



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

JA94-002A

Dual Audio Controller - Front Panel ICS ISO



Installation and Operating Manual

Rev B

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

Copyright 2018 Jupiter Avionics Corp.

All rights reserved

Jupiter Avionics Corporation (JAC) permits a single copy of this manual to be printed or downloaded for the express use of an installing agency. Any such electronic or printed copy of this manual must contain the complete text of this copyright notice. Any unauthorized commercial distribution of this manual is strictly prohibited. Except as described above, no part of this manual may be reproduced, copied, transmitted, disseminated, downloaded, or stored in any storage medium for any purpose without the express prior written consent of JAC.

IMPORTANT:

Information in this document is subject to change without notice.
To confirm the current revision status of this manual, visit the JAC website:
www.jupiteravionics.com

[illegible]

Prepared:	Checked:	Approved:
MPB		



Table of Contents

SECTION 1 - DESCRIPTION	1
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 Environmental Specifications	5
1.4.4 Flammability of Materials	5
SECTION 2 – INSTALLATION	6
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	14
2.6 Installation Kit	15
2.6.1 Recommended Crimp tools	15
2.7 Installation Drawings	15
2.7.1 Generation of Custom Drawings	15
SECTION 3 – OPERATION	16
3.1 Introduction	16
3.2 Front Panel Controls	16
(1) (2) NAV1-COM4 Receive Select Switches and Legends	17
(3) AUX Receive and Intercom ISO Select switches and Legends	17
(4) VOX Threshold Control	17
(5) (8) Transmit Selector	18
(7) (10) RX/ICS Volume control and legend	19
(9) Music/Configuration Connector cover (🔊/io)	19



3.3	Normal Operation Mode	19
3.3.1	Panel Lighting.....	19
3.3.2	Receiving.....	20
3.3.3	Transmitting (Transmit Operation)	20
3.3.4	VOX Operation	20
3.3.5	ICS Operation.....	20
3.3.6	Direct Audio Operation	21
3.3.7	Music Operation	21
3.3.8	Rear Hand Mic Operation	21
3.3.9	Cockpit Voice Recorder (CVR) Operation	21
3.3.10	Remote RMT Operation	21
3.4	Emergency Operation Mode	22
3.4.1	Left User Emergency Mode	22
3.4.2	Right User Emergency Mode	22
3.4.3	Auto Emergency Mode.....	22
3.4.4	Selected Emergency Mode	22
Appendix A - Installation Drawings.....		A1
A1	Introduction.....	A1
A2	Installation Drawings	A1
Appendix B - Installation Documents		B1
B1	Airworthiness Approval	B2
B2	Instructions for Continued Airworthiness	B2

JA94-002A Dual Audio Controller- Front Panel ICS ISO

SECTION 1 - DESCRIPTION

1.1 System Overview

The JA94-002A dual audio controller is a centralized management system for two independent users that distributes and controls all transceiver, receiver and warning source audio in an aircraft. It enables the selected transmission of microphone audio to one or more transceivers and distributes all intercom audio. The JA94-002A dual 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 Right User to the COM1 transceiver and NAV1 receiver, and the Left User to COM2 transceiver and NAV2 receiver.

The JA94-002A 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. To facilitate future customizations and certification, neither software nor complex electronic devices are used in the JA94-002A design.

1.2 Features Overview

The JA94-002A supports up to 5 transceivers, each selectable from two rotary switches.

The JA94-002A supports up to 4 selectable receivers in two banks of 4 switches.

The JA94-002A provides intercom functions for up to 2 users and up to 6 passengers.

The JA94-002A has individual VOX gating for each user and passenger.

The JA94-002A supports two Direct Audio inputs at a fixed level to two users in Normal and Emergency mode.

The Direct audios may be routed to both Left and Right User phones or Direct Audio 2 routed to Right User and Direct Audio 1 to Left User.

The JA94-002A supports a third Direct Audio input in Normal mode only.

The JA94-002A allows the receive audios to be disconnected from the Passenger Phones.

The JA94-002A supports two CVR outputs.

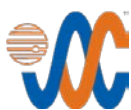
The JA94-002A allows transmit access for five crew members (Right User, Left User, Passenger 1, Passenger 2, and Passenger 6). The JA94-002A allows ICS PTT access for all users and passengers.

The JA94-002A features a Music / Configuration connector on the faceplate 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 JA94-002A has three modes of operation: Normal Mode, Emergency Mode and ICS Isolate Mode.

The JA94-002A supports a remote transmit select input.

The JA94-002A supports selection of Normal Mode and Emergency Mode from a front panel control and selection of ICS Isolate Mode from an external switch.



1.3 **Inputs and Outputs**

Refer to the JA94-002A [connector maps](#) for the mating connector designators and pin assignments for the input and output signals.

1.3.1 **Inputs**

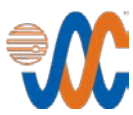
Name	Qty	Type
COM Remote TX Select	5	Control signal
CONFIG DATA TO JA94-002A	1	Data signal
DIRECT AUDIO	3	Audio signal (Configurable via ProCS)
ICS Isolate Mode	1	Control signal, Active Low (Function Configurable)
ICS PTT	8	Control signal, Active Low
LIGHTS INPUT	1	Analog control signal
MIC	8	Audio signal
MODE SELECT	1	Multi format signal
MUSIC	4	Audio signal (Two configurable via ProCS)
POWER INPUT	1	Power supply, 28 Vdc
RX HI/LO	10	Audio signal (5 COMs, 4 NAVs and 1 Unswitched)
TX PTT	5	Control signal

1.3.2 **Outputs**

Name	Qty	Type
CVR	2	Audio signal (Configured via ProCS)
CONFIG DATA FROM JA94-002A	1	Data signal
Headphones	7	Audio signal (Note: 7 outputs for driving 8 phones)
Transceiver MIC	6	Audio signal
Transmit PTT	6	Control signal, Active Low
RX COMP OUT	2	Audio signal, (Configurable via ProCS)

1.3.3 **Bi-directional Ports**

Name	Qty	Type
ICS TIE	1	Audio signal



1.4 Specifications

1.4.1 Electrical Specifications

Power Input

Primary nominal voltage	28 Vdc
Maximum voltage	32.2 Vdc
Minimum voltage	22.0 Vdc
Emergency voltage	18.0 Vdc
Power Off Voltage	≤ 15.0 Vdc
Input current at 28 Vdc	0.95 A max
Input current at 18.0 Vdc	1.5 A max

1.4.1.1 Audio Performance

Rated Input Level

Receive audio rated input level	7.75 Vrms ± 10%
Direct audio rated input level	7.75 Vrms ± 10%
Music rated input level	400 mVrms ± 10%
Microphone input level	250 mVrms ± 10%
Intercom Tie Line type 1 input level	340 mVrms ± 10%
Intercom Tie Line type 2 input level	1.20 Vrms ± 10%

Rated Output Level

PHN rated output	8.7 Vrms ± 10%
LEFT or RIGHT USER PHN rated output in emerg mode	2.34 Vrms ± 20%
Phone rated output level, with MUSIC input	4.35 Vrms ± 10%
COM MIC rated output	0.250 Vrms ± 10%
CVR rated output	0.500 Vrms ± 10%
CVR rated output with MUSIC INPUT	0.250 Vrms ± 10%
CVR rated output with MIC INPUT	1.00 Vrms ± 10%
CVR rated output, in emergency mode,	0.500 Vrms ± 10%
RX COMP rated output	2.50 Vrms ± 10%
Intercom Tie Line type 1 rated output	340 mVrms ± 10%
Intercom Tie Line type 2 rated output	1.20 Vrms ± 10%

Audio Frequency Response

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

Distortion Characteristics

Audio output distortion at rated power	≤ 10%
--	-------

Input Impedance

Microphone input Impedance	150 Ω ± 10%
Direct Audio input Impedance	1000 Ω ± 10%
Receive Audio input Impedance	1000 Ω ± 10%
Music Audio input Impedance	1000 Ω ± 10%
Intercom Tie Line Audio input Impedance	2000 Ω ± 10%

Output Load

Phone load	600 Ω ± 10%
Transceiver Microphone load	150 Ω ± 10%
CVR load	5000 Ω ± 10%
Receive Composite Audio load	600 Ω ± 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 Ω max (3 loads)
Intercom Tie Line type 2 maximum load	285 Ω max (7 loads)

Volume Controls

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

Crosstalk Level

Input to Output crosstalk	$\leq$ 55 dB
Input to Input crosstalk	$\leq$ 60 dB
Station to Station crosstalk	$\leq$ 65 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/electret
Microphone inputs bias voltage	12 Vdc $\pm$ 10%
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
MUSIC attenuation	38 dB max
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
PHN HI / LO output music fade in duration	2.5 $\pm$ 1.0 seconds
VOX Threshold level range relative to rated MIC input	-28 to +6 dB
VOX off Delay Time range	0.5 to 2.0 seconds
Transmit Timeout Timer	90 $\pm$ 10 seconds

1.4.1.2 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 [47.63 mm] max
Behind panel depth	5.48 in [139.2 mm] max
Faceplate width	5.75 in [146.1 mm] max
Behind panel width	5.00 in [127 mm] max
Weight	1.99 lbs. [0.91 kg] max
Material	brushed aluminum with conversion coating
Connectors:	J1 One 37-pin D-Sub male, V5 locking
	J2 One 50-pin D-Sub male, V5 locking
	J3 One 15-pin D-Sub male, V5 locking
	J4 One 4 pole 3.5mm stereo jack
	J5 One 4-40, 0.5 in. max
Mounting	4 Dzus fasteners
Bonding	$\leq 2.5 \text{ m}\Omega$
Installation kit part number	INST-JA94 or equivalent

1.4.3 Environmental Specifications

The JA94-002A Dual Audio Controller - Front Panel ICS ISO 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

1.4.4 Flammability of Materials

The JA94-002A complies with the requirements of RTCA/DO-160G Sec 26.3.3 "Flammability", through equivalent flammability testing of materials and the Small Parts Exemption.



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 JA94-002A 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

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

Those installing the JA94-002A, on or in a specific type or class of aircraft, must determine that the aircraft installation conditions meet standards. The JA94-002A 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.

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 JA94-002A 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.



Note: During bench test set up, it is normal for the JA94-002A chassis to become warm to the touch.

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 JA94-002A 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 +28 Vdc +14 Vdc or +5 Vdc.
- b) Check P2 pin **17** for +28 Vdc power relative to ground.
- c) Check P2 pin **34** for continuity to ground (less than 0.5 Ω).
- d) Check P2 pins **6 thru 10** for continuity to ground (less than 0.5 Ω) when the relevant switch is closed.
- e) Check P3 all pins for continuity to ground (less than 0.5 Ω) when the relevant switch is closed or selection made.
- f) Check all pins for shorts to ground or adjacent pins.

2.4.6.2 Configuration

Ensure that the JA94-002A contains the correct configuration settings. This may be done at the factory, on the maintenance bench or in the aircraft before or during the power on checks. 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 JA94-002A. Refer to Section 3 (Operation) for specific operational details.



