JA23-030

Speaker Amplifier - 30 Watt

Installation and Operating Manual

Rev B

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IMPORTANT:

Information in this document is subject to change without notice.

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

www.jupiteravionics.com

RECORD OF REVISIONS

Revision	Rev Date	Description	ECR
A	May 2019	Initial release, Serial number 1001 and higher.	6048
B	Aug 2020	New mechanical installation drawing.	7344

Prepared:	Checked:	Approved:
DGB	JAC 01-07-21 KDV	JAC 01-07-21 MQS

Table of Contents

SECTION 1 - DESCRIPTION

1.1 System Overview

The JA23-030 Speaker Amplifier - 30 Watt is an integrated speaker amplifier which allows the user to monitor receive audio without a headset.

1.2 Features Overview

The JA23-030 provides a 30 Watt audio signal to a speaker.

The JA23-030 supports speaker impedances of 4, 8 and 16 Ohm and greater.

The JA23-030 supports three differential audio inputs.

The JA23-030 supports one single ended microphone input with Mic bias.

The JA23-030 supports a speaker mute and Push-to-talk input.

The JA23-030 supports an internal and external speaker level control.

1.3 Inputs and Outputs

Refer to the JA23-030 connector maps for the mating connector designators and pin assignments for the input and output signals.

1.3.1 Inputs

Name	Qty	Type
SPEAKER MIC HI/LO	1	Audio signal
POWER INPUT	1	power supply 28 Vdc
SPEAKER PTT	1	Control signal, active low
SPEAKER INPUT 1 to 3 HI/LO	3	Audio signal
SPEAKER LEVEL & MUTE HI/LO	1	Analog control signal

1.3.2 Outputs

Name	Qty	Type
SPEAKER OUTPUT HI/LO	1	Audio signal

1.4 Specifications

1.4.1 Electrical Specifications

Power Input

Primary nominal voltage	28 Vdc
Maximum voltage	32.2 Vdc
Minimum voltage	22.0 Vdc
Emergency voltage	18.0 Vdc
POWER INPUT 'off' voltage	≤ 15.0 Vdc
Input current at Emergency voltage	≤ 2.0 A

1.4.1.1 Audio Performance

Rated Input Level

SPEAKER INPUT audio rated input level	1.00 Vrms ± 10%
SPEAKER MIC input level	250 mVrms ± 10%

Rated Output Level

SPEAKER OUTPUT rated output level	11.0 Vrms ± 10%

Audio Frequency Response

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

Distortion Characteristics

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

Input Impedance

SPEAKER MIC input Impedance	150 Ω ± 10%
SPEAKER INPUT Impedance	1000 Ω ± 10%

Output Load

SPEAKER load impedance	≥ 4.0 Ω

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

1.4.1.2 Audio Performance, Other

SPEAKER MIC inputs designed for MIC type	amplified dynamic/electret
Microphone input bias voltage	12 Vdc ±10%
Microphone input circuitry type	single ended
SPEAKER INPUT circuitry type	differential

1.4.1.3 Discrete Signals

Active low control input, active signal level	≤ +3 Vdc
Active low control input, active signal level sources	0.1 to 10 mA
Active low control input signals have	internal pull-up resistor

1.4.1.4 Volume Control

Chassis Speaker Level Control (with SPEAKER LEVEL AND MUTE HI/LO shorted)	
Maximum volume, Chassis Speaker Level Control fully CW	rated output level
Maximum volume, Chassis Speaker Level Control fully CCW	-32 ± 3 dB
Speaker Level and Mute control (with Chassis Speaker Level fully CCW)	
Maximum volume, output level with control resistance ≥ 1 kΩ	rated output level
Maximum volume, output level with control resistance ≤ 10 Ω	-32 ± 3 dB
Speaker Mute Switch SPEAKER LEVEL AND MUTE HI shorted to power ground	≤ -60 dB

1.4.2 Mechanical Specifications

Height		2.60 in [66.0 mm] max
Depth not including connectors		6.30 in [160.0 mm] max
Width		2.75 in [69.9 mm] max
Weight		1.12 lb [0.51 kg] max
Material		brushed aluminum with clear conversion coating
Connector (Speaker)	J1	One 15-pin D-Sub male V5 locking
Mounting		4 x 10-32 fasteners
Bonding		≤ 2.5 mΩ
Installation kit part number		INST-JA23

1.4.3 Environmental Specifications

The JA23-030 Speaker Amplifier - 30 Watt has been tested to the environmental conditions listed below.

