



AMX240

Audio Panel Installation Manual



Document P/N 200-890-0240

Revision 03

September 2026

This document is applicable to the Avidyne AMX240 Audio Panel, PS Engineering P/N 050-890-0240 (Avidyne P/N 200-00253-000).

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The latest installation manuals are available to authorized dealers at www.avidyne.com.

Revision History

Rev	Date	Description of Change
00	November 2013	New release of manual P/N 200-890-0240 for the AMX240.
01	November 2013	Release for publication.
02	July 2014	Corrected Avidyne part numbers; minor cleanup.
03	September 2026	Corrected installation kit contents (Section 1.6, Section 2.3.4, Appendix A) per Parts Identification Sheet 002-890-1404 Rev. 0. Corrected technical, cross-reference and typographical errors throughout; merged duplicate telephone sections; renumbered Section 3; moved drawing notes into text and corrected them; updated Avidyne address. Document reformatted.

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Section 1 – General Information

1.1 Introduction

The AMX240 represents another evolutionary step in cockpit audio control and intercommunication. Using the patented *IntelliVox*® design, a front-panel utility jack, and pilot-programmable configurations, it delivers the next level of audio control. The unit is designed for outstanding ergonomics, with visually and aurally defined mode annunciation and selection.

Read this manual completely before installing or using this product to take full advantage of all the features of the AMX240.

1.2 Scope

This manual provides installation and operating instructions for the Avidyne AMX240 Audio Selector Panel / Intercom System. It applies to the following unit:

Table 1 – Applicable unit

Model	Description	PS Engineering P/N	Avidyne P/N
AMX240	Stereo audio selector panel with marker beacon receiver, six-place stereo intercom, front utility jack, internal recorder and Bluetooth® interface	050-890-0240	200-00253-000

1.3 Equipment Description

The AMX240 is an audio isolation amplifier and audio selector that contains an automatic voice-activated (VOX) intercom and an integral marker beacon receiver. It switches two transceivers (COM 1, COM 2) and five receivers (NAV 1, NAV 2, MON 1, MON 2 and MKR).

A full-duplex telephone (TEL) mode allows the AMX240 to act as an audio interface between the aircraft headsets and microphones and aircraft-approved (FAA/FCC) telephone equipment.

WARNING

Use of non-aviation-approved cellular telephone equipment may be prohibited by FCC regulation. Avidyne is not responsible for unauthorized airborne use of cellular telephones. For airborne use, the AMX240 must be interfaced with an approved system.

Five unswitched inputs are available for traffic or TAWS/EGPWS alerts, autopilot disconnect, radar altimeter warning and similar audio. Four are on the rear connector; the fifth is the front-panel utility jack when it is configured as an unswitched input. Pushbuttons select the receiver audio heard in the headsets. The SPKR button places the selected receiver audio on the cabin speaker. Except for the unswitched inputs, all speaker audio is muted during transmit. Unswitched inputs 1, 3 and 4 are always presented to the aircraft speaker; unswitched input 2 is presented to the speaker only when SPKR is selected.

The MIC 1 and MIC 2 pushbuttons select the transceiver used for transmission by the pilot and copilot. In Split mode the pilot transmits on COM 1 while the copilot transmits on COM 2. A fail-safe mode connects the pilot headset and microphone to COM 1 if power is removed for any reason or if the unit is switched off. Unswitched input 1 is also provided to the pilot headset in fail-safe mode.

A six-station, voice-activated stereo intercom is built into the AMX240. Its patented *IntelliVox*® circuitry requires no manual squelch adjustment and helps eliminate background noise. The intercom provides Pilot Isolate, All and Crew modes and two independent stereo music inputs with SoftMute™. Intercom

volume is set with front-panel knobs: the left knob controls the pilot; on the right-hand concentric control, the small (inner) knob controls the copilot and the large (outer) knob controls the passengers. Intercom squelch is automatic and hands-free.

A three-light, 75 MHz marker beacon receiver is integrated in the AMX240. It provides the marker lights and audio required for the marker portion of an Instrument Landing System (ILS) approach. The MKR pushbutton selects marker audio.

A Bluetooth® wireless interface is provided for telephone and music connection.

1.4 Approval Basis

FAA TSO approval. The AMX240 is FAA approved under TSO-C50c (Audio Selector Panels and Amplifiers) and TSO-C35d (Airborne Radio Marker Receiving Equipment), and is EASA approved under ETSO-C50c and ETSO-2C35d.

The manufacturer and TSO holder is PS Engineering, Inc., Lenoir City, Tennessee, USA.

The AMX240 complies with the relevant portions of RTCA/DO-143 (*Minimum Operational Performance Standards for Airborne Radio Marker Receiving Equipment*), EUROCAE ED-14D / RTCA DO-160D (*Environmental Conditions and Test Procedures for Airborne Equipment*), ED-12B / DO-178B Level D (*Software Considerations in Airborne Systems and Equipment Certification*) and ED-18 / DO-214 (*Audio Systems Characteristics and Minimum Operational Performance Standards for Aircraft Audio Systems and Equipment*).

1.5 Specifications

Table 2 – AMX240 specifications

TSO Compliance	
Marker beacon	FAA TSO-C35d, Class A; ETSO-2C35d
Audio selector / intercom	FAA TSO-C50c, Class 1a; ETSO-C50c
Applicable documents	RTCA DO-214, DO-143, DO-160D, DO-178B (Level D), DO-254
Environmental	
DO-160D qualification	A1D1CABSUXXXXXXZBABATBXxE2XXX (see Appendix E)
Operating temperature	–15 °C to +55 °C
Altitude	Up to 50,000 ft, non-pressurized area
Physical	
Dimensions	Height 1.3 in (3.3 cm); width 6.25 in (15.9 cm); depth behind panel 7.15 in (18.2 cm)
Weight	AMX240 unit: 1.34 lb (0.61 kg) Rack with connectors: 0.51 lb (0.23 kg)
Power Requirements (including internal lighting)	
Voltage	11 to 33 VDC
Maximum current	2.5 A (externally protected by a 5 A pull-type circuit breaker)
Audio Selector	
Input impedance	510 Ω
Input isolation	–60 dB minimum
Speaker muting	–60 dB minimum

Speaker output (into 4 Ω, no clipping)	3 W minimum at 14 VDC; 10 W minimum at 28 VDC
Receiver inputs	8 (COM 1, COM 2, NAV 1, NAV 2, MON 1, MON 2, MKR, TEL)
Unswitched inputs	5 (4 on rear connector, plus front utility jack)
Transmitter selections	COM 1, COM 2, TEL, Split (COM 1 / COM 2)
Speaker impedance	4 Ω
Headphone impedance	150 – 1000 Ω
Headphone output	38 mW per headset, no clipping, <1% THD typical
Microphone impedance	150 – 600 Ω
Bluetooth radio	Class 3, FCC ID QOQWT32AE
Intercom	
Intercom positions	6 (each with an individual <i>IntelliVox</i> ® circuit)
Music inputs	2 independent stereo inputs, plus front jack and Bluetooth streaming
Music muting	Greater than 30 dB "SoftMute™" when COM or intercom is active
Distortion	<1% THD at 38 mW into 150 Ω
Mic frequency response (3 dB)	300 Hz – 6 kHz
Music frequency response (3 dB)	10 Hz – 26 kHz
Marker Beacon Receiver	
Frequency	75 MHz, crystal controlled
Sensitivity (factory preset)	Low: 1000 μ V hard (360 – 570 μ V soft) High: 200 μ V hard (130 – 200 μ V soft)
Selectivity	–6 dB at $\pm$ 10 kHz; –40 dB at $\pm$ 120 kHz
External lamp output	+7.5 VDC $\pm$ 4 VDC positive when active (unloaded, at maximum brightness); 125 mA maximum per lamp
MM sense output	Active high, 4.5 $\pm$ 1.0 VDC

1.6 Equipment Supplied

One AMX240 audio panel, PS Engineering P/N 050-890-0240 (Avidyne P/N 200-00253-000), is supplied, together with the installation components listed in Table 3. The components are identified on the *Audio Panel Installation Parts Identification Sheet*, document 002-890-1404, packed with the kit.

Table 3 – Installation components supplied

Part Number	Description	Qty	Used For
430-890-0040	Installation rack (tray) assembly	1	Supplied with the AMX240 installed in it; mounts in instrument panel
430-890-0050	Rack back plate	1	Carries the two rack connectors

Part Number	Description	Qty	Used For
120-891-2045	44-pin connector kit, each consisting of: • 1 ea 425-044-2045 HD 44-pin connector housing • 44 ea 425-094-2043 crimp pin	2	J1 and J2 rack connectors (2 housings, 88 pins total)
625-025-1131	Back shell hood, DB44	2	Connector back shell
625-025-1132	Back shell cover, DB44	2	Connector back shell
475-256-0516	Screw, 2-56 × 5/16", flat head Phillips, SS, 100°	8	Attaching back shell cover to hood
475-440-1038	Screw, 4-40 × 3/8", Phillips truss, with patch	4	Mounting 44-pin connectors
475-440-0007	Screw, 4-40 × 7/16", Phillips pan, with patch	4	Mounting back plate
475-440-0001	Screw, 4-40 × 1/4", Phillips pan, with washer	2	Mounting solder lugs
475-049-3189	Screw, #2-56 X 3/8	8	J1 and J2 rack connectors
475-009-0001	Solder lug	2	Shield ground bus
425-249-1179	Taylor clamp, SR (medium)	2	Shield ground bus
625-001-0002	Nylon cable clamp	1	Harness strain relief
475-632-0012	Screw, #6-32 × 1/2", flat head Phillips	6	Mounting tray

NOTE

The back shell (625-025-2465), back shell retainer (431-881-0100) and retaining/mounting block (431-891-0100) listed in earlier revisions of this manual are **not** supplied. They have been replaced by the DB44 back shell hood and cover and associated hardware listed above.

