

JA31-001

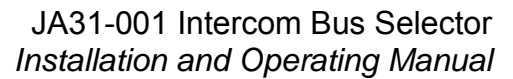
Intercom Bus Selector



Installation and Operating Manual

Rev. A

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Table of Contents

| | |
|---|-----------|
| SECTION 1 - DESCRIPTION | 1 |
| 1.1 Overview | 1 |
| 1.2 Features | 1 |
| 1.3 Inputs and Outputs | 1 |
| 1.3.1 Inputs | 1 |
| 1.3.2 Outputs | 1 |
| 1.3.3 Bi-directional Signals | 1 |
| 1.4 Specifications | 2 |
| 1.4.1 Electrical Specifications | 2 |
| 1.4.2 Mechanical Specifications | 2 |
| 1.4.3 Environmental Specifications | 2 |
| 1.4.4 Flammability of Materials | 2 |
| SECTION 2 – INSTALLATION | 3 |
| 2.1 Introduction | 3 |
| 2.2 Continued Airworthiness | 3 |
| 2.3 Unpacking and Inspecting Equipment | 3 |
| 2.3.1 Warranty | 3 |
| 2.4 Installation Procedures | 3 |
| 2.4.1 Installation Limitations | 3 |
| 2.4.2 Cabling and Wiring | 3 |
| 2.4.3 Mechanical Installation | 4 |
| 2.4.4 Legend Replacement | 4 |
| 2.4.5 Post Installation Checks | 4 |
| 2.5 Legend Text Selection using ProCS™ | 5 |
| 2.5.1 Front Panel Switches | 5 |
| 2.5.2 Connector Maps | 5 |
| 2.6 Installation Kit | 6 |
| 2.6.1 Recommended Crimp tools | 6 |
| 2.7 Installation Drawings | 6 |
| 2.7.1 Generation of Custom Drawings | 6 |
| SECTION 3 – OPERATION | 7 |
| 3.1 Introduction | 7 |
| 3.2 Front Panel Controls | 7 |
| (1) User/Crew Member Designation | 7 |
| (2) Intercom Bus Selector Legends | 7 |
| (3) Intercom Bus Selector Switches | 7 |
| 3.3 Operation | 8 |
| 3.3.1 Panel Lighting | 8 |
| 3.3.2 BUS Selection | 8 |
| Appendix A - Installation Drawings | A1 |
| A1 Introduction | A1 |
| A2 Installation Drawings | A1 |
| Appendix B - Installation Documents | B1 |
| B1 Airworthiness | B2 |
| B2 Instructions for Continued Airworthiness | B2 |

JA31-001 Intercom Bus Selector

SECTION 1 - DESCRIPTION

1.1 Overview

The JA31-001 Intercom Bus Selector provides the crew with the ability to manage the intercom amongst up to six audio controllers in the aircraft. The ICS TIE lines from three or four groups are connected to one of two intercom buses. Groups three and four can support up to two audio controllers each.

1.2 Features

The JA31-001 is comprised of two subassemblies. The main subassembly features a 25 pin D-Min connector, with backward compatibility to legacy systems. The faceplate subassembly contains the removable legends.

The JA31-001 legends are directly dimmable from the aircraft lighting bus and may be replaced with legends having custom markings.

The JA31-001 features four intercom tie line switches to individually connect each audio controller group to one of two intercom buses.

The JA31-001 provides load matching to maintain ICS TIE line audio levels.

The JA31-001 switching functions are passive and do not require power from the aircraft.

1.3 Inputs and Outputs

Refer to the JA31-001 [connector map](#) for the mating connector designators and pin assignments for the input and output signals.

1.3.1 Inputs

| Name | Qty | Type |
|---------------------|-----|-----------------------|
| +28VDC LIGHTS INPUT | 1 | Analog control signal |

1.3.2 Outputs

| Name | Qty | Type |
|---------------------------|-----|----------------------|
| USER 4 ICS TIE LOAD HI/LO | 1 | Termination Resistor |
| USER 5 TERMINATION A/B | 1 | Termination Resistor |
| USER 6 TERMINATION A/B | 1 | Termination Resistor |

1.3.3 Bi-directional Signals

| Name | Qty | Type |
|----------------------|-----|--------------|
| USER # ICS TIE HI/LO | 4 | Audio signal |



1.4 Specifications

1.4.1 Electrical Specifications

Power Input N/A

1.4.1.1 Audio Performance

Rated Input Level

ICS TIE rated input level 1.2 Vrms \pm 10%

Rated Output Power

ICS TIE rated output level 1.2 Vrms \pm 10%

Output Load

User 1 ICS TIE load 1 load of 2000 $\Omega \pm$ 10%
User 2 ICS TIE load 1 load of 2000 $\Omega \pm$ 10%
User 3 ICS TIE load 1 or 2 parallel loads of 2000 $\Omega \pm$ 10%
User 4 ICS TIE load 1 or 2 parallel loads of 2000 $\Omega \pm$ 10%

Input to output Crosstalk and Bleed-through Level

Input to Output crosstalk \leq 55 dB

Input to Input Crosstalk Level

Input to Input crosstalk \leq 60 dB

System Input to Output Polarity Maintained

1.4.1.2 Audio Performance, Other

ICS TIE input to output circuitry type Balanced, Pass-through

1.4.1.3 Lights Input

LIGHTS INPUT current 40 mA max.