Temperature:	
Operating	-45 to +50°C
Ground Survival	-55 to +85°C
Altitude	50,000 ft
Shock, Crash Safety	6 g, 20 g for 11 ms

SECTION 2 – INSTALLATION

2.1 Introduction

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

2.2 Continued Airworthiness

Maintenance of the JA23-030 is on condition only. Scheduled inspection and/or periodic maintenance of this unit is not required.

2.3 Unpacking and Inspecting Equipment

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

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 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 JA23-030, on or in a specific type or class of aircraft, must determine that the aircraft installation conditions meet standards. The JA23-030 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 JA23-030 can be mounted in any attitude and location with sufficient clearance for the connector and wiring harness. It requires no direct cooling.

2.4.4 Post Installation Checks

2.4.4.1 Voltage/Resistance checks.

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

a) Check P1 pin **1** for +28 Vdc relative to ground.
b) Check P1 pin **9** for continuity to ground (less than 0.5 Ω).
c) Check P1 pin **6** for continuity to ground (less than 0.5 Ω) when relevant switch is closed (if connected).
d) Check all pins for shorts to ground or adjacent pins.

2.4.4.2 Configuration

Ensure the chassis mount speaker level control is adjusted correctly.

2.4.4.3 Power on Checks.

Power up the aircraft's systems and confirm normal operation of all functions of the JA23. Refer to section 2.5 and section 3.2 for all operating functions.

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

2.5 Equipment Function

The SPEAKER INPUT signals and the SPEAKER MIC signal are summed and routed to the SPEAKER OUTPUT, when the SPEAKER PTT input is active.

The SPEAKER OUTPUT is muted when the SPEAKER PTT input is inactive

The SPEAKER OUTPUT is muted when the SPEAKER LEVEL AND MUTE HI input is grounded.

The Chassis Volume Control functions when the SPEAKER LEVEL AND MUTE HI & LO are connected.

The SPEAKER OUTPUT is at maximum level when the Chassis Volume Control is fully CW.

The SPEAKER OUTPUT is at minimum level when the Chassis Volume Control is fully CCW.

The remote speaker level control, connected to the SPEAKER LEVEL AND MUTE HI & LO inputs, functions when the Chassis Volume Control is fully CCW.

The SPEAKER OUTPUT is at maximum level when the remote speaker level control is fully CW.

The SPEAKER OUTPUT is at minimum level when the remote speaker level control is fully CCW.

2.6 Installation Kit

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

The installation kit (Part # INST-JA23) consists of the following:

Qty	Description	JAC Part #
1	15 Socket, D-Subminiature - Crimp Socket Connector Assembly	CON-3420-0015
1	0.375" Inside Diameter, Hardware - Tag Ring	CON-5500-0375
1	Shell knob with VOL printed on cap, Non-illuminated - Pointer Style - 0.5	KNB-1100-VOL
1	Label, MIN to MAX - Speaker VOL, Plastic	LAB-PLAS-0154
1	Panel Pot - 1 kOhm - Linear - Solder Lugs	POT-1RV6-1K00
1	3/4" Inside Diameter - Black, Heat Shrink Tube	WIR-HTSK-0750

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.

SECTION 3 – OPERATION

3.1 Introduction

This section contains the operating instructions for the JA23-030.

3.2 Controls

Note: The JA23-030 has no operator controls. Confirm details of the speaker system with your installing agency.

3.2.1 Speaker Push To Talk

The JA23-030 can be provided with a Speaker PTT signal that will allow speaker operation when grounded.

3.2.2 Optional Speaker Mute Switch

The JA23-030 can be connected to a remote Speaker Mute Switch that will mute the speaker when grounded.

3.2.3 Optional Volume Level Potentiometer

The JA23-030 can be connected to a remote rotary control that can be used to adjust the speaker level.

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Installation and Operating Manual

Appendix A - Installation Drawings

A1 Introduction

The drawings necessary for installation and troubleshooting of the JA23-030 Speaker Amplifier - 30 Watt are in this Appendix, as listed below.