- Begin with only the Right user 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.
- If there is a music source in the system, turn it on and check for proper mute operation.
- 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.
- Check the ICS operation and Emergency operation.
- Plug in the Left user headset. Check for correct ICS operation. Check yoke or cyclic switch functions.
- 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.
- 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 JA94-002A internal adjustments are set from the [Product Configuration Software ProCS™](#). Configuration data is sent to the JA94-002A 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.

2.5.1 Configuration Cabling Requirements

To configure the JA94-002A, 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 JA94-002A are not included with the unit.

Cabling option 1:

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

Cabling option 2:

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

2.5.2 ProCS™ Setup



The ProCS™ JA94-002A menu item 'ProCS Setup' provides Setup drawings showing the cabling arrangement for connecting the JA94-002A to a computer running the ProCS™.

2.5.3 Configurable Settings

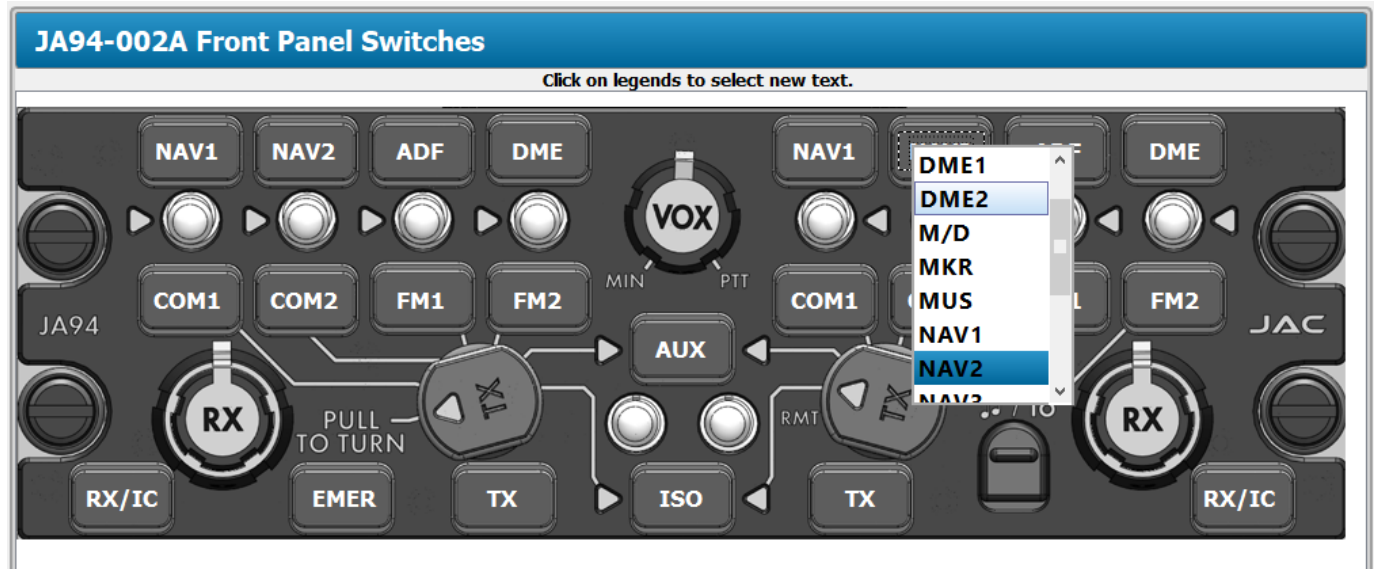
A standard unit is shipped from the factory with all internal adjustments configured to the default levels. At installation, it may be desirable to change some of these settings to suit the local operating environment.



Note: To properly configure the JA94-002A, power must be applied, and the left TX Select switch must be in the COM1, COM2, FM1, FM2 or AUX position (not EMER).

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

2.5.3.1 Front Panel Switches

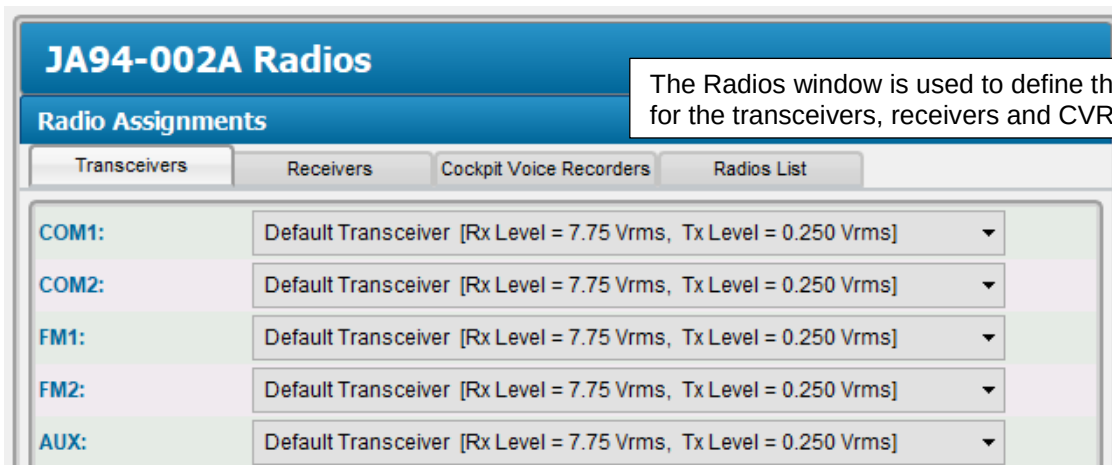


The Front Panel Switches window is used to specify the text for each legend.



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

JA94-002A Receive Levels

Input Levels

COM1	Default Transceiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level
COM2	Default Transceiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level
FM1	Default Transceiver :	The receive and direct audio input level of each of the RX and DIRECT AUDIO inputs can be adjusted from 1 to 10 Vrms. (Default 7.75 Vrms)				
FM2	Default Transceiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level
AUX	Default Transceiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level
NAV1	Default Receiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level
NAV2	Default Receiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level
ADF	Default Receiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level
DME	Default Receiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level
DIRECT1	Default Receiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level
DIRECT2	Default Receiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level
DIRECT3	Default Receiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level
UNSWITCHED RX:	Default Receiver :	0.80 Vrms	<input type="range"/>	99.00 Vrms	[7.75 Vrms]	Default Level

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)

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

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

Receive Composite Output

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)

LEFT User Level: 0.25 Vrms 2.50 Vrms [1.00 Vrms]

RIGHT User Level: 0.25 Vrms 2.50 Vrms [1.00 Vrms]

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



2.5.3.4 Transmit Levels

JA94-002A Transmit Levels

Transmit Levels

Rated Load Impedance = 150 Ohms

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

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
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
AUX	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 FM2 Duplex check box is checked the FM2 radio is set to duplex operation **(Default not checked)** (see [section 3.3.3.2.](#))

Transmit Settings

☐ Transmit Time-out (90 Sec.)

☐ FM2 Duplex

2.5.3.5 Sidetone Levels

JA94-002A Sidetone Levels

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

Receive Sidetone Level

LEFT USER COM1 thru AUX RX input Level on PHN output:	-12 dB	<input type="range"/>	0 dB	[-6 dB]
RIGHT USER COM1 thru AUX RX input Level on PHN output:	-12 dB	<input type="range"/>	0 dB	[-6 dB]

2.5.3.6 Passenger Settings

JA94-002A Passenger Settings

Passengers can be assigned to either the RIGHT or LEFT USER controls and will hear the assigned user's Receive Audio.

Passenger Settings

Passenger Assignment: ☐ Passengers & Rear Hand Mic Assigned to LEFT USER's Controls ☒ Passengers & Rear Hand Mic Assigned to RIGHT USER's Controls

☒ Passengers Listen to Receive Audio

☐ Legacy Passenger ICS Mode



Note: When Legacy Passenger ICS Mode is selected, the Passenger Mics are controlled by the VOX control until the fully cw (PTT) position is reached. Then the Passenger Mics are automatically set to the minimum VOX level and should be controlled by in-line PTT drop-cords.



2.5.3.7 Connector Pin Configuration

Several of the connector pins can be configured to meet the requirements of specific installations. Refer to JA94-002A [Interconnect sheet 5 of 6](#). Direct Audio routing can also be selected in this section.

JA94-002A Connector Pin Configuration

J1 Contacts Selection

Pin 1/20:	☒ DIRECT AUDIO 1	☐ LEFT CVR
Pin 13/32:	☒ DIRECT AUDIO 2	☐ RIGHT CVR
Pin 14/33:	☒ MUSIC LEFT HI/LO INPUT	☐ LEFT RX COMP OUT
Pin 15/34:	☒ MUSIC RIGHT HI/LO INPUT	☐ RIGHT RX COMP OUT

J2 Contacts Selection

Pin 6:	☒ REAR HAND PTT	☐ PAX 6 TX PTT
Pin 23:	☒ REAR HAND MIC HI	☐ PAX 6 MIC HI
Pin 40:	☒ REAR HAND MIC LO	☐ PAX 6 MIC LO

DIRECT AUDIO Routing

Routing:	☒ DIRECT 1 and 2 to Both LEFT and RIGHT USER	☐ DIRECT 1 to LEFT USER and DIRECT 2 to RIGHT USER
	☒ DIRECT 3 Enabled for LEFT User	
	☒ DIRECT 3 Enabled for RIGHT User	

Routing for DIRECT 1, 2 and 3 can be selected as shown.

2.5.3.8 Audio Muting (During Transmit)

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

When the Mute ICS Audio check box is checked the ICS 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.)

JA94-002A Audio Muting

Audio Muting During Transmit

☐ Mute Rx Audio
☐ Mute ICS Audio
☒ Mute Music Audio (Note: always enabled)



2.5.2.9 CVR Level

JA94-002A CVR Level

LEFT USER CVR Audio Output Levels

Rated Load Impedance = 5 kOhms

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.

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

RIGHT USER CVR Audio Output Levels

Rated Load Impedance = 5 kOhms

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

JA94-002A Music Levels

LEFT USER Music Output Level

0dB = Rated Phone Level

Output Level:	-40 dB	<input type="range"/>	0 dB	[0 dB]
Attenuation Level (During Mute Function):	-40 dB	<input type="range"/>	0 dB	[-40 dB]

LEFT USER, RIGHT USER and Music Input Levels may be individually adjusted.

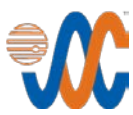
RIGHT USER Music Output Level

0dB = Rated Phone Level

Output Level:	-40 dB	<input type="range"/>	0 dB	[0 dB]
Attenuation Level (During Mute Function):	-40 dB	<input type="range"/>	0 dB	[-40 dB]

Music Input Level

Music Left (Front Panel & Rear Connector):	0.10 Vrms	<input type="range"/>	1.00 Vrms	[0.40 Vrms]
Music Right (Front Panel & Rear Connector):	0.10 Vrms	<input type="range"/>	1.00 Vrms	[0.40 Vrms]



2.5.3.11 ICS Tie Line

JA94-002A 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 Selection

JA94-002A Lighting Voltage

Lighting Voltage

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

The rated input level for the lighting voltage may be selected from +5 Vdc, +14 Vdc or +28Vdc (**Default +28 Vdc**).

