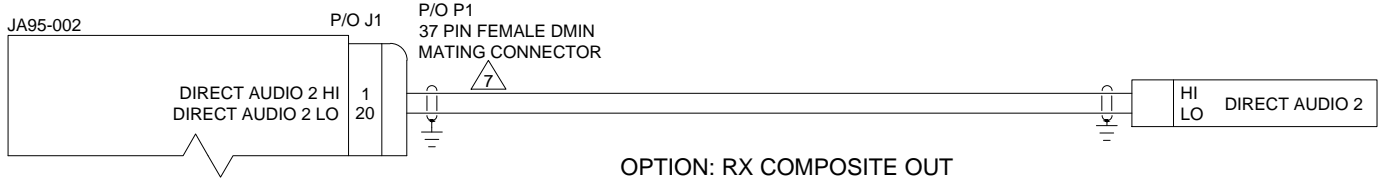


# OPTION: STEREO PLAYER

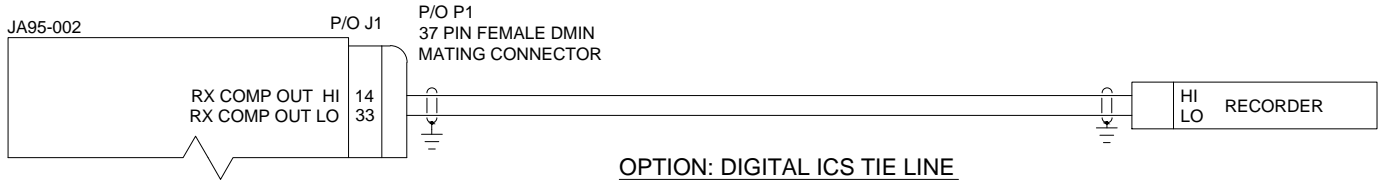


PREPARED	TAT			
CHECKED				
APPROVED		TITLE Audio Controller - Six Transceiver Interconnect Options		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA95-002	SHEET 4/5
		DOC NO. JA95-002 Interconnect Rev A.dwg		