1.4.2 Mechanical Specifications

Height 1.12 in [28.3 mm] max

Behind panel depth (excluding connectors) 1.69 in [42.9 mm] max

Dimensions in front of Dzus rail 0.92 in [23.4 mm] max

Faceplate width 5.75 in [146.1 mm] max

Behind panel width 4.90 in [124.5 mm] max

Weight 0.46 lb [0.21 kg] max

Connectors (3): J1 One 25-pin D-Sub male, V5 locking
J2 One Ground stud 4-40, 0.5 in. max

Mounting 2 Dzus fasteners

Bonding \leq 2.5 m Ω

Installation kit part number INST-JA31

1.4.3 Environmental Specifications

Environmental categories for the JA31-001 Intercom Bus Selector are listed in the [Environmental Qualification Form](#) in Appendix B of this manual.

1.4.4 Flammability of Materials

The JA31-001 complies with the requirements of RTCA/DO-160G Sec 26.3.3 "Flammability", through equivalent flammability testing of materials and the Small Parts Exemption.

JA31-001 Intercom Bus Selector

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 JA31-001 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 any tests, and slowly increase the volume to a comfortable listening level.



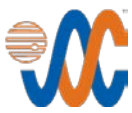
CAUTION: The power input circuitry of the unit may be damaged if the installation does not conform to the wiring instructions in this manual.

2.4.1 Installation Limitations

The JA31-001 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 JA31-001 can be mounted in any attitude and location with adequate space for the front panel and sufficient clearance for the connector and wiring harness. It requires no direct cooling.

2.4.4 Legend Replacement

The JA31-001 illuminated legends are field replaceable. For further information, refer to the '[Legend Replacement](#)' document in Appendix A of this manual.

2.4.5 Post Installation Checks

2.4.5.1 Voltage/Resistance checks.

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

- a) Check P1 pin 2 for +28 Vdc lights bus voltage.
- b) Check P2 pin 14 for continuity to ground (less than 0.5 Ω).
- c) Check all pins for shorts to ground or adjacent pins.

2.4.5.3 Power on Checks.

Power up the aircraft's systems and confirm normal operation of all functions of the JA31-001. Refer to Section 3 (Operation) for specific operational details.

- a) With all switches in the BUS 1 position, confirm each USER can communicate to all other USERS on the intercom tie lines.
- b) With the USER 1 switch to BUS 2 and all other switches on BUS 1, confirm that USER 1 cannot hear the other USERS. Confirm that the other USERS cannot hear USER 1. Repeat for each USER.
- c) Adjust the lighting bus from minimum to maximum. Confirm that the JA31 legend illumination changes from dim to bright.

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



2.5 Legend Text Selection using ProCS™

The JA31-001 has no required adjustments, but the configuration program ProCS™ can be used to customize the text for each legend either at the time of ordering the unit, or if text changes are required after installation. The JA31-001 need not be connected to a computer to select the legend text.

For information on ordering customized legends, refer to the [ProCS™ Ordering Instructions](#) on the [JAC website](#).

2.5.1 Front Panel Switches

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



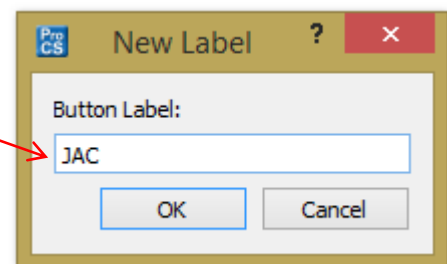
Note: If the name of a front panel switch is changed using this software, the change will be incorporated in the connector maps and interconnect, to give truly customized installation diagrams.



Clicking on a customizable legend will open a **drop-down menu** listing the options for that label. The currently selected option will be highlighted. To escape from the menu, click on the desired option, or right-click in the window. A 'Print...' box will appear. Click outside the box to escape, or select it to print the '**Front Panel Switches**' window showing the current label selections.

Among the options is '----' which signifies that the legend will be left blank, and '**New...**' which allows the user to enter a completely new legend of up to five characters. If a 'new' legend has been added, the option '**Edit ...**' is added to the menu to enable changes to the newly created label.

In the example shown here, the option '**New...**' has been selected. A pop-up '**New Label**' window will appear, allowing the user to create a customized legend – in this case, JAC. The new legend name will now be shown in the appropriate position on the faceplate representation in the software program, and will be used in the connector maps and interconnect.



2.5.2 Connector Maps

This section contains connector maps and interconnects that are automatically generated to show changes to switch labels that affect the installation of the JA31-001.



2.6 **Installation Kit**

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

The installation kit (Part # INST-JA31) consists of the following:

| Quantity | Description | JAC Part # |
|-----------------|--|-------------------|
| 1 | D-Sub 25-pin connector, hood and 25 crimp pins | CON-3420-0025 |
| 1 | TAG ring, 0.375" Inside Diameter | CON-5500-0375 |
| 1 | 3/4" Inside Diameter - Black Heat Shrink Tube | WIR-HTSK-0750 |

2.6.1 **Recommended Crimp tools**

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

2.7 **Installation Drawings**

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

2.7.1 **Generation of Custom Drawings**

The interconnects and connector maps in Appendix A of this manual are generic drawings based on the standard version of the JA31-001. However, if JAC's ProCS™ software has been used to change switch legends, the software can be used to generate fully customized interconnects and connector maps for use by the installer.