2.5.3.13 VOX

JA94-002A VOX

VOX Delay

VOX OFF Delay Time: 0.50 s 2.00 s **[1.00 s]**

The VOX OFF Delay Time can be adjusted from 0.50 to 2.00 sec (**Default 1 sec**).

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 JA94-002A, such as switch labels and voltages. See [section 2.7.1](#).

2.5.4 Other Configuration Features

In the JA94-002A Product Information Window, the model number, serial number and check sum of the JA94-002A Dual Audio Controller 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-JA94) consists of the following:

Quantity	Description	JAC Part #
1	15 Socket Positions, Zinc Plated, D-Subminiature - Crimp Socket Housing	CON-3460-0115
1	37 Socket Positions, Zinc Plated, D-Subminiature - Crimp Socket Housing	CON-3460-0137
1	50 Socket Positions, Zinc Plated, D-Subminiature - Crimp Socket Housing	CON-3460-0150
1	15 Pin Clamshell, Hardware - Plastic D-Sub Hoods	CON-5300-0115
1	37 Pin Clamshell, Hardware - Plastic D-Sub Hoods	CON-5300-0137
1	50 Pin Clamshell, Hardware - Plastic D-Sub Hoods	CON-5300-0150
102	Machined 20 to 24 AWG wire size range, MIL spec, D-Sub - Crimp Socket	CON-3320-2024
3	For Any D-sub Connector, Hardware - Slide Locks - Vertical	CON-5275-0050
2	0.625" Inside Diameter, Hardware - Tag Ring	CON-5500-0625
2	1" Inside Diameter, Heat Shrink Tube	WIR-HTSK-1000

2.6.1 Recommended Crimp tools

Tool Type	Hand crimp tool	Positioner	Insertion/extraction tool
Positronic	9507-0-0-0	9502-5-0-0	4711-2-0-0
Daniels	AFM8	K13-1	91067-2
MIL-SPEC	M22520/2-01	M22520/2-08	M81969/1-02

Note: Application specific install kits are available, please contact factory for details.

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 interconnect and connector maps in Appendix A of this manual are generic drawings based on the standard version of the JA94-002A. 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.

JA94-002A Dual Audio Controller- Front Panel ICS ISO

SECTION 3 – OPERATION

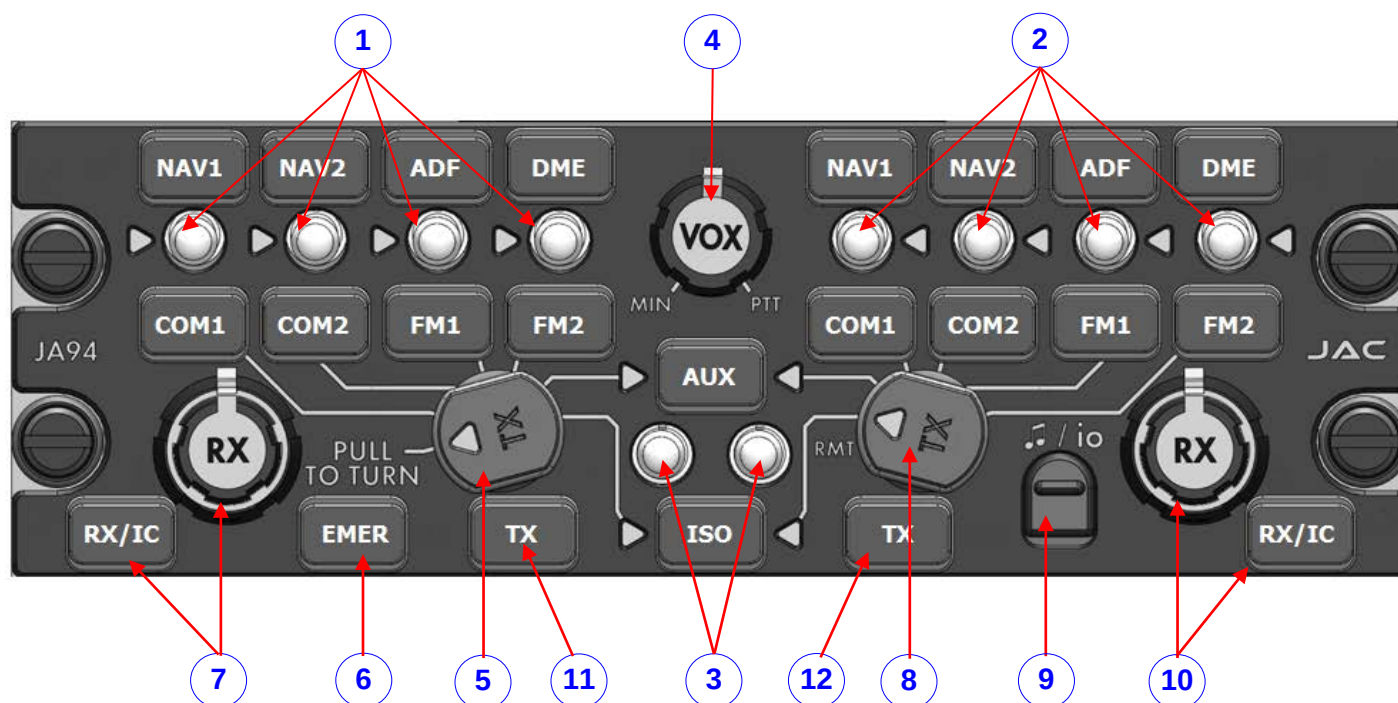
3.1 Introduction

This section contains the operating instructions for the JA94-002A.

3.2 Front Panel Controls



Note: The 21 legends and 2 deadfront 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. Left User Receive select switches, TX select annunciators and associated legends
2. Right User Receive select switches, TX select annunciators and associated legends
3. Left and Right User AUX Receive and Intercom ISO select switches, TX select and ISO annunciators and associated legends
4. VOX threshold control
5. Left User Transmit Selector Switch and Emergency Switch
6. EMER (Emergency) Legend
7. Left User ICS/RX Volume control and legend
8. Right User Transmit Selector Switch
9. Music/configuration input connector cover (🎵 / io)
10. Left User ICS/RX Volume control and legend
11. Left User Transmit Deadfront Annunciator
12. Right User Transmit Deadfront Annunciator



(1) (2) NAV1-COM4 Receive Select Switches and Legends

Each User has four white two-position centre-off toggle switches for the NAV1/COM1 to NAV4/COM4 receivers/transceivers. When a left or right switch is set to the 'up' position, audio from the receiver associated with the legend above the switch is routed to the phones of that side's user (and passengers if configured.) In the 'down' position, audio from the transceiver associated with the legend below the switch is routed to the phones of that side's user (and passengers if configured.)

The backlit legends are interchangeable to allow customization. The default legends are NAV1, NAV2, ADF and DME above the switches, and COM1, COM2, FM1 and FM2 below the switches.



(3) AUX Receive and Intercom ISO Select switches and Legends

The AUX/ISO switches are two white two-position centre-off toggle switches. The left-hand switch is associated with the Left User, and the right-hand switch is for the Right User.

To route audio from the AUX transceiver to the phones of that side's user (and passengers if configured) place the AUX/ISO switch in the AUX position.

To isolate the left or right user from the other user and the passengers, put the appropriate AUX/ISO switch in the ISO position.

To connect the left and right users via ICS and isolate the left and right users from the passenger's ICS, put the left and right AUX/ISO switches in the ISO position. The passenger ICS audio volume goes to maximum when the user who is configured to control the passengers puts the AUX/ISO switch in the ISO position. To keep the left and right user isolated from the ICS when transmitting; configure the mute ICS audio on transmit as selected.

The backlit legends are interchangeable to allow customization. The default legends are AUX above the switches and ISO below the switches.



(4) VOX Threshold Control

The VOX Threshold Control is an unlit rotary knob in the centre top of the panel that is used to set the VOX threshold level of the unit for all users and passengers.

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

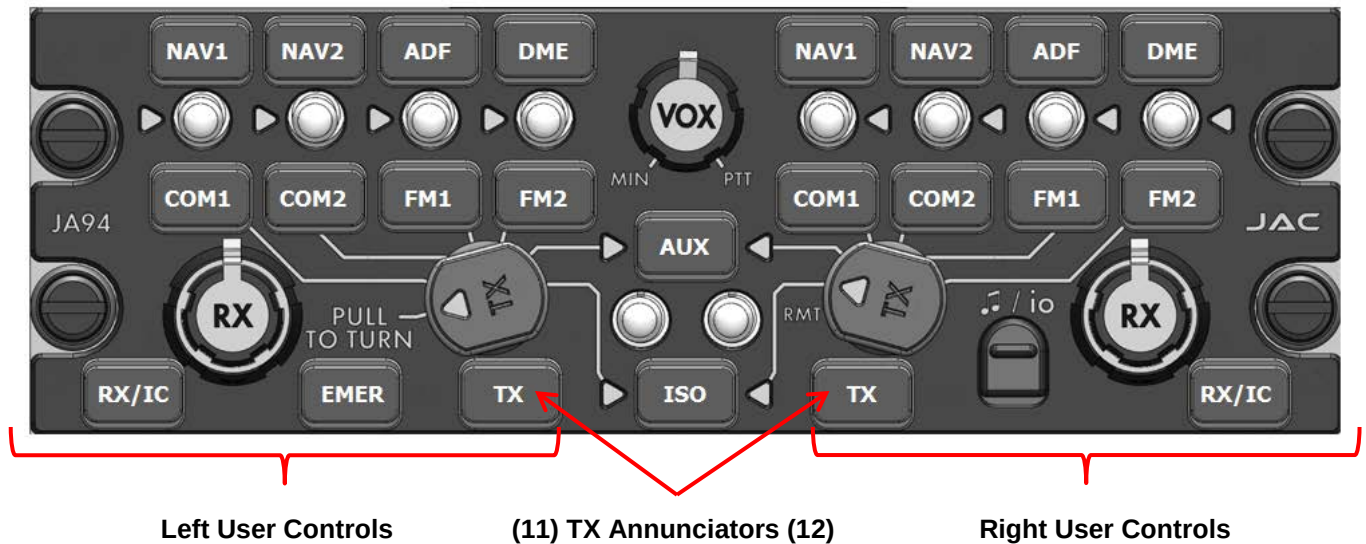
When rotated fully counterclockwise (ccw), the threshold will be at minimum (almost live).

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 may require adjustment for proper operation as ambient noise changes.





(5) (8) Transmit Selector



The **Right User** TX selector is an unlit rotary seven-position knob that is used to select transmission for one of the five transceivers, the ISO function, or the RMT (remote) position (extreme ccw - position 7). Below the knob is a 'TX' deadfront annunciator (12) which will illuminate during transmission. For Remote operation, refer to [section 3.3.10](#).

Each of the transmit selector positions is linked by a white line to the corresponding transceiver switch and legend, and each transceiver has a transmit select annunciator pointing to the associated switch or legend. The appropriate annunciator will light green to show which transceiver is selected for transmit (right user PA in the example above).