1.7 Equipment Required but Not Supplied

- Circuit breaker: 1 ea, 5 A, **pull type** (required)
- Speaker, 4 Ω
- Headphone jacks (stereo, as required)
- Microphone jacks (as required)
- Headphones, 150 Ω stereo, up to 6 as required
- Microphones, up to 6 as required
- Marker beacon antenna (75 MHz, VSWR less than 1.5:1, appropriate for the aircraft airspeed)
- Interconnect wiring and shielded cable (see Section 2.4)

1.8 License Requirements

No license is required. The AMX240 Bluetooth® radio holds the following approvals:

- FCC ID: QOQWT32AE
- Industry Canada (ISED) ID: 5123A-BGTWT32AE
- CE EMC Directive 89/336/EEC, as amended by Directives 92/31/EEC and 93/68/EEC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

1.9 Plug-and-Play Compatibility

The AMX240 is plug-and-play compatible with the following audio panel trays:

- Garmin GMA 340
- PS Engineering PMA8000
- PS Engineering PMA8000B
- PS Engineering PMA8000BT
- PS Engineering PMA8000B/BT/MP3 for Avidyne R9
- PS Engineering PMA8000C
- PS Engineering PMA5000EX

The AMX240 can be installed directly in one of these trays with no further wiring. However, some functions may be unavailable unless wiring is added, and some legacy functions are not supported. Table 4 lists legacy functions that the AMX240 does not support; Table 5 lists AMX240 functions that need added tray wiring. An "X" marks the affected legacy panel.

Table 4 – Legacy audio panel features not supported by the AMX240

Feature / Function	PMA 8000	PMA 8000B	PMA 8000BT	PMA8000 B/BT/MP3 (R9)	PMA 8000C	PMA 5000EX	GMA 340
CNX80 inhibit	X	X	X				
COM 3 input and MIC					X		X

Table 5 – AMX240 features requiring extra tray wiring

Feature / Function	PMA 8000	PMA 8000B	PMA 8000BT	PMA8000 B/BT/MP3 (R9)	PMA 8000C	PMA 5000EX	GMA 340
Marker sensitivity	X	X	X	X		X	
Marker beacon receiver						X	
Split COM (R9 display)	X	X	X		X	X	X
PA mode						X	
Playback	X					X	
Speaker support						X	
MON 1 & MON 2	X	X	X			X	X

See Section 2 for the wiring details of each function.

Section 2 – Installation

2.1 General Information

2.1.1 Scope

This section provides installation and interconnection instructions for the Avidyne AMX240 Audio Selector Panel / Intercom with internal marker beacon receiver.

Read this manual carefully before beginning the installation to prevent damage and post-installation problems. Installation of this equipment requires special tools, test equipment (see Section 2.12.1) and knowledge as required by 14 CFR 65.81(b).

2.1.2 Certification Requirements

NOTE

The AMX240 requires specialized knowledge and tools for effective installation. An appropriately rated certificated repair station **must** install this equipment in accordance with applicable regulations. The warranty is not valid unless the equipment is installed by an authorized Avidyne dealer.

Failure to follow any of the installation instructions, or installation by a non-certificated individual or agency, will **void the warranty** and may result in an **unairworthy** installation.

2.2 Unpacking and Preliminary Inspection

Use care when unpacking the equipment. Inspect the unit and the parts supplied for visible signs of shipping damage, and examine the unit for loose or broken buttons, bent knobs, etc. Verify the components supplied against the list in Section 1.6 and the Parts Identification Sheet (002-890-1404).

If a claim is to be made, save the shipping material and contact the freight carrier. Do **not** return a unit damaged in shipping to Avidyne; contact Avidyne to arrange for a replacement. Under no circumstances attempt to install a damaged unit in an aircraft. Equipment returned to Avidyne for any other reason should be shipped in the original Avidyne packaging or other UPS-approved packaging.

2.3 Equipment Installation Procedures

2.3.1 Cooling Requirements

Forced-air cooling of the AMX240 is not required. However, keep the unit away from heat-producing sources (defrost or heater ducts, dropping resistors, heat-producing avionics) unless adequate cooling air is provided.

2.3.2 Mounting Requirements

The AMX240 must be rigidly mounted to the instrument panel or aircraft structure, within view and reach of the pilot position(s). Installation must comply with FAA Advisory Circular AC 43.13-2B or other FAA-approved technical data. The unit may be mounted in any area with adequate clearance for the unit and its wiring bundle.

To prevent noise, avoid installing units close to high-current devices or systems with high-voltage pulse outputs, such as DME or transponders. Do not route the interconnecting bundles near high-current wires.

2.3.3 Audio Panel Mounting Rack Installation

Remove the unit from the mounting tray by unscrewing the 3/32" hex-head screw in the center of the front panel, then carefully slide the unit free of the tray. Set the unit aside in a safe location until needed. Install the tray using the six #6-32 clip nuts (475-630-0002) and six #6-32 × 1/2" flat head Phillips screws (475-

632-0012). The audio panel must be supported at both the front and rear of the mounting tray. Rack dimensions are given in Appendix A.

2.3.4 Audio Panel Tray and Connector Assembly

The rack connectors mate with the two 44-pin connectors on the AMX240. They are high-density sub-miniature crimp-type connectors and require a hand crimp tool from Table 6 (or equivalent). Refer to Appendix A for the rack assembly and Appendices B and C for pin locations.

1. Crimp a contact (425-094-2043) onto each wire and insert it into the correct position of the 44-pin connector housing (425-044-2045). Eighty-eight contacts are supplied (44 per connector); unused positions may be left empty.
2. Mount each connector to the rack back plate (430-890-0050) with two #4-40 × 3/8" truss screws (475-440-1038), installed from the inside of the tray.
3. Fit a DB44 backshell hood (625-025-1131) and cover (625-025-1132) to each connector. Secure each cover to its hood with four 2-56 × 5/16" flat head screws (475-256-0516).
4. Attach the two solder lugs (475-009-0001) to the back plate with the two #4-40 × 1/4" screws with washer (475-440-0001). Use the solder lugs and the two Taylor clamps (425-249-1179) to form a shield ground bus for terminating the cable shields.
5. Mount the back plate to the rack with the four #4-40 × 7/16" pan head screws (475-440-0007).
6. Secure the harness with the nylon cable clamp (625-001-0002). Ensure proper strain relief and protection against chafing.

Table 6 – Connector pin crimping tools

Manufacturer	Crimping Tool	Positioner	Extraction Tool
AMP	601966-1	601966-6	91067-1
Daniels	AFM8	K42	M24308-1
ITT Cannon	995-0001-584	995-0001-739	91067-1

2.4 Cable Harness Wiring

Referring to Appendices B and C, assemble a wiring harness as required for the installation. All wire must be MIL-spec in accordance with current regulations. Two- and three-conductor **shielded wire must be used where indicated** and must be M27500 (formerly MIL-C-27500) or equivalent. Proper stripping, shielding and soldering technique must be always used. It is imperative that the correct wire be used.

Refer to FAA Advisory Circular AC 43.13-2B for more information. Incorrect technique may result in improper operation, electrical noise or unit failure. Damage caused by improper installation will void the Avidyne warranty.

2.4.1 Electrical Noise

Due to the variety and high power of radio equipment often found in general aviation aircraft, there is potential for both radiated and conducted noise interference.

The AMX240 power supply is designed to reduce conducted electrical noise from the aircraft power bus by at least 50 dB. Although this is a large amount of attenuation, it may not eliminate all noise, particularly if the noise amplitude is very high. At least 13.8 VDC must be present at J2 pins 8 and 9 for the power supply to operate in regulation; below this it cannot adequately attenuate power-line noise.

Shielding can reduce or prevent radiated noise (beacons, electric gyros, switching power supplies, etc.); however, installation combinations can occur where interference is possible. The AMX240 uses an RFI-hardened chassis and has internal electromagnetic interference (EMI) filters on all inputs and outputs.

Ground-loop noise occurs when there are two or more ground paths for the same signal (for example, airframe and ground return wire). Large cyclic loads such as strobes and inverters can inject noise onto the airframe that is then detected by the audio system. Follow the wiring diagrams carefully to minimize ground-loop potential. Use only M27500 shielded wire (or better). **Never combine microphone and headphone wiring in the same shielded bundle.** Always use 2- or 3-conductor shielded wire as shown in the wiring diagrams.

The shields can be daisy-chained together and connected to the ground lugs mounted on the back plate (see Appendix A).

Radiated signals can be a factor when low-level microphone signals are bundled with current-carrying power wires; keep these cables physically separated. Use insulated washers to isolate the ground return path of **all** headphones and microphone jacks from the airframe.

Music Inputs and Noise

The AMX240 uses differential music inputs to help prevent noise from entering the music system. This is usually transparent to the installer; however, the music signal and ground connections must be made directly to the dedicated music signal and ground inputs on the AMX240. The in-flight entertainment equipment and the audio panel should be powered from a common bus.

If a music **jack** rather than a music source is installed for Music 1 or 2, we recommend grounding the jack to airframe ground.

NOTE

Adding a high-performance audio control system, particularly with high-performance active noise-cancelling headsets, cannot improve older avionics designed for cabin-speaker use. Avidyne makes no claim that the audio panel will provide noise-free audio under all installation conditions, particularly with older avionics.

2.4.2 Power

The AMX240 is compatible with both 14 V and 28 V DC systems. A 5 A pull-type circuit breaker is required for all installations. Connect aircraft power through the breaker to J2 pins 8 and 9, and airframe ground to J2 pins 10 and 11 only. Power and ground wires must be #22 AWG minimum (#20 AWG recommended).

2.4.3 Audio Panel Interface

The AMX240 interfaces with standard aircraft avionics and presents a 510 Ω receiver input impedance. For best results, use twisted shielded cable from each avionics audio source to the audio panel, with the shield grounded at the audio panel end only.

Some avionics do not provide a separate audio low and may introduce additional electrical noise into the system. For best results, connect the audio low from the audio panel to the radio ground using one conductor of the twisted shielded cable.

2.4.4 Transmit Interlock

Some communications transceivers use a transmit-interlock system. To fully use the Split mode feature this function must be disabled; consult the radio manufacturer's installation manual for details.

