JA97-002

Audio Controller with RX Volume Controls

Installation and Operating Manual

Rev A

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IMPORTANT:

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To confirm the current revision status of this manual, visit the JAC website:

www.jupiteravionics.com

RECORD OF REVISIONS			
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SECTION 1 - DESCRIPTION

1.1 System Overview

The JA97-002 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 JA97-002 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 an emergency operating mode that connects the primary user (pilot) to COM1, NAV1 and Direct Audio 1, or to COM2, NAV2 and Direct Audio 2 sources (selectable via ProCS™).

The JA97-002 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 (♫/io) without the necessity of removing the unit from the panel. To facilitate future customizations and certification, no software or complex electronic devices are used in the JA97-002 design.

1.2 Features Overview

The JA97-002 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™ (**Pro**duct **C**onfiguration **S**oftware) to write configuration commands via the JA99-001 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 JA97-002 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 each of 2 toggle switches and 3 on the other).

The JA97-002 features individual VOX gating, and supports two Direct Audio inputs to provide audio at a fixed level to the users.

The JA97-002 has a CVR output and a two channel Alert Generator. Each alert has a separate key input.

The JA97-002 allows transmit access for three crew members (Pilot, Co-pilot, and Passenger 1).

A Music / Configuration connector is provided on the faceplate of the JA97-002 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 JA97-002 has two modes of operation: Normal Mode and Emergency Mode.

The JA97-002 has Emergency Mode radio selection.

1.3 Inputs and Outputs

Refer to the JA97-002 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 JA97	1	Data signal
DIRECT AUDIO	2	Audio signal
FRONT PANEL MUSIC	2	Audio signal
LIGHTS INPUT	1	Analog control signal
MIC	7	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 AUDIO	11	Audio signal

1.3.2 Outputs

Name	Qty	Type
CVR	1	Audio signal
CONFIG DATA FROM JA97	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
PTT	6	Active low discrete (PA PTT feature selected from ProCS)
RX COMP OUT	1	Audio signal (Feature selected from 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
Secondary nominal voltage	14 Vdc
Maximum voltage	32.2 Vdc
Minimum voltage	10.2 Vdc
Emergency voltage	9.0 Vdc
Input current at 28 Vdc	≤ 0.7 A
Input current at 14 Vdc	≤ 1.4 A

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%
CONFIG AUDIO input level	400 mVrms ±10%

Rated Output Level

Phone rated output	7.75 Vrms±10%
Pilot Phone rated output,	
in emergency mode or with power input ≤6 Vdc	2.20 Vrms±10%
Phone rated output power,	
with MUSIC input	3.88 Vrms±10%
Microphone rated output	250 mVrms±10%
CVR rated output	500 mVrms±10%
CVR rated output with input as MUSIC	250 mVrms±10%
CVR rated output with input as PILOT MIC	1.00 Vrms±10%
CVR rated output, in emergency mode,	500 mVrms ±10%
Receive Composite rated output	2.5 Vrms ±10%
Intercom Tie Line type 1 rated output	340 mVrms ±10%
Intercom Tie Line type 2 rated output	1.2 Vrms ±10%

Audio Frequency Response

Audio output audio frequency response	≤3dB from 300 to 6000 Hz
Alert audio output audio frequency response	≤3dB from 300 to 3000 Hz

Distortion Characteristics

Audio output distortion at rated power	≤10%
Audio output distortion at 10% of rated power	≤3%

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 Ω ±10%
Intercom Tie Line type 2 rated load	2000 Ω ±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 ±3dB
ICS Audio control variation	42 ±3dB

Input to output Crosstalk and Bleed-through Level

Input to Output crosstalk	≤55 dB

Input to Input Crosstalk Level

Input to Input crosstalk	≤60 dB

Audio Noise Level without Signal

Noise level below the rated output	≥60 dB

Listening Test   Loud and Clear

1.4.1.2   Audio Performance, Other

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 bias voltage	11 Vdc ±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	40 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 ± 1.0 seconds
VOX Threshold level range relative to rated MIC input	-30 to +12 dB
VOX Delay Time range	0.5 to 2.0 seconds
Transmit Timer duration	90 ± 30 seconds

1.4.1.3   Discrete Signals

Active low control input, active signal level	≤ +3 Vdc
Active low control input, inactive signal level	≥ +10 Vdc
Active low control input, current	≤ 10 mAdc
Active low control output, active output	≤ +2 Vdc
Active low control output, active, current	≤ 1 Adc
ALERT ENABLE signal active signal level	≥ +9 Vdc
ALERT ENABLE signal, when active, sinks	≤ 10 mAdc
ALERT ENABLE signal inactive signal level	≤ +3 Vdc

1.4.1.4 <u>Lights Input</u>

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

1.4.2 <u>Mechanical Specifications</u>

Height		2.625 in [66.7 mm] max
Behind panel depth		5.48 in [139 mm] max
Faceplate width		5.75 in [146 mm] max
Behind panel width		4.92 in [125 mm] max
Weight		2.23 lbs. [1.01 kg] max
Material		brushed aluminum with conversion coating
Connectors (4):	J1	One 37-pin D-Sub male
	J2	One 50-pin D-Sub male
	J3	One 4 pole 3.5mm stereo jacks
	J4	One ground stud, 4-40
Mounting		4 Dzus fasteners
Bonding		≤ 2.5 mΩ
Installation kit part number		INST-JA97
Faceplate		white legends on black
Faceplate legend colour, luminance		white, 1 ± 0.5 fL

1.4.3 <u>Environmental Specifications</u>

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 <u>Flammability of Materials</u>

The JA97-002 complies with the requirements of RTCA/DO-160G Sec 26.3.3 "Flammability", through equivalent flammability testing of materials and the Small Parts Exemption.

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 JA97-002 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/warranty

2.3.1 Warranty

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

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

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

2.4 Installation Procedures

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

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

2.4.1 Installation Limitations

Those installing the JA97-002, on or in a specific type or class of aircraft, must determine that the aircraft installation conditions are within standards. The JA97-002 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 JA97-002 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 JA97-002 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 **16** for alert power.
c) Check P2 pin **17** for +28 Vdc or +14 Vdc relative to ground.
d) Check P2 pin **34** for continuity to ground (less than 0.5 Ω).
e) Check P2 pins **6 thru 12** for continuity to ground (less than 0.5 Ω) when the relevant switch is closed.
f) Check all pins for shorts to ground or adjacent pins.

2.4.6.2 Configuration

Ensure that the JA97-002 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 JA97-002. 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 JA94-001 internal adjustments are set from the Product Configuration Software ProCS™. Configuration data is sent to the JA94-001 via the front panel connector (♫/io), using the Configuration Cables and a computer running the ProCS™ software. For configuration requirements, see section 2.5.1.

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

2.5.1 Configuration Cabling Requirements

To configure the JA94-001, 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 JA97-002 are not included with the unit.

Cabling option 1: (Needed for Loading Alert Messages)

Quantity	Description	JA97-002
1	USB A to RS232 9-Pin Cable	CAB-USB-0002
1	Configuration Cable	JA99-001

Cabling option 2: (For Use Without Loading Alert Messages)

Quantity	Description	JA97-002
1	USB A Male to RS232 3.5mm Plug	CAB-USB-0006

2.5.2 ProCS™ Setup

The ProCS™ JA97-002 menu item 'ProCS Setup' provides Setup drawings showing the cabling arrangement for connecting the JA97-002 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.
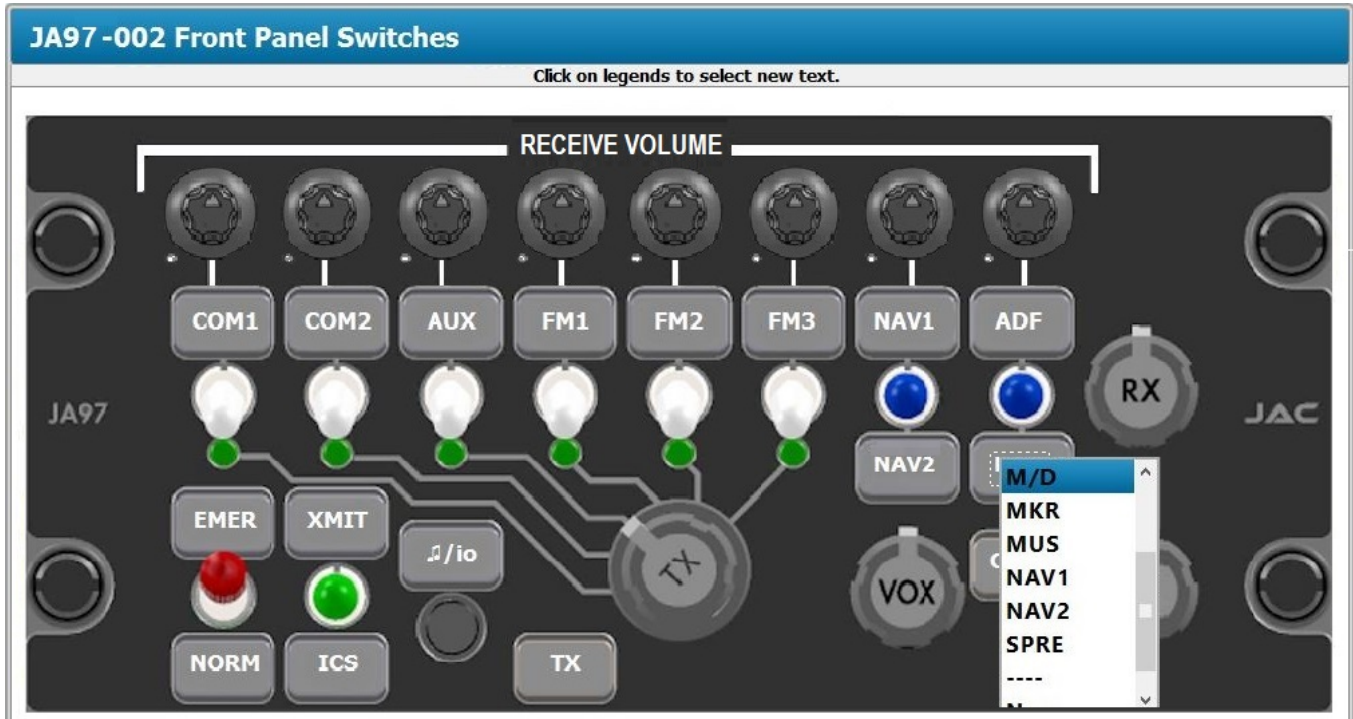
Note: To properly configure the JA97-002, power must be applied to the unit.

