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Modification Instructions

P178 Failsafe Audio Mixer

7001-MI-001

Revision --

Prepared	C. Bonar	*Date Prepared*	30 OCT 2014
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Record of Revisions

Revision	*Date*	*Description*
--	30 OCT 2014	Initial Release

Table of Contents

1. Scope

These modification instructions are for the installation of the Eagle Copters P178 Failsafe Audio Mixer.

2. Abbreviations

EMI ..... Electro-Magnetic Interference

3. References

7001-TP-001 EMI Test Procedure

4. General Information

4.1 The Audio Mixer provides 3 composite outputs from up to 8 input signals. Channel 1 and Channel 2 composite outputs are failsafe relay protected for Master Caution or Essential Tones to ensure that no fault in the system or an electrical bus failure can prevent pass through of Essential Warnings or Tones. Channels 3 through 8 are for non-essential tones and will drop off line in case of fault or Avionics Bus failure.

4.2 The P178 Failsafe Audio Mixer removes the need for external relays to ensure Essential Tones are passed to unswitched inputs on any audio system. The mixer also has internal fault detection. Upon fault, the relays go to their normally closed (Failsafe) position.

4.3 There are no restrictions as to the quantity of Audio Mixers that are installed. However, it is the installer's responsibility to verify that the installation of this device does not interfere with other installed equipment and to perform an electrical load analysis to verify that the aircraft electrical buss can support the installation of the Audio Mixer.

5. Installation

5.1 The Audio Mixer is designed to be mounted in a variety of locations within the airframe, provided it is protected from the environment. It may be mounted to a deck, bulkhead, tray, avionics shelf or other structure rated to carry a 0.50 lb load. The exact mounting location is left to the installer's discretion provided that the installation of the Audio Mixer does not interfere with other installed equipment.

5.2 Mount the Audio Mixer using (4) #8-32 screws, washers and locknuts or nutplates.

5.3 When mounting into composite structure, #8-32 potted inserts (not included in kit) should be used.

5.4 Unless otherwise specified, follow aircraft manufacturer's standard practices and maintenance manuals for installation of all hardware.