2.4.5 Backlighting

Unit backlighting and indicator intensity are controlled by the aircraft avionics dimmer. For **14 V** aircraft, connect J2 pins 6 and 7 to the aircraft dimmer bus and pin 5 to ground. For **28 V** aircraft, connect pin 7 to the aircraft dimmer bus and pins 5 and 6 to ground.

When the aircraft dimmer is turned to minimum (or off), the lighting automatically goes to full brightness.

2.4.6 Unswitched Inputs

J1 pin 31, J1 pin 44, J1 pin 29 and J2 pin 15 are unswitched inputs #1, #2, #3 and #4 respectively. They are not muted by transmitter keying, are presented to the pilot and copilot regardless of audio selection and always mute the entertainment inputs. These 510 Ω inputs can be used for radar altimeter decision-height audio, GPS waypoint audio, autopilot disconnect tones or any other critical audio signal. Their distribution is summarized below.

Table 7 – Unswitched input distribution

Input	Pin	Heard in Fail-Safe	Crew Headsets	Cabin Speaker	Gain
1	J1-31	Yes (pilot)	Yes	Always	1:1 (fixed)
2	J1-44	No	Yes	Only when SPKR selected	1:1 (fixed)
3	J1-29	No	Yes	Always	Adjustable
4	J2-15	No	Yes	Always	1:1 (fixed)
5 (front jack)	Front	No	Yes	No	1:1 (fixed)

The audio low for unswitched #4 (J2 pin 15) should be connected to a convenient audio low but must **not** be connected to Music Low.

NOTE

Inputs 1, 2 and 4 are fixed at 1:1; any level adjustment must be made at the source. Unswitched #3 has a level adjustment on the bottom of the unit (see Section 2.7).

The front-panel utility jack can be configured as a fifth unswitched input from the front panel (see Section 3.10). Audio on this jack is then presented to the pilot and copilot headsets and is not muted.

NOTE

The front utility jack is intended for **portable equipment** that is advisory in nature. It is NOT intended for use as a primary warning channel. Important audio **MUST ALWAYS** be hard-wired to the unswitched inputs on the rear connector.

2.4.7 Swap Mode

When a momentary, normally open pushbutton switch is connected between J2 pin 20 and aircraft ground, the pilot can switch between COM 1 and COM 2 with this (typically yoke-mounted) switch without reaching for the MIC buttons. The transfer of the MIC indication from COM 1 to COM 2 shows that a swap has taken place; there is no dedicated swap indicator.

2.4.8 TEL (Duplex) Function for Telephones

Audio selected by the intercom mode is provided to the TEL output, and audio from the telephone is presented to the headsets, giving a telephone-like interface.

The TEL mode is compatible with many cellular telephones that have hands-free headset interfaces. The front-panel 3/32" (2.5 mm) utility jack can be used as the telephone interface, or an additional jack can be installed on the aircraft panel and wired to the AMX240 as shown in Figure 1.

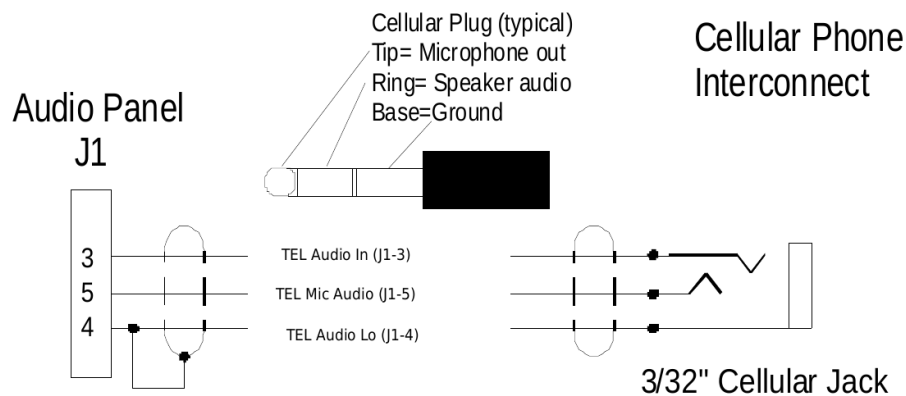


Figure 1 – Telephone interface to rear connector (when an additional jack is desired). This is a typical interconnect; Avidyne does not guarantee compatibility in all cases.

The AMX240 is also compatible with most Bluetooth®-enabled telephones for making and receiving calls through the aircraft audio system (see Section 3.11).

Telephone Sidetone

As shipped, the AMX240 provides telephone sidetone (the user's voice fed back to the headset). Because some telephones provide their own sidetone, AMX240 sidetone can be disabled by pressing and holding the NAV 2 button for more than one second with the unit on.

NOTE

Unauthorized use of unapproved cellular telephone devices in aircraft is subject to FCC enforcement action, which may include monetary forfeitures.

FCC regulation 47 CFR § 22.925, *Prohibition on airborne operation of cellular telephones*: "Cellular telephones installed in or carried aboard airplanes, balloons or any other type of aircraft must not be operated while such aircraft are airborne (not touching the ground). When any aircraft leaves the ground, all cellular telephones on board that aircraft must be turned off."

Avidyne Corporation does not endorse using unapproved cellular telephone equipment in flight and takes no responsibility for the user's actions.

2.4.9 Public Address Mode

Pressing and holding the SPKR pushbutton for more than one second places the AMX240 in public address (PA) mode. In this mode the pilot is heard over the cabin speaker when the pilot presses the PTT switch, while the copilot continues to use the selected COM radio. The SPKR button blinks green while PA mode is active. To cancel PA mode, press and hold SPKR again or cycle power to the audio panel.

When the PA discrete output is enabled, J2 pin 19 goes low while in PA mode, providing a logic level for a speaker-switching scheme. This 50 mA (10 Ω) output can drive a relay that transfers the speaker amplifier output from the cockpit speaker to another cabin speaker. If PA mode is used with a microphone near an active cockpit speaker, feedback may result.

To **enable** the PA discrete output, the internal configuration jumper J4 must be placed across both pins of its header. The jumper is shipped in the open position.

Setting the PA Output Jumper

1. Remove the five Phillips screws securing the top cover: four on the top and one at the rear (Figure 2). **The rear screw is shorter than the other four. It must be reinstalled in the same location or damage will occur.**
2. Lift off the top cover.
3. Locate jumper J4 in the rear corner of the board near the sub-D connectors (Figure 3) and move the blue jumper so that it covers **both** pins (Figure 4).

4. Replace the cover, aligning the holes.
5. Install the four long screws in the top cover and the **short screw at the rear**. Tighten all screws.

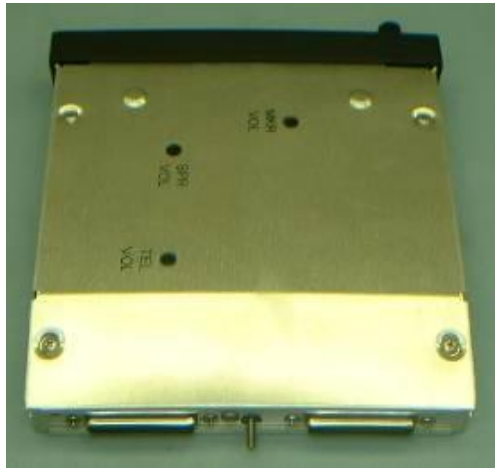


Figure 2 – Cover screw locations



Figure 3 – Jumper J4 location

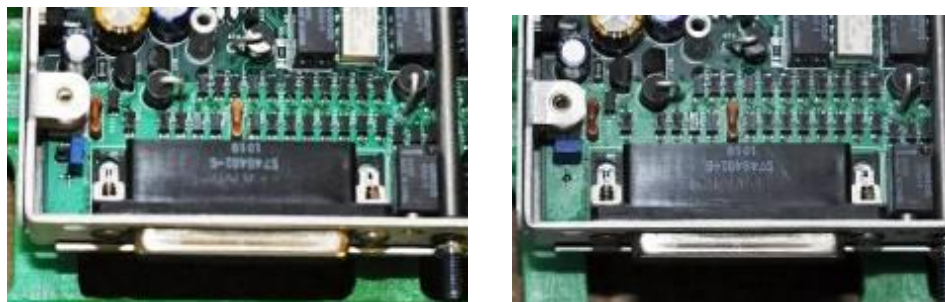


Figure 4 – Jumper J4 positions: open, as shipped (left); PA output enabled (right)

2.4.10 PA Mute (J2 Pin 12)

J2 pin 12 is a TTL logic **output** that is pulled low during PTT operation.

2.4.11 Split / COM 2 Select Outputs

J1 pins 24 and 25 are logic outputs used by the Avidyne R9 Integrated Flight Display system: pin 24 is low when Split COM is selected, and pin 25 is low when COM 2 is selected for transmission. Connect them via the R9 installation manual.

2.5 Intercom Wiring

See Appendices B and C for intercom connections. Proper operation of the system depends on the connectors being wired in accordance with these diagrams. Use 2- and 3-conductor MIL-spec shielded cable as shown. Connect the shields at the audio panel end only and tie them to the audio low inputs as shown.

2.5.1 Entertainment Inputs

The AMX240 has two independent music inputs, plus a front-panel jack connected to Entertainment 1. Entertainment 1 is J2 pins 23 (left) and 24 (right), referenced to pin 25. Entertainment 2 is J2 pins 26 (left) and 27 (right), referenced to pin 28.

The AMX240 can also stream music wirelessly from a paired Bluetooth® device. This stream is distributed as Music 1. See Section 3.11 for more information.

CAUTION

Use only the **low-level** (line or headphone) output of an entertainment device. The maximum input signal level is **3 V p-p**. **Do not** connect a speaker-level output; this will cause internal damage to the audio panel.

2.5.2 Entertainment Muting

The AMX240 incorporates a SoftMute™ system that mutes the entertainment audio during intercom and radio conversation. See Section 3.9 for details.

SoftMute™ for the crew can be disabled from the front panel. Turning down the entertainment volume lets the pilot keep music in the background while radios remain in the foreground, eliminating constant interruption of the music while keeping the radios a priority.