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

2.5.3.1   <u>**Front Panel Switches**</u>

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   <u>**Radios**</u>

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

2.5.3.3 **Receive Levels**

JA97-002 Receive Levels

Input Levels

COM1	Default Transceiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level
COM2	Default Transceiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level
AUX	Default Transceiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level
FM1	Default Transceiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level
FM2	Default Transceiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level
FM3	Default Transceiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level
NAV1	Default Receiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level
ADF	Default Receiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level
M/D (MKR)	Default Receiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level
NAV2	Default Receiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level
M/D (DME)	Default Receiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level
DIRECT1	Default Receiver :	1.00 Vrms	10.00 Vrms **[7.75 Vrms]**	Default Level

DIRECT2   Default Receiver :   **Note:** DIRECT 2 Rated Input Level is fixed (Not Adjustable)

Other selections that can be made in the Receive Levels window are shown below:

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 1.0 Vrms)**

Receive Composite: 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**

JA97-002 Transmit Levels

Transmit Levels

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

Rated Load Impedance = 150 Ohms

COM1	Default Transceiver :	0.010 Vrms	1.000 Vrms **[0.250 Vrms]**	Default Level
COM2	Default Transceiver :	0.010 Vrms	1.000 Vrms **[0.250 Vrms]**	Default Level
AUX	Default Transceiver :	0.010 Vrms	1.000 Vrms **[0.250 Vrms]**	Default Level
FM1	Default Transceiver :	0.010 Vrms	1.000 Vrms **[0.250 Vrms]**	Default Level
FM2	Default Transceiver :	0.010 Vrms	1.000 Vrms **[0.250 Vrms]**	Default Level
FM3	Default Transceiver :	0.010 Vrms	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 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**

JA97-002 Sidetone Levels

Receive Sidetone Level

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

COM1 thru FM3 RX input Level on PHN output: 0 dB   -12 dB   **[-6 dB]**

2.5.3.6 **Connector Pin Configuration**

JA97-002 Connector Pin Configuration

Multi Function Switch

Switch Operation: ⦿ PILOT TX and ICS PTT   ○ MF SW OUTPUT PINS

J1 Contacts Selection

Pin 1/20:	⦿ CVR HI/LO OUTPUT	○ DIRECT AUDIO 2 HI/LO INPUT
Pin 14/33:	⦿ MUSIC LEFT HI/LO INPUT	○ RX COMP HI/LO OUTPUT
Pin 15/34:	⦿ MUSIC RIGHT HI/LO INPUT	○ DIGITAL TIE +/- INPUT
Pin 16/35:	⦿ ICS TIE HI/LO INPUT/OUTPUT	○ DIGITAL TIE +/- OUTPUT

> Several of the connector pins can be configured to meet the requirements of specific installations. Refer to JA97-002 Interconnect sheet 5 of 6.

J2 Contacts Selection

|			
Pin 6:	⦿ PAX 1 TX PTT INPUT	○ MF SW 2 OUTPUT (ICS)	
Pin 11:	⦿ PAX 1 ICS PTT INPUT	○ ALERT 1 KEY INPUT	○ MF SW 1 OUTPUT (XMIT)
Pin 12:	⦿ ALERT 2 KEY INPUT	○ CALL INPUT	○ PAX 2 TX PTT INPUT
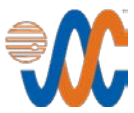
2.5.3.7 **Alerts**

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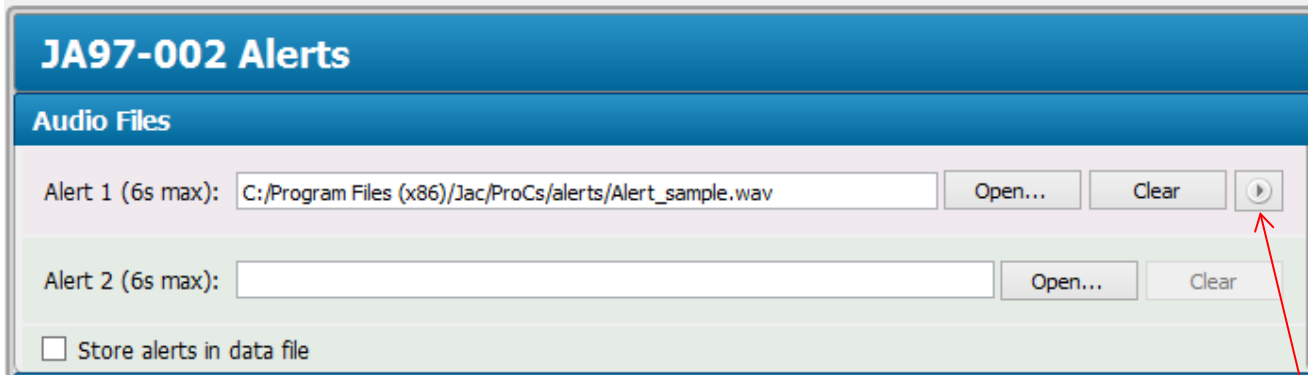
Saving new Audio Files
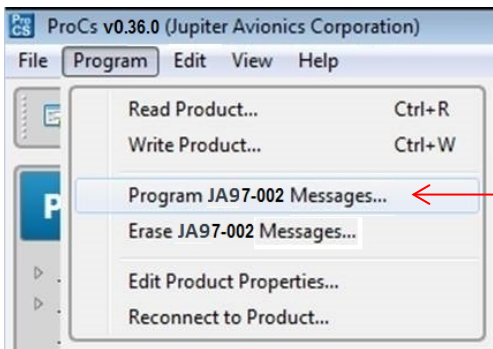
If a new audio file is selected, it may be played using the arrow to the right of the Message line.

It may be uploaded to the JA97-002 using the 'Program' menu and selecting 'Program JA97-002 Messages…'

Note that this pane will have different content if a JA95-N42 is not connected.

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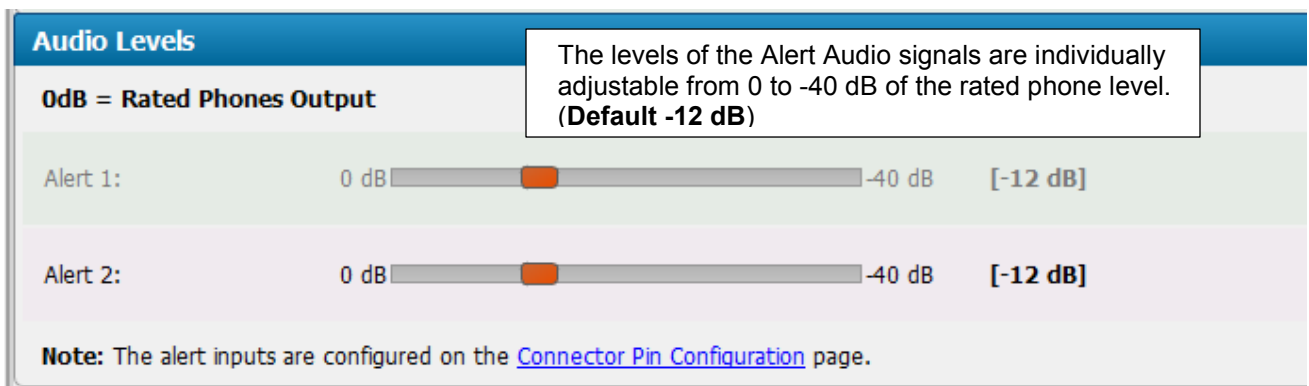
Audio Files

The JA97-002 has standard audio signals for each of the 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:
    JA97-002 Wav File (Sine 300Hz 10 sec) Rev A.WAV
    JA97-002 Wav File (Sine 1000Hz 10 sec) Rev A.WAV

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 checked**)

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

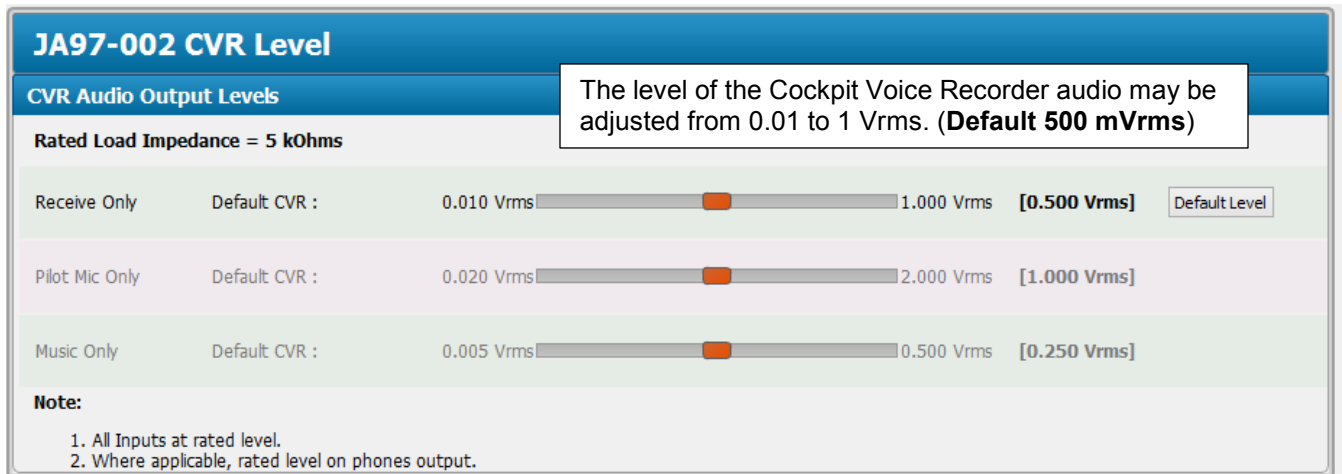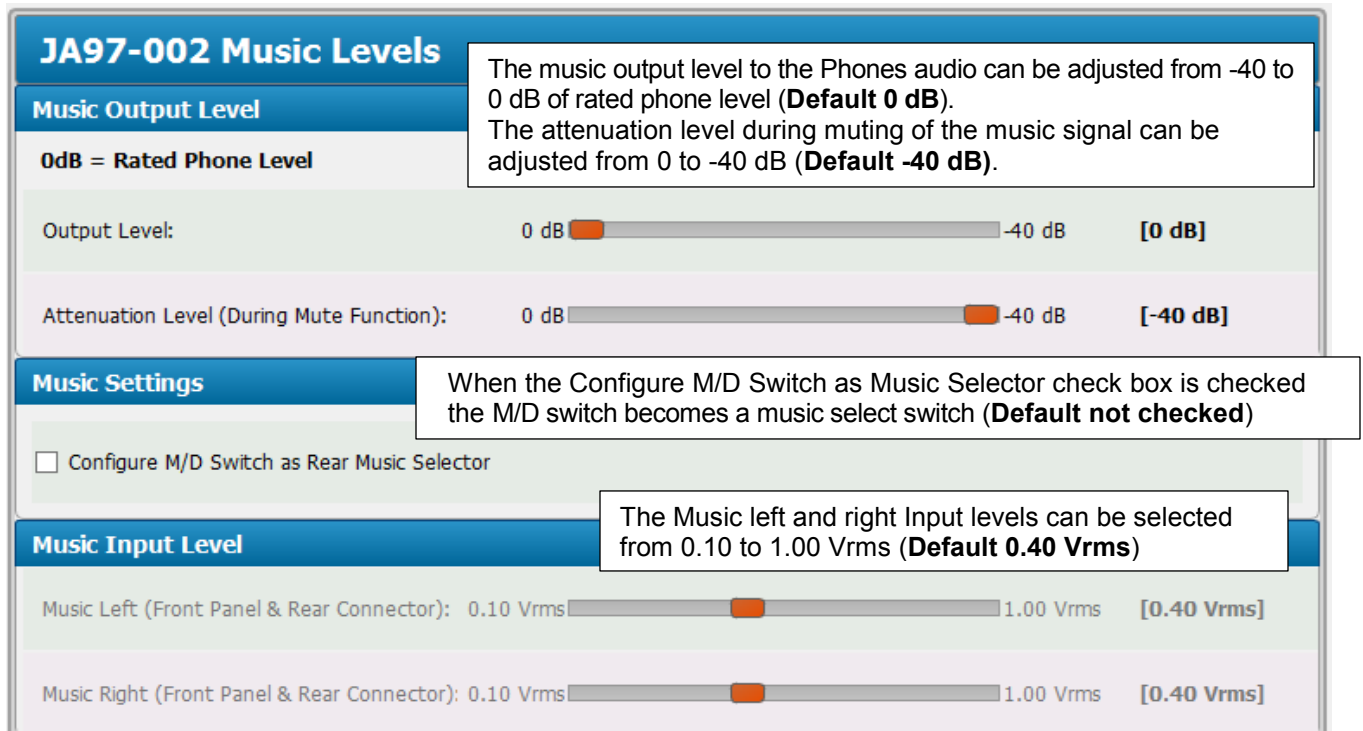When the Mute Alert Audio check box is checked the Alert Audio is muted during transmit (**Default not checked**)
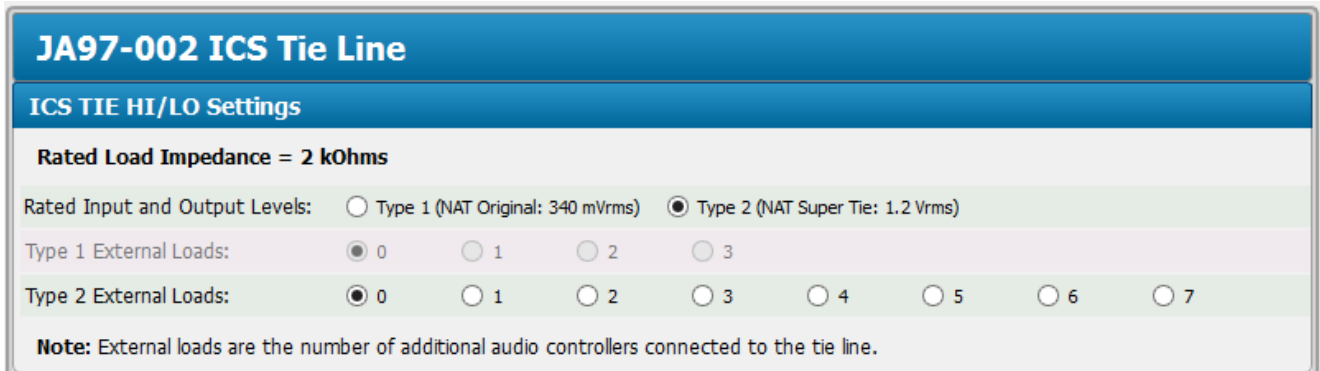
JA97-002 Audio Muting