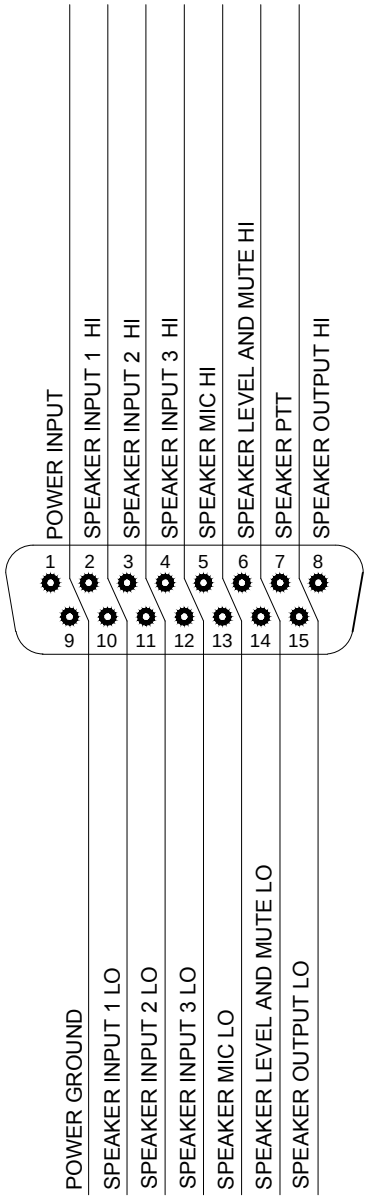
A2 Installation Drawings

DOCUMENT	Rev
JA23-030 Connector Map	A
JA23-030 Interconnect	A
JA23-030 Mechanical Installation (ECR 7305 Incorporated)	A

SPEAKER CONNECTOR

P1

15 PIN FEMALE DMIN
MATING CONNECTOR



VIEW IS FROM REAR OF MATING CONNECTOR

PREPARED	KV	JUPITER AVIONICS CORPORATION	
CHECKED	JAC 01-21-20 SRM	TITLE	Speaker Amplifier P1 - Speaker Connector
APPROVED	JAC 01-27-20 KDV	NCAGE CODE: L00N3	PART NO.: JA23-030 / SHEET: 1/1
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO.	JA23-030 Connector Map Rev A

JA23-030 INTERCONNECT WIRING NOTES

NOTES

1. ALL WIRE SIZE SHOULD BE 24 AWG MIN UNLESS OTHERWISE SPECIFIED. UNSHIELDED WIRE SHOULD BE SELECTED PER FAA AC43.13-1B CHANGE 1 PARA 11-76 TO 11-78. WIRE TYPES SHOULD BE IN ACCORDANCE WITH MIL-W-22759 AS DESCRIBED IN FAA AC43.13-1B CHANGE 1 PARA 11-85 AND 11-86 AND LISTED IN TABLE 11-11 OR 11-12. ALL SHIELDED CABLE SHOULD BE IN ACCORDANCE WITH MIL-DTL-27500 (REVISION H OR LATER).

△2 CONNECTION TO AIRFRAME GROUND SHOULD BE MADE WITH 20 AWG WIRE. LENGTH NOT TO EXCEED 3 FT (0.91 M).