CAUTION

Local oscillators and internal signals from entertainment equipment can cause interference with other aircraft systems. Before takeoff, operate the entertainment devices to determine whether there is any adverse effect on aircraft systems. If any unusual operation is noted in flight, switch off the entertainment devices immediately.

All additional entertainment devices must be switched off for takeoff and landing.

Entertainment 2 Muting

Entertainment 2 is always in "karaoke" mode and is not muted by any other audio.

2.5.3 Configuring the Music Inputs

The music inputs can be configured from the front panel (see Section 3.9). Two configurations are available:

- **Independent** – Music 1 (rear connector, front jack or Bluetooth) is provided to the pilot and copilot, with SoftMute™ controlled from the front panel. Music 2 is always provided to the passengers and is not muted.
- **Single source** ("Music 1 to all headsets") – Music 1 or Bluetooth-streamed music is provided to all intercom positions. Muting is controlled from the front panel.

The pilot and copilot hear the function annunciations and internal recorder playback audio.

2.5.4 Remote Playback Button

Internal recorder playback is available from the front-panel REPLAY button. A remote momentary, normally open (NO) pushbutton may also be installed anywhere within the pilot's reach. Connect the switch between J2 pin 22 (Playback) and ground. When installed, it operates as described in Section 3.12. Pressing and holding REPLAY, or pressing MUTE, stops playback.

2.6 Marker Beacon Installation

2.6.1 Marker Antenna Installation

A marker beacon antenna appropriate to the type and speed of the aircraft is required (not supplied). Refer to the aircraft and antenna manufacturers' instructions and to AC 43.13-2B, Chapter 3, for proper antenna installation techniques. The marker beacon antenna must be mounted on the bottom of the aircraft. Connect it to J1 pin 1 (center) and pin 2 (shield) with RG-58A/U or equivalent coax.

2.6.2 External Marker Lights

For installations that require external marker beacon lights, three outputs (J1 pins 36, 37 and 38) can drive 12 V lamps only. The outputs are driven high when active (+7.5 VDC $\pm$ 4 VDC unloaded, at maximum brightness). Maximum source current is 125 mA per lamp. Output voltage varies with aircraft panel light dimming.

2.6.3 Middle Marker Sense

A Middle Marker sense output (J1 pin 39) is available for certain flight control systems. It goes to +4.5 VDC ($\pm$ 1.0 VDC) when a valid middle marker signal is received. This output does not operate during marker lamp test.

2.7 Adjustments

The AMX240 is factory adjusted to suit most aircraft. Three adjustments are accessible through holes in the top cover (Figure 5); two more require removal of a cover.

- **SPKR VOL** (top cover hole) – turn clockwise to increase cabin speaker output.
- **MKR VOL** (top cover hole) – turn counterclockwise to increase marker beacon audio level.
- **TEL VOL** (top cover hole) – turn clockwise to increase incoming telephone audio.
- **ANN VOL** (top cover removed) – sets the level of the unit's voice annunciations.
- **Unswitched Input 3 level** (bottom cover removed, Figure 6) – adjustable from 50% to 200% of the input level.

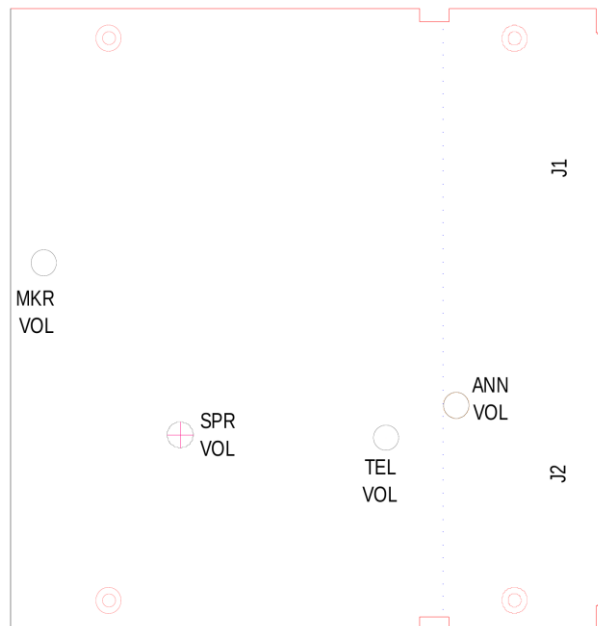


Figure 5 – AMX240 adjustments, top cover

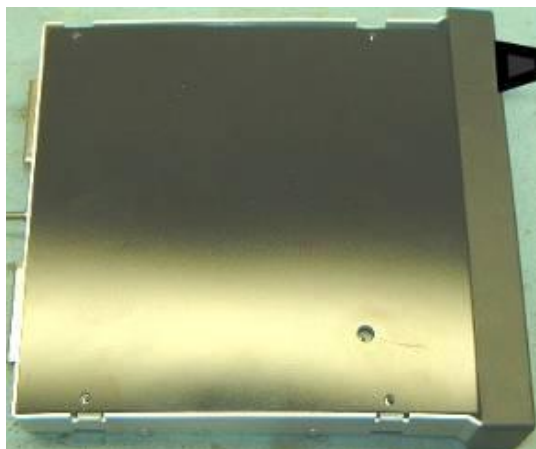


Figure 6 – Unswitched input 3 level adjustment (bottom cover removed)

2.8 Communications Antenna Installation Notes

For best results in Split mode, it is recommended that one VHF communications antenna be located on the **top** of the aircraft and the other on the **bottom**. Any antenna relocation must be accomplished in accordance with AC 43.13-2B, the aircraft manufacturer's recommendations and FAA-approved technical data.

WARNING

Radio interference is likely in Split mode when the frequencies of the two aircraft radios are close together and/or the antennas are physically close together. **Avidyne makes no express or implied warranties regarding the suitability of the AMX240 in Split mode.**

2.9 AMX240 Pin Assignments

Both connectors are high-density 44-pin sub-D connectors, viewed from the back of the tray as shown in Appendix A.

Table 8 – J1 and J2 pin assignments

J1	Function	J2	Function
1	Marker antenna	1	Pilot phones lo
2	Marker antenna lo	2	Copilot phones lo
3	TEL audio in	3	Copilot phones (L)
4	TEL audio lo	4	Copilot phones (R)
5	TEL mic audio	5	Lights lo
6	TEL mic key (not used)	6	14 V lights hi / 28 V lights lo
7	MON 1 audio in	7	14/28 V lights hi
8	MON 1 audio lo	8	Aircraft power
9	COM 1 audio	9	Aircraft power
10	COM 1 audio lo	10	Aircraft ground
11	COM 1 mic	11	Aircraft ground
12	COM 1 mic key	12	PA mute (output)

J1	Function	J2	Function
13	COM 2 audio	13	MKR HI sense
14	COM 2 audio lo	14	MKR HI sense lo
15	COM 2 mic	15	Unswitched audio #4
16	No connect	16	Pilot phones (L)
17	NAV 1 audio	17	No connect
18	NAV 1 audio lo	18	No connect (see Appendix C, Note 9)
19	NAV 2 audio	19	PA active (discrete output)
20	NAV 2 audio lo	20	Swap
21	MON 2 audio	21	Swap lo
22	MON 2 audio lo	22	Playback
23	No connect	23	Music 1 (L)
24	Split COM select (output)	24	Music 1 (R)
25	COM 2 select (output)	25	Music 1 lo
26	No connect	26	Music 2 (L)
27	16 Ω COM load	27	Music 2 (R)
28	16 Ω COM load lo	28	Music 2 lo
29	Unswitched audio #3	29	MUTE discrete output
30	COM 2 mic key	30	No connect
31	Unswitched audio #1	31	Pilot phones (R)
32	Unswitched lo	32	Copilot mic audio
33	Pilot mic audio	33	Copilot mic PTT
34	Pilot mic PTT	34	Copilot mic lo
35	Pilot mic lo	35	Pass 1 mic audio
36	Ext. inner marker lamp (white)	36	Pass 1 mic audio lo
37	Ext. outer marker lamp (blue)	37	Pass 2 mic audio
38	Ext. middle marker lamp (amber)	38	Pass 2 mic audio lo
39	MM sense	39	Pass 3 mic audio
40	Pass headphones (L)	40	Pass 3 mic audio lo
41	Pass headphones (R)	41	Pass 4 mic audio
42	Pass headphones lo	42	Pass 4 mic audio lo
43	Unswitched #2 lo	43	Speaker lo
44	Unswitched audio #2	44	Speaker output

2.10 Wiring Checkout

After wiring is complete and **before** installing the unit, verify that aircraft power is present **only** on J2 pins 8 and 9, and airframe ground only on J2 pins 10 and 11. Failure to do so will cause serious internal damage and void the Avidyne warranty.

2.11 Unit Installation

Gently slide the AMX240 into the mounting rack until the hold-down screw engages. While applying gentle pressure to the face of the unit, tighten the 3/32" hex-head screw in the center of the unit until it is secure.

CAUTION

Apply steady pressure to the bezel while screwing the unit into the tray to ensure even seating of the unit and connectors.

WARNING

Do not over-tighten the hold-down screw. **Internal damage will result.**

2.12 Operational Checkout

2.12.1 Required Test Equipment

To return the aircraft to service after installation of the AMX240, the installer must have access to a marker beacon signal generator, such as:

- a. IFR NAV-401L, NAV-402AP or IFR 4000
- b. TIC T-30D or T-36C

Equivalent test equipment is acceptable provided the test requirements can be met.

2.12.2 Audio Panel Test

NOTE

IntelliVox® is designed for ambient noise levels of 70 dB or above. Some syllable clipping may therefore occur in a quiet cabin, such as in a hangar without the engine running. This is normal.