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

JA97-002 CVR Level

CVR Audio Output Levels

Rated Load Impedance = 5 kOhms

The level of the Cockpit Voice Recorder audio may be adjusted from 0.01 to 1 Vrms. (**Default 500 mVrms**)

Receive Only	Default CVR :	0.010 Vrms	1.000 Vrms	[0.500 Vrms]	Default Level
Pilot Mic Only	Default CVR :	0.020 Vrms	2.000 Vrms	[1.000 Vrms]	
Music Only	Default CVR :	0.005 Vrms	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

JA97-002 Music Levels

Music Output Level

0dB = Rated Phone Level

The music output level 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**).

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

Music Settings

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

☐ Configure M/D Switch as Rear Music Selector

Music Input Level

The Music left and right Input levels can be selected from 0.10 to 1.00 Vrms (**Default 0.40 Vrms**)

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]

2.5.3.11 **ICS Tie Line**

JA97-002 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 Selection**

JA97-002 Lighting Voltage

Lighting Voltage

Rated Input Level: ○ +5 Vdc ○ +14 Vdc ● +28 Vdc

The rated input level of the LIGHTS INPUT signal may be +5 Vdc, +14 Vdc or +28Vdc (**Default +28 Vdc**).

2.5.3.13 **VOX**

JA97-002 VOX

VOX Delay

VOX OFF Delay Time: 0.50 s [=====●=========] 2.00 s **[1.00 s]**
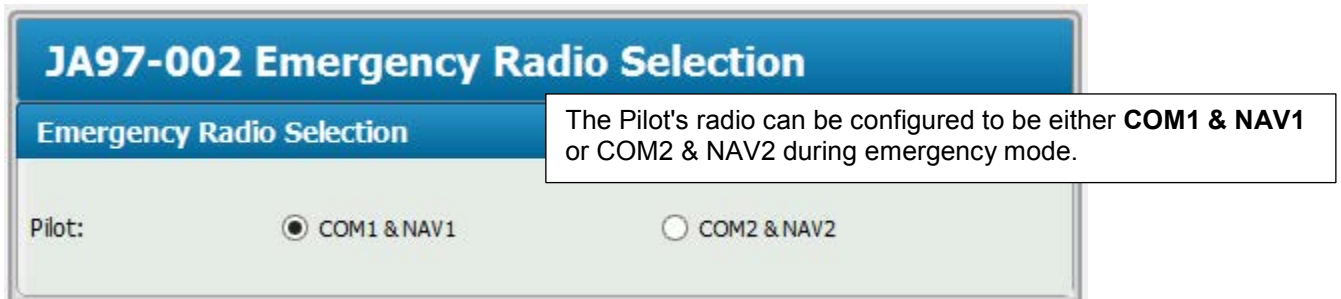
The VOX OFF Delay Time can be adjusted from 0.50 to 2.00 sec (**Default 1 sec**).

PAX Drop Cord Mode

☐ PAX Drop Cord Enable. (Sets VOX Threshold for passengers to a minimum level when VOX Pot is set to maximum.)

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 **Emergency Radio Selection**

JA97-002 Emergency Radio Selection

Emergency Radio Selection

Pilot: ● COM1 & NAV1 ○ COM2 & NAV2

The Pilot's radio can be configured to be either **COM1 & NAV1** or COM2 & NAV2 during emergency mode.

2.5.3.15   Connector Maps

This section contains connector maps and interconnects that are automatically generated to show changes that affect the installation of the JA97-002, such as switch labels and voltages. See section 2.7.1.

2.5.4   Other Configuration Features

In the JA97-002 Product Information Window, the model number, serial number and check sum of the JA97-002 audio panel 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-JA97) consists of the following:

Quantity	Description	JA97-002
2	TAG ring	CON-5500-0625
1	D-Sub 37-pin connector, hood and 37 crimp pins	CON-3420-0037
1	D-Sub 50-pin connector, hood and 50 crimp pins	CON-3420-0050
2	Heat Shrink Tubing	WIR-HTSK-1000

2.6.1   Recommended Crimp Tools

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

2.7   Installation Drawings

The drawings and documents required for Installation can be found in Appendix A of this manual.

2.7.1   Generation of Custom Drawings

The interconnects and connector maps in Appendix A of this manual are generic drawings based on the standard version of the JA97-002. 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.
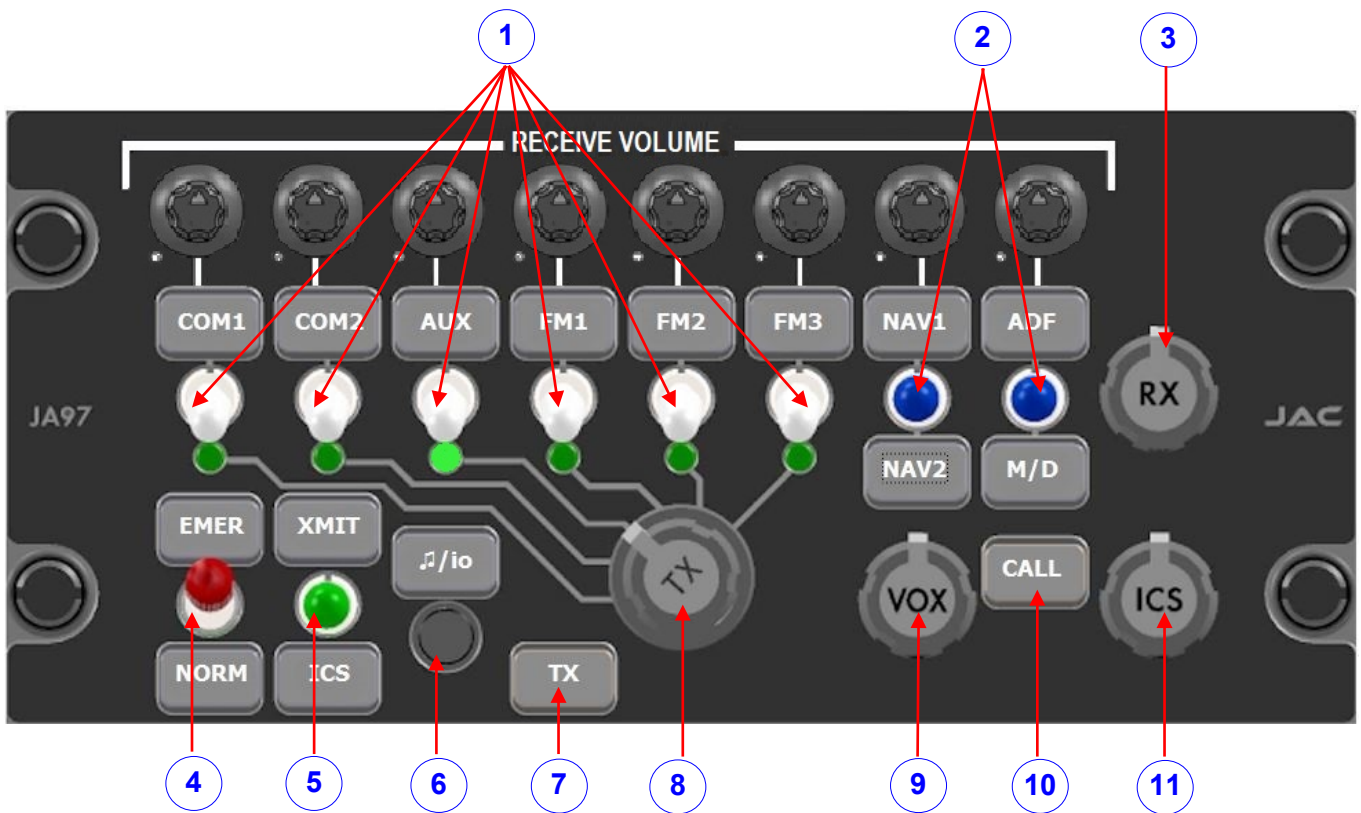
SECTION 3 – OPERATION

3.1   Introduction

This section contains the operating instructions for the JA97-002.

3.2   Front Panel Controls

✅ **Note**: The 15 legends and two deadfront annunciators are removable and may be replaced with custom ordered parts. The front panel controls are referred to by the default legend and annunciator names shown below.

1.   Transceiver switches, associated legends and volume controls
2.   Receiver switches, associated legends and volume controls
3.   Master 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 Controls and Annunciators

Individual Receive Volume Control

Minimum Volume Mark

Legend

Switch

TX Select indicator
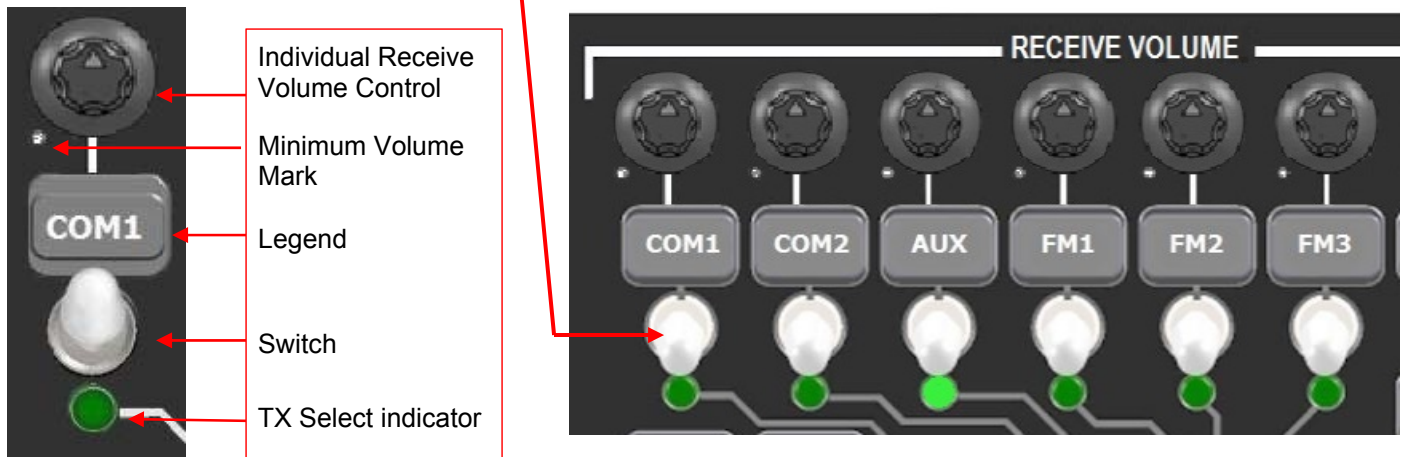
These are six white two-position toggle switches. When a switch is set to the 'up' position (towards the legend), audio from the associated transceiver is routed to the phones.