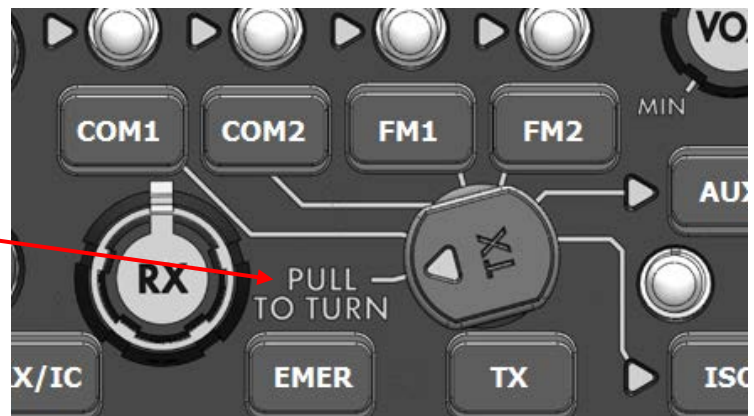


To isolate the left or right user from the other user and the passengers, put the appropriate TX selector in the ISO position. To connect the left and right users via ICS and isolate the left and right users from the passenger's ICS, put the left and right TX Selector switches in the ISO position. When the user to whom the passengers are assigned puts the AUX/ISO switch in the ISO position, the passenger ICS audio volume goes to maximum. To keep the left and right user isolated from the ICS when transmitting, configure the mute ICS audio on transmit as selected.

The **Left User** TX selector is an unlit rotary seven-position knob that operates in the same manner as the Right User selector, except that position 7, marked PULL TO TURN (extreme ccw) is used to select Emergency (EMER) mode.

Below the knob is a 'TX' deadfront annunciator (11) which will illuminate during transmission.

For full information on Emergency mode see [section 3.4](#).



Note: To prevent accidental selection of Emergency mode, the knob must be pulled towards the user before it can be rotated to the EMER position.



(6) EMER legend



The backlit EMER (Emergency) legend is associated with the Left User TX control only. For full information on Emergency mode see section 3.4.

(7) (10) RX/ICS Volume control and legend

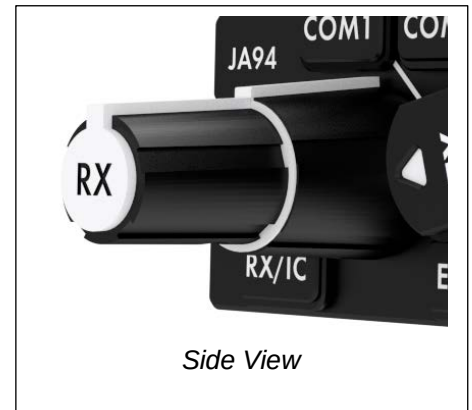


These are two unlit dual rotary knobs that adjust the receive (RX) volume ((the smaller, top knob marked RX) and the ICS volume (the larger, bottom knob).

Each user can adjust the volumes individually. Rotating the knobs clockwise (cw) will increase the volume, and counterclockwise (ccw) will reduce it

Individual radio volume controls should be set to a nominal level, and then adjusted for changing flight conditions using this control.

Legend



(9) Music/Configuration Connector cover (🎵/io)

This cover is located between the Right User RX/ICS and TX controls. It protects a music input port compatible with most music players, and 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: 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.

3.3 Normal Operation Mode

The JA94-002A is in Normal mode unless EMER mode has been selected via the Left User TX control, or if the power input is off.



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

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 JA94-002A receives an incoming transmission on a transceiver or receiver that has been selected, either by the white transceiver receive switches (1) (2) or (3) or a transmit selector (5) or (8), the incoming audio will be directed to the user's phones.

The audio level of any incoming transmission will depend upon the level selected by the user's front panel RX volume control – (7) or (10). It will be muted if the unit is transmitting and muting of receive audio during transmit is enabled.

ProCS™ can be configured to route no receive audio, Right User receive audio, or Left User receive audio to passengers.

3.3.3 Transmitting (Transmit Operation)

To select a transceiver for transmit, rotate the Transmit Select Switch (5) or (8) until it aligns with the line leading to the Transceiver Select switch legend (1) (2) or (3) - default legends COM1, COM2, FM1, FM2 or AUX. The corresponding Transmit Select annunciator will illuminate green.

The mic audio, from all users that have TX PTT active, is summed and routed to the selected transceiver, the PTT for the selected transceiver is activated, and the deadfront Transmit Annunciator will illuminate 'TX'. Sidetone audio is routed to the user's phones, and music (and RX and/or ICS audio if selected by ProCS™) is muted for the duration of the transmission.

Passengers 1, 2 and 6 (designated at installation) will transmit on the radio selected by either the Right User or Left User, as configured by ProCS™.

3.3.3.1 Transmit Timeout Operation



Note: It is important to be aware of the Transmit Timeout configuration of the aircraft.

The ProCS™ configuration program allows the selection of Transmit Timeout. If selected, transmissions will timeout after 90 seconds.

3.3.3.2 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 FM2 transmitting. A second momentary activation of the TX PTT, or moving the Transmit Selector away from FM2, will stop FM2 from transmitting.

3.3.4 VOX Operation

A user's MIC audio is routed to the ICS when the MIC audio level exceeds the VOX threshold (3).

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.

3.3.5 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 as configured by ProCS™.

The ICS audio level at the phones is controlled by the ICS volume control (7) or (10).



Note: If **Legacy Passenger ICS Mode** has been selected via ProCS™ for compatibility with a previously installed unit, the passenger microphones are always open when the VOX control is set to PTT and should be controlled by in-line PTT drop-cords.



3.3.6 Direct Audio Operation

DIRECT AUDIO 1 and, when configured by ProCS™, the DIRECT AUDIO 2 & 3, are routed to the LEFT USER Phones.

DIRECT AUDIO 2 and, when configured by ProCS™, the DIRECT AUDIO 1 & 3 are routed to the RIGHT USER Phones.

3.3.7 Music Operation

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

3.3.8 Rear Hand Mic Operation

When configured by ProCS™, the Rear Hand MIC audio and PTT signal are connected to the Transceiver as selected by the left or right TX Select switch. The Rear Hand MIC is assigned to left or right user's controls by ProCS™ in the Passenger and Rear Hand MIC settings.

3.3.9 Cockpit Voice Recorder (CVR) Operation

The RIGHT CVR output consists of the sum of the RIGHT USER MIC input (independent from VOX control setting) and the RIGHT USER PHONE output, and the LEFT CVR output is the sum of the LEFT USER MIC input (independent from VOX control setting) and the LEFT USER PHONE output.

3.3.10 Remote RMT Operation

A remote transmit selector may be linked to the JA94-002A to allow remote selection for transmission via the right user controls. (This remote selector could be on the right user's cyclic control.) When a remote transmit selector is installed and the RIGHT USER TX SELECT switch is in the RMT position, then the RIGHT USER will transmit on the radio or radios as selected by the remote transmit selector.



Note: It is important to be aware of the Remote Operation configuration of the aircraft.



3.4 Emergency Operation Mode

The JA94-002A operates in Emergency Mode automatically (**Auto Emergency Mode**) when the power to the unit is off, or when the left Transmit Selector Switch is in the EMER position (**Selected Emergency Mode**).

3.4.1 Left User Emergency Mode

In emergency mode, the Left User phone and MIC signals are connected by mechanical relay contacts to the COM2 transceiver and the NAV2 receiver. Left User PTT is routed directly to COM2 PTT and the LEFT USER MIC is routed to the COM 2 MIC. The Left User is disconnected from the ICS.

The sum of COM 2 RX, NAV 2 RX and Direct Audio 1 (and Direct Audio 2 if configured by ProCS™) is routed to the LEFT USER PHN output. The LEFT USERPHN is routed to the LEFT CVR output.

3.4.2 Right User Emergency Mode

In emergency mode, the Right User phone and MIC signals are connected by mechanical relay contacts to the COM1 transceiver and the NAV1 receiver. Right User TX PTT is routed directly to COM1 PTT, and the RIGHT USER MIC is routed to the COM 1 MIC. The Right User is disconnected from the ICS.

The sum of COM 1 RX, NAV 1 RX and Direct Audio 2 (and Direct Audio 1 if configured by ProCS™) is routed to the RIGHT USER PHN output. The RIGHT USERPHN is routed to the RIGHT CVR output.

3.4.3 Auto Emergency Mode

The unit will enter emergency mode automatically if power to the unit is off.

Other than Emergency operation described above, no functions of the JA94-002A will operate when power is lost. Legends and annunciators will not be illuminated.

3.4.4 Selected Emergency Mode

If the JA94-002A retains power, the unit can be placed into emergency mode by rotating the Left User TX control to the EMER position (pull to turn).

Emergency mode conditions will apply (see above) but all other functions of the JA94-002A 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 JA94-002A Dual 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.

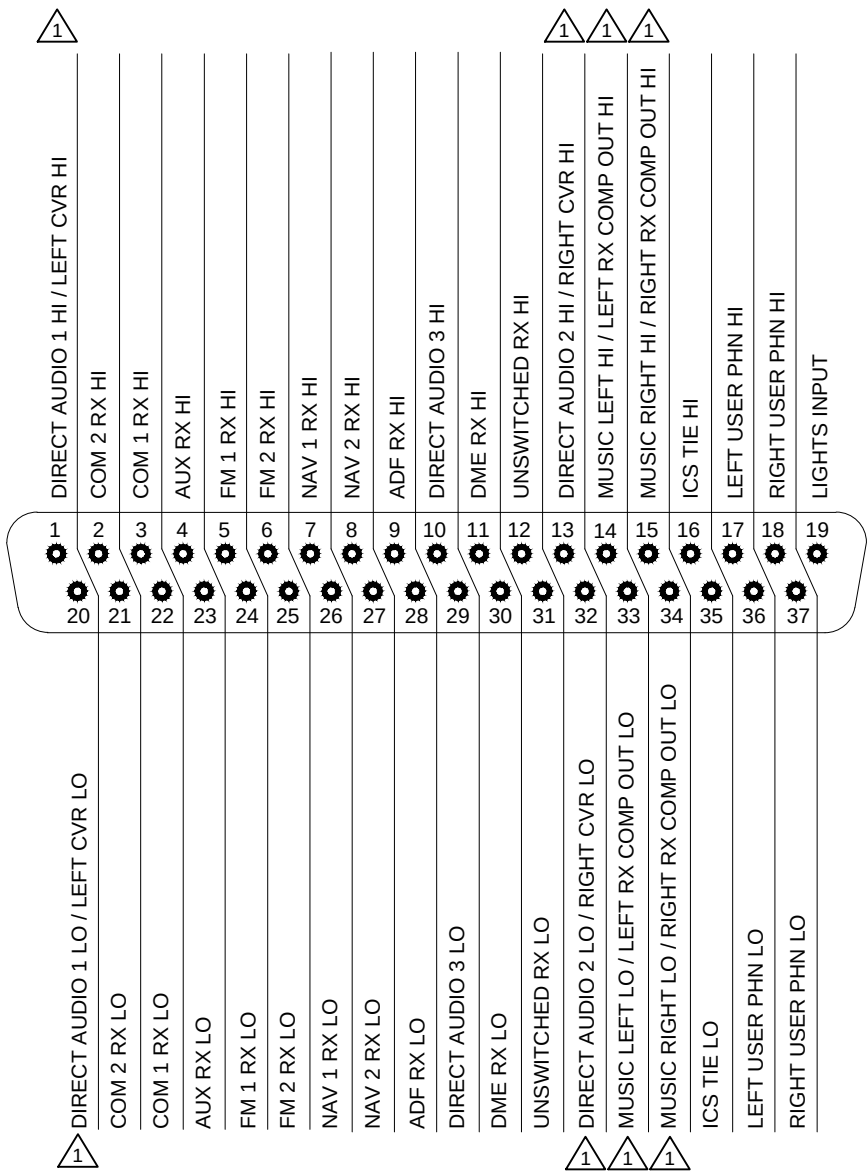
A2 **Installation Drawings**

DOCUMENT	Rev
JA94-002A Connector Map	A
JA94-002A Interconnect	A
JA94-002A Mechanical Installation	B
JA94-002A Equipment Block Diagram	A