1. Apply power to the aircraft and avionics.
2. Plug headsets into the pilot, copilot and occupied passenger positions.
3. With the audio panel **off**, verify fail-safe operation by receiving and transmitting on COM 1 from the pilot position. COM audio will be present in one ear cup only.
4. Switch the unit on by turning the left (pilot) volume knob clockwise.
5. Check intercom operation.
6. Press the **MIC 1** button.
7. Verify that the MIC 1 and COM 1 buttons illuminate. Verify that the MIC 1 button is **not** blinking. If it is blinking, stop testing and troubleshoot the microphone PTT installation.
8. Verify proper transmit and receive operation from the pilot position. Repeat from the copilot position, noting that the copilot PTT switch transmits on the selected transceiver. Verify that the MIC 1 button blinks while transmitting.
9. Press **MIC 2** and repeat steps 7 and 8 for COM 2.

10. Press the **SPLIT** button. Verify that the pilot can transmit and receive on COM 1 while the copilot transmits and receives on COM 2. Press MIC 1 to exit Split mode.
11. Verify proper operation of all receiver sources by selecting each with the appropriate button. The button illuminates to show which source is in use.
12. Press SPKR. Verify that all selected audio is heard on the cabin speaker, and that speaker audio mutes when a microphone is keyed.
13. Verify proper intercom operation in the **All**, **Pilot Isolate** and **Crew** modes (see Section 3.8.4).
14. Verify that the audio panel does not adversely affect any other aircraft system by systematically switching the unit on and off while monitoring the other avionics and electrical equipment.

2.12.3 Marker Beacon Checkout

1. Connect a ramp generator at the antenna end of the marker coax. With the unit in HI sensitivity, verify that a 160 μ V signal, 95% modulated at 1300 Hz, illuminates the amber (M) marker light, and that marker audio is present in the headsets when MKR is selected. Select SPKR and verify that marker audio is heard on the cabin speaker. Verify that the white (I) and blue (O) lights illuminate within ± 3 dB of the amber lamp with 3000 Hz and 400 Hz modulation respectively.
2. Repeat with the unit in LOW sensitivity, with 430 μ V applied.
3. Connect the marker antenna and verify proper operation.

2.12.4 TEL Checkout

Press the TEL button. Verify that the pilot headset is connected to the telephone system (if installed). Verify that the pilot can transmit on the selected radio (COM 1 or COM 2) using the pilot PTT. Verify that anyone the pilot hears on the intercom is also heard on the telephone.

Bluetooth® Checkout

Verify that the AMX240 pairs with a Bluetooth® device and interfaces with a telephone and a music source. See Section 3.11.

2.12.5 Internal Recorder Checkout

With a headset plugged into the pilot jacks, tune COM 1 to an active local frequency (for example ATIS, ground or tower) and select MIC 1. Record several incoming transmissions.

Press REPLAY; the last recorded message plays back. Press and hold REPLAY to stop playback, then press it again momentarily to play earlier messages. The audio should be heard in the pilot and copilot headsets and should consist only of incoming transmissions from the transceiver selected for transmit. If a remote playback switch is installed, verify that it operates the same way. Repeat for COM 2. Verify that playback is interrupted by incoming audio on the selected COM.

2.13 Final Inspection

Verify that the wiring is bundled away from all controls and that no part of the installation interferes with aircraft control operation. Move all controls through their full range while examining the installation to confirm that no mechanical interference exists. Verify that the cables are secured to aircraft structure in accordance with good practice, with adequate strain relief, no kinks or sharp bends in the cables or coax, no exposure to sharp edges or rough surfaces, and all contact points protected from abrasion.

Complete all required documentation, such as the logbook entry, weight and balance computation and FAA Form 337. Sample FAA Form 337 text and Instructions for Continued Airworthiness are provided in Appendix D. Complete the warranty registration with Avidyne.

Section 3 – Operation

3.1 Scope

This section provides operating instructions for the Avidyne AMX240 Audio Selector Panel / Marker Beacon Receiver / Intercom. Read it carefully before using the equipment to take full advantage of its capabilities. It covers transceiver selection, audio selection, telephone, speaker and PA, marker beacon, intercom, music, utility jack, Bluetooth® and the internal recorder.



Figure 7 – AMX240 operating controls

Table 9 – Front-panel controls

Control	Function	Section
O / M / I lamps	Outer, middle and inner marker beacon lights	3.7
Left knob	Unit power and pilot intercom volume	3.1, 3.8.2
MIC 1 / MIC 2	Transmitter (microphone) selection	3.2
COM 1 / COM 2	Transceiver receive audio selection	3.2
MON 1 / MON 2	Monitor receiver audio (e.g. R9 standby, DME, ADF)	3.3
NAV 1 / NAV 2, MKR	Navigation and marker beacon audio selection	3.4, 3.7
TEL (telephone symbol)	Telephone mode	3.5
SPKR	Cabin speaker; press and hold for PA mode	3.6
MUTE	Mutes marker audio; stops recorder playback	3.7, 3.12
♪ (music)	Music / SoftMute™ control	3.9
ISOL and mode arcs	Intercom mode selection and indication (PLT, CPLT, PAX)	3.8.4
SPLIT	Split COM mode	3.2.1
REPLAY	Internal recorder playback	3.12
Right concentric knob	Inner: copilot intercom volume; outer: passenger intercom volume	3.8.2

3.1.1 Power and Fail-Safe

Unit power is turned on by turning the left (pilot) volume knob clockwise. With the knob fully counterclockwise, the AMX240 is **off** (fail-safe): the pilot headset and microphone are connected directly to COM 1, and unswitched input #1 is heard in the pilot headset. This provides communication capability regardless of the unit's condition. Whenever power is removed or the unit is turned off, the audio panel reverts to fail-safe mode.

The power switch controls all audio selector, intercom and marker beacon functions. Pushbutton selections are remembered and restored when the unit is turned on.

3.2 Transmit (MIC) and Receive (COM) Selection

The MIC 1 and MIC 2 buttons select the transceiver used for transmit. The COM 1 and COM 2 buttons select receiver audio.

The AMX240 has an automatic selection system: audio from the transceiver selected for transmit is automatically heard in the headsets and on the speaker (if selected). You can check this by pressing MIC 2 and noting that the COM 2 indicator turns green. This ensures that the pilot will **always** hear the transceiver selected for transmit.

The AMX240 remembers receiver selections. When switching from MIC 1 to MIC 2, if COM 2 audio had previously been selected, COM 1 audio continues to be heard. If COM 2 had not previously been selected, COM 1 audio is switched off. In other words, changing the MIC selection does not override a prior manual selection of COM receive audio.

In normal (non-split) operation, the AMX240 gives priority to the pilot's PTT. If the copilot is transmitting and the pilot presses PTT, the pilot's microphone is heard on the selected transmitter.

In TEL mode the pilot microphone and headphones are connected to the telephone. The pilot PTT switches the pilot microphone to the selected COM transceiver so that aircraft communications can continue (see Section 3.5). The copilot can also transmit on the selected radio with the copilot PTT.

3.2.1 Split Mode

Split mode can be activated at any time by pressing the **SPLIT** button. This places the pilot on MIC 1 (COM 1) and the copilot on MIC 2 (COM 2). The reverse arrangement (pilot on COM 2, copilot on COM 1) is not available.

In Split mode the pilot hears the other selected navigation and unswitched audio; the copilot hears only COM 2 and unswitched audio. The intercom enters Isolate mode and no intercom mode segments are lit. Pressing ISOL during Split mode re-enables the Crew intercom and lights the corresponding segment.

To exit Split mode, press MIC 1 or MIC 2 to put both crew members on the desired transceiver.

NOTE

Due to the nature of VHF communications and the size constraints of general aviation aircraft, some bleed-over is likely in Split mode, particularly on adjacent frequencies. Avidyne makes no warranty about the suitability of Split mode in all aircraft conditions.

3.2.2 Swap Mode (Remote MIC 1 / MIC 2 Switching)

With a yoke-mounted, normally open momentary switch installed (Section 2.4.7), the pilot can change from the current COM transceiver to the other by pressing the switch. To cancel Swap mode, press the switch again or select a COM with the MIC buttons.

3.3 Transceiver Monitor (MON 1 / MON 2)

The MON 1 and MON 2 buttons allow the crew to listen to the standby frequency of the #1 or #2 Avidyne R9 IFD. Alternatively, MON 1 and MON 2 can be used to listen to DME and/or ADF audio.

3.4 NAV Audio Selection

Navigation receiver audio is selected with three momentary, backlit pushbuttons labeled **NAV 1**, **NAV 2** and **MKR** (marker). Press a button to select that receiver; its indicator turns green. Press it again to deselect it. In Split mode only the pilot hears the selected navigation audio.

3.5 Telephone (TEL) Mode

WARNING

FCC regulation 47 CFR § 22.925 prohibits airborne operation of cellular telephones: "Cellular telephones installed in or carried aboard airplanes, balloons or any other type of aircraft must not be operated while such aircraft are airborne (not touching the ground). When any aircraft leaves the ground, all cellular telephones on board that aircraft must be turned off."

TEL mode provides a full-duplex interface and audio distribution for telephone systems, such as telephones with headset jacks and Bluetooth®-enabled telephones. When interfaced with an approved airborne telecommunications system, the AMX240 serves as the audio control and distribution center. Press the TEL (telephone symbol) button to activate telephone mode. The telephone is connected according to the intercom mode:

- **All** – all crew and passengers are heard on the telephone when they speak, and all hear the selected audio. COM audio is heard in the headsets. If the pilot or copilot presses PTT, that microphone is transferred to the selected COM radio. The telephone party does not hear ATC communications, and vice versa.
- **Crew** – only the pilot and copilot are connected to the telephone; passengers do not hear it. The pilot and copilot can transmit on the selected COM with their PTT switches.
- **Pilot Isolate** – the pilot is in the "phone booth": only the pilot hears the telephone and only the pilot is heard. The pilot retains access to COM 1 or COM 2 using PTT, and hears all selected audio.

NOTE

Because the telephone uses an intercom circuit, all stations on that circuit lose intercom capability while the telephone is in use. Intercom conversation is still heard if the telephone or the AMX240 provides sidetone. Avidyne does not guarantee compatibility with personal cellular telephones.

3.5.1 Telephone Sidetone

As shipped, the AMX240 provides telephone sidetone (the user's voice fed back to the headset). Some telephones already provide sidetone; AMX240 sidetone can be disabled by pressing and holding the NAV 2 button for more than one second with the unit on.