JA31-001 Intercom Bus Selector

SECTION 3 – OPERATION

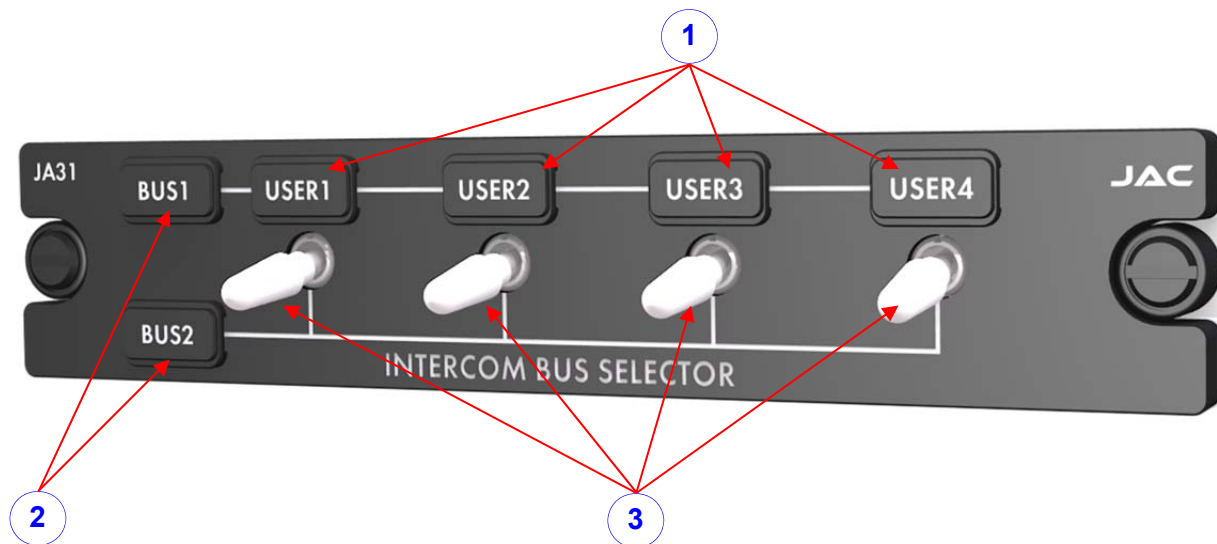
3.1 Introduction

This section contains the operating instructions for the JA31-001.

3.2 Front Panel Controls



Note: The 6 legends are removable and may be replaced with custom ordered parts. The controls are referred to by the default legend names shown below.



(1) User/Crew Member Designation

The four User Designation legends are interchangeable to allow customization.

(Default – USER1; USER2; USER3; USER4.)

(2) Intercom Bus Selector Legends

The two Intercom Bus Selector Legends are interchangeable to allow for customization.

(Default – BUS1, BUS2.)

(3) Intercom Bus Selector Switches

The Intercom Bus Selector Switches are four white two-position toggle switches that allow each user to select the Intercom Bus for connection. When the switch associated with the user is in the UP position, the user will be connected to BUS 1, and in the DOWN position the user will be connected to BUS 2.



3.3 Operation



Note: The JA31-001 does not require power from the aircraft for operation.

3.3.1 Panel Lighting

The legends will be illuminated and dim through the aircraft lighting bus.

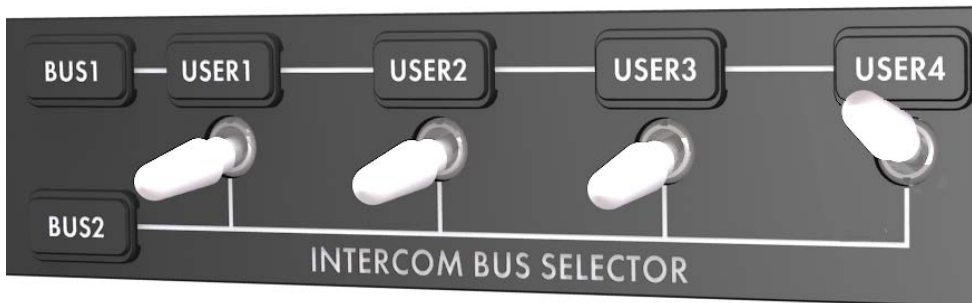
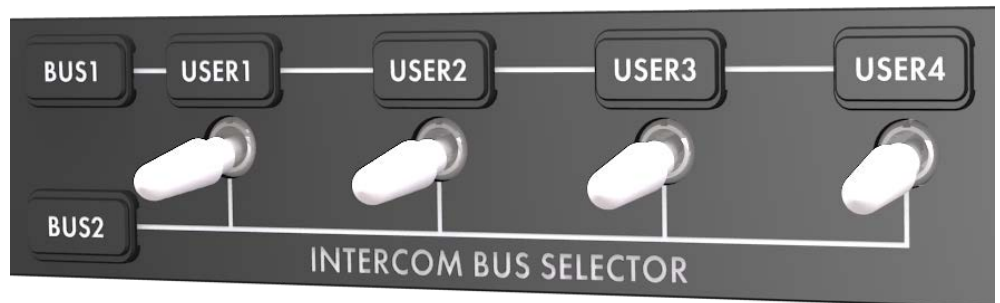
3.3.2 BUS Selection (Talk Groups)

When the USER switch is in the BUS 1 position, the USER's ICS Tie Line will be connected to Bus 1.

When the USER switch is in the BUS 2 position, the USER's ICS Tie Line will be connected to Bus 2.

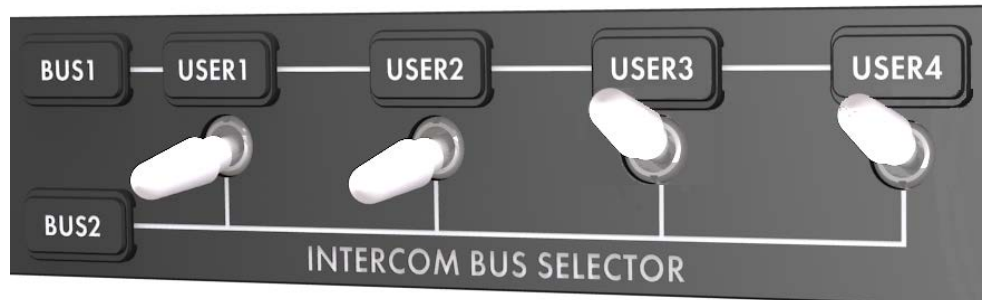
3.3.2.1 JA31-001 for Talk Groups/Isolation

If it is a requirement for **ALL USERS** to be able to talk together on the intercom, all users' switches must either select BUS 1 or BUS 2 (i.e. all switches in the same direction.)