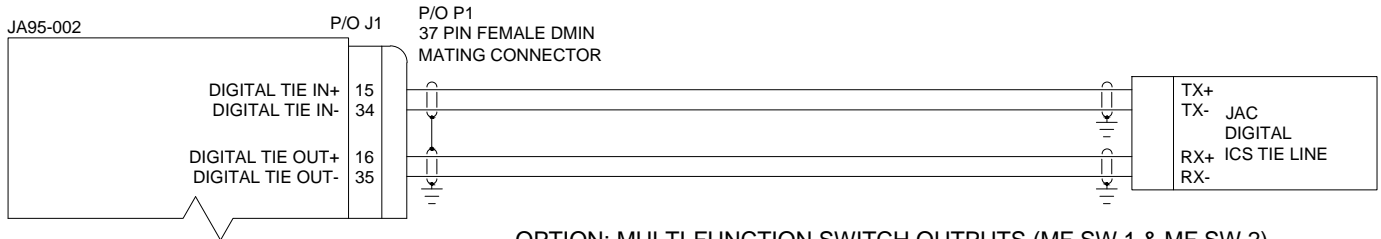
OPTION: DIRECT AUDIO 2 IN



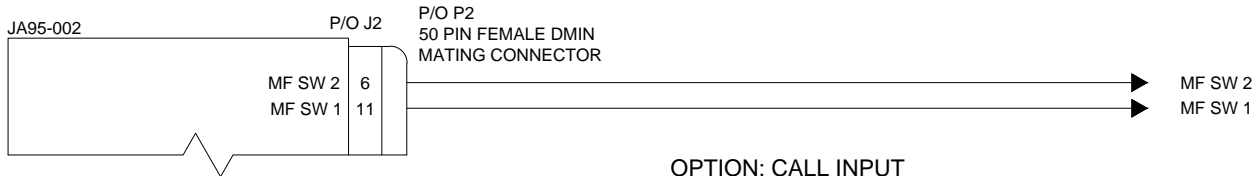
OPTION: RX COMPOSITE OUT



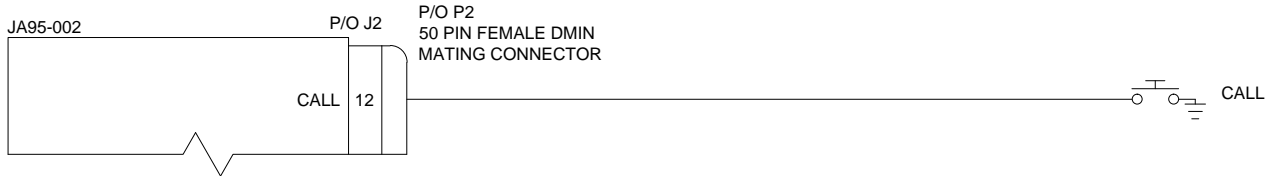
OPTION: DIGITAL ICS TIE LINE



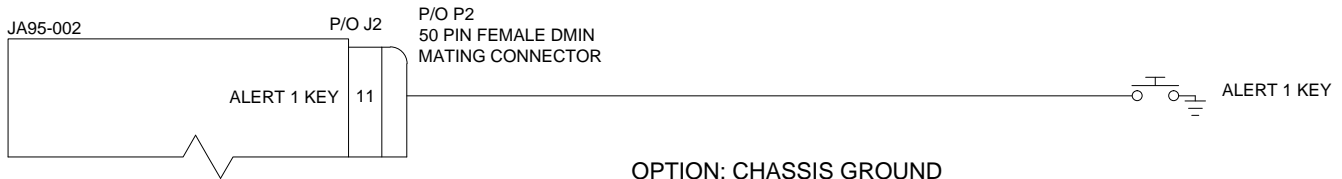
OPTION: MULTI-FUNCTION SWITCH OUTPUTS (MF SW 1 & MF SW 2)