3.6 Speaker Amplifier (SPKR)

Press **SPKR** to place all selected audio on the cabin speaker. Except for certain unswitched inputs, the speaker amplifier is not active in Split mode.

Depending on the installation, important annunciations such as radar altimeter or autopilot disconnect are heard on the speaker even when SPKR is not selected, while other unswitched inputs, such as GPS alerts, are heard on the speaker only when SPKR is selected. Consult your avionics installer for these configuration details.

3.6.1 Public Address (PA) Mode

Press and hold SPKR for more than one second to enter PA mode. The pilot microphone is heard on the speaker when the pilot PTT is pressed, while the copilot continues to use the selected COM radio. The SPKR button flashes while PA mode is active. To exit PA mode, press and hold SPKR again or cycle power to the audio panel.

To address all passengers and crew, we recommend selecting the "All" intercom mode when making a PA announcement.

3.7 Marker Beacon Operation

The marker beacon receiver uses visual and audio indications to alert you when the aircraft passes over a 75 MHz marker transmitter.

- **Outer marker** – blue lamp "O", 400 Hz "dash" tone, keyed at two tones/flashes per second.
- **Middle marker** – amber lamp "M", 1300 Hz tone, keyed with alternating "dot" and "dash" bursts at 95 combinations per minute.
- **Inner marker** – white lamp "I", 3000 Hz "dot" tone, keyed at six times per second.

Marker audio is heard by selecting **MKR**. The marker audio level is set with a service adjustment on the top of the unit (Section 2.7).

Pressing and holding MKR for one second activates the marker lamp test, which illuminates all three lamps (internal and external) simultaneously. Lamp test does not activate the MM sense output.

Pressing **MUTE** while marker audio is active mutes the audio until the next beacon is received.

Receiver sensitivity is set by an external switch wired to J2 pins 13 and 14 (MKR HI sense). The default is LOW sensitivity.

3.8 Intercom Operation

3.8.1 IntelliVox® VOX Squelch

No adjustment of the *IntelliVox*® squelch is necessary, and there is no field adjustment. Individual signal processors continually sample the ambient noise in all six microphones. Non-voice signals are blocked; when someone speaks, only that microphone circuit opens and places their voice on the intercom.

The system is designed to block continuous tones, so humming or whistling in a monotone may be blocked after a few moments.

For consistent performance, each headset microphone **must** be placed within 1/4 inch of the lips, preferably touching them (ref. RTCA/DO-214, 1.3.1.1(a)).

NOTE

Keep the microphone out of direct wind. Moving your head through a vent air stream may cause *IntelliVox*® to open momentarily. This is normal.

IntelliVox® is designed for normal aircraft cabin noise levels (70 dB and above). It may clip syllables or fail to recognize speech in a quiet cabin, such as in the hangar or with the engine off. This is normal.

For optimum microphone performance, Avidyne recommends fitting microphone muffs (for example, the Oregon Aero Mic Muff™). This optimizes VOX performance and improves the clarity of **all** your communications.

Table 10 – Oregon Aero Mic Muff™ part numbers (reference)

Headset Manufacturer	Model	Mic Muff™ P/N
Bose	Dynamic	90010
	Electret	90015
	M87 Dynamic	90020
David Clark	H10-30	90010
	H10-20, H10-40	90015
	H10-13.4	90015
Lightspeed	All	90015

Headset Manufacturer	Model	Mic Muff™ P/N
Peltor	7003	90010
	7004	90015
Pilot	11-20 and 11-90	90015
Sennheiser	All	90015
Telex	Airman 750, Echelon	90015
	AIR 3000	90010

3.8.2 Intercom Volume Controls

The left knob sets the pilot intercom volume. It has no effect on radio, music, copilot or passenger volume.

On the right concentric control, the inner (small) knob sets the copilot intercom volume, and the outer (large) knob sets the passenger intercom volume. Neither affects radio or music levels.

Adjust the radio and intercom volumes for a comfortable listening level. Most general aviation headsets have built-in volume controls for further adjustment at the headset.

3.8.3 Mono Headsets in a Stereo Installation

The pilot and copilot positions work with stereo or mono headsets. All passenger headsets are connected in parallel; therefore, if a mono headset is plugged into a passenger position, one channel is shorted. No damage to the unit will occur, but passengers with stereo headsets will not hear that channel unless they switch their headsets to "MONO".

3.8.4 Intercom Modes

The **ISOL** button on the right side of the panel cycles through the three intercom modes: **Pilot Isolate**, **All** and **Crew**. Green LED arc segments between the PLT, CPLT and PAX labels indicate the active mode. The descriptions below apply when the unit is not in Split mode.

- **All** – all three segments are lit. Pilot, copilot and passengers are on one intercom.
- **Crew** – the segment between PLT and CPLT is lit. Pilot and copilot share an intercom; passengers share a separate intercom.
- **Pilot Isolate** – the segment between CPLT and PAX is lit. The pilot is isolated from the intercom and hears only the radios; copilot and passengers share the intercom.
- **Split** – no segments are lit. Pressing ISOL during Split mode re-enables the Crew intercom and lights the PLT–CPLT segment.



Figure 8 – Intercom mode indication

3.9 Music and Music Muting

The AMX240 has two independent music inputs on the rear connector, a front-panel jack, and Bluetooth® music streaming.

Music 1 is heard at the pilot and copilot positions. Music 1 can also be distributed to the passengers by pressing and holding the  (music) button for more than one second.

NOTE

All music devices should be turned off for takeoff, landing and any critical phase of flight. 14 CFR 91.21 restricts the use of portable electronic devices:

§ 91.21 "(a) Except as provided in paragraph (b) of this section, no person may operate, nor may any operator or pilot in command of an aircraft allow the operation of, any portable electronic device on any of the following U.S.-registered civil aircraft . . . (b)(5) Any other portable electronic device that the operator of the aircraft has determined will not cause interference with the navigation or communication system of the aircraft on which it is to be used."

See FAA Advisory Circular AC 91.21-1 (current revision) at www.faa.gov for more information.

The front-panel mute control has **two** modes and controls muting of Music 1. In the default mode, Music 1 is muted by both radio and intercom audio. When muting is switched off (indicator green), intercom and radio audio do **not** mute the music. At power-up, music muting is always on.

Table 11 – Music 1 muting

Music Mute	Muted by Intercom	Muted by Radio	Indicator
On (default)	Yes	Yes	White
Off	No	No	Green

Music 2 (passenger, rear connector) is always in "karaoke" mode; it is never muted, and muting cannot be enabled for it.

3.9.1 Music in Pilot Isolate Mode

The pilot can elect to hear Music 1 in Pilot Isolate mode. With the intercom in Pilot Isolate (PLT–CPLT segment not lit), press and hold ISOL for one second. The pilot segment blinks slowly (once every five seconds) to indicate this mode. The pilot now hears Music 1, muted in accordance with the mute mode described above.

3.10 Utility Jack

The 2.5 mm (3/32") jack on the front of the AMX240 has three functions: telephone input, advisory audio input and music input. Its use is set automatically by the Smart Jack function and by the front-panel controls described below.

3.10.1 Telephone

When a telephone is connected to this jack, the AMX240 connects the intercom to the telephone when the TEL button is pressed and operates as described in Section 3.5. The telephone ringer, if present, is heard unless muted by other radio or intercom audio.

3.10.2 Advisory Audio Input

The front jack can be used as a priority advisory input for auxiliary systems such as a portable terrain or traffic advisory system. To prevent radio or intercom audio from muting this input, press the  (music) button.

Smart Jack Function

When a music signal is present on the rear-connector Music 1 input, the front jack automatically becomes a priority advisory input and is heard in the crew headsets.

NOTE

The front jack is no substitute for a certified installation of alerts such as GPS waypoint or autopilot tones, which must still be hard-wired to the rear connector. The front jack input **will be muted** by radio or intercom unless music is *playing* on the rear connector.

3.10.3 Music Input

When used as a music input, the front jack is treated as Music 1 and can be distributed to all users depending on the intercom mode and music configuration.

3.11 Bluetooth® Interface

The AMX240 has a Bluetooth interface. The audio panel is always “discoverable,” so you just need to search for the AMX240 from your Bluetooth-equipped phone or music source. The default access code is 0000, if needed. Once the AMX240 has been “paired” with your Bluetooth device.

You can answer a call by pushing the [] button while it is ringing. Calls can be answered from the telephone handset or the audio panel. You can disconnect from either the handset or the audio panel. When a call is disconnected or dropped, the [] button indicator will change to white after a few moments.

3.11.1 Pairing and Unpairing Devices

The AMX240 can be paired with up to eight devices. When that number is exceeded, one existing device, selected at random by the Bluetooth® module, is automatically unpaired to make room for the new device.

If a previously paired device is no longer recognized, reset the Bluetooth® interface: with the AMX240 off, press and hold the NAV 2 and MKR buttons and turn the unit on. A tone in the headset confirms the reset. At Bluetooth devices select “Forget This Device” and pair again.

Pairing Separate Music and Telephone Devices

A separate music source (tablet, music player, laptop) and telephone can be used together. If the telephone can also stream music, pair the music source **first**; otherwise, the smartphone may take over music streaming. Many smartphones allow media audio to be disabled for a given Bluetooth® connection in the phone's Bluetooth® settings.