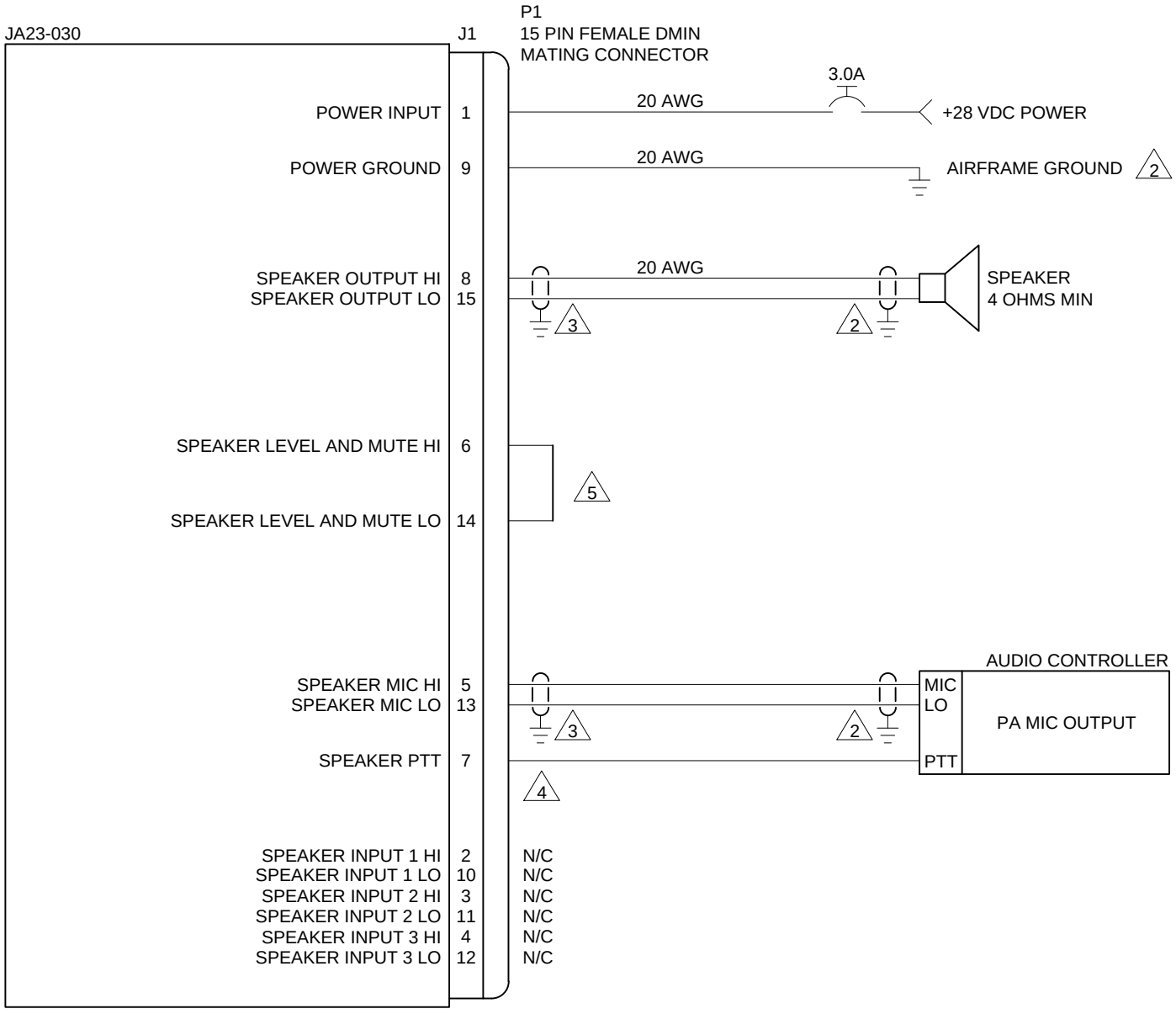
△3 CABLE SHIELDS AT THE JA23 CONNECTOR END SHOULD BE TERMINATED TO AIRFRAME GROUND USING THE TAG RING SUPPLIED IN THE INSTALLATION KIT OR EQUIVALENT.

△4 SPEAKER PTT MUST BE GROUNDED TO ALLOW SPEAKER OPERATION.

△5 CONNECT WIRE BETWEEN PINS 6 AND 14 TO ALLOW CHASSIS MOUNTED SPEAKER LEVEL CONTROL OPERATION.