Reference Documents	
TOL-CUST-EXTR Legend Replacement	A

RECEIVE CONNECTOR

P1
37 PIN FEMALE DMIN
MATING CONNECTOR



NOTE:

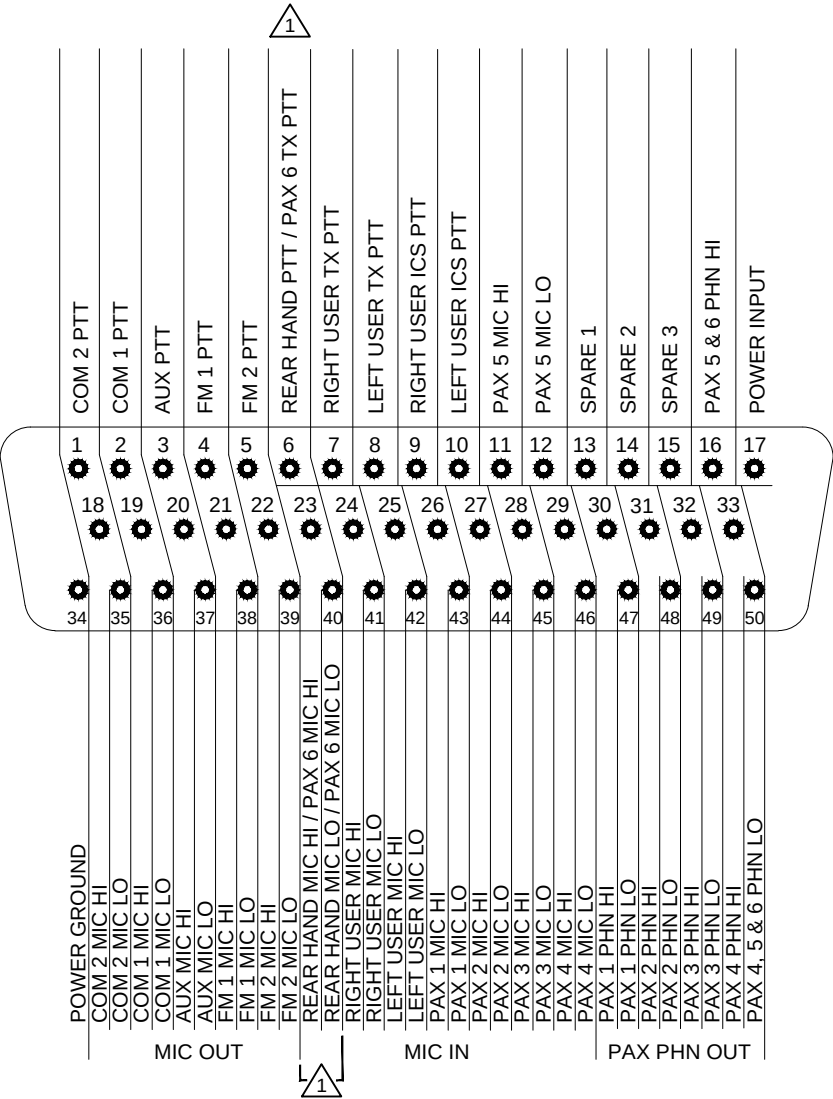
VIEW IS FROM REAR OF MATING CONNECTOR

1 CONFIGURABLE CONTACT

PREPARED	TAT	 JUPITER AVIONICS CORPORATION		
CHECKED				
APPROVED		TITLE Dual Audio Controller - Front Panel ICS ISO P1 Connector Map		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA94-002A	SHEET 1/3
		DOC NO. JA94-002A Connector Map Rev A.dwg		

TRANSMIT CONNECTOR

P2
50 PIN FEMALE DMIN
MATING CONNECTOR

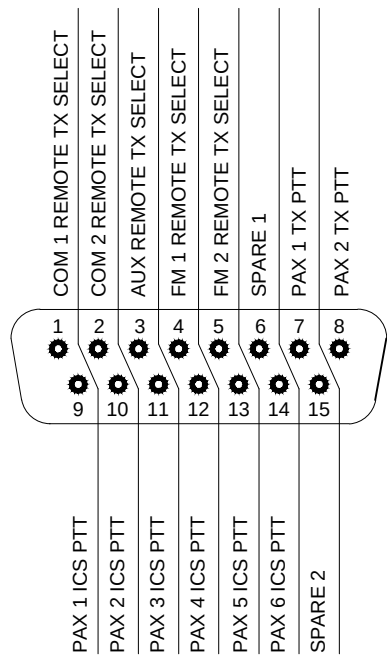


VIEW IS FROM REAR OF MATING CONNECTOR

PREPARED	TAT	 JUPITER AVIONICS CORPORATION		
CHECKED				
APPROVED		TITLE Dual Audio Controller - Front Panel ICS ISO P2 Connector Map		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA94-002A	SHEET 2/3
		DOC NO. JA94-002A Connector Map Rev A.dwg		

REMOTE TX SELECTOR CONNECTOR

P3
15 PIN FEMALE DMIN
MATING CONNECTOR



VIEW IS FROM REAR OF MATING CONNECTOR

FRONT PANEL MUSIC/CONFIGURATION CONNECTOR

P4	ACCEPTS THE FOLLOWING PLUG FORMATS	MATING PLUG NAMES	JA94-002A 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 JA94-002A CONFIG DATA FROM JA94-002A GROUND MODE SELECT
MP3 STEREO PLAYER 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
IPHONE 4 POLE MALE 3.5MM STEREO		TIP: LEFT MUSIC 1ST RING: RIGHT MUSIC 2ND RING: GROUND 3RD RING: MICROPHONE	FRONT PANEL MUSIC LEFT FRONT PANEL MUSIC RIGHT GROUND MODE SELECT

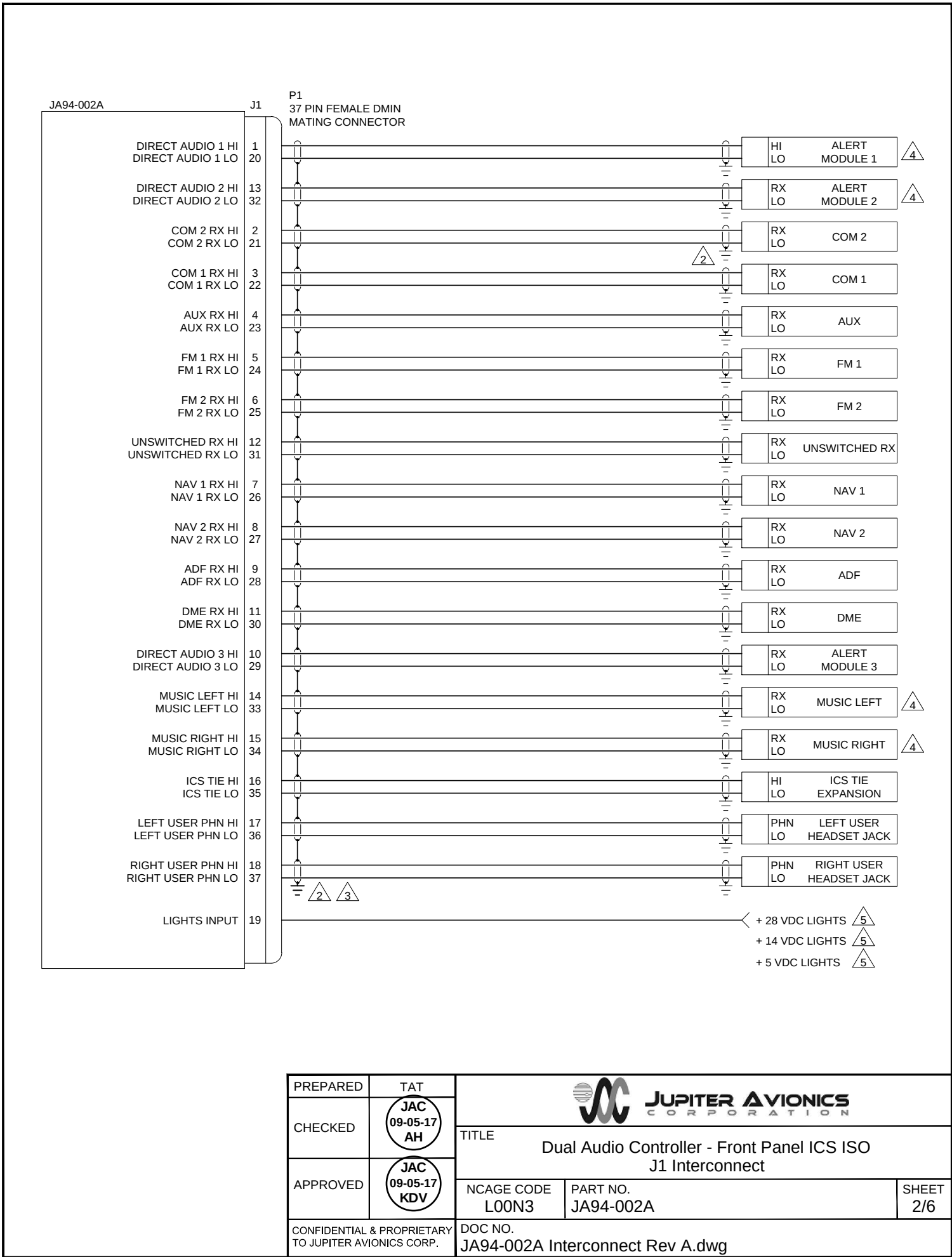
PREPARED	TAT	 JUPITER AVIONICS CORPORATION		
CHECKED	JAC 09-05-17 AH			
APPROVED	JAC 09-05-17 KDV	TITLE Dual Audio Controller - Front Panel ICS ISO P3, P4 Connector Map		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA94-002A	SHEET 3/3
		DOC NO. JA94-002A Connector Map Rev A.dwg		