Each switch has an associated Individual Receive Volume control, and a TX select indicator to show which transceiver is selected for Transmit (AUX in the example above).
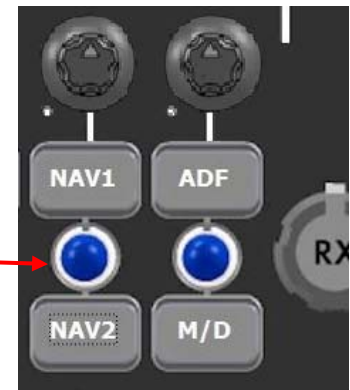
The Individual Receive Volume control is a rotary knob that adjusts the individual transceiver phones receive audio volume from minimum (CCW) to maximum (CW).

The legends (above the switches) are interchangeable to allow customization.
(**Default** – COM1, COM2, AUX, FM1, FM2, FM3.)

(2) Receiver Controls and Annunciators

These are two blue three-position centre-off toggle switches. When a switch is set to the 'up' or 'down' position audio from the relevant receiver is routed to the phones. Each switch has an associated Receive Volume control, and an interchangeable legend.

The individual Receive Volume controls are rotary knobs that adjusts the individual transceiver phones receive audio volume from minimum (CCW) to maximum (CW). The Individual Receive Volume Control above NAV1 controls the volume for NAV1 and NAV2 and the control above ADF controls the volume for ADF and MKR/DME (M/D.)

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

.

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

(3) Master Receive Volume Control

This is a rotary knob that adjusts the phones volume of all 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.
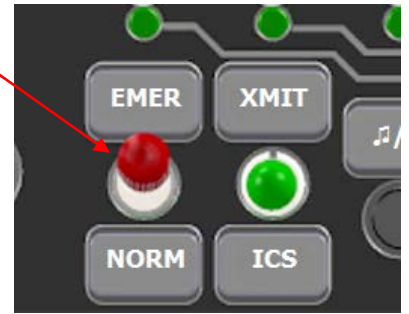
(5)   Multi-function (Transmit/ICS) Switch

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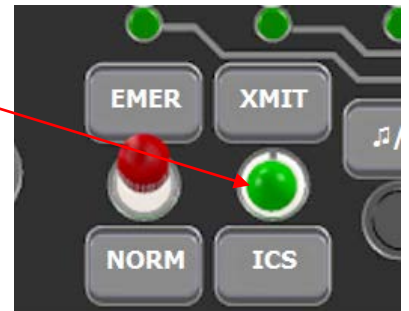
Note: At installation, this switch may be configured to operate in default or alternative mode. Check with your installing agency for confirmation of the operation of this switch. The legends are interchangeable to allow customization.

(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 JA97-002 is transmitting.

The default legend is 'TX', but it is interchangeable to allow customization.
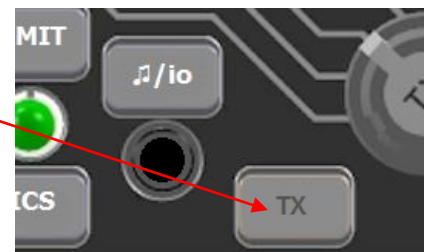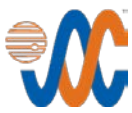
(8) Transmit Selector

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 illuminate to show which transceiver is selected for transmit - 'AUX' in this example.
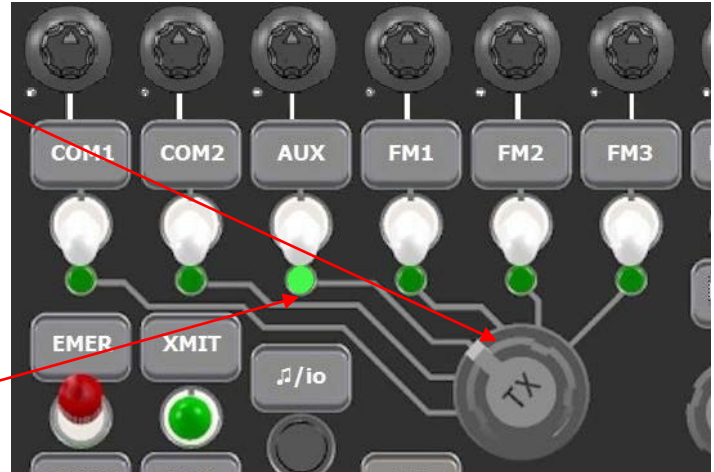
(9) VOX Threshold Control

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

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.

(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 JA97-002 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 JA97-002 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 COM1, COM2, AUX, FM1, FM2, 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 FM2 transmitting. A second momentary activation of the TX PTT, or moving the Transmit Selector away from FM2, will stop FM2 from transmitting.

3.3.5 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.

⚠️ **CAUTION:** At installation, the JA97-002 can be configured for Emergency Mode with the Pilot Headset connected to **COM1 & NAV1** or COM2 & NAV2. It is important to be aware of the configuration of your unit.

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 configured COM transceiver, NAV receive, (**COM1 & NAV1** or COM2 & NAV2) 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 configured COM transceiver. No other function in the JA97-002 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 JA97-002, the sum of the configured COM receive, NAV 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 configured COM transceiver. The pilot is disconnected from the ICS. The COM1 transceiver and NAV1 receiver and DIRECT AUDIO are not available to the other users. All other functions of the JA97-002 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 JA97-002 Audio Controller with RX Volume Controls 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.

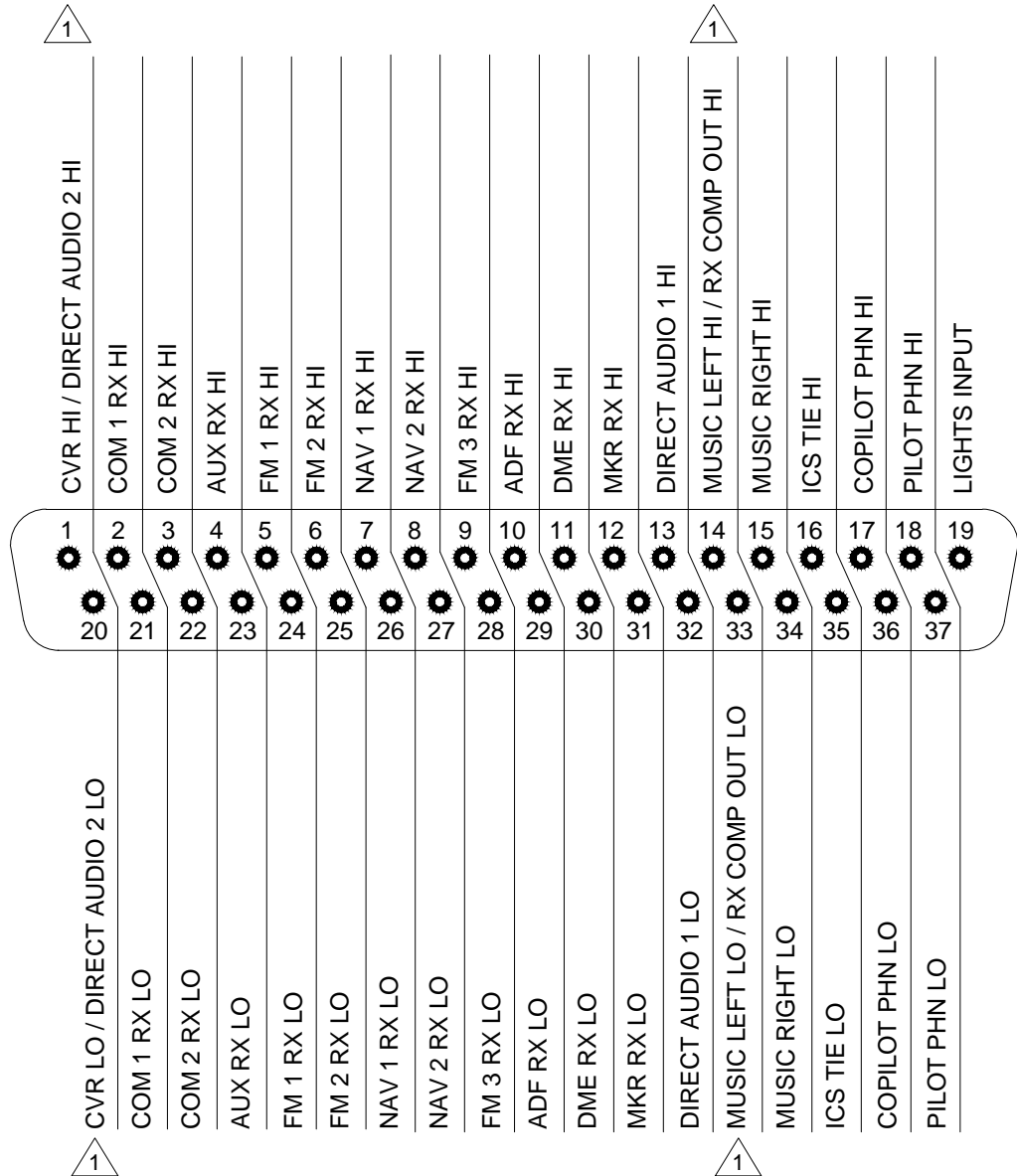## A2   Installation Drawings

DOCUMENT	Rev
JA97-002 Connector Map	A
JA97-002 Interconnect	A
JA97-002 Mechanical Installation	B

Reference Documents	
TOL-CUST-EXTR Legend Replacement	A

RECEIVE CONNECTOR

P1

37 PIN FEMALE DMIN
MATING CONNECTOR

Top row (pins 1–19):

Pin	Signal
1	CVR HI / DIRECT AUDIO 2 HI
2	COM 1 RX HI
3	COM 2 RX HI
4	AUX RX HI
5	FM 1 RX HI
6	FM 2 RX HI
7	NAV 1 RX HI
8	NAV 2 RX HI
9	FM 3 RX HI
10	ADF RX HI
11	DME RX HI
12	MKR RX HI
13	DIRECT AUDIO 1 HI
14	MUSIC LEFT HI / RX COMP OUT HI
15	MUSIC RIGHT HI
16	ICS TIE HI
17	COPILOT PHN HI
18	PILOT PHN HI
19	LIGHTS INPUT

Bottom row (pins 20–37):

Pin	Signal
20	CVR LO / DIRECT AUDIO 2 LO
21	COM 1 RX LO
22	COM 2 RX LO
23	AUX RX LO
24	FM 1 RX LO
25	FM 2 RX LO
26	NAV 1 RX LO
27	NAV 2 RX LO
28	FM 3 RX LO
29	ADF RX LO
30	DME RX LO
31	MKR RX LO
32	DIRECT AUDIO 1 LO
33	MUSIC LEFT LO / RX COMP OUT LO
34	MUSIC RIGHT LO
35	ICS TIE LO
36	COPILOT PHN LO
37	PILOT PHN LO

△1

VIEW IS FROM REAR OF MATING CONNECTOR

NOTE:

△1 CONFIGURABLE CONTACT

JUPITER AVIONICS TEMPLATE AUTOCAD PORTRAIT SIZEA REV B.DWT

TRANSMIT CONNECTOR

P2

50 PIN FEMALE DMIN
MATING CONNECTOR

PTT OUT

PTT IN

1

1 1

Top row (pins 1-17):

Pin	Signal
1	COM 1 PTT
2	COM 2 PTT
3	AUX PTT
4	FM 1 PTT
5	FM 2 PTT
6	PAX 1 TX PTT / MF SW 2
7	PILOT TX PTT
8	COPILOT TX PTT
9	PILOT ICS PTT
10	COPILOT ICS PTT
11	PAX 1 ICS PTT / MF SW 1 / ALERT 1 KEY
12	ALERT 2 KEY / CALL
13	FM 3 PTT
14	FM 3 MIC HI
15	FM 3 MIC LO
16	ALERT ENABLE
17	POWER INPUT

Middle row pins: 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33

Bottom row pins: 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

Bottom row (pins 34-50):

Pin	Signal
34	POWER GROUND
35	COM 1 MIC HI
36	COM 1 MIC LO
37	COM 2 MIC HI
38	COM 2 MIC LO
39	AUX MIC HI
40	AUX MIC LO
41	FM 1 MIC HI
42	FM 1 MIC LO
43	FM 2 MIC HI
44	FM 2 MIC LO
45	PAX 1 MIC HI
46	PAX 1 MIC LO
47	PILOT MIC HI
48	PILOT MIC LO
49	COPILOT MIC HI
50	COPILOT MIC LO

PAX 2 MIC HI
PAX 2 MIC LO
PAX 3 MIC HI
PAX 3 MIC LO
PAX 4 MIC HI
PAX 4 MIC LO
PAX 5 MIC HI
PAX 5 MIC LO
PAX 1 PHN HI
PAX 1 PHN LO
PAX 2 PHN HI
PAX 2 PHN LO
PAX 3 PHN HI
PAX 3 PHN LO
PAX 4 & 5 PHN HI
PAX 4 & 5 PHN LO

MIC OUT   MIC IN   PAX PHN OUT

VIEW IS FROM REAR OF MATING CONNECTOR

PREPARED	TAT
CHECKED	JAC 12-07-16 SRM
APPROVED	JAC 12-07-16 KDV

JUPITER AVIONICS CORPORATION

TITLE: Audio Controller with RX Volume Controls
P2 Connector Map

NCAGE CODE	PART NO.	SHEET
L00N3	JA97-002	2/3

DOC NO.
JA97-002 Connector Map Rev A.dwg

FRONT PANEL MUSIC/CONFIGURATION CONNECTOR
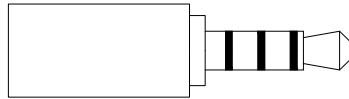
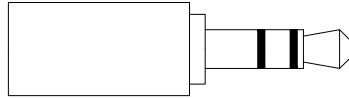P3   ACCEPTS THE FOLLOWING PLUG FORMATS   MATING PLUG NAMES   JA97 SIGNAL NAMES

JA99 CONFIGURATION CABLE
4 POLE MALE 3.5MM STEREO

TIP: TX DATA   CONFIG DATA TO JA97
1ST RING: RX DATA   CONFIG DATA FROM JA97
2ND RING: GROUND   GROUND
3RD RING: CONFIG AUDIO   MODE SELECT / CONFIG AUDIO

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

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

PREPARED	TAT			
CHECKED	JAC 12-07-16 SRM	JUPITER AVIONICS CORPORATION		
		TITLE	Audio Controller with RX Volume Controls P3 Connector Map	
APPROVED	JAC 12-07-16 KDV	NCAGE CODE L00N3	PART NO. JA97-002	SHEET 3/3
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO. JA97-002 Connector Map Rev A.dwg		

JA97-002 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 JA97-002 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.
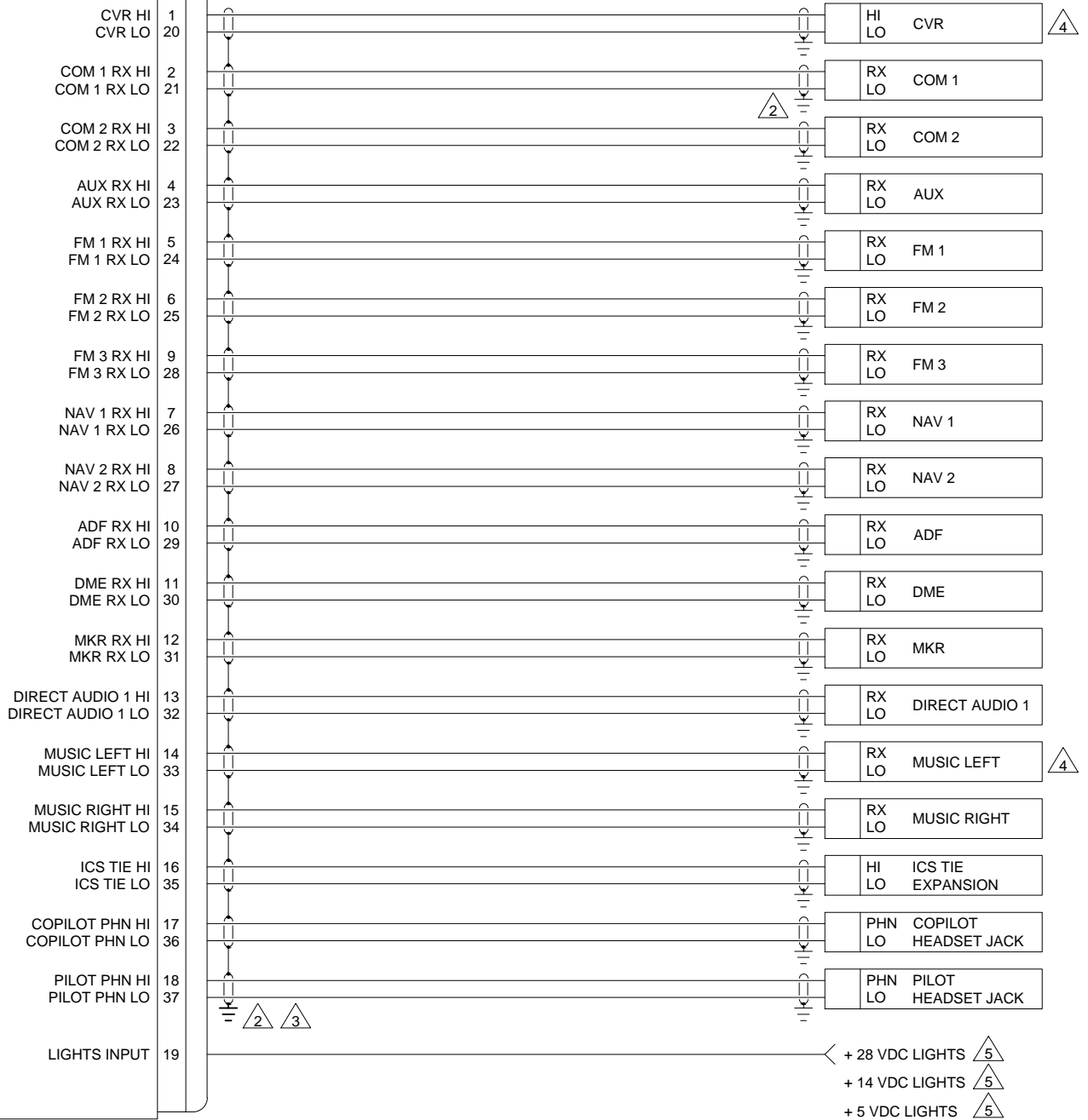
CONNECTOR PIN LEGENDS

LEGEND

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

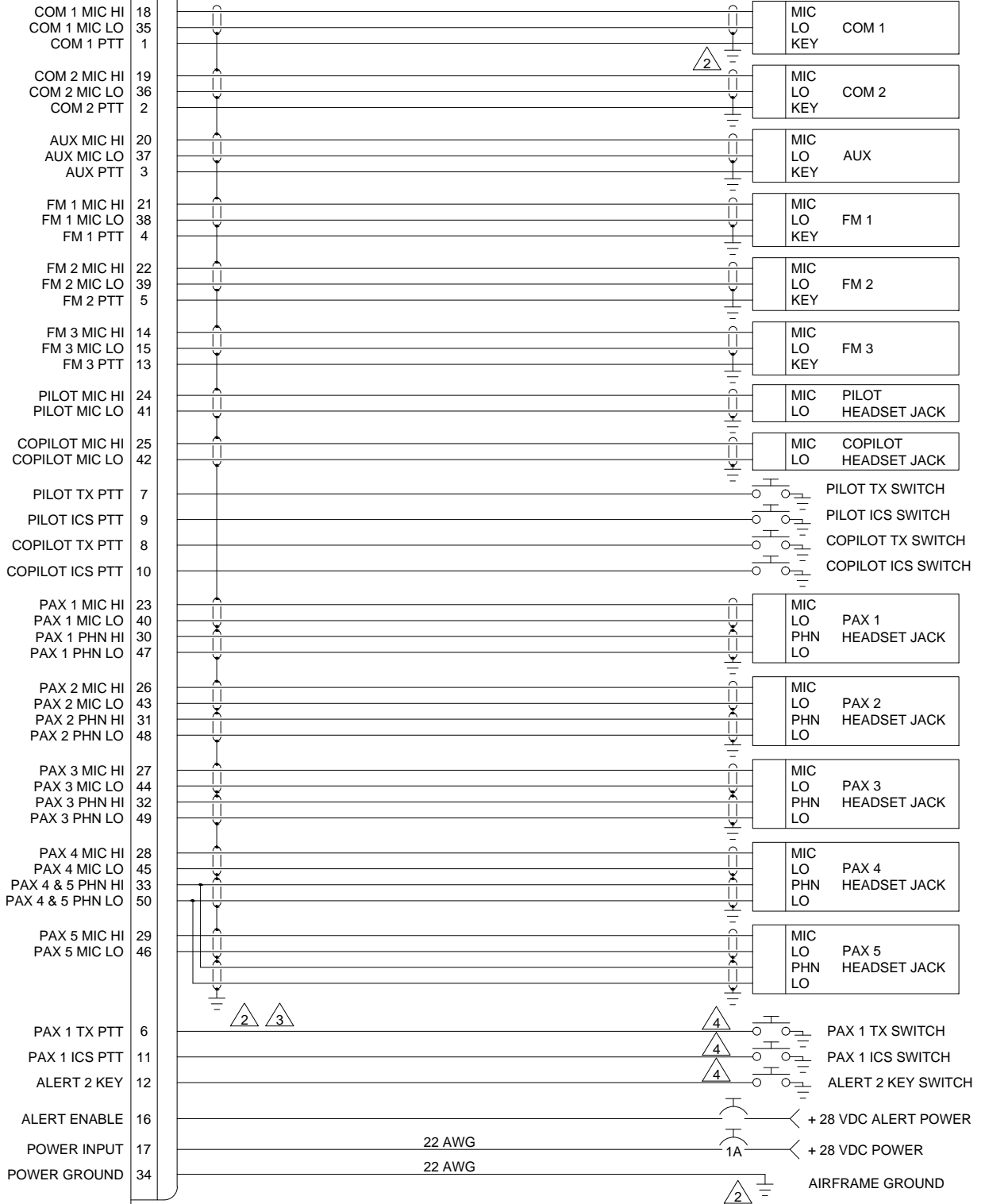| PREPARED	TAT	JUPITER AVIONICS CORPORATION		
CHECKED	JAC 12-07-16 SRM	TITLE Audio Controller with RX Volume Controls Interconnect Notes		
APPROVED	JAC 12-07-16 KDV	NCAGE CODE L00N3	PART NO. JA97-002	SHEET 1/6
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO. JA97-002 Interconnect Rev A.dwg		