5.5 Maintain a minimum 2 e/d edge margin for all installed fasteners.

5.6 Refer to Figure 1 for Audio Mixer reference dimensions that may be used when planning the installation.

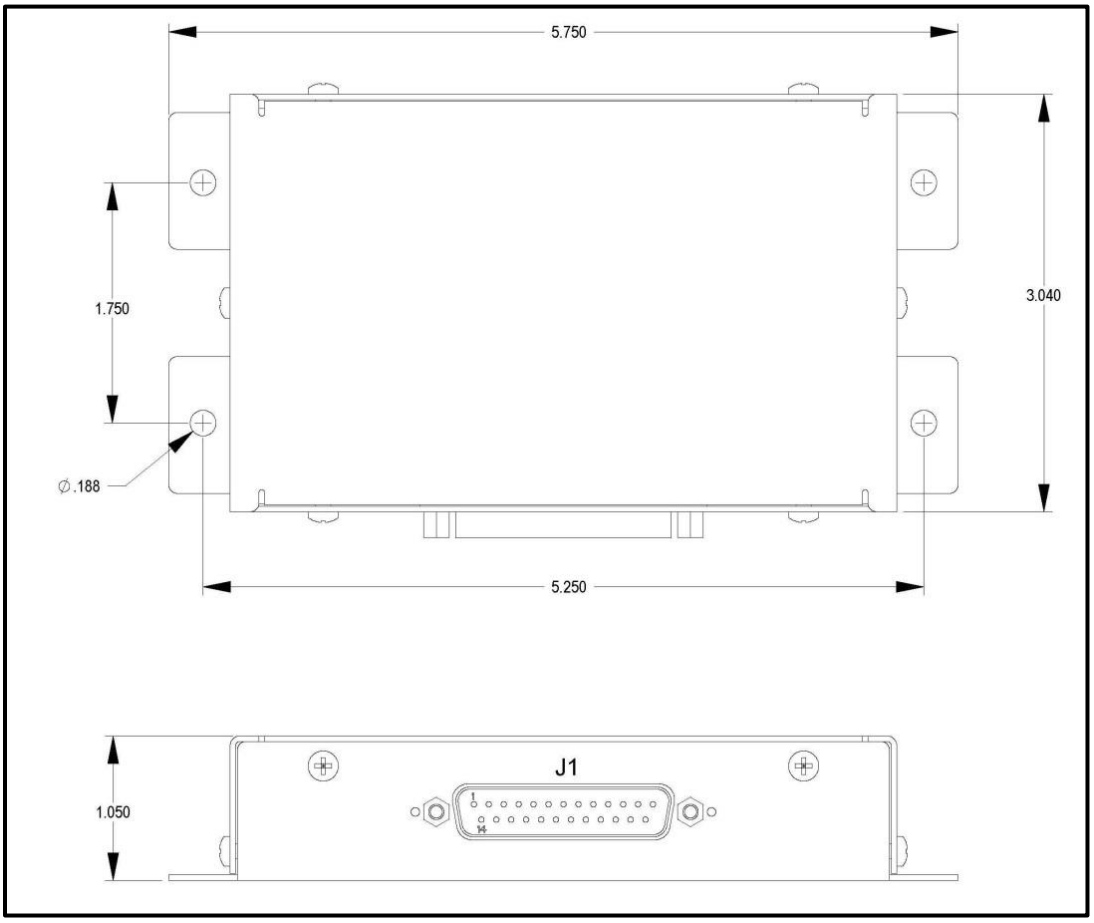


Figure 1 Audio Mixer Dimensions

6. System Wiring

6.1 Unless otherwise specified, follow the aircraft manufacturer's electrical wiring practices and maintenance manuals for installation of all system wiring.

6.2 Refer to Figure 2 for cable harness fabrication instructions to connect to the Audio Mixer.

6.3 Ground Audio Shields at ONE end only.

6.4 Unless otherwise noted, all shielded wire is M27500-(ga)TG(n)T14 and all unshielded wire is M22759/16-(ga)-9, where (ga) is the wire gauge and (n) is the number of wires inside the shield.

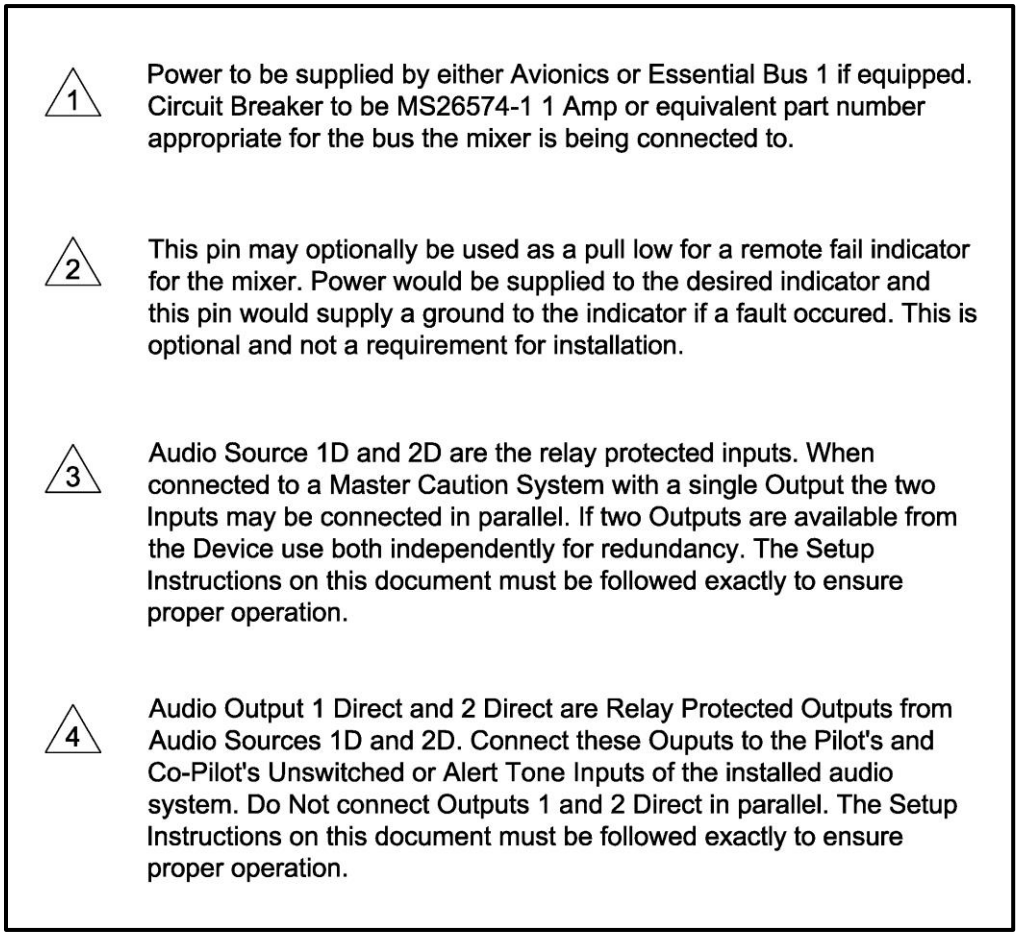
6.5 Unless otherwise noted, all wire is 22 GA.