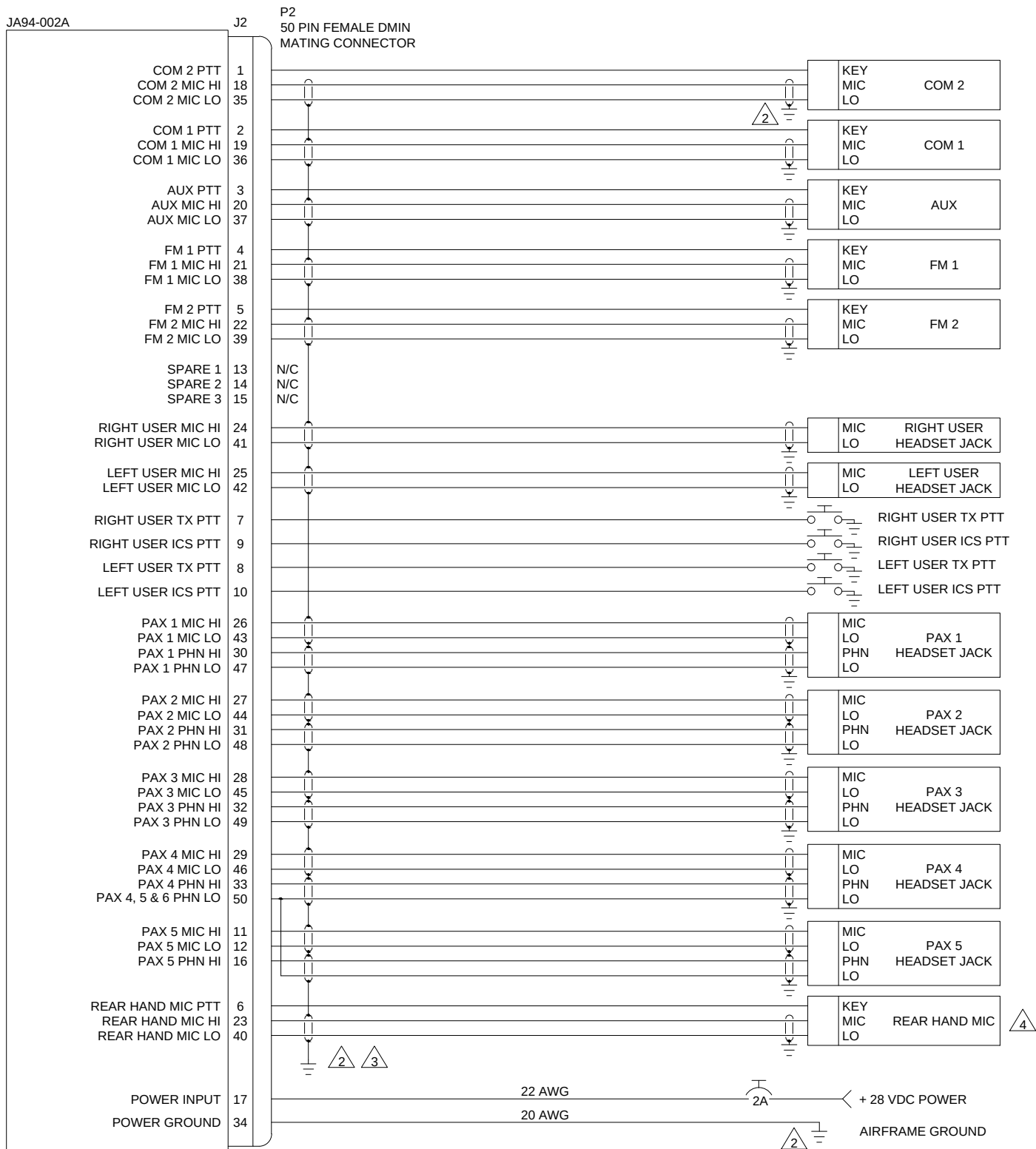
JA94-002A INTERCONNECT WIRING NOTES

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 (0.91 M).
3. CABLE SHIELDS AT THE JA94-002A 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.

PREPARED	TAT	 JUPITER AVIONICS CORPORATION		
CHECKED				
APPROVED		TITLE Dual Audio Controller - Front Panel ICS ISO Interconnect Notes		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA94-002A	SHEET 1/6
		DOC NO. JA94-002A Interconnect Rev A.dwg		





PREPARED	TAT			
CHECKED				
APPROVED		TITLE Dual Audio Controller - Front Panel ICS ISO J2 Interconnect		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA94-002A	SHEET 3/6
		DOC NO. JA94-002A Interconnect Rev A.dwg		

JA94-002A

J3

P3
15 PIN FEMALE DMIN
MATING CONNECTOR

PARKED POSITION

COM 1 REMOTE TX SELECT

1

COM 2 REMOTE TX SELECT

2

AUX REMOTE TX SELECT

3

FM 1 REMOTE TX SELECT

4

FM 2 REMOTE TX SELECT

5

SPARE 1

6

N/C

PAX 1 TX PTT

7

PAX 2 TX PTT

8

PAX 1 ICS PTT

9

PAX 2 ICS PTT

10

PAX 3 ICS PTT

11

PAX 4 ICS PTT

12

PAX 5 ICS PTT

13

PAX 6 ICS PTT

14

SPARE 2

15

N/C

REMOTE TX
SELECTOR

2

PAX 1 TX PTT

PAX 2 TX PTT

PAX 1 ICS PTT

PAX 2 ICS PTT

PAX 3 ICS PTT

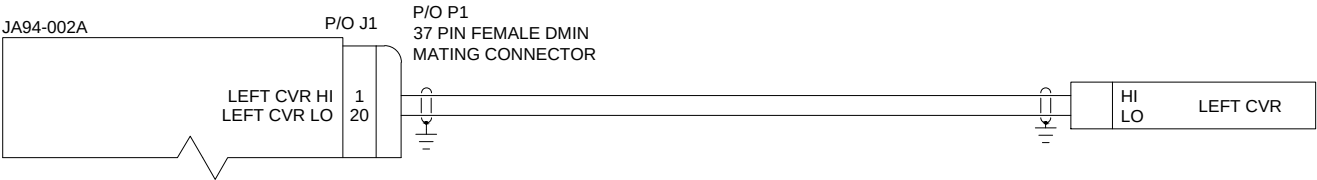
PAX 4 ICS PTT

PAX 5 ICS PTT

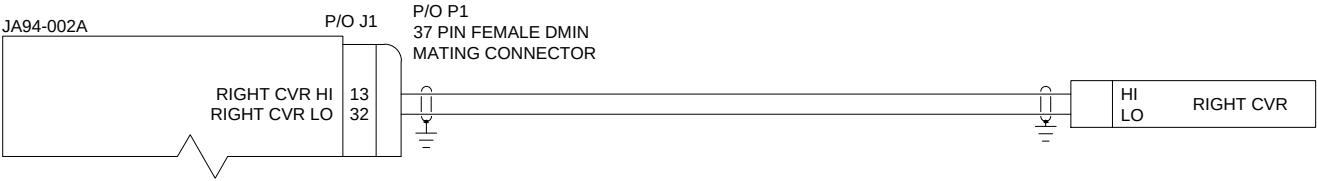
PAX 6 ICS PTT

PREPARED	TAT	 JUPITER AVIONICS CORPORATION		
CHECKED	JAC 09-05-17 AH			
APPROVED	JAC 09-05-17 KDV	NCAGE CODE L00N3	PART NO. JA94-002A	SHEET 4/6
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO. JA94-002A Interconnect Rev A.dwg		