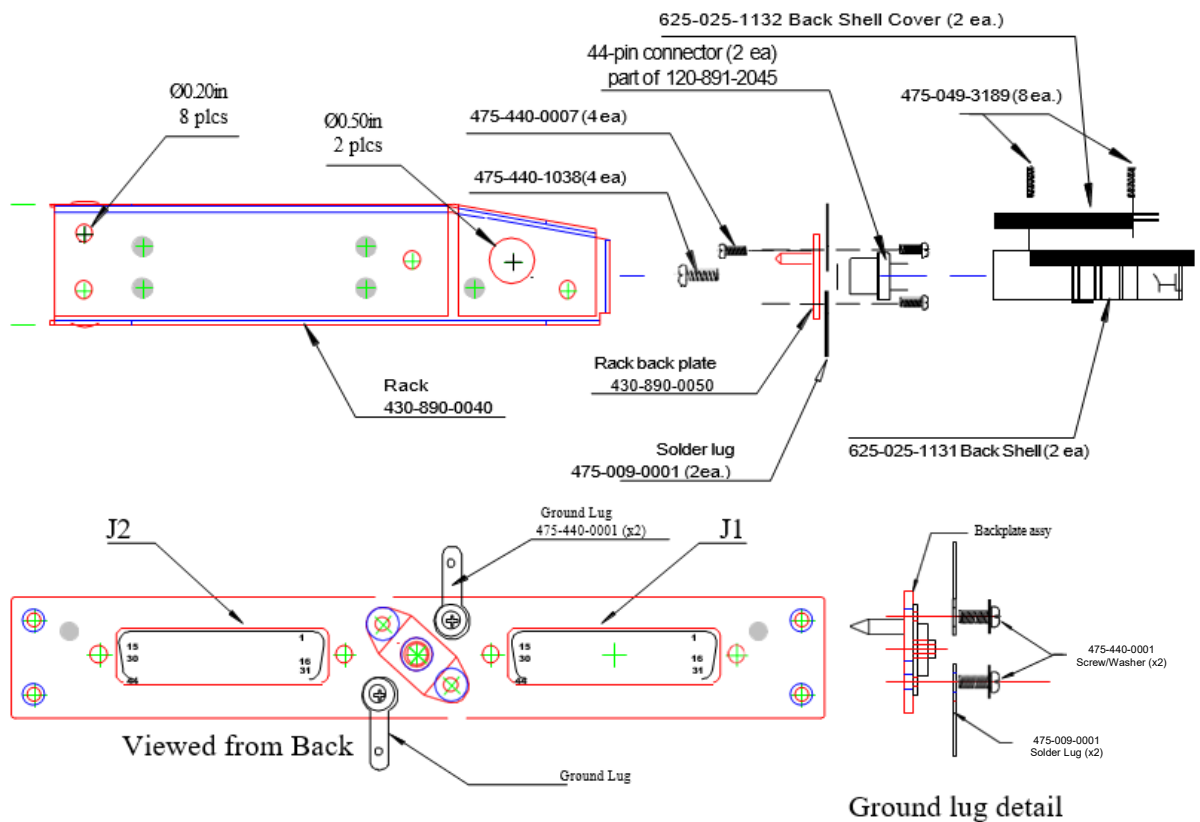
3.12 Internal Recorder and Playback

The AMX240 contains a digital recorder that automatically stores incoming audio from the radio selected for transmission. It stores up to eight messages, totaling up to 60 seconds of audio. The pilot and copilot hear the playback.

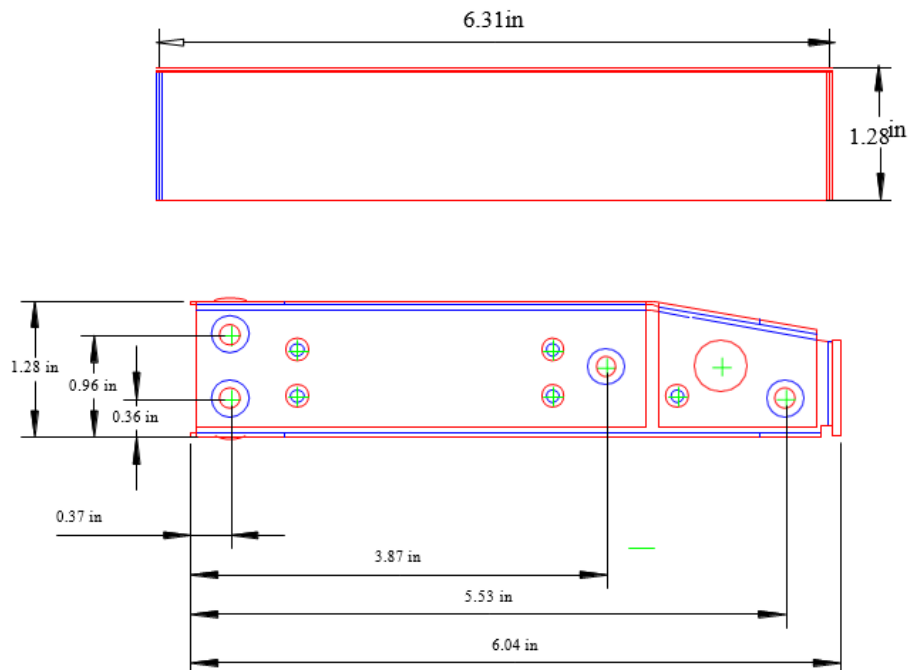
To play the most recent message, press **REPLAY** momentarily. You can let the message finish before selecting the prior message or stop the current playback and step backward: press and hold REPLAY for two seconds to stop playback; the next momentary press plays the next-earlier message.

Playback stops whenever new audio is received on the selected COM. Audio received during playback is not stored. A remote playback switch (Section 2.5.4) operates in the same way as REPLAY.

Appendix A – AMX240 Installation Drawings



Rear plate detail (not to scale)



CAUTION

Apply steady pressure to the bezel while screwing the unit into the tray to ensure even seating of the unit and connectors.

Appendix B – J1 Connector Interconnect

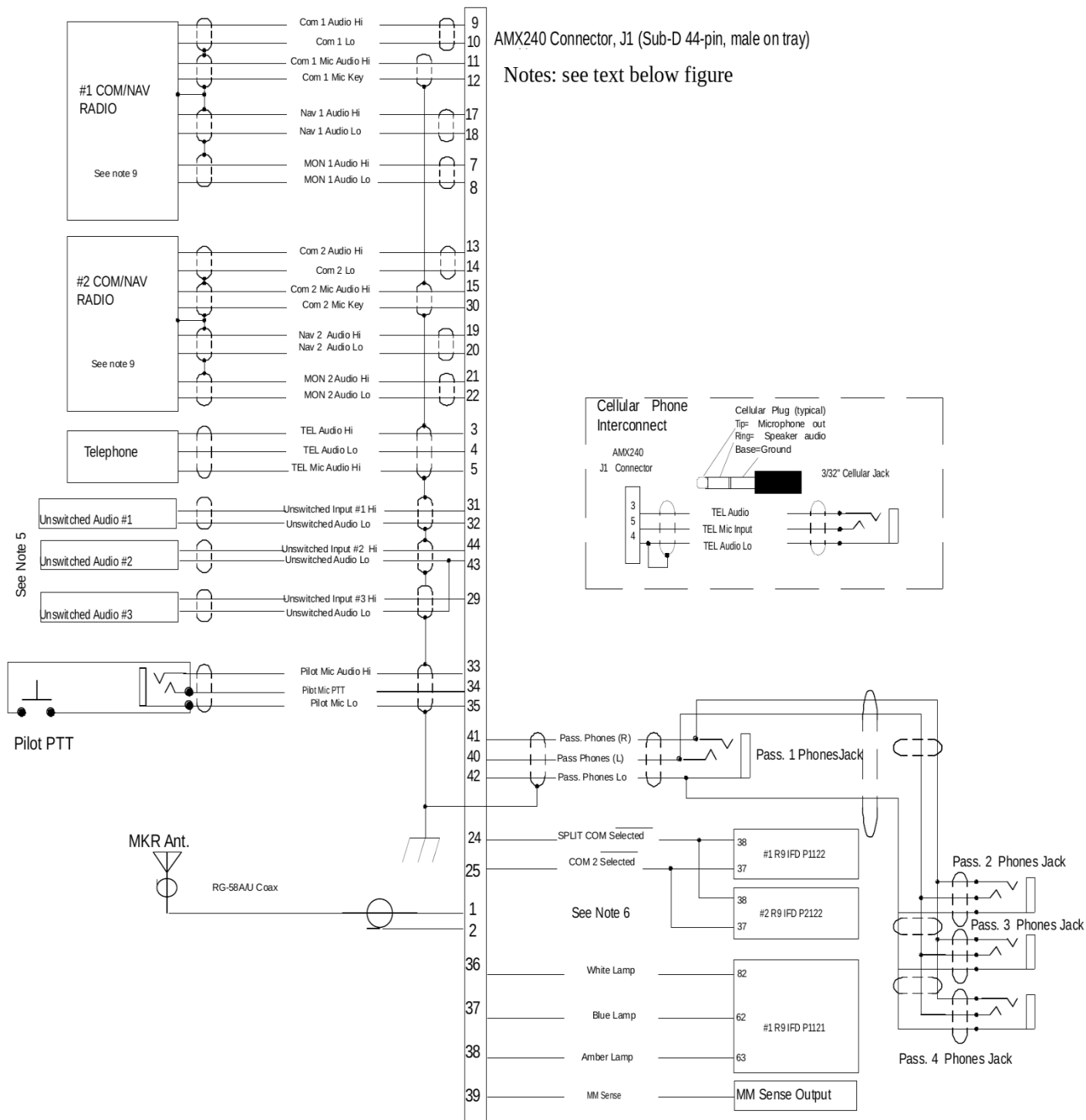


Figure 12 – J1 interconnect (sub-D 44-pin, male on tray)

J1 notes:

1. Ground all shields at the audio panel end only; leave the other end floating.
2. Minimum wire size #24 AWG. See Appendix C for power, ground and lighting wire sizes.
3. All microphone and headphone jacks must be isolated from airframe ground.
4. All shielded wire must be M27500 (or equivalent).
5. Unswitched inputs #1 and #3 are always presented to the crew headsets and the speaker, regardless of SPKR selection or PTT. Unswitched #2 is heard on the speaker only when SPKR is selected. See Section 2.4.6.
6. Pin 25 is logic low when COM 2 is selected for transmit. Pin 24 is logic low when Split COM is selected.
7. No connection to pins 6, 16, 23 and 26. Pins 27 and 28 (16 Ω COM load): see pin assignments, Section 2.9.
8. Pin 39 (MM sense) is used by some specific autopilots only; otherwise, it will be left unconnected.
9. MON 1 and MON 2 can be connected to the Avidyne R9 IFDs to listen to the standby frequencies. Alternatively, they can be used for DME and/or ADF audio, if installed.