6.6 Route all system cabling through existing cable runs.

6.7 Secure all cabling using nylon cable ties and/or cable clamps using standard practices.

6.8 Cable lengths are dependent on Audio Mixer installation location.

6.9 Notes for Figure 2:



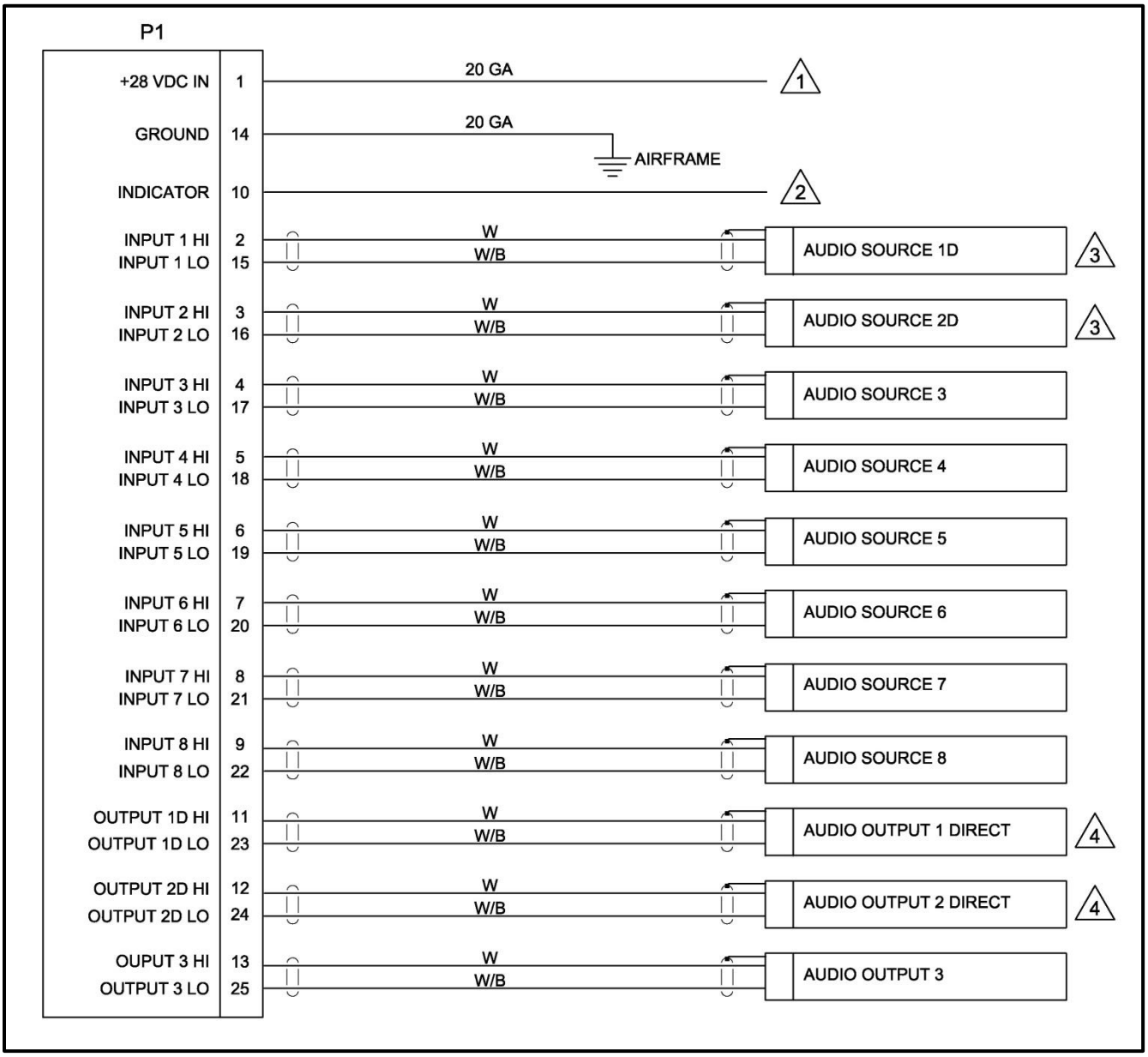