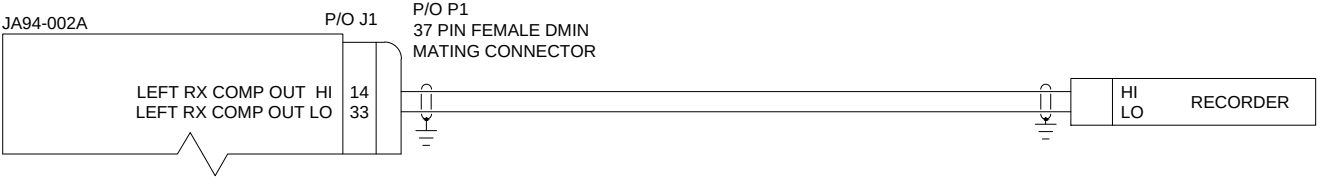
OPTION: LEFT CVR



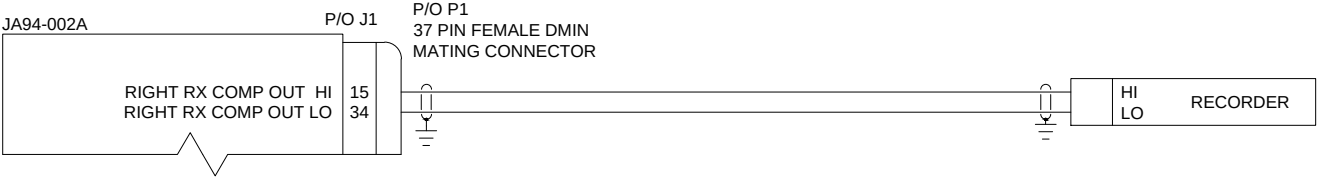
OPTION: RIGHT CVR



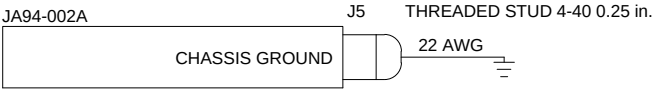
OPTION: LEFT RX COMPOSITE OUT



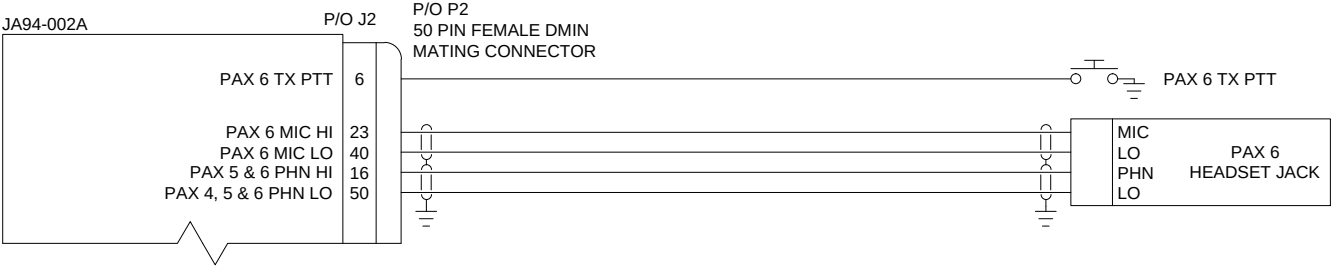
OPTION: RIGHT RX COMPOSITE OUT



OPTION: CHASSIS GROUND

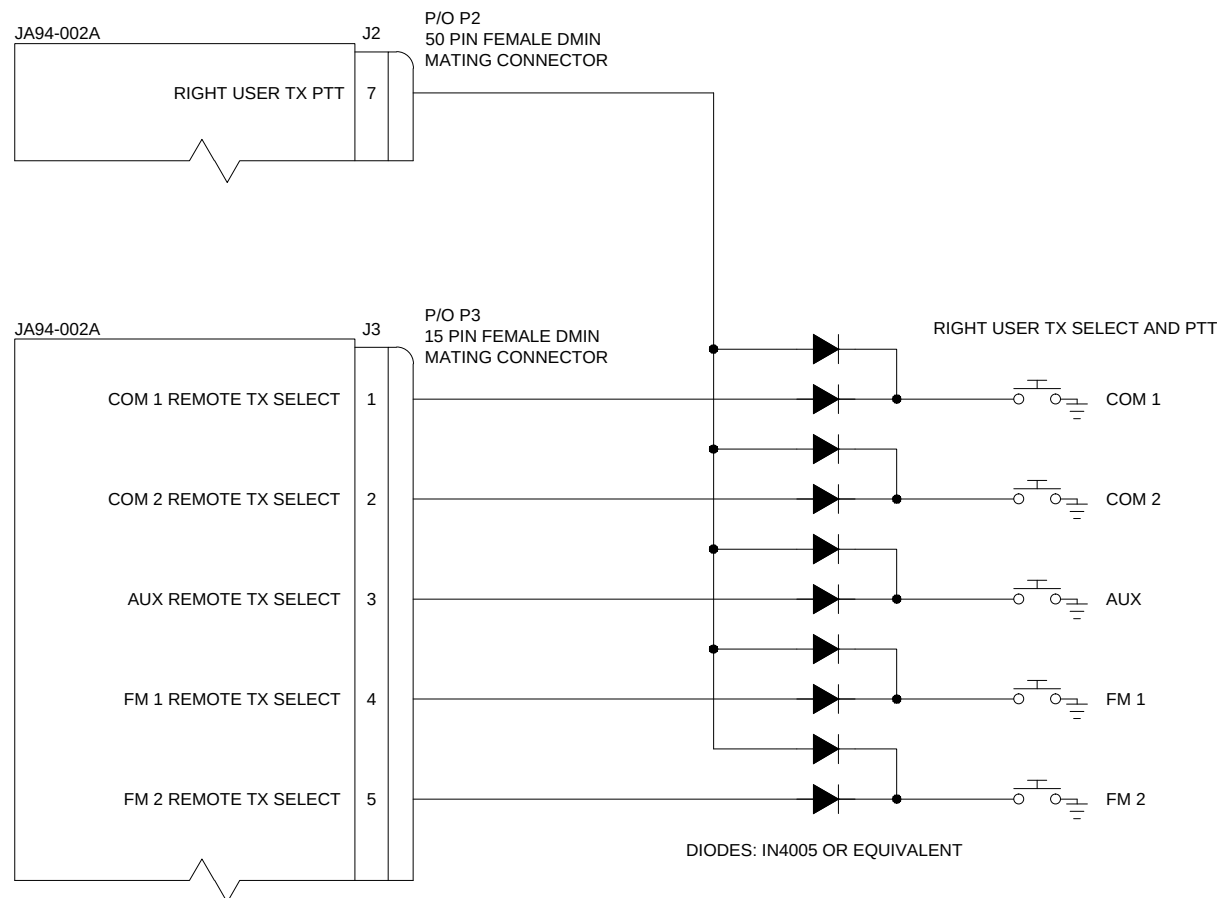


OPTION: PAX 6 HEADSET

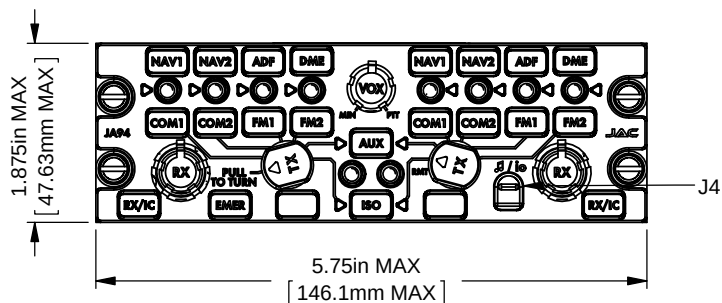
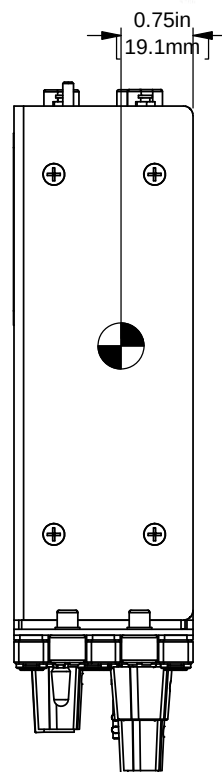
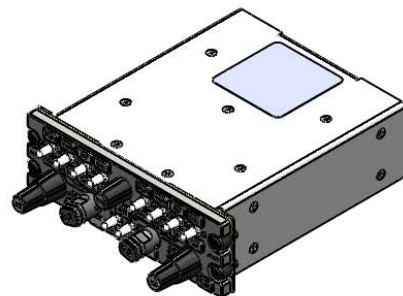
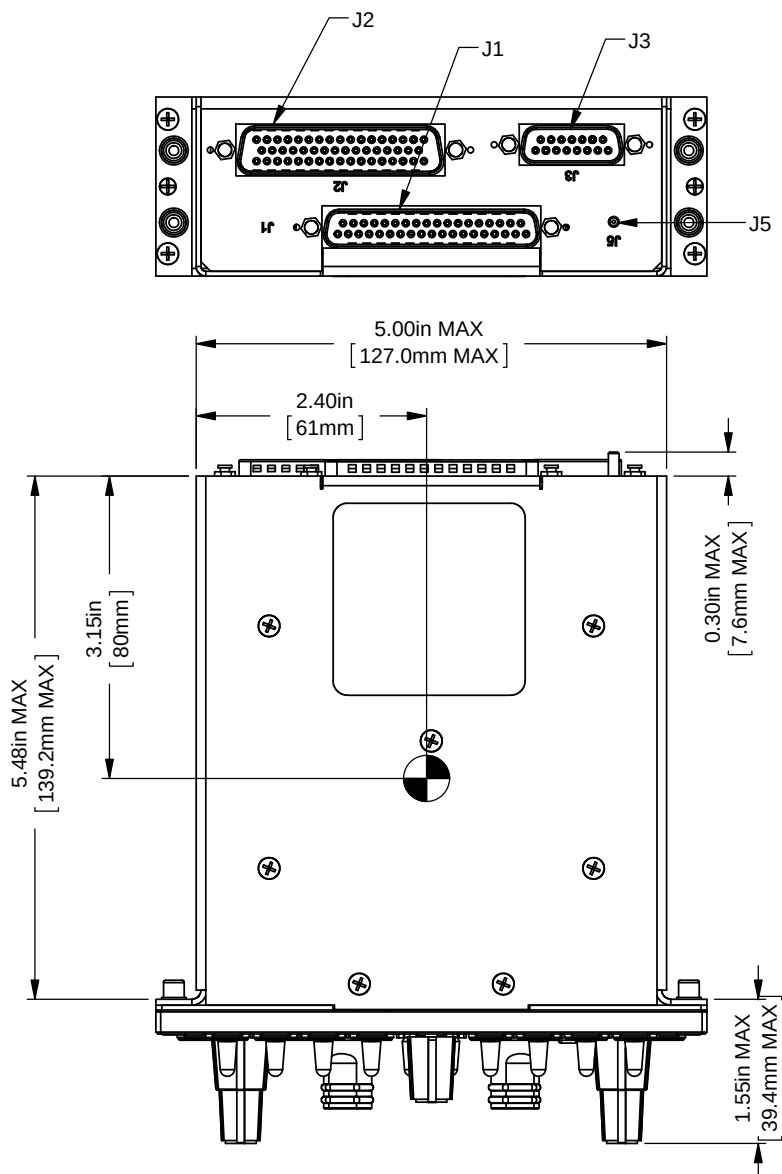


PREPARED	TAT			
CHECKED	JAC 09-05-17 AH			
APPROVED	JAC 09-05-17 KDV	TITLE Dual Audio Controller - Front Panel ICS ISO Interconnect Options		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA94-002A	SHEET 5/6
		DOC NO. JA94-002A Interconnect Rev A.dwg		

OPTION: MULTIPLE DISCRETE TX SELECT AND PTT



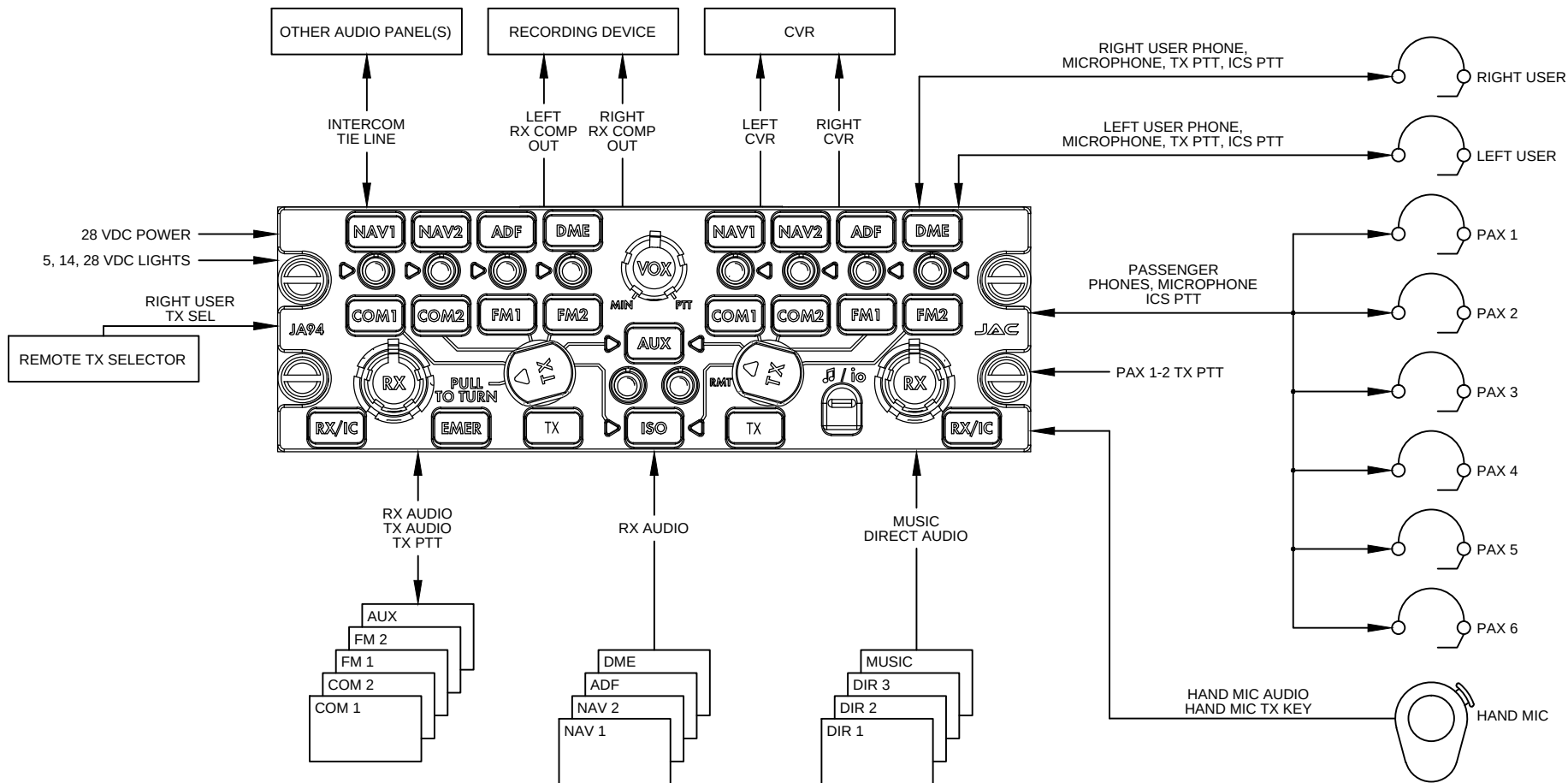
PREPARED	TAT			
CHECKED	JAC 09-05-17 AH			
APPROVED	JAC 09-05-17 KDV	TITLE Dual Audio Controller - Front Panel ICS ISO Interconnect Options		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA94-002A	SHEET 6/6
		DOC NO. JA94-002A Interconnect Rev A.dwg		