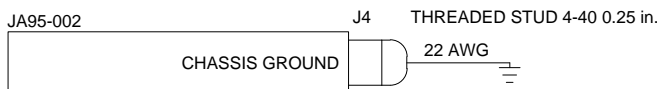
OPTION: CALL INPUT






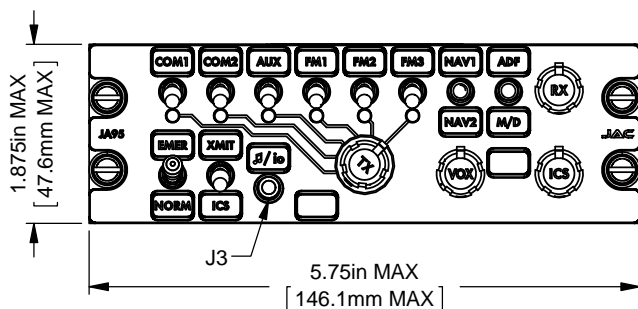
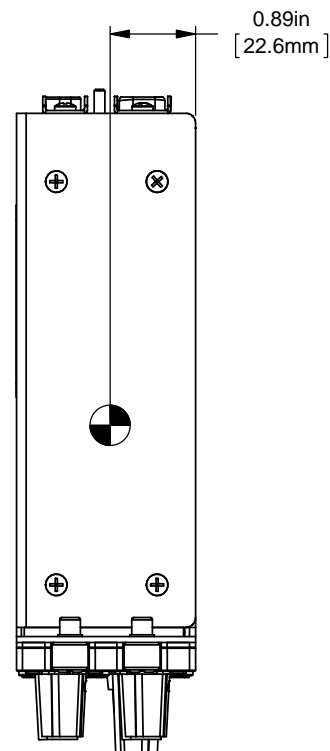
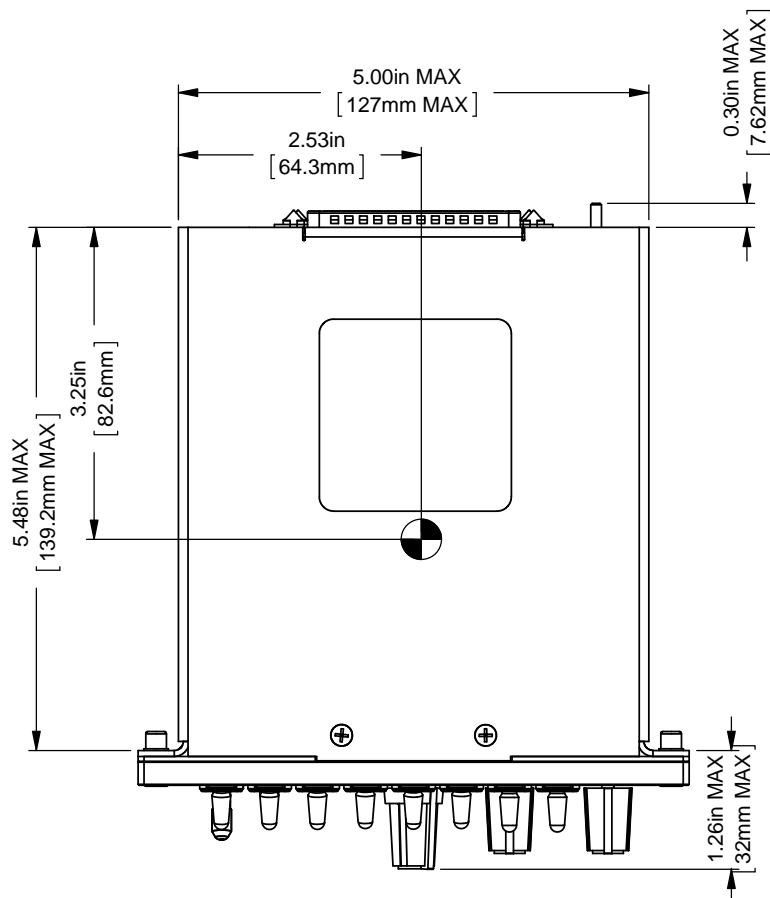
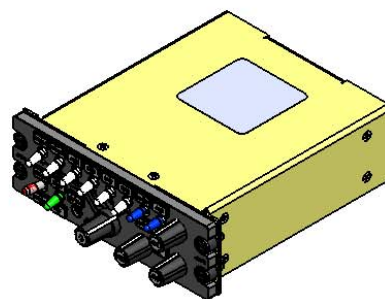
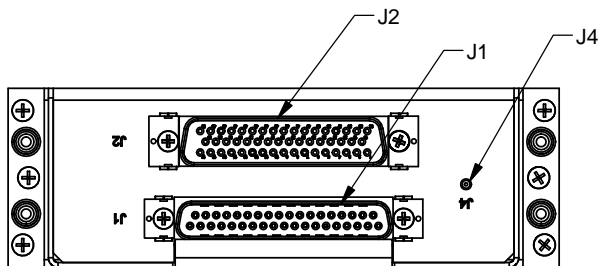
OPTION: CONFIGURABLE SWITCH INPUTS (ALERT 1 KEY)




OPTION: CHASSIS GROUND



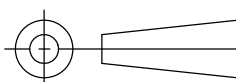
PREPARED	TAT			
CHECKED				
APPROVED		TITLE Audio Controller - Six Transceiver Interconnect Options		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA95-002	SHEET 5/5
		DOC NO. JA95-002 Interconnect Rev A.dwg		