Figure 2 Cable Wiring

6.10 Refer to Figure 3 for Audio Mixer pin designation.

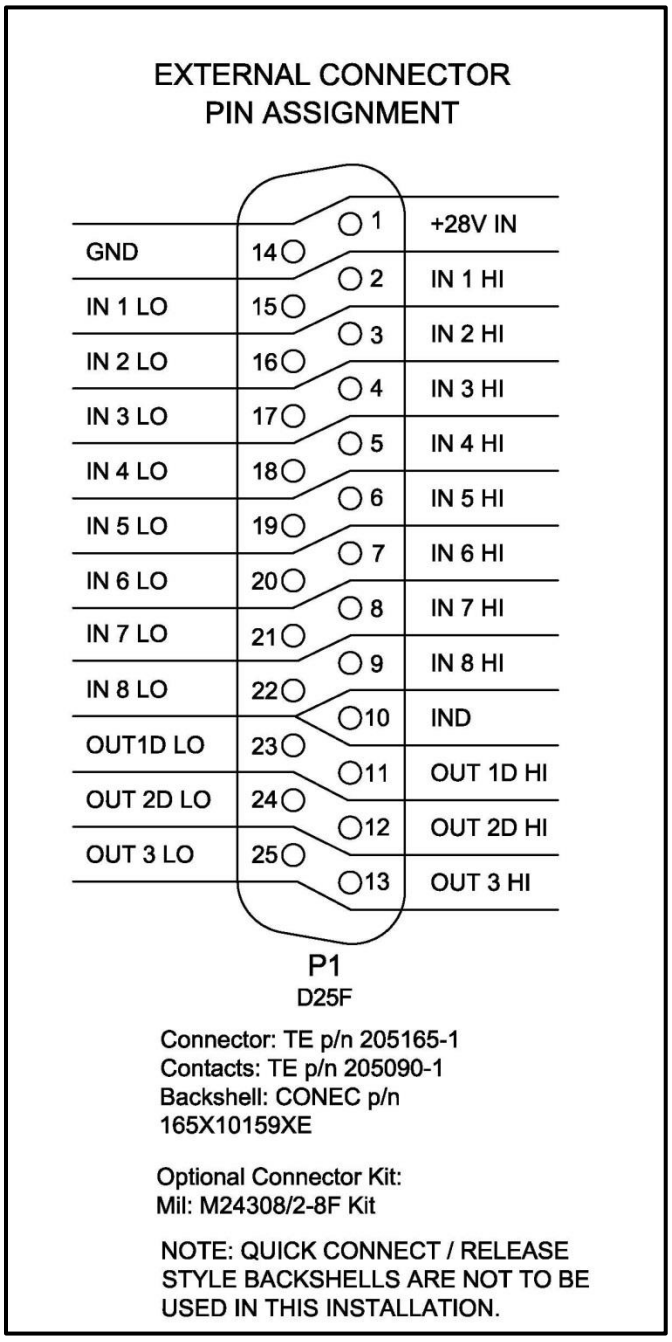
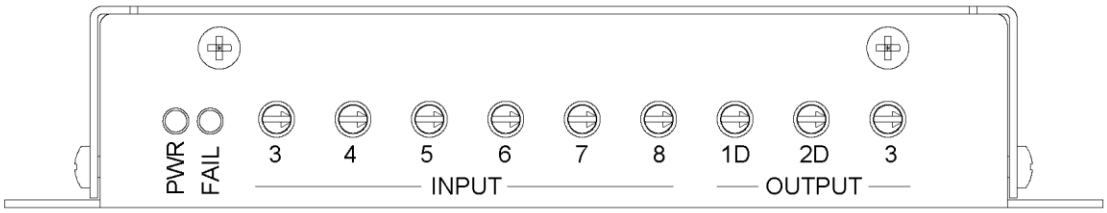


Figure 3 Pin Designation

7. System Testing

Failure to follow these instructions will result in improper operation.