 CENTER OF GRAVITY
±0.03in [0.8mm]

WEIGHT: 1.99 lbs [0.91 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 	PREPARED	TAT	 JUPITER AVIONICS CORPORATION		
	CHECKED	 04-25-18 AH			
	APPROVED	 04-25-18 KDV	TITLE		
	CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP. DRAWING NOT TO SCALE		NCAGE CODE L00N3	PART NO. JA94-002A	SHEET 1/1
MATERIAL: N/A	DOC. NO. JA94-002A Mechanical Installation Rev B.SLDDRW				
FINISH: N/A					



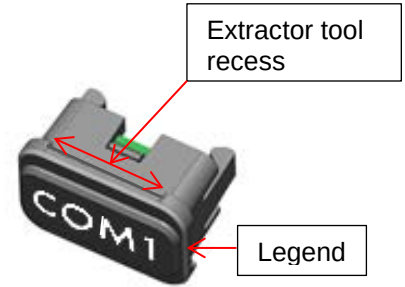
PREPARED	TAT			
CHECKED	JAC 09-22-17 AH			
APPROVED	JAC 09-22-17 KDV	TITLE Dual Audio Controller - Front Panel ICS ISO Equipment Block Diagram		
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		NCAGE CODE L00N3	PART NO. JA94-002A	SHEET 1/1
		DOC NO. JA94-002A Equipment Block Diagram Rev A.dwg		



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.

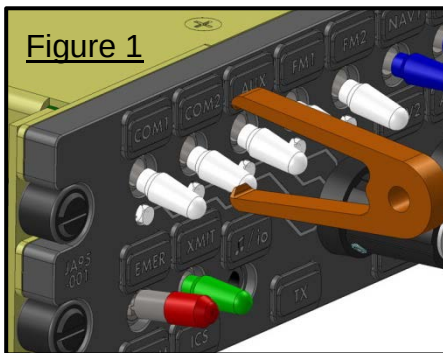


Figure 1

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).

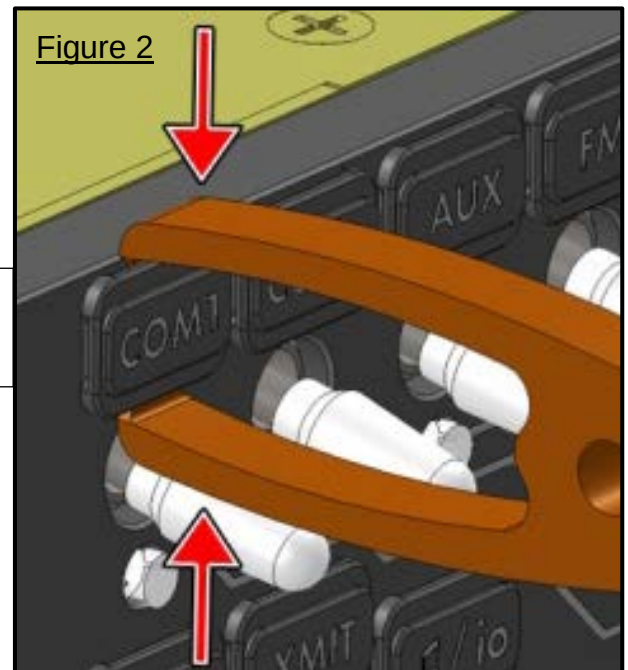


Figure 2

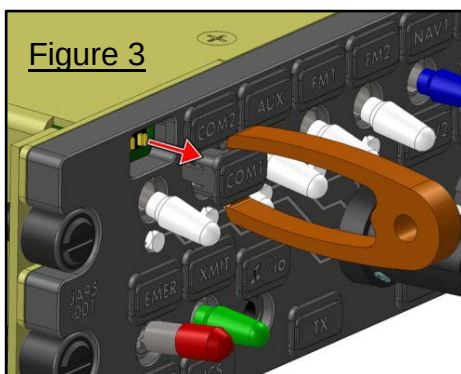


Figure 3

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 - Installation Documents



B1 **Airworthiness Approval**

Airworthiness approval of the JA94-002A 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 JA94-002A Dual 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 JA94-002A Dual Audio Controller in [aircraft location].

The JA94-002A is approved to CAN-TSO-C139. The JA94-002A meets RTCA DO-160G environmental qualifications for this installation. See Section 1 of the JA94-002A Installation Manual.

Installed in accordance with the JA94-002A Installation Manual, Revision [], and AC 43.13-2, Chapters 2, and 3.

The JA94-002A interfaces with existing aircraft systems per the Installation Manual instructions.

The JA94-002A Installation Manual provides detailed installation instructions and wiring diagrams (Section 2, and Appendices A and B).

Power is supplied to the JA94-002A through a 2 Amp circuit breaker.

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 JA94-002A Dual Audio Controller is "on condition" only. Refer to the JA94-002A Maintenance Manual. Periodic maintenance of the JA94-002A is not required.

The following sample Instructions for Continued Airworthiness (ICA) provides assistance in preparing ICA for the Jupiter Avionics JA94-002A 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 JA94-002A Dual 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 JA94-002A installed in an [aircraft make and model]. **Applicability:**

Applies to a Jupiter Avionics JA94-002A installed in an [aircraft make and model]. **Definitions/**

Abbreviations: None, N/A.

Precautions: None, N/A.

Units of Measurement: None, N/A.

Referenced Publications: JA94-002A Installation and Operating Manual

JA94-002A Maintenance Manual

JA94-002A 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 JA94-002A Dual 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 JA94-002A Operating Manual.

4. Servicing Information

N/A

5. Maintenance Instructions

Maintenance of the JA94-002A is 'on condition' only. Periodic maintenance is not required. Refer to the JA94-002A Maintenance Manual.

6. Troubleshooting Information

Refer to the JA94-002A Maintenance Manual.

7. Removal and Replacement Information

Refer to Section 2 of this manual - the JA94-002A 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 JA94-002A 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

JA94-002A 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 JA94-002A 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: 
----------------------	---	--

Nomenclature	Dual Audio Controller - Front Panel ICS ISO
Type/Model/ Part No.:	JA94-002A
TSO No.:	CAN-TSO-C139
Manufacturer's Build Configuration:	JA94-002A Build Configuration Rev B
Manufacturer's Test Report:	JA94-001A Test Report (Qualification - Final) Rev B JA94-002A CAN-TSO Design Change Assessment (BC Rev B) Rev A
Manufacturer's Specification and/or Other Applicable Specification:	JA94-002A Derivative Declaration of Design and Performance (BC Rev B) Rev A
Manufacturer:	Jupiter Avionics Corporation
Address:	1959 Kirschner Road, Kelowna, BC, Canada, V1Y 4N7
Revision & Change No of DO-160:	Rev. G dated December 8, 2010
Dates Tested:	2017 June 01 to Sep 11

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	7.0	Equipment tested to Category B
Operational Shock	7.2.1	Equipment tested to Category B, (6 g for 11 ms)
Crash Safety (impulse)	7.3.1	Equipment tested to Category B, (20 g for 11 ms)
Crash Safety (sustained)	7.3.3	Equipment tested to Category B, (20 g for 3 sec)
Vibration ¹	8.0	Equipment tested to Categories: [(SBM)(U2FF1)]
Fixed Wing - Sine	8.5.1	Equipment tested to Category SM
Fixed Wing - Random	8.5.2	Equipment tested to Category SB
Helicopter - Random, unknown	8.8.3	Equipment tested to Category 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 (≤ 0.3 m)
Power Input	16.0	Equipment tested to Category: Z(XX)
DC Equipment		Equipment tested to Category Z (+28 Vdc equipment),
DC Current Ripple		X, no test to be performed
DC Inrush		X, no test to be performed
Voltage Spike	17.0	Equipment tested to Category A, (600Vp, 10 us)
Audio Frequency Susceptibility	18.0	Equipment tested to Category Z, (+28 Vdc equipment)
Induced Signal Susceptibility	19.0	Equipment tested to Category [ZC]
Magnetic Fields into Equipment	19.3.1	20 A at 400 Hz
Magnetic Fields into Interconnect	19.3.3	30 A·m at 400 Hz
Electric Fields into Interconnect	19.3.4	1800 V·m from 380 to 420 Hz
Voltage Spikes into Interconnect	19.3.5	3.0 m
Radio Frequency Susceptibility ²	20.0	Equipment tested to Category [RR]
Radiated		Category R, (20 V/m CW&SW) and (150 V/m PM)
Conducted		Category R, (30 mA)
Radio Frequency Emission ²	21.0	Equipment tested to Category H



CONDITIONS	SECTION	DESCRIPTION OF TESTS CONDUCTED
Lightning Induced Transient Susceptibility ² Pin Injection Cable Bundle Single and Multiple Stroke Cable Bundle Multiple Burst	22.0	Equipment tested to Category [A3J3L3] Equipment tested to Waveform Set A, Test Level 3 Equipment tested to Waveform Set J, Test Level 3 Equipment tested to Waveform Set L, Test Level 3
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 C.
Other Tests	N/A	N/A

REMARKS

- ¹ During exposure to vibration test conditions all critical resonances changed frequency greater than 1.5%:

Orientation	Initial Freq. [Hz]	Final Freq. [Hz]
Longitudinal Axis	312	318
Vertical Axis	765	752
	1165	1144

- ² Testing performed at CKC Laboratories in Bothell, WA, USA.
Reference report: *JA94-001A Test Report (CKC Labs - DO-160G Section 20, 21, 22 - 20170911) Rev A*
- ³ A similarity analysis between JA94-002A Rev B and JA94-001A Rev B is detailed in the Jupiter Avionics Corp. document: *JA94-002A CAN-TSO Design Change Assessment (BC Rev B) Rev A*