 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  
09-27-18  
AH

APPROVED

JAC  
09-27-18  
KDV

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



**JUPITER AVIONICS**  
CORPORATION

TITLE

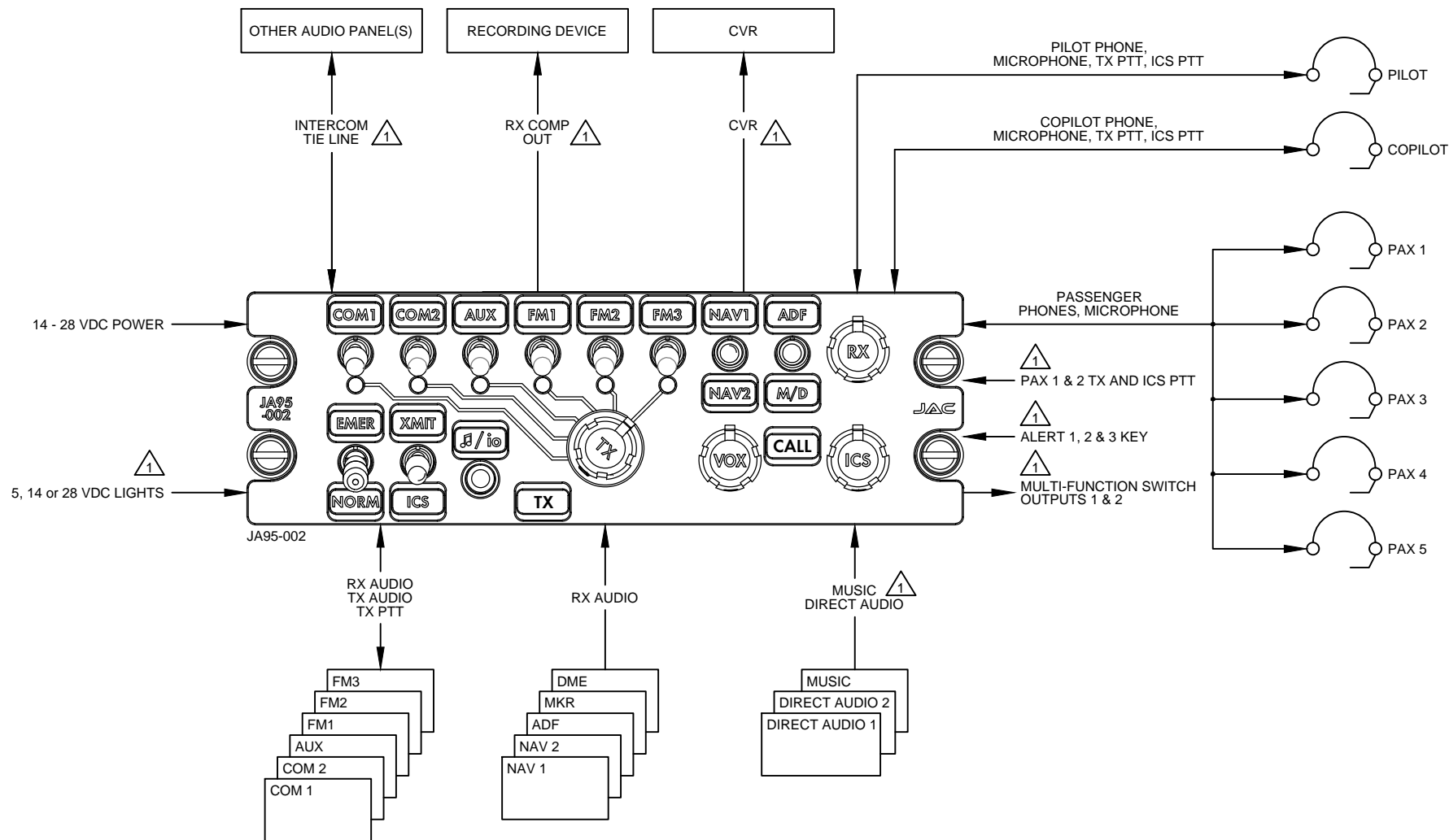
Audio Controller - Six Transceiver


NCAGE CODE  
L00N3

PART NO.  
JA95-002

SHEET  
1/1

DOC. NO.  
JA95-002 Mechanical Installation Rev B.SLDDRW



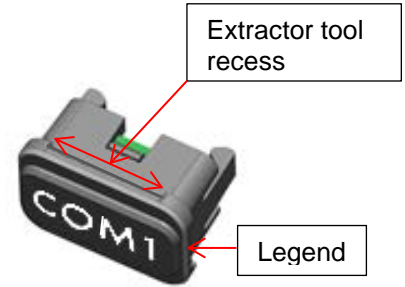
PREPARED	TAT/CPM			
CHECKED	<div> <div>JAC</div> <div>08-14-17</div> <div>CPM</div> </div>			
APPROVED	<div> <div>JAC</div> <div>08-14-17</div> <div>KDV</div> </div>	<div> <div>TITLE</div> <div>Audio Controller - Six Transceiver Equipment Block Diagram</div> </div>		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE	PART NO.	SHEET
		L00N3	JA95-002	1/1
		DOC NO. JA95-002 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.