If one user is to be **ISOLATED** from the other users, that user must be connected to a different bus to all the other users. (i.e. User's switch must be in the opposite direction to all the others.) In this example, User 4 is isolated from Users 1, 2 and 3.

If it is necessary to **SPLIT** the users into Talk Groups, (for instance Flight Crew and Cabin Crew) the users' switches should be connected to different busses (in this example, User 1 and User 2 are connected on BUS 2; User 3 and User 4 are connected on BUS 1).



Installation and Operating Manual

Appendix A - Installation Drawings

A1 **Introduction**

The drawings necessary for installation and troubleshooting of the JA31-001 Intercom Bus Selector are in this Appendix, as listed below.



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

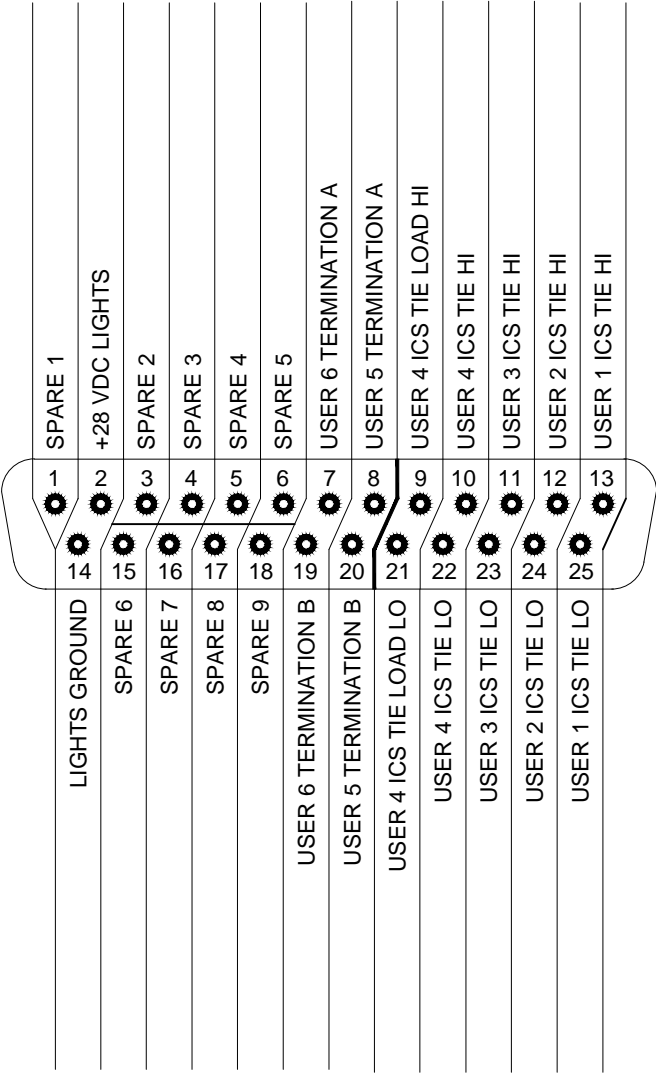
A2 **Installation Drawings**

| DOCUMENT | Rev |
|--|-------------------|
| JA31-001 Connector Map | A |
| JA31-001 Interconnect | A |
| JA31-001 Mechanical Installation | A |
| | |


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

P1

25 PIN FEMALE DMIN
MATING CONNECTOR



VIEW IS FROM REAR OF MATING CONNECTOR

| | | | | |
|---|--|---|----------------------|--------------|
| PREPARED | TAT | <div>  JUPITER AVIONICS CORPORATION </div> | | |
| CHECKED | <div> <div>JAC</div> <div>06-01-15</div> <div>DS</div> </div> | | | |
| APPROVED | <div> <div>JAC</div> <div>06-01-15</div> <div>KDV</div> </div> | TITLE Intercom Bus Selector | | |
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| | | DOC NO. JA31-001 Connector Map Rev A.dwg | | |