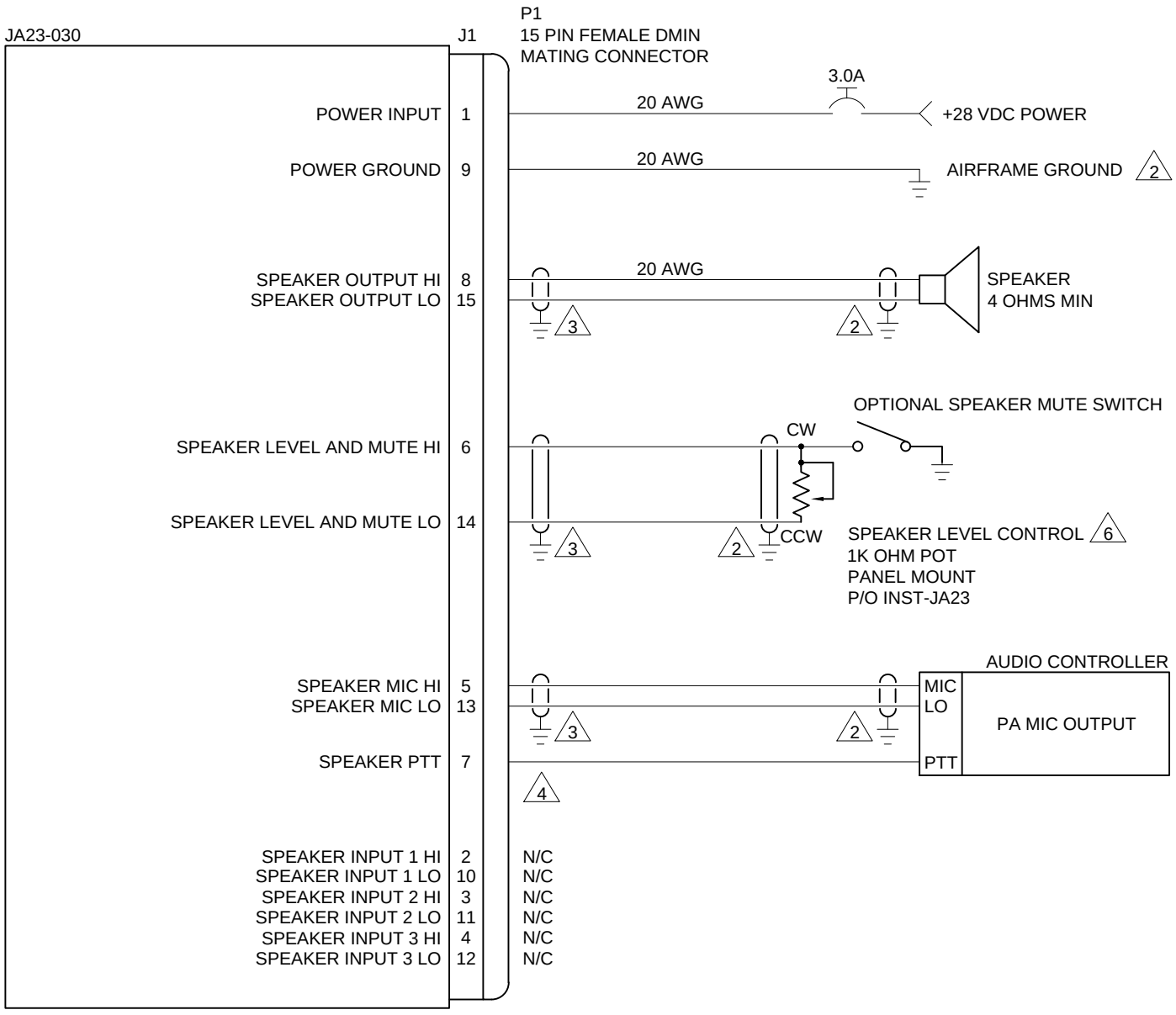
△6 ADJUST CHASSIS MOUNTED SPEAKER LEVEL CONTROL FULLY COUNTER CLOCKWISE FOR REMOTE SPEAKER LEVEL CONTROL OPERATION.

PREPARED	TAT/CPM	JUPITER AVIONICS CORPORATION		
CHECKED	JAC 01-27-20 SRM	TITLE: Speaker Amplifier - 30 Watt Interconnect Notes		
APPROVED	JAC 01-28-20 KDV	NCAGE CODE: L00N3	PART NO.: JA23-030	SHEET: 1/4
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO.: JA23-030 Interconnect Rev A.dwg		