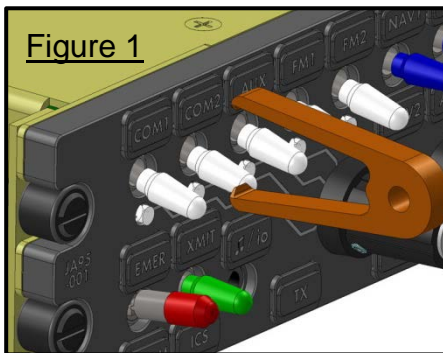
The internal circuitry ensures that, although the legends are individually illuminated, the illumination is consistent and uniform throughout all legends, and never needs to be balanced. This means that if it is a requirement to change the labelling due to damage or for a different project, there is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



### Legend Removal



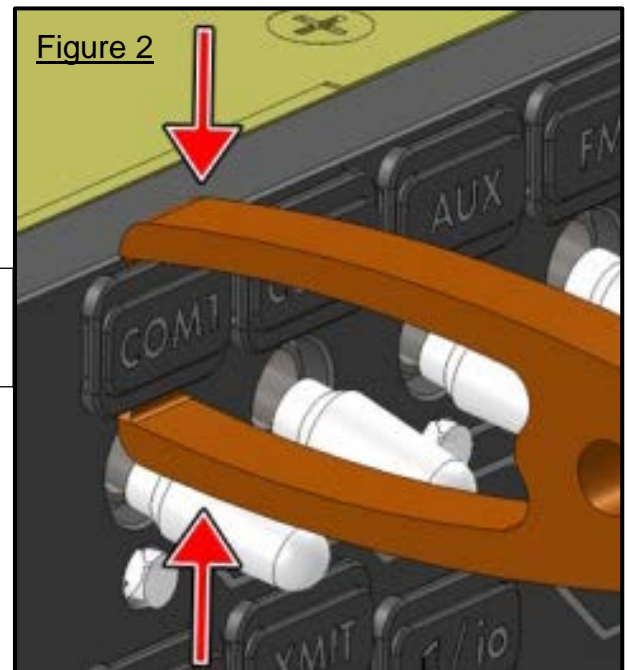
Caution: Take care not to scratch or otherwise damage the faceplate or the legend.



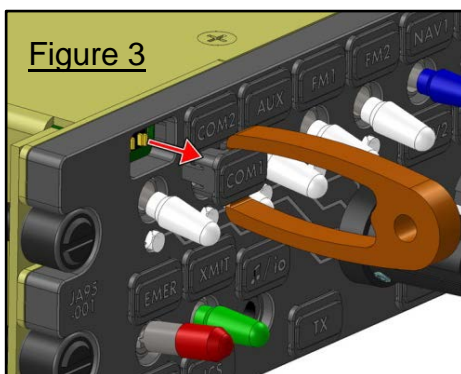
**Figure 1**

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 JA95-002 may require completion of a TCCA Major Modification Report per CAR STD (AWM) 571 Appendix L. 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 JA95-002 Audio Controller. 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 JA95-002 Audio Controller in [aircraft location].

The JA95-002 is approved to CAN-TSO-C139. The JA95-002 meets RTCA DO-160F environmental qualifications for this installation. See Section 1 of the JA95-002 Installation Manual.

Installed in accordance with the JA95-002 Installation Manual, Revision [ ], and AC 43.13-2, Chapters 2, and 3.

The JA95-002 interfaces with existing aircraft radios per the Installation Manual instructions.

The JA95-002 Installation Manual provides detailed installation instructions and wiring diagrams (Section 2, and Appendices A and B).

Power is supplied to the JA95-002 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 JA95-002 Audio Controller is "on condition" only. Refer to the JA95-002 Maintenance Manual. Periodic maintenance of the JA95-002 is not required.

The following sample Instructions for Continued Airworthiness (ICA) provides assistance in preparing ICA for the Jupiter Avionics JA95-002 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 JA95-002 Audio Controller 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 JA95-002 installed in an [aircraft make and model].