JA97-002

J1

P1
37 PIN FEMALE DMIN
MATING CONNECTOR

Signal	Pin		Dest	Label	Note
CVR HI	1		HI	CVR	4
CVR LO	20		LO		
COM 1 RX HI	2		RX	COM 1	
COM 1 RX LO	21		LO		
COM 2 RX HI	3		RX	COM 2	
COM 2 RX LO	22		LO		
AUX RX HI	4		RX	AUX	
AUX RX LO	23		LO		
FM 1 RX HI	5		RX	FM 1	
FM 1 RX LO	24		LO		
FM 2 RX HI	6		RX	FM 2	
FM 2 RX LO	25		LO		
FM 3 RX HI	9		RX	FM 3	
FM 3 RX LO	28		LO		
NAV 1 RX HI	7		RX	NAV 1	
NAV 1 RX LO	26		LO		
NAV 2 RX HI	8		RX	NAV 2	
NAV 2 RX LO	27		LO		
ADF RX HI	10		RX	ADF	
ADF RX LO	29		LO		
DME RX HI	11		RX	DME	
DME RX LO	30		LO		
MKR RX HI	12		RX	MKR	
MKR RX LO	31		LO		
DIRECT AUDIO 1 HI	13		RX	DIRECT AUDIO 1	
DIRECT AUDIO 1 LO	32		LO		
MUSIC LEFT HI	14		RX	MUSIC LEFT	4
MUSIC LEFT LO	33		LO		
MUSIC RIGHT HI	15		RX	MUSIC RIGHT	
MUSIC RIGHT LO	34		LO		
ICS TIE HI	16		HI	ICS TIE	
ICS TIE LO	35		LO	EXPANSION	
COPILOT PHN HI	17		PHN	COPILOT	
COPILOT PHN LO	36		LO	HEADSET JACK	
PILOT PHN HI	18		PHN	PILOT	
PILOT PHN LO	37		LO	HEADSET JACK	
LIGHTS INPUT	19				

2 3

+ 28 VDC LIGHTS 5
+ 14 VDC LIGHTS 5
+ 5 VDC LIGHTS 5

PREPARED	TAT	
CHECKED	JAC 12-07-16 SRM	
APPROVED	JAC 12-07-16 KDV	

JUPITER AVIONICS CORPORATION

TITLE
Audio Controller with RX Volume Controls
J1 Interconnect

NCAGE CODE	PART NO.	SHEET
L00N3	JA97-002	2/6

CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.

DOC NO.
JA97-002 Interconnect Rev A.dwg

JA97-002

J2

P2
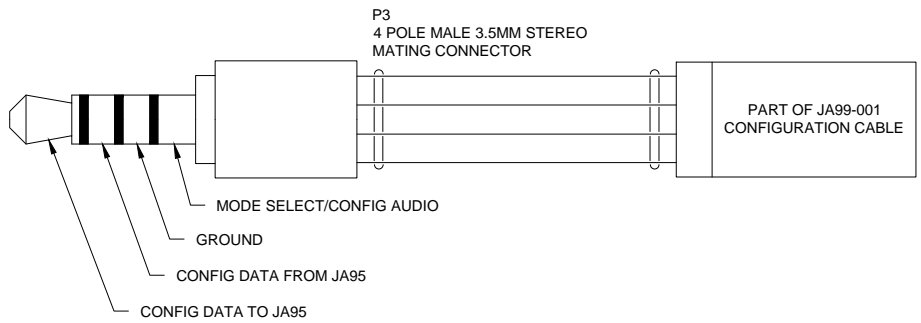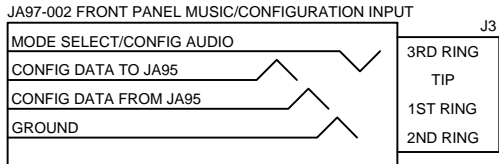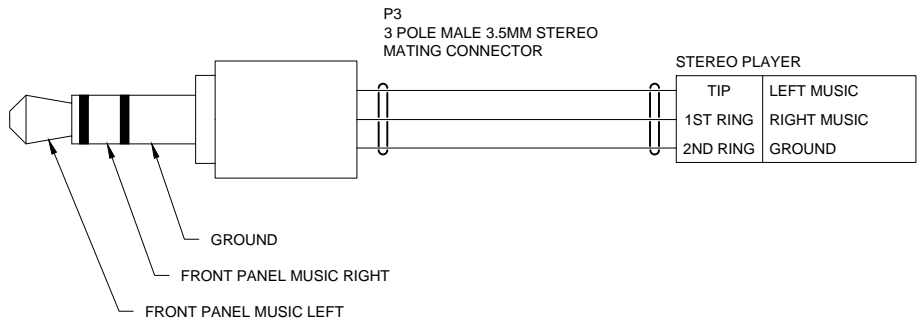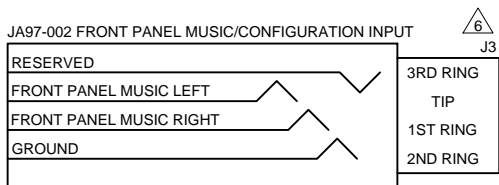50 PIN FEMALE DMIN
MATING CONNECTOR

Signal	Pin		
COM 1 MIC HI	18	MIC LO KEY	COM 1
COM 1 MIC LO	35		
COM 1 PTT	1		
COM 2 MIC HI	19	MIC LO KEY	COM 2
COM 2 MIC LO	36		
COM 2 PTT	2		
AUX MIC HI	20	MIC LO KEY	AUX
AUX MIC LO	37		
AUX PTT	3		
FM 1 MIC HI	21	MIC LO KEY	FM 1
FM 1 MIC LO	38		
FM 1 PTT	4		
FM 2 MIC HI	22	MIC LO KEY	FM 2
FM 2 MIC LO	39		
FM 2 PTT	5		
FM 3 MIC HI	14	MIC LO KEY	FM 3
FM 3 MIC LO	15		
FM 3 PTT	13		
PILOT MIC HI	24	MIC LO	PILOT HEADSET JACK
PILOT MIC LO	41		
COPILOT MIC HI	25	MIC LO	COPILOT HEADSET JACK
COPILOT MIC LO	42		
PILOT TX PTT	7		PILOT TX SWITCH
PILOT ICS PTT	9		PILOT ICS SWITCH
COPILOT TX PTT	8		COPILOT TX SWITCH
COPILOT ICS PTT	10		COPILOT ICS SWITCH
PAX 1 MIC HI	23	MIC LO PHN LO	PAX 1 HEADSET JACK
PAX 1 MIC LO	40		
PAX 1 PHN HI	30		
PAX 1 PHN LO	47		
PAX 2 MIC HI	26	MIC LO PHN LO	PAX 2 HEADSET JACK
PAX 2 MIC LO	43		
PAX 2 PHN HI	31		
PAX 2 PHN LO	48		
PAX 3 MIC HI	27	MIC LO PHN LO	PAX 3 HEADSET JACK
PAX 3 MIC LO	44		
PAX 3 PHN HI	32		
PAX 3 PHN LO	49		
PAX 4 MIC HI	28	MIC LO PHN LO	PAX 4 HEADSET JACK
PAX 4 MIC LO	45		
PAX 4 & 5 PHN HI	33		
PAX 4 & 5 PHN LO	50		
PAX 5 MIC HI	29	MIC LO PHN LO	PAX 5 HEADSET JACK
PAX 5 MIC LO	46		
PAX 1 TX PTT	6	/4\	PAX 1 TX SWITCH
PAX 1 ICS PTT	11	/4\	PAX 1 ICS SWITCH
ALERT 2 KEY	12	/4\	ALERT 2 KEY SWITCH
ALERT ENABLE	16		+ 28 VDC ALERT POWER
POWER INPUT	17	22 AWG / 1A	+ 28 VDC POWER
POWER GROUND	34	22 AWG	AIRFRAME GROUND

/2\ /3\

/2\

PREPARED	TAT
CHECKED	JAC 12-07-16 SRM
APPROVED	JAC 12-07-16 KDV

JUPITER AVIONICS
CORPORATION

TITLE
Audio Controller with RX Volume Controls
J2 Interconnect

NCAGE CODE	PART NO.	SHEET
L00N3	JA97-002	3/6

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TO JUPITER AVIONICS CORP.

DOC NO.
JA97-002 Interconnect Rev A.dwg

OPTION: PROGRAMMING FROM JA99-001

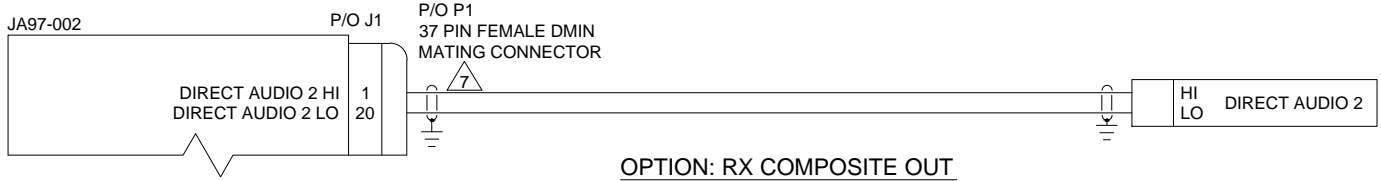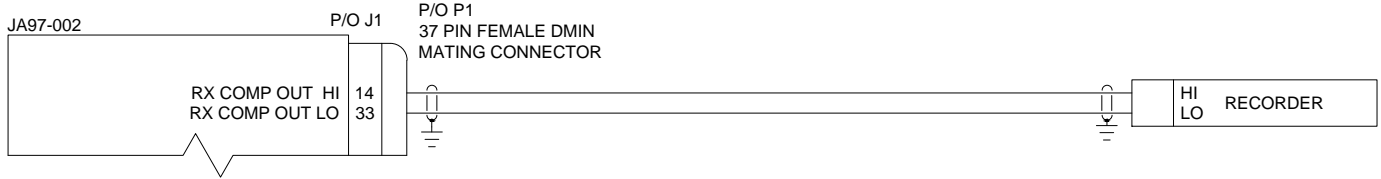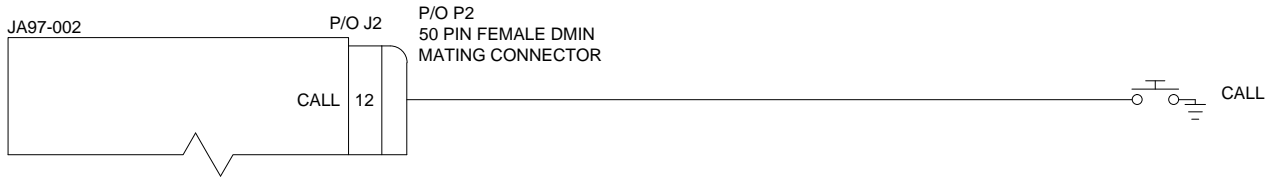JA97-002 FRONT PANEL MUSIC/CONFIGURATION INPUT

	J3
MODE SELECT/CONFIG AUDIO	3RD RING
CONFIG DATA TO JA95	TIP
CONFIG DATA FROM JA95	1ST RING
GROUND	2ND RING

P3
4 POLE MALE 3.5MM STEREO
MATING CONNECTOR

PART OF JA99-001
CONFIGURATION CABLE

MODE SELECT/CONFIG AUDIO

GROUND

CONFIG DATA FROM JA95

CONFIG DATA TO JA95

OPTION: STEREO PLAYER

JA97-002 FRONT PANEL MUSIC/CONFIGURATION INPUT

⚠6

	J3
RESERVED	3RD RING
FRONT PANEL MUSIC LEFT	TIP
FRONT PANEL MUSIC RIGHT	1ST RING
GROUND	2ND RING

P3
3 POLE MALE 3.5MM STEREO
MATING CONNECTOR

STEREO PLAYER

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

GROUND

FRONT PANEL MUSIC RIGHT

FRONT PANEL MUSIC LEFT

PREPARED	TAT	JUPITER AVIONICS CORPORATION		
CHECKED	JAC 12-07-16 SRM	TITLE	Audio Controller with RX Volume Controls Interconnect Options	
APPROVED	JAC 12-07-16 KDV	NCAGE CODE L00N3	PART NO. JA97-002	SHEET 4/6
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO. JA97-002 Interconnect Rev A.dwg		