JA31-001 INTERCONNECT WIRING NOTES




NOTES

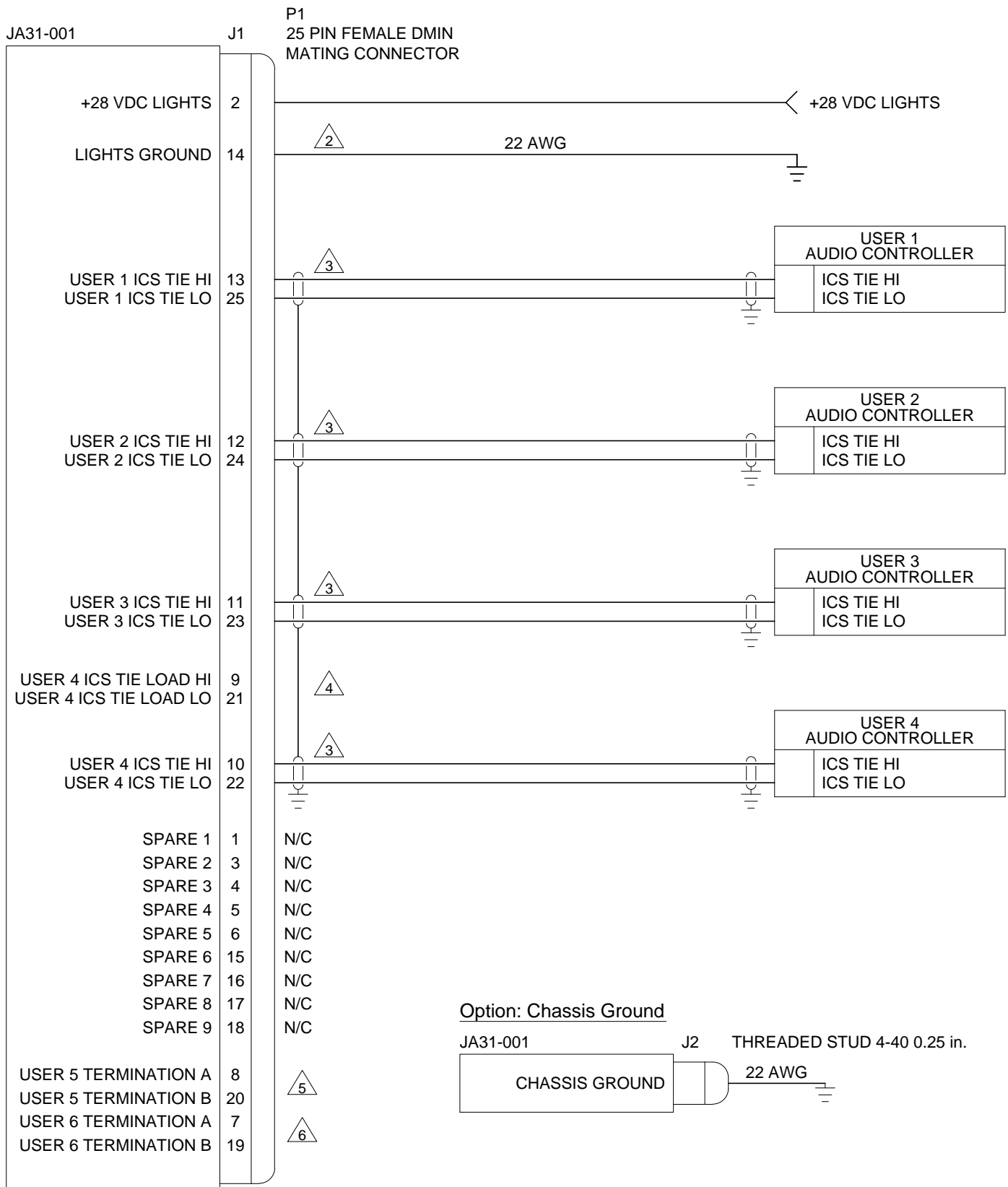
1. ALL WIRE SIZE SHOULD BE 24 AWG MIN UNLESS OTHERWISE SPECIFIED. UNSHIELDED WIRE SHOULD BE SELECTED PER FAA AC43.13-1B CHANGE 1 PARA 11-76 TO 11-78. WIRE TYPES SHOULD BE IN ACCORDANCE WITH MIL-W-22759 AS DESCRIBED IN FAA AC43.13-1B CHANGE 1 PARA 11-85 AND 11-86 AND LISTED IN TABLE 11-11 OR 11-12. ALL SHIELDED CABLE SHOULD BE IN ACCORDANCE WITH MIL-DTL-27500 (REVISION H OR LATER).
2. CONNECTION TO AIRFRAME GROUND SHOULD BE MADE WITH 22 AWG WIRE. LENGTH NOT TO EXCEED 3 FT (0.91 M).
3. CABLE SHIELDS AT THE CONNECTOR PINS SHOULD BE TERMINATED TO AIRFRAME GROUND USING A TAG RING P/N: MS27741-5 OR EQUIVALENT.
4. CONNECT LOAD TO USER 4 ICS TIE LINE, IF USER 4 AUDIO CONTROLLER IS NOT CONNECTED.
5. IF A FIFTH USER ICS TIE LINE IS CONNECTED IN PARALLEL WITH USER 3, PINS 8 AND 20 MUST BE SHORTED TOGETHER.
6. IF A SIXTH USER ICS TIE LINE IS CONNECTED IN PARALLEL WITH USER 4, PINS 7 AND 19 MUST BE SHORTED TOGETHER.




CONNECTOR PIN LEGENDS

LEGEND

| | |
|-------|---|
| SPARE | INTERNAL CIRCUITS MAY EXIST AND MAY BE ACTIVATED FOR FUTURE USE. NO EXTERNAL WIRE CONNECTION. |
| N/C | NO CONNECTION |

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| | | DOC NO. JA31-001 Interconnect Rev A.dwg | | |