**Applicability:** Applies to a Jupiter Avionics JA95-002 installed in an [aircraft make and model].

**Definitions/Abbreviations:** None, N/A.

**Precautions:** None, N/A.

**Units of Measurement:** None, N/A.

**Referenced Publications:** JA95-002 Installation and Operating Manual  
JA95-002 Maintenance Manual  
JA95-002 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 JA95-002 Audio Controller 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 JA95-002 Operating Manual.

## **4. Servicing Information**

N/A

## **5. Maintenance Instructions**

Maintenance of the JA95-002 is 'on condition' only. Periodic maintenance is not required. Refer to the JA95-002 Maintenance Manual.

## **6. Troubleshooting Information**

Refer to the JA95-002 Maintenance Manual.

## **7. Removal and Replacement Information**

Refer to Section 2 of this manual - the JA95-002 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 JA95-002 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**

JA95-002 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 JA95-002 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.



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

<b>Nomenclature</b>	Audio Controller - Six Transceiver		
<b>Type/Model/ Part No.:</b>	JA95-002		
<b>TSO No.:</b>	CAN-TSO-C139; TSO-C139		
<b>Manufacturer's Build Configuration:</b>	JA95-002 Build Configuration Rev B		
<b>Manufacturer's Test Report:</b>	JA95-001 Test Report (Qualification - Final) Rev B JA95-002 CAN-TSO Design Change Assessment (BC Rev B) Rev A		
<b>Manufacturer's Specification and/or Other Applicable Specification:</b>	JA95-001 Declaration of Design and Performance Rev D JA95-002 Derivative Declaration of Design and Performance Rev B		
<b>Manufacturer:</b>	Jupiter Avionics Corporation		
<b>Address:</b>	1959 Kirschner Road, Kelowna, BC, Canada, V1Y 4N7		
<b>Revision &amp; Change No of DO-160:</b>	Rev. F dated December 6, 2007	<b>Dates Tested:</b>	Sept 28 – Dec 27, 2012

CONDITIONS	SECTION	DESCRIPTION OF TESTS CONDUCTED
Temperature and Altitude	4.0	Equipment tested to Category (C4)(D1)(A1)
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	4.6.1	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)
Operational Shock and Crash Safety	7.0	
Operational Shock		Equipment tested to Category B (6 g for 11 ms)
Crash Safety (impulse)		Equipment tested to Category B (20 g for 11 ms)
Crash Safety (sustained)		Equipment tested to Category B (20 g for 3 sec)



CONDITIONS	SECTION	DESCRIPTION OF TESTS CONDUCTED
Vibration Fixed Wing –Sine Fixed Wing – Random Helicopter – Random, unknown (See remark 4)	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 ( $0 < D < 0.3 \text{ m}$ )
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
Radio Frequency Susceptibility Radiated Conducted (See remark 3)	20.0	Equipment tested to Category RR R (20 V/m CW&SW) and (150 V/m PM) R (30 mA)
Radio Frequency Emission (See remark 3)	21.0	Equipment tested to Category H



CONDITIONS	SECTION	DESCRIPTION OF TESTS CONDUCTED
Lightning Induced Transient Susceptibility Pin Injection Cable Bundle (See remark 3)	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 the JA95-001. A similarity analysis between the two products is detailed in the Jupiter Avionics Corp. document: *JA95-002 CAN-TSO Design Change Assessment (BC Rev B) Rev A*
2. Test information can be found in the Jupiter Avionics Corp. document: *JA95-001 Test Report (Qualification - Final) Rev B*
3. Testing of Radio Frequency Susceptibility, Radio Frequency Emission and Lightning Induced Transient Susceptibility was conducted at CKC Laboratories in Bothell, WA, USA.  
Reference Jupiter Avionics Corp. document: *JA95-001 Test Report (CKC Labs DO-160F Section 20, 21, 22 – 2012-11-26 to 30) Rev A*

4. During exposure to vibration test conditions the following critical resonances changed frequency greater than 2.5%:

<u>Orientation</u>	<u>Initial Freq.</u>	<u>Final Freq.</u>
Horizontal	72.5 Hz	75.0 Hz
Vertical	338 Hz	329 Hz
	203 Hz	208 Hz
Lateral	140 Hz	136 Hz
	156 Hz	168 Hz
	169 Hz	157 Hz
	265 Hz	285 Hz