OPTION: DIRECT AUDIO 2 IN

JA97-002   P/O J1

P/O P1
37 PIN FEMALE DMIN
MATING CONNECTOR

DIRECT AUDIO 2 HI   1   /7\
DIRECT AUDIO 2 LO   20

HI
LO   DIRECT AUDIO 2

OPTION: RX COMPOSITE OUT

JA97-002   P/O J1

P/O P1
37 PIN FEMALE DMIN
MATING CONNECTOR

RX COMP OUT HI   14
RX COMP OUT LO   33

HI
LO   RECORDER

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

JA97-002   P/O J2

P/O P2
50 PIN FEMALE DMIN
MATING CONNECTOR

MF SW 2   6
MF SW 1   11

MF SW 2
MF SW 1

OPTION: CALL INPUT

JA97-002   P/O J2

P/O P2
50 PIN FEMALE DMIN
MATING CONNECTOR

CALL   12
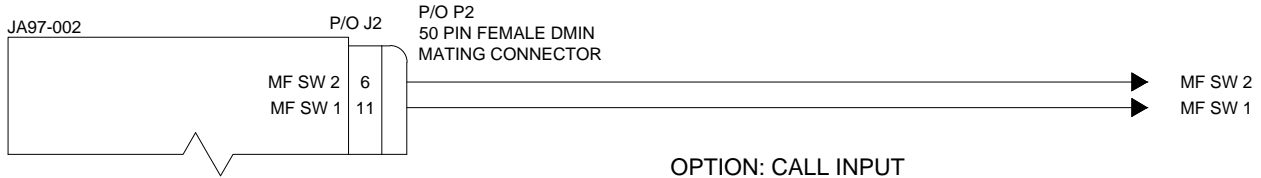
CALL

OPTION: CONFIGURABLE SWITCH INPUTS (ALERT 1 KEY)

JA97-002   P/O J2

P/O P2
50 PIN FEMALE DMIN
MATING CONNECTOR

ALERT 1 KEY   11

ALERT 1 KEY

OPTION: CHASSIS GROUND

JA97-002   J4   THREADED STUD 4-40 0.25 in.

CHASSIS GROUND   22 AWG

PREPARED	TAT	JUPITER AVIONICS CORPORATION		
CHECKED	JAC 12-07-16 SRM	TITLE	Audio Controller with RX Volume Controls Interconnect Options	
APPROVED	JAC 12-07-16 KDV	NCAGE CODE L00N3	PART NO. JA97-002	SHEET 5/6
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO. JA97-002 Interconnect Rev A.dwg		

JA97-002 #1

J1 P1
37 PIN FEMALE DMIN
MATING CONNECTOR

PILOT PHN HI | 18
PILOT PHN LO | 37

PRIMARY JACK

HI
LO | PILOT HEADSET JACK

J2 P2
50 PIN FEMALE DMIN
MATING CONNECTOR

PILOT MIC HI | 24
PILOT MIC LO | 41

PILOT TX PTT | 7

HI
LO | PILOT MIC JACK
KEY | PILOT TX KEY

PILOTS JACKS

J1 P1
37 PIN FEMALE DMIN
MATING CONNECTOR

COPILOT PHN HI | 17
COPILOT PHN LO | 36

SECONDARY JACK

HI
LO | PILOT HEADSET JACK

J2 P2
50 PIN FEMALE DMIN
MATING CONNECTOR

COPILOT MIC HI | 25
COPILOT MIC LO | 42

COPILOT TX PTT | 8

HI
LO | PILOT MIC JACK
KEY | PILOT TX KEY

JA97-002 #2

J1 P1
37 PIN FEMALE DMIN
MATING CONNECTOR

COPILOT PHN HI | 17
COPILOT PHN LO | 36

J2 P2
50 PIN FEMALE DMIN
MATING CONNECTOR

COPILOT MIC HI | 25
COPILOT MIC LO | 42

COPILOT TX PTT | 8

J1 P1
37 PIN FEMALE DMIN
MATING CONNECTOR

PILOT PHN HI | 18
PILOT PHN LO | 37

PRIMARY JACK

HI
LO | COPILOT HEADSET JACK

J2 P2
50 PIN FEMALE DMIN
MATING CONNECTOR

PILOT MIC HI | 24
PILOT MIC LO | 41

PILOT TX PTT | 7

HI
LO | COPILOT MIC JACK
KEY | COPILOT TX KEY

COPILOTS JACKS

SECONDARY JACK

HI
LO | COPILOT HEADSET JACK

HI
LO | COPILOT MIC JACK
KEY | COPILOT TX KEY

JA97-002 #3

J1 P1
37 PIN FEMALE DMIN
MATING CONNECTOR

COPILOT PHN HI | 17
COPILOT PHN LO | 36

PRIMARY JACK

REAR USER PHN HI
REAR USER PHN LO

J2 P2
50 PIN FEMALE DMIN
MATING CONNECTOR

COPILOT MIC HI | 25
COPILOT MIC LO | 42

COPILOT TX PTT | 8

REAR USER MIC HI
REAR USER MIC LO

REAR USER TX KEY

PREPARED	TAT		
CHECKED	JAC 12-07-16 SRM		
APPROVED	JAC 12-07-16 KDV		

JUPITER AVIONICS CORPORATION

TITLE
Audio Controller with RX Volume Controls
Multiple Audio Controller Option

NCAGE CODE	PART NO.	SHEET
L00N3	JA97-002	6/6

CONFIDENTIAL & PROPRIETARY
TO JUPITER AVIONICS CORP.

DOC NO.
JA97-002 Interconnect Rev A.dwg

JUPITER AVIONICS TEMPLATE AUTOCAD PORTRAIT SIZEA REV B.DWT

Dimensions (Top View)

- 4.92in MAX [125.0mm MAX]
- 2.45in MAX [62.2mm MAX]
- 0.30in MAX [7.6mm MAX]
- 3.47in MAX [88.1mm MAX]
- 5.48in MAX [139.2mm MAX]
- 1.26in MAX [32.0mm MAX]

Front Panel

RECEIVE VOLUME

| COM1 | COM2 | AUX | FM1 | FM2 | FM3 | NAV1 | ADF |

RX

NAV2 M/D

EMER XMIT 🔊/🔈

TX

VOX CALL ICS

NORM ICS TX

JA97   JAC

- 2.625in MAX [66.7mm MAX]
- 5.75in MAX [146.1mm MAX]