7.1 If the mixer is not powered or is in fault mode (Essential), Input 1 will be connected directly via relay closure to Output 1D, and Input 2 will be connected directly to Output 2D. It is important to follow the setup instructions exactly in order for the mixer to work properly in the Essential Mode.

7.2 The mixer has internal fault detection. Upon fault, the relays go to their normally closed (Failsafe) position and the FAIL indicator light will illuminate. Optionally, the installer may connect Pin #10 (pull low) to an external fault indicator (see note #2 in Section 6.9). There are no internal adjustments, jumpers or user serviceable parts. If the mixer fails, return it to Eagle Copters USA, Inc. for repair or replacement.

7.3 The direct inputs in essential mode are non-adjustable. The level that is present at Inputs 1 and 2 will be present at 1D and 2D respectively.

7.4 Output 3 is not relay direct protected and therefore will drop off line in unpowered or fail mode. This output is designed to be a monitor port to a non-critical device.

7.5 Before applying power, perform a continuity check of all leads to confirm they are connected properly.

7.6 With the circuit breaker to the mixer pulled (Off) and the audio system on, adjust the source to Audio Source 1D and 2D so that the proper level is heard at both the Pilot and Co-Pilots Headsets when the source is triggered, i.e. Master Caution. DO NOT adjust the 1D or 2D outputs of the mixer; instead, adjust the source to the mixer.

7.7 With all other avionics off, push the mixer's circuit breaker In (On). Verify visually that the power indicator (PWR) is on, and the FAIL indicator is off. The mixer is now in powered mode. Trigger the source for Inputs 1D and 2D. Adjust the mixer Output Adjustments 1D and 2D so that the proper level is heard in the Pilot and Co-Pilot Headsets. It should be the same as in the unpowered mode. Pull the circuit breaker to the mixer in order to verify this operation.

7.8 Once steps 7.6 and 7.7 are completed, turn on all avionics or other sources connected to Audio Sources 3 through 8. Adjust the levels as required at Inputs 3 through 8 on the mixer. DO NOT change the adjustments on Outputs 1D, 2D or 3.

7.9 After Completion of Steps 7.6 through 7.8, adjust Output 3 to the desired level required by the device connected to Output 3.

Conduct EMI test in accordance with EMI Test Procedure 7001-TP-001.

8. Kit Parts List

P178 Failsafe Audio Mixer Kit

QTY	PART NUMBER	DESCRIPTION
1	G13120	Audio Mixer
8	CCR264SS-3-02	Pull Rivet
4	MS21042-08	Lock Nut, #8-32
4	MS21059L08	Nut Plate, #8-32, Floating
4	MS35206-245	Screw, #8-32 x 1/2", Phil Pan
8	NAS1149FN832P	Flat Washer, #8
25	205090-1	Contacts
1	205165-1 **	Connector, D25F
1	165X10159XE **	Backshell

** Optional: use Connector Kit M2430812-8F in place of these items

9. Specifications

P178 FAILSAFE AUDIO MIXER SPECIFICATIONS	
Number of Inputs	8 each Balanced @ 600 Ohm Impedance
Number of Ouputs	3 each Composite @ 600 Ohm Transformer Coupled. 2 are Relay Protected Channels
Input Gain Adjustment	-17dB to +10dB
Output Gain Adjustment	-6dB to +6dB
Output Signal	150mW into 600 Ohms Nominal
Output Current Limit	20mA
Voltage (Start)	20 VDC
Voltage (Hold)	12 VDC
Voltage (Max)	32 VDC
Power	250 mA
Temperature	- 40 to 80C
Finish	Gold Iridite per MIL-C-5541 Class 1A
Weight	.50 lbs.
Size	3.04 W x 5.75 L x 1.05 H inches Less protrusion of connector.

10. Weight and Balance

10.1 Weight of the Audio Mixer and mounting hardware = 0.50 lbs.

10.2 The arm will depend on the exact location that it is installed.

10.3 The installer will record the location for the Audio Mixer along with its installed weight on the aircraft's weight and balance record.