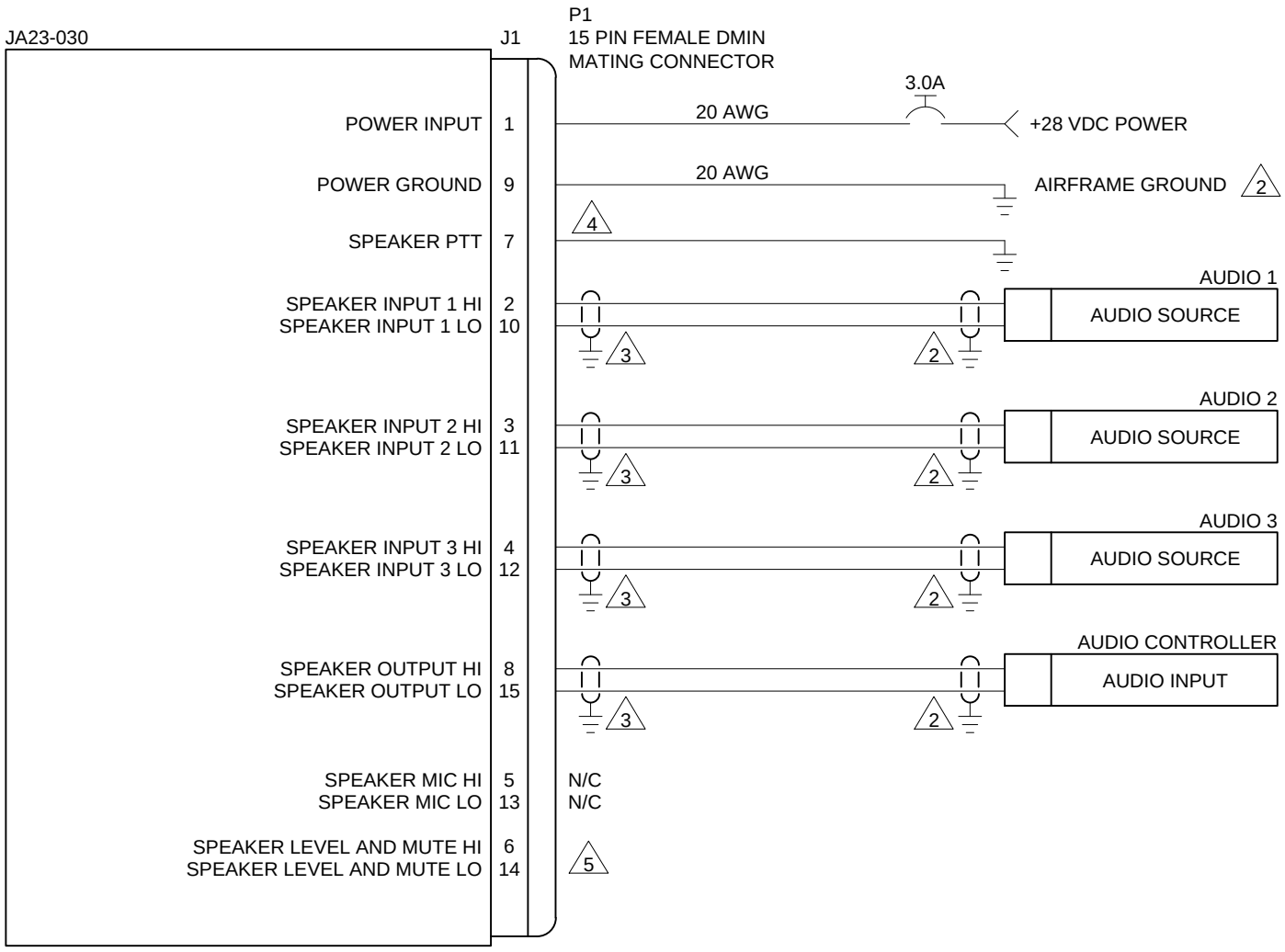
PREPARED	TAT/CPM	JUPITER AVIONICS CORPORATION		
CHECKED	JAC 01-27-20 SRM	TITLE: Speaker Amplifier - 30 Watt J1 Interconnect		
APPROVED	JAC 01-28-20 KDV	NCAGE CODE: L00N3	PART NO.: JA23-030	SHEET: 2/4
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO.: JA23-030 Interconnect Rev A.dwg		