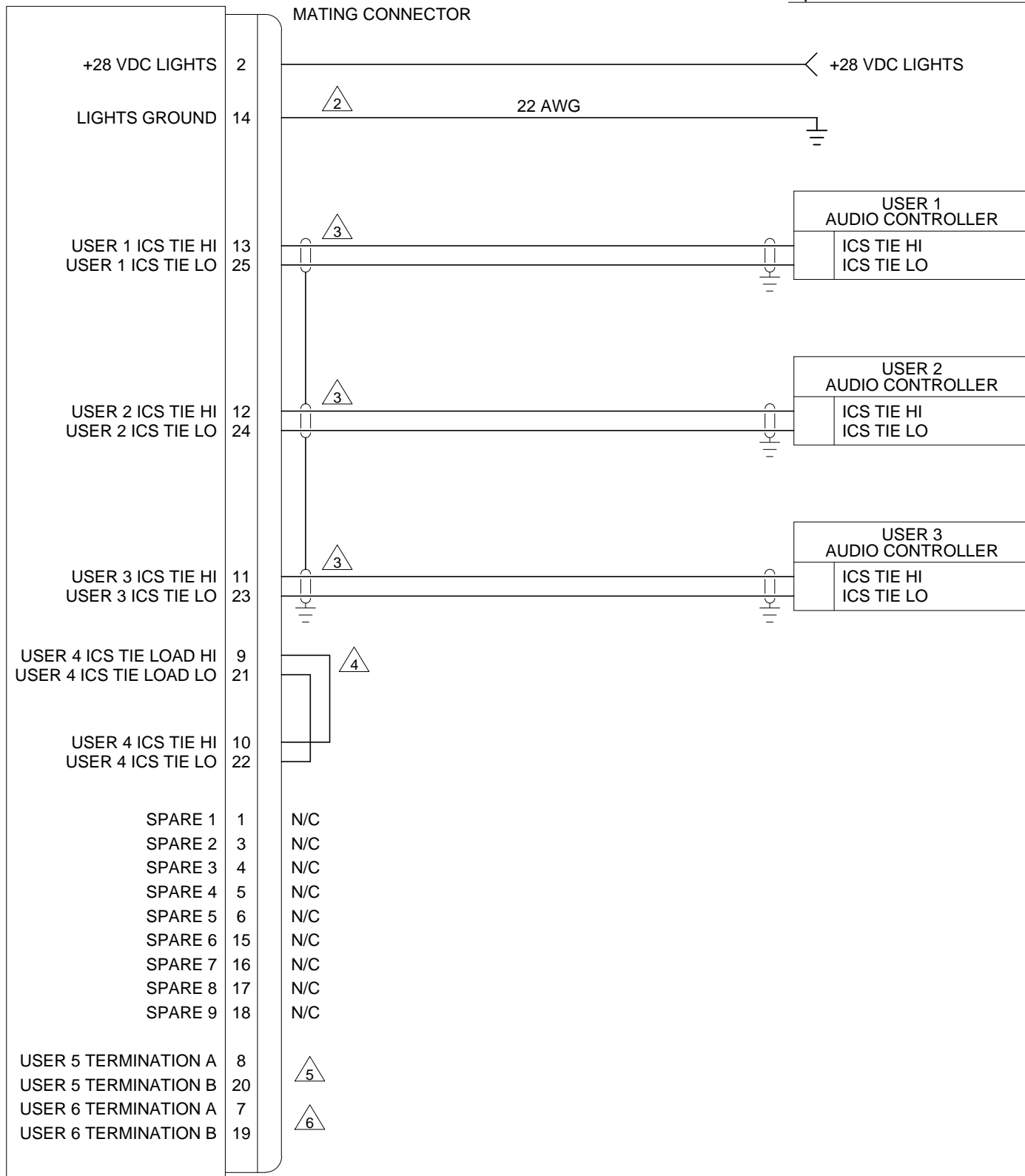
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| | | DOC NO. JA31-001 Interconnect Rev A.dwg | | |


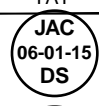
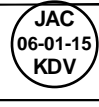
JA31-001