Appendix C – J2 Connector Interconnect

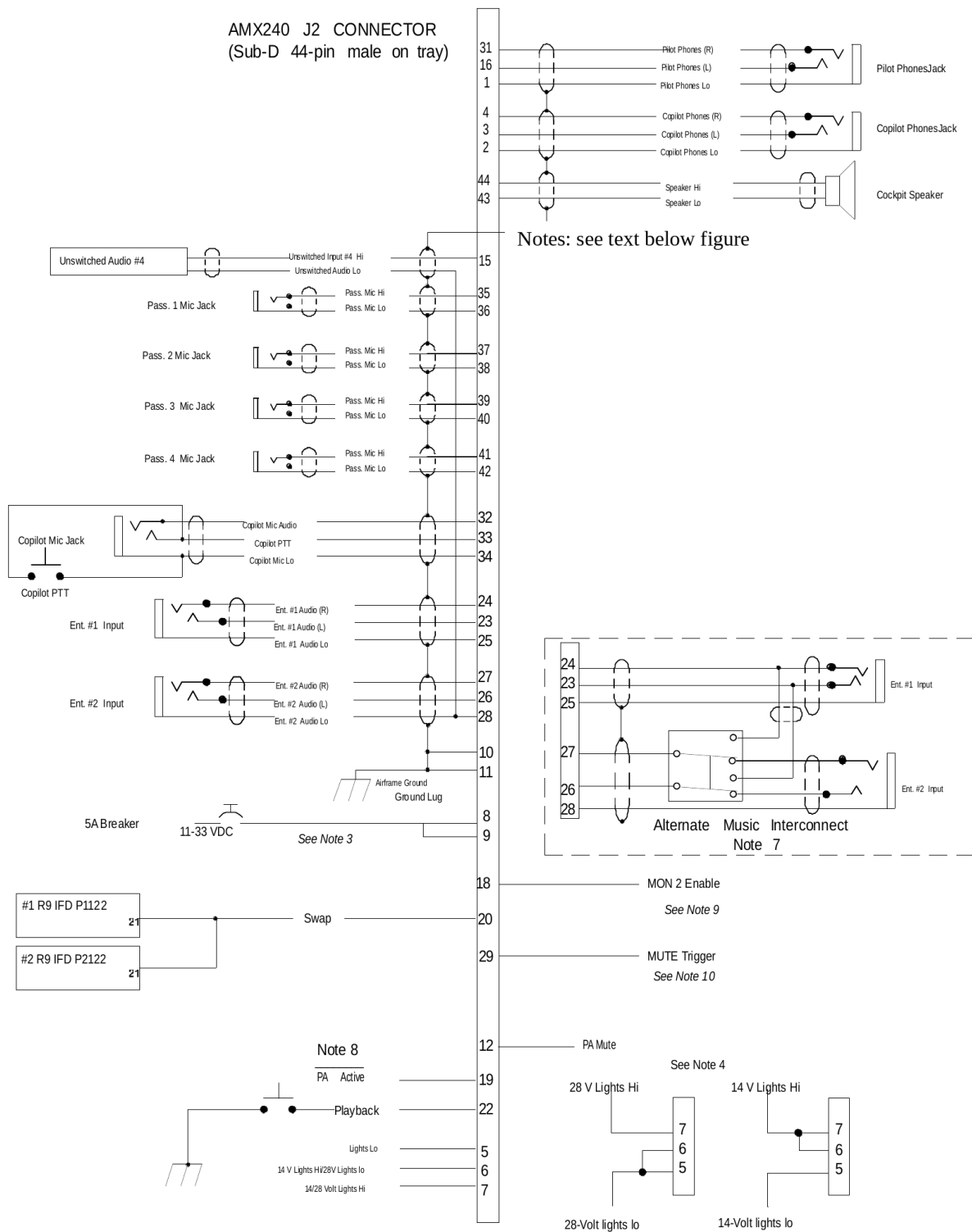


Figure 13 – J2 interconnect (sub-D 44-pin, male on tray)

J2 notes:

1. Power and ground wires #22 AWG minimum (20 AWG recommended); lighting #22 AWG; all other wires #24 AWG minimum.
2. Ground all shields at the audio panel end only; leave the other end floating.
3. Connect pins 8 and 9 to aircraft power through a 5 A pull-type circuit breaker.
4. PA mute (pin 12) is a TTL-level logic output that is pulled low when PTT is active.
5. All shielded wire must be M27500 (or equivalent).
6. Reserved.
7. The music inputs are independent. To use a single source for both inputs, connect them together as shown in Alternate Music Interconnect. For music distribution see Section 2.5.3.
8. Pin 19 is switched to ground when PA mode is active (J4 jumper installed), placing the pilot microphone on the speaker output when PTT is active. See Section 2.4.9.
9. MON 2 enable (pin 18) goes low when the MON 2 button is on.
10. Pin 29 is an active-low MUTE output from the audio panel for the IFD.
11. No connection to pins 17 and 30. Pins 13/14 (MKR HI sense) and 21 (swap lo) are used as listed in Section 2.9.
12. For a monaural installation, connect the left channel only.

Appendix D – FAA Form 337 and Instructions for Continued Airworthiness

D.1 Sample FAA Form 337 Text

One method of airworthiness approval is FAA Form 337, *Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance)*. For the AMX240, the following text may be used as a guide:

NOTE

Installed audio selector panel and six-place intercom, Avidyne AMX240, part number 050-890-0240, in _____ (location) at station _____. Installed per AC 43.13-2B, Chapter 2 (Instrument Panel Mounting), and Avidyne Installation Manual P/N 200-890-0240, Revision ____, dated _____.

This unit is FAA-approved under TSO-C50c (audio selector panels and amplifiers) and TSO-C35d (marker beacon receivers), and meets the environmental qualifications of RTCA DO-160D as appropriate for this aircraft.

Interfaced to existing aircraft radios in accordance with the installation manual and the practices of AC 43.13-2B, Chapter 2. All wires are M22759 or M27500. Connection to aircraft dimmer bus is _____. Power is supplied to the unit through a 5 A pull-type circuit breaker (type and part number _____), and total electrical load does not exceed ____% of the electrical system capacity with the AMX240 added.

Aircraft equipment list and weight and balance amended. Compass compensation checked. A copy of the operating instructions, contained in Avidyne document 600-00306-000, is placed in the aircraft records. All work accomplished is listed on Work Order _____.

D.2 Instructions for Continued Airworthiness – Audio System

Table 12 – Sample ICA checklist

#	Item	Information
1	Introduction	Installation of an audio control panel with integrated marker beacon receiver and intercommunication system.
2	Description	Installation as described in the manufacturer's installation manual referenced on FAA Form 337, including interface with other avionics audio as required.
3	Controls	See the installation manual and operator's guide referenced on FAA Form 337.
4	Servicing	None required.
5	Maintenance instructions	On condition; no special instructions.
6	Troubleshooting	In the event of a unit problem, turn the unit off (fail-safe mode). This allows pilot communication on COM 1. Follow the checkout instructions in the installation manual referenced on FAA Form 337. For a specific unit fault, contact the manufacturer.
7	Removal and replacement	Removal: Using a 3/32" hex (Allen) wrench, carefully unscrew the hold-down screw in the center of the unit. While turning the wrench counterclockwise, gently pull on the EDGES of the bezel until the unit is free of the mounting tray. Installation: Engage the hold-down screw. Turn it clockwise while applying slight pressure to the edges of the bezel. Do not over-tighten.
8	Diagrams	Not applicable.

#	Item	Information
9	Special inspection requirements	Not applicable.
10	Protective treatments	Not applicable.
11	Structural data	Not applicable.
12	Special tools	None.
13	Reserved	Not applicable.
14	Recommended overhaul periods	None.
15	Airworthiness limitations	Not applicable.
16	Revision	To be determined by installer.

Appendix E – RTCA DO-160D Environmental Qualification Form

Nomenclature: Audio Selector Panel / Intercom / Marker Beacon Receiver

Part number: 050-890-0240 **FAA TSO:** TSO-C50c, TSO-C35d

Manufacturer: PS Engineering, Inc., 9800 Martel Road, Lenoir City, TN 37772

Table 13 – DO-160D environmental qualification

Condition	Section	Conducted Test
Temperature and altitude	4.0	Equipment tested to Category A1 and D1
Low temperature	4.5.1	–55 °C survival; –15 °C low operating (A1); –40 °C short-term operating (A1)
High temperature	4.5.2	+85 °C survival; +70 °C high short-time operating
In-flight loss of cooling	4.5.4	Not applicable; no cooling required
Altitude	4.6.1	50,000 ft unpressurized (D1)
Decompression	4.6.2	Not applicable
Overpressure	4.6.3	Not applicable
Temperature variation	5.0	Category C
Humidity	6.0	Category A
Shock	7.0	Operational test only
Operational shock	7.2	Operational test only
Crash safety	7.3	Operational test only
Vibration	8.0	Category S and U2
Explosion proofness	9.0	Category X, not tested
Waterproofness	10.0	Category X, not tested
Fluids susceptibility	11.0	Category X, not tested
Sand and dust	12.0	Category X, not tested
Fungus resistance	13.0	Category X, not tested
Salt spray	14.0	Category X, not tested
Magnetic effect	15.0	Category Z
Power input	16.0	Category B
Voltage spike	17.0	Category A
Audio frequency conducted susceptibility	18.0	Category B
Induced signal susceptibility	19.0	Category A
Radio frequency susceptibility	20.0	Category T
Radio frequency emission	21.0	Category B
Lightning induced transient susceptibility	22.0	Category XXE2
Lightning direct effects	23.0	Category X, not tested

Condition	Section	Conducted Test
Icing	24.0	Category X, not tested
Electrostatic discharge	25.0	Category X, not tested

Warranty

Avidyne warrants the product manufactured by it against defects in material and workmanship for a period of twenty-four (24) months from delivery to the installer. The complete warranty terms are available at www.avidyne.com.

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