OPTIONAL CONFIGURATION: REMOTE SPEAKER LEVEL CONTROL

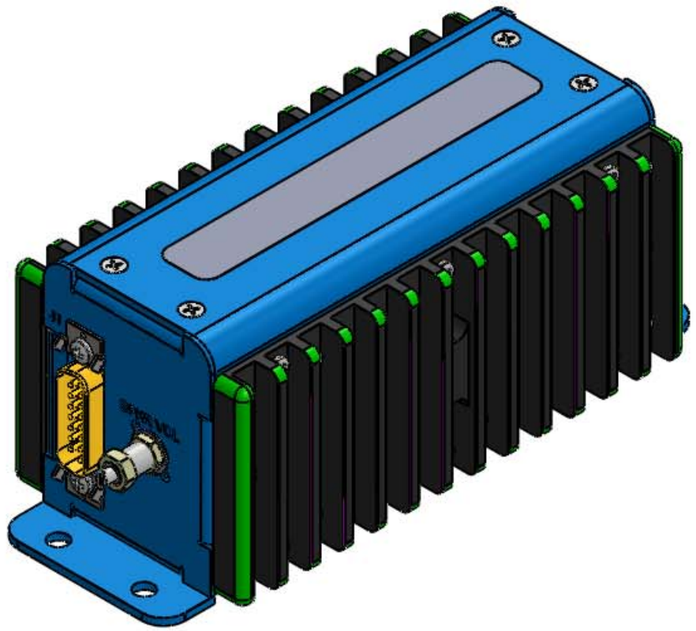


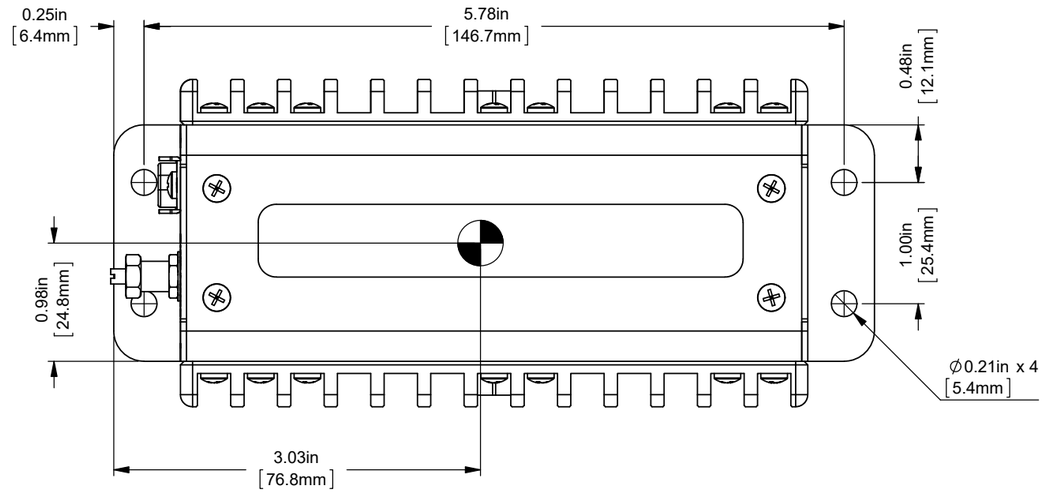
PREPARED	TAT/CPM	JUPITER AVIONICS CORPORATION		
CHECKED	JAC 01-27-20 SRM	TITLE: Speaker Amplifier - 30 Watt Optional Remote Speaker Level Control		
APPROVED	JAC 01-28-20 KDV	NCAGE CODE: L00N3	PART NO.: JA23-030	SHEET: 3/4
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO.: JA23-030 Interconnect Rev A.dwg		