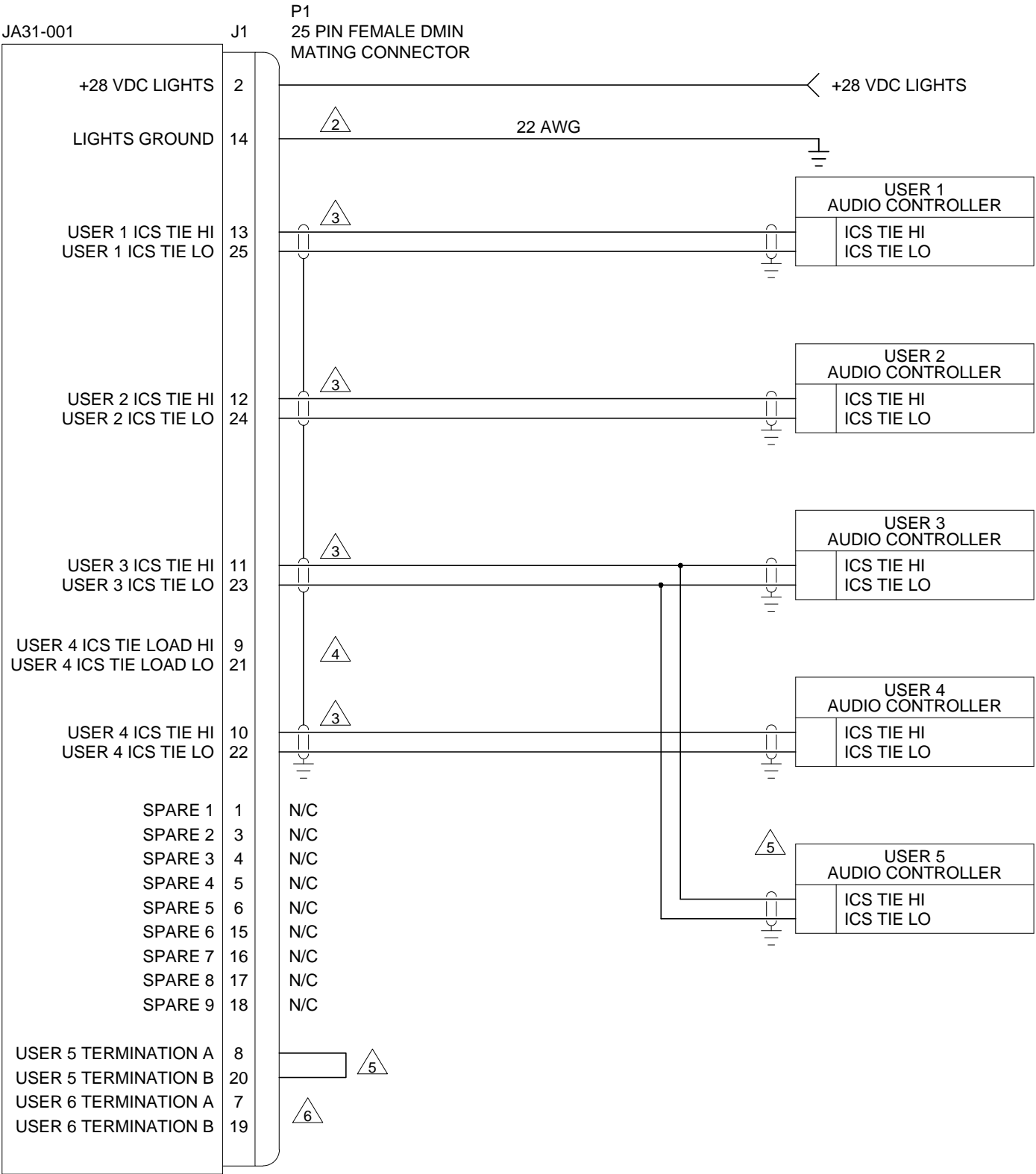
J1


P1
25 PIN FEMALE DMIN
MATING CONNECTOR



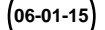
Option: 3 User Interconnect

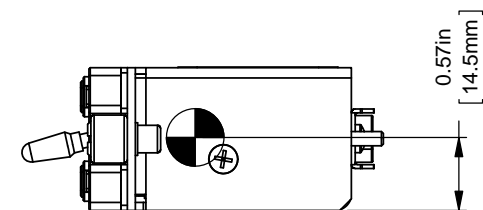
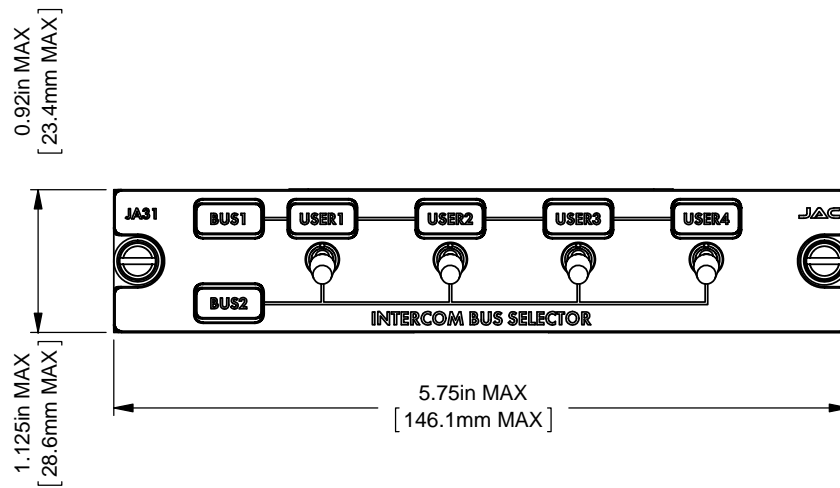
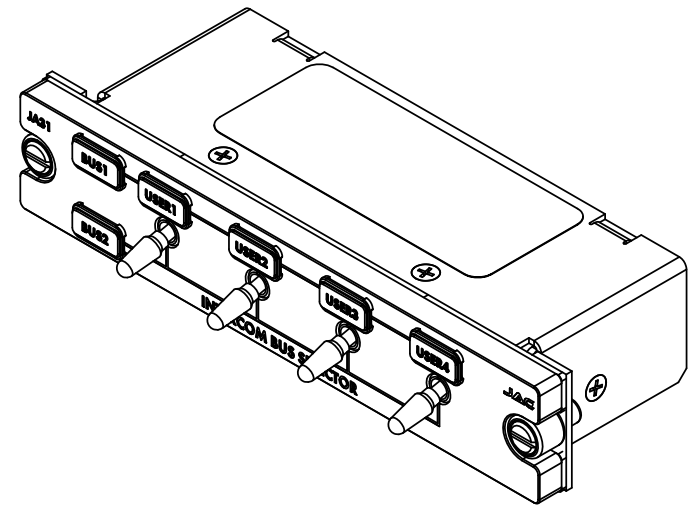
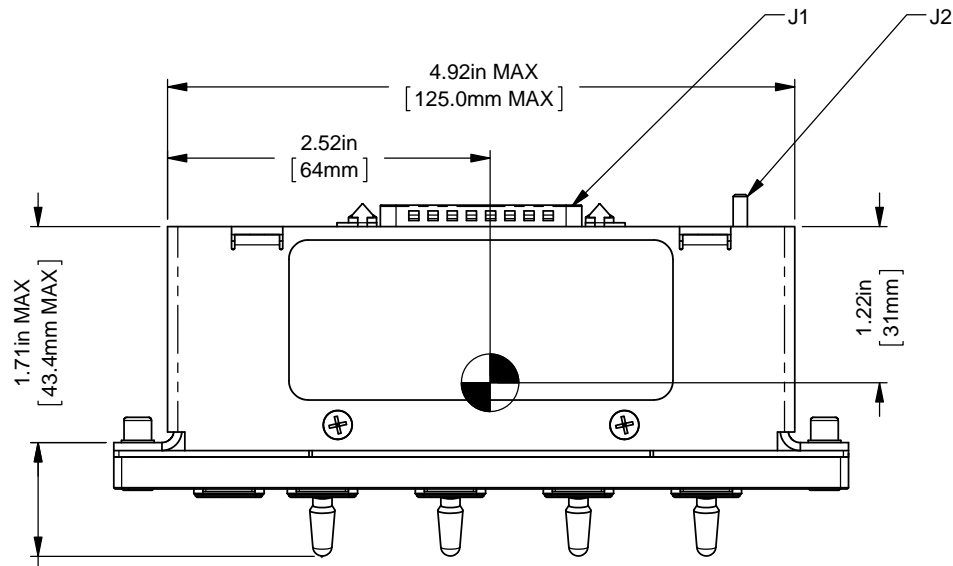



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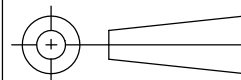
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| CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP. | | DOC NO. JA31-001 Interconnect Rev A.dwg | | |



 CENTER OF GRAVITY
±0.03in [0.8mm]

WEIGHT: 0.46 lbs [0.21 kg] MAX.