J3
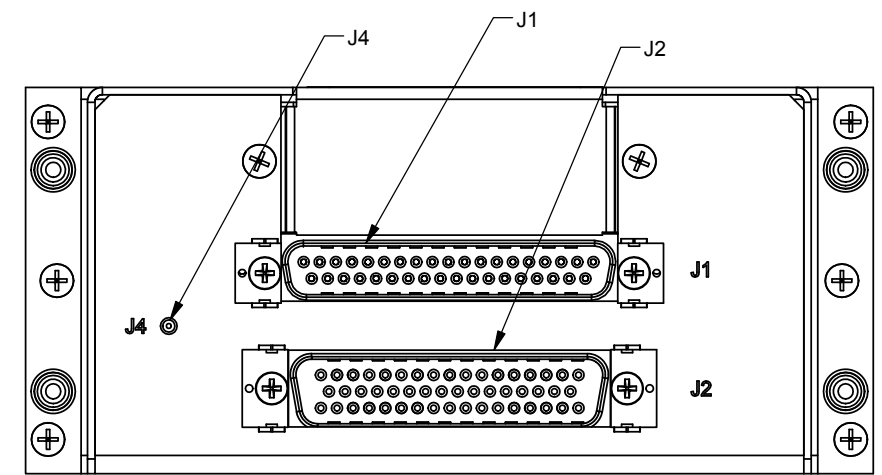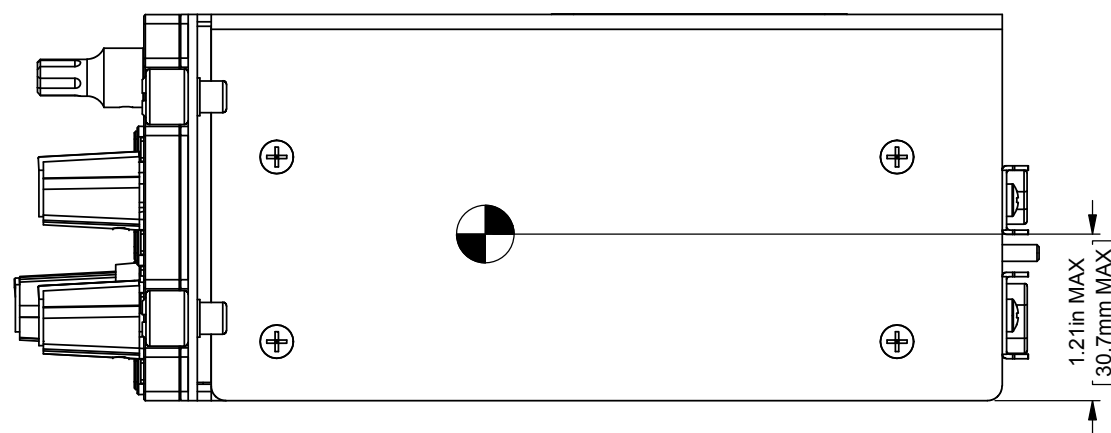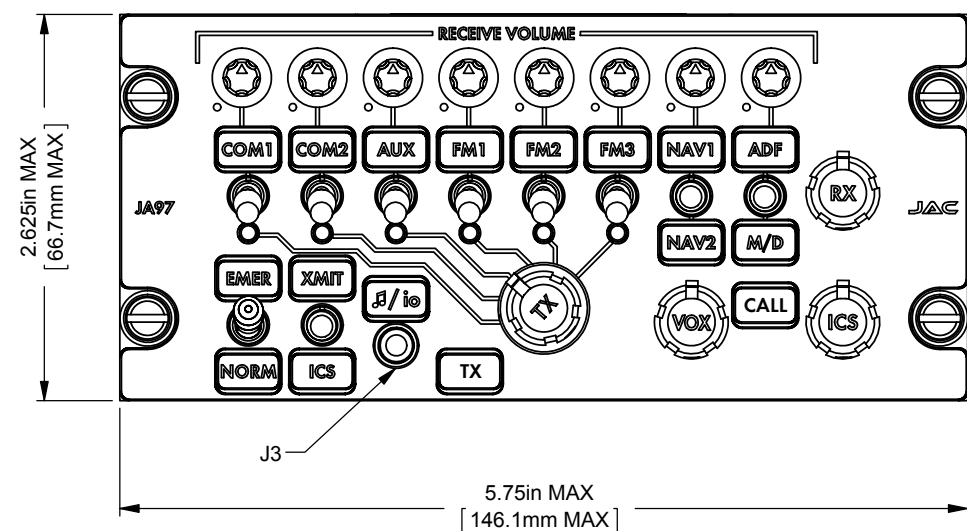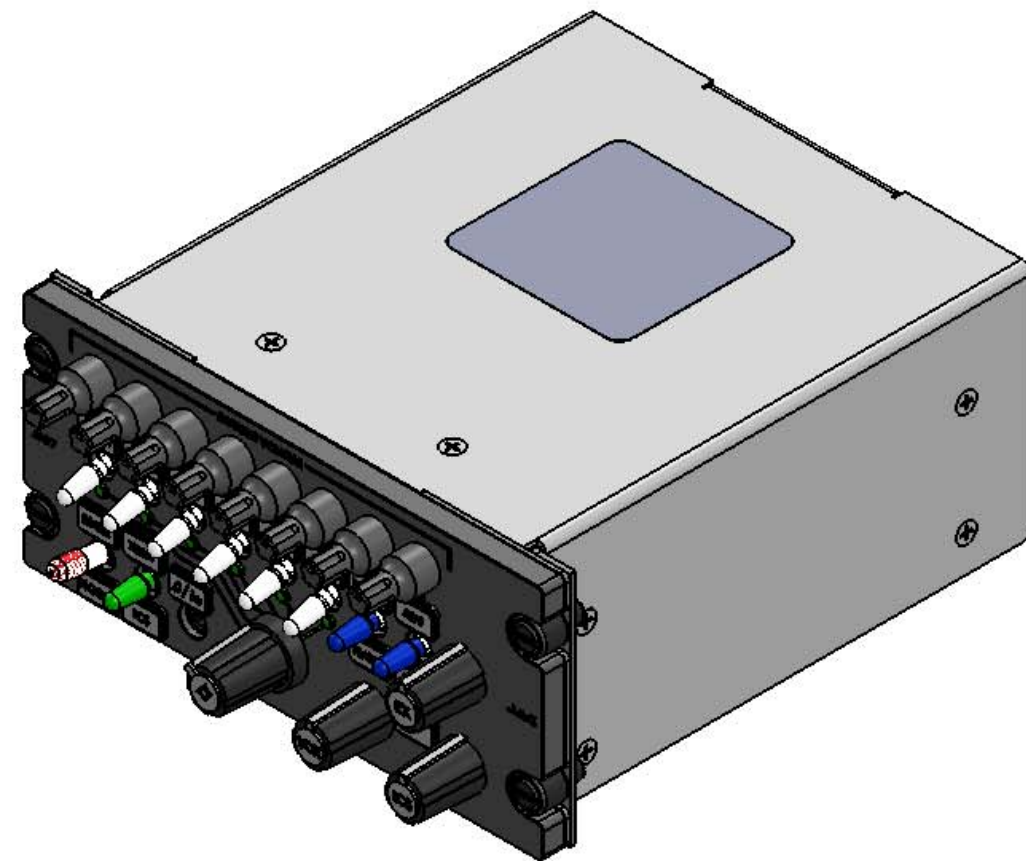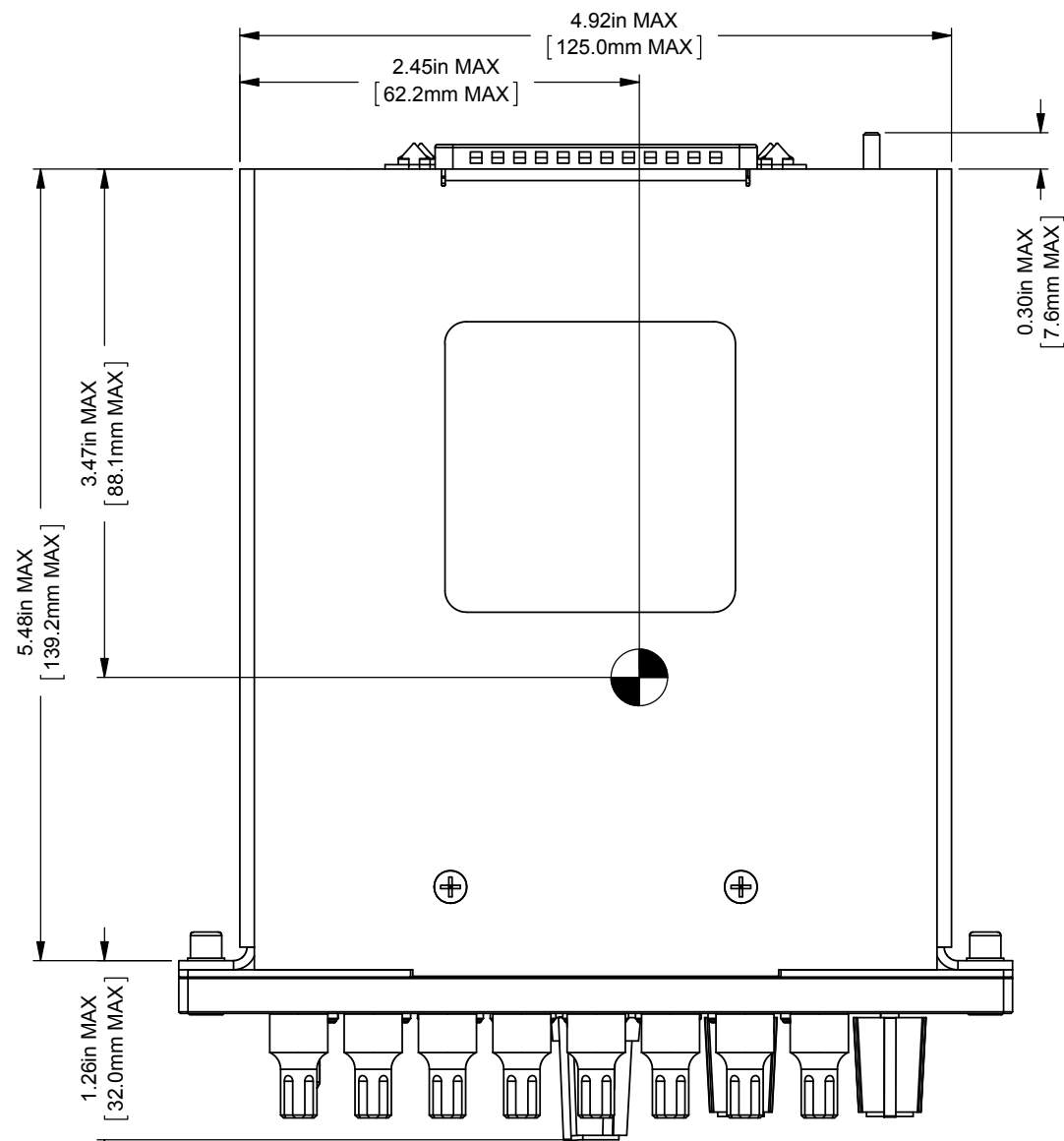
CENTER OF GRAVITY
±0.03in [0.8mm]

WEIGHT: 2.23 lbs [1.01 kg] MAX.

Side View

1.21in MAX [30.7mm MAX]

Rear View

J4 — J1 — J2

J1
J2
J4

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.

Extractor tool recess
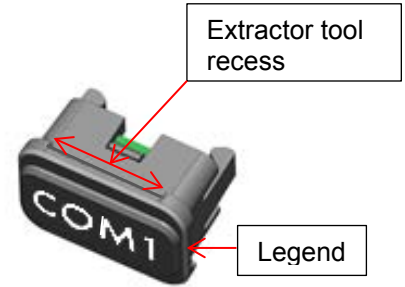
Legend

Legend Removal

⚠️ **Caution**: Take care not to scratch or otherwise damage the faceplate or the legend.
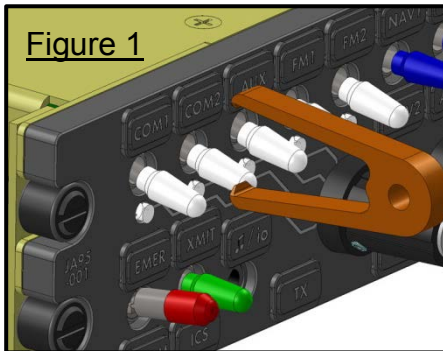
Figure 1

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

Figure 2

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).

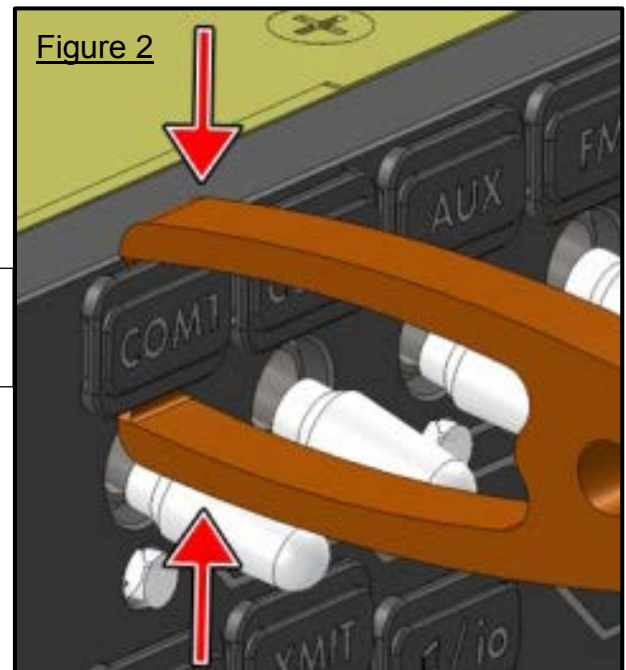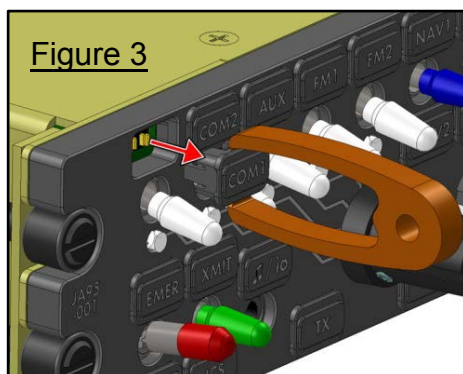Figure 3

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
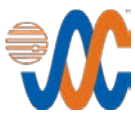
B1 Airworthiness Approval

Airworthiness approval of the JA97-002 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 JA97-002 Audio Controller with RX Volume Controls. 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 JA97-002 Audio Controller with RX Volume Controls in [aircraft location].

See Section 1 of the JA97-002 Installation Manual.

Installed in accordance with the JA97-002 Installation Manual, Revision [ ], and AC 43.13-2, Chapters 2, and 3.

The JA97-002 interfaces with existing aircraft systems per the Installation Manual instructions.

The JA97-002 Installation Manual provides detailed installation instructions and wiring diagrams (Section 2, and Appendices A and B).

Power is supplied to the JA97-002 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 JA97-002 Audio Controller with RX Volume Controls is "on condition" only. Refer to the JA97-002 Maintenance Manual. Periodic maintenance of the JA97-002 is not required.

The following sample Instructions for Continued Airworthiness (ICA) provides assistance in preparing ICA for the Jupiter Avionics JA97-002 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 JA97-002 Audio Controller with RX Volume Controls 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 JA97-002 installed in an [aircraft make and model].

Applicability: Applies to a Jupiter Avionics JA97-002 installed in an [aircraft make and model].
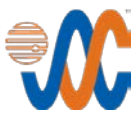
Definitions/Abbreviations: None, N/A.

Precautions: None, N/A.

Units of Measurement: None, N/A.

Referenced Publications: JA97-002 Installation and Operating Manual
JA97-002 Maintenance Manual
JA97-002 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 JA97-002 Audio Controller with RX Volume Controls 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 JA97-002 Operating Manual.

4. Servicing Information

N/A

5. Maintenance Instructions

Maintenance of the JA97-002 is 'on condition' only. Periodic maintenance is not required. Refer to the JA97-002 Maintenance Manual.

6. Troubleshooting Information

Refer to the JA97-002 Maintenance Manual.

7. Removal and Replacement Information

Refer to Section 2 of this manual - the JA97-002 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 JA97-002 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

JA97-002 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 JA97-002 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