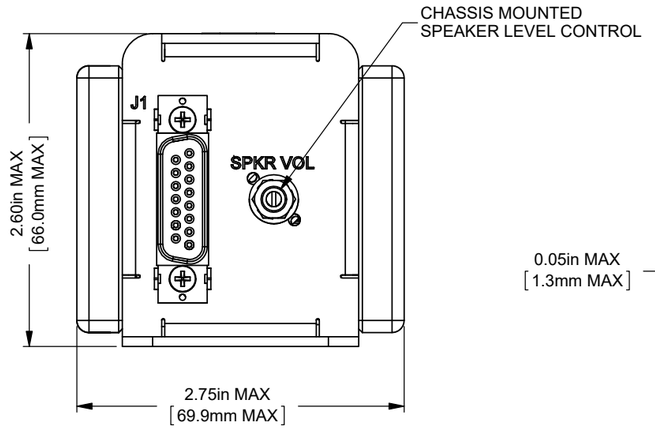
OPTIONAL CONFIGURATION AUDIO SUMMING AMPLIFIER

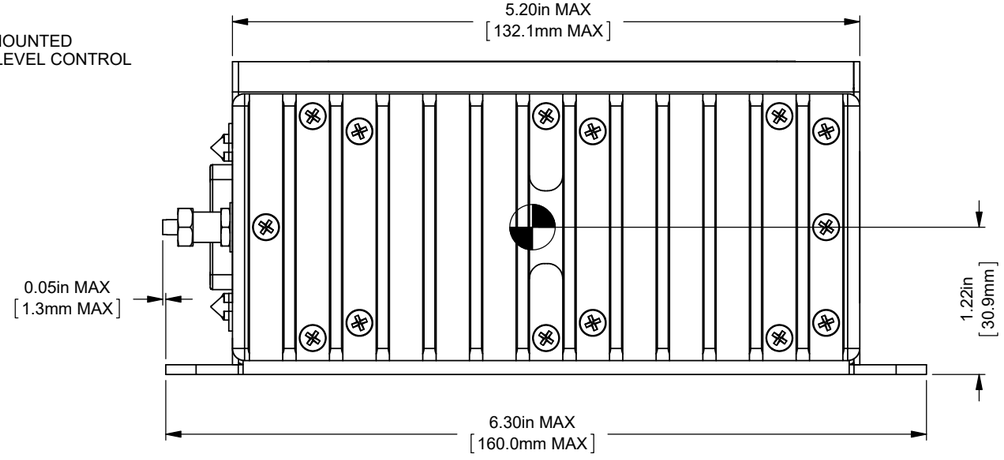


PREPARED	TAT/CPM	JUPITER AVIONICS CORPORATION		
CHECKED	JAC 01-27-20 SRM	TITLE: Speaker Amplifier - 30 Watt Optional Audio Summing Amplifier		
APPROVED	JAC 01-28-20 KDV	NCAGE CODE: L00N3	PART NO.: JA23-030	SHEET: 4/4
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO.: JA23-030 Interconnect Rev A.dwg		









CENTER OF GRAVITY
±0.03in [0.8mm]

WEIGHT: 1.12 lbs [0.51 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 08-05-20 TAT	
APPROVED	JAC 08-10-20 KDV	

CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.

DRAWING NOT TO SCALE

JUPITER AVIONICS CORPORATION

TITLE: Speaker Amplifier - 30 Watt

NCAGE CODE	PART NO.	SHEET
L00N3	JA23-030	1/1

DOC. NO.
JA23-030 Mechanical Installation (ECR 7305 Incorporated)Rev A

Installation and Operating Manual

Appendix B - Installation Documents

B1 Airworthiness Approval

Airworthiness approval of the JA23-030 Speaker Amplifier - 30 Watt 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 Speaker Amplifier with a Jupiter Avionics JA23-030 Speaker Amplifier - 30 Watt. 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] Speaker Amplifier and replaced with a Jupiter Avionics JA23-030 Speaker Amplifier - 30 Watt in [aircraft location].

Installed in accordance with the JA23-030 Installation Manual, Revision [ ], and AC 43.13-2, Chapters 2, and 3.

The JA23-030 interfaces with existing aircraft systems per the Installation Manual instructions.

The JA23-030 Installation Manual provides detailed installation instructions and wiring diagrams (Section 2, and Appendices A and B).

Power is supplied to the JA23-030 through an existing [ ]-Amp circuit breaker that was previously used by the original Speaker Amplifier - 30 Watt. 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 JA23-030 Speaker Amplifier - 30 Watt is "on condition" only. Refer to the JA23-030 Maintenance Manual. Periodic maintenance of the JA23-030 is not required.

The following sample Instructions for Continued Airworthiness (ICA) provides assistance in preparing ICA for the Jupiter Avionics JA23-030 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 JA23-030 Speaker Amplifier - 30 Watt 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 JA23-030 installed in an [aircraft make and model].

Applicability: Applies to a Jupiter Avionics JA23-030 installed in an [aircraft make and model].

Definitions/Abbreviations: None, N/A.

Precautions: None, N/A.

Units of Measurement: None, N/A.

Referenced Publications: JA23-030 Installation and Operating Manual
JA23-030 Maintenance 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 JA23-030 Speaker Amplifier - 30 Watt 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

N/A

4. Servicing Information

N/A

5. Maintenance Instructions

Maintenance of the JA23-030 is 'on condition' only. Periodic maintenance is not required. Refer to the JA23-030 Maintenance Manual.

6. Troubleshooting Information

Refer to the JA23-030 Maintenance Manual.

7. Removal and Replacement Information

Refer to Section 2 of this manual - the JA23-030 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 JA23-030 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

JA23-030 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 JA23-030 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