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



MATERIAL: N/A
FINISH: N/A

PREPARED

TAT

CHECKED

JAC
06-01-15
DS

APPROVED

JAC
06-01-15
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JUPITER AVIONICS
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TITLE

Intercom Bus Selector

NCAGE CODE
L00N3

PART NO.
JA31-001

SHEET
1/1

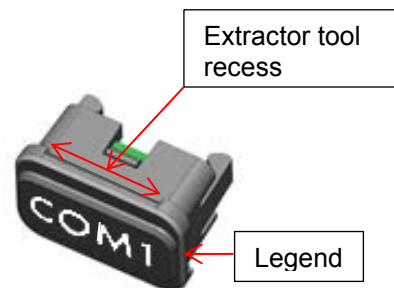
DOC. NO.
JA31-001 Mechanical Installation Rev A.SLDDRW



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.

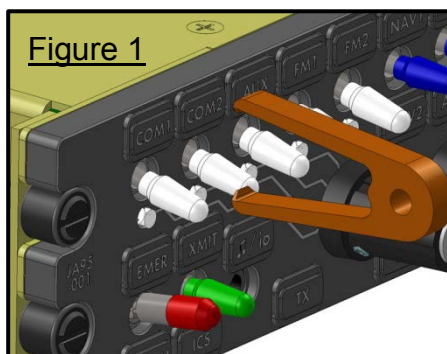


Figure 1

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).

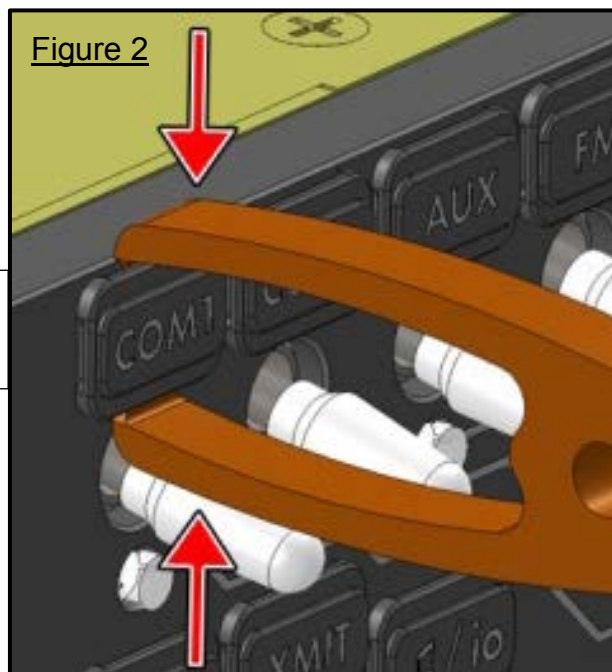


Figure 2

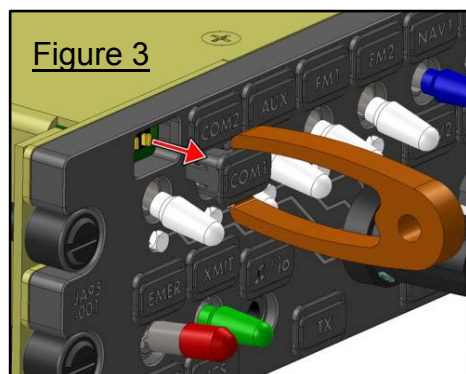


Figure 3

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

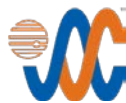
Legend Replacement

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

Airworthiness approval of the JA31-001 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 installing a Jupiter Avionics JA31-001 Intercom Bus Selector. 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:

Installed a Jupiter Avionics JA31-001 Intercom Bus Selector in [aircraft location].

Installed in accordance with the JA31-001 Installation & Operation Manual, Revision [], and AC 43.13-2, Chapters 2, and 3.

The JA31-001 interfaces with existing aircraft systems per the Installation & Operation Manual instructions.

The JA31-001 Installation & Operation Manual provides detailed installation instructions and wiring diagrams (Section 2, and Appendices A and B).

Power is supplied to the JA31-001 through a []-Amp circuit. 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 JA31-001 Intercom Bus Selector is "on condition" only. Refer to the JA31-001 Maintenance Manual. Periodic maintenance of the JA31-001 is not required.

The following sample Instructions for Continued Airworthiness (ICA) provides assistance in preparing ICA for the Jupiter Avionics JA31-001 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 JA31-001 Intercom Bus Selector 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 JA31-001 installed in an [aircraft make and model].

Applicability: Applies to a Jupiter Avionics JA31-001 installed in an [aircraft make and model].

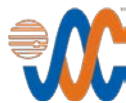
Definitions/Abbreviations: None, N/A.

Precautions: None, N/A.

Units of Measurement: None, N/A.

Referenced Publications: JA31-001 Installation and Operating Manual
JA31-001 Maintenance Manual
JA31-001 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 JA31-001 Intercom Bus Selector 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 JA31-001 Operating Manual.

4. Servicing Information

N/A

5. Maintenance Instructions

Maintenance of the JA31-001 is 'on condition' only. Periodic maintenance is not required. Refer to the JA31-001 Maintenance Manual.

6. Troubleshooting Information

Refer to the JA31-001 Maintenance Manual.

7. Removal and Replacement Information

Refer to Section 2 of this manual - the JA31-001 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 JA31-001 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

JA31-001 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 JA31-001 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