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PMA8000B

Audio Selector Panel Marker Beacon Receiver High-fidelity Stereo Intercom System



Pilot's Guide and Operation Manual

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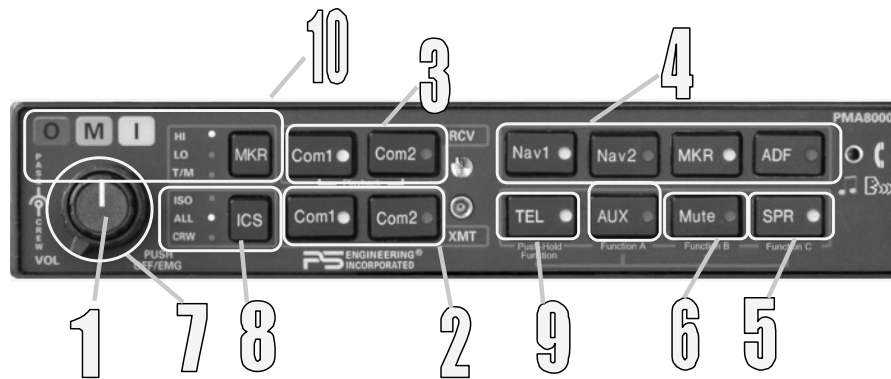
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FAA-Approved: TSO C50c, C35d



This pilot guide provides detailed operating instructions for the PS Engineering PMA8000B, Audio Selector Panel/Intercom Systems. Please read it carefully before using the equipment so that you can take full advantage of its capabilities.

This publication covers the basic operating areas of the PMA8000B systems. They are Com Transceiver Selection, Audio Selector, Intercom, and Marker Beacon Receiver, utility jack and the configuration buttons.



PMA8000B controls

Power Switch (1) (EMG-Fail Safe Operation)

Unit power is turned on and off by pushing the volume knob. In the OFF or "EMG" position, the pilot headset is connected directly to Com 1 as well as unswitched input #1. This allows communication capability regardless of unit condition. Any time power is removed or turned OFF, the audio selector will revert to fail-safe mode.

The power switch controls all audio selector panel functions, intercom and marker beacon receiver. All pushbutton selections will be remembered and return to the last state when turned on.

Communications Transmit (XMT) Selection (2)

There are two pushbuttons associated with the transmitter selection. The two lower buttons (# 2) control which transceiver is selected for transmit. The top row of pushbuttons (# 3) allows selection of the receiver audio. Push the lower button to select the desired COM transmitter.



The PMA8000B-Series has an automatic selector system. Audio from the selected transceiver is automatically heard in the headsets and speaker (if selected). You can check this function by switching from COM 1 transmitter to Com 2 transmitter by pressing the COM 2 transmitter selector pushbutton. Note that the associated Com 2 receive pushbutton indicator light that is located immediately above the Com 2 transmitter pushbutton turns green. This guarantees that the pilot will *always* hear the audio from the transceiver selected for transmit.

The PMA8000B “remembers” the receiver selection, so that when switching transmitters from COM 1 to COM 2, if COM 2 audio was previously selected, COM 1 audio will continue to be heard. This eliminates the pilot having to switch Com 1 audio back on, after changing transmitters.

When switching from COM 1 to COM 2 while Com 2 was not previously selected, COM 1 audio will be switched off. In essence, switching the mic selector will not override prior selection of COM receiver audio.

In normal (not split) modes, the PMA8000B gives priority to the pilot’s radio Push-To-Talk (PTT). If the copilot is transmitting, and the pilot presses his PTT, the pilot’s microphone will be heard over the selected com transmitter.

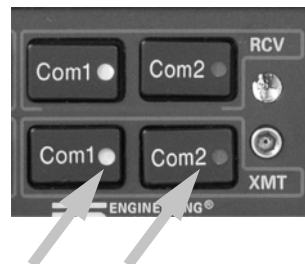
In TEL mode, the pilot microphone and headphones are connected to the cell phone. The pilot PTT will switch the pilot mic to the selected com transceiver, and allow continued aircraft communications to continue. (See Page 4—TEL—for more details)

The copilot will also be able to transmit on the other selected radio with his PTT as well.

Split Mode

The split mode can be activated at any time by pressing the **COM 1** and **COM 2 XMT** buttons at the same time. This places the pilot on COM 1 and the copilot on COM 2.

Pilot on COM 2 and Copilot on COM 1 is not possible.



NOTE: Due to the nature of VHF communications signals, and the size constraints in general aviation aircraft, it is probable that there will be some bleed-over in the Split mode, particularly on adjacent frequencies. PS Engineering makes no warranty about the suitability of Split Mode in all aircraft conditions.

Note: Split Mode does not turn off Nav, ADF, or Aux selected audio to pilot. However, the copilot will only hear the selected com receiver and unswitched inputs.

Swap Mode (Switch from Com 1 to Com 2 remotely)

With a yoke mounted, momentary switch, the pilot can change from the current Com transceiver to the other by depressing this switch. To cancel "Swap Mode," the pilot may either press the yoke mounted switch again, or select a different Com with the XMT buttons.

Audio Selector (4)

Navigation receiver audio is selected through five momentary, push-button, backlit switches. You will always hear the audio from the selected transceiver.



The users can identify which receivers are selected by noting which green switch LEDs are lit. Navigation aid audio push buttons are labeled **Nav 1**, **Nav 2**, **MKR** (Marker), **ADF** and **AUX** (auxiliary). DME audio (if present) will come through when the **AUX** button is selected. When one of these buttons is pressed, the mode is active, and the LED will illuminate. Press the switch again and it will be "off" and remove that receiver from the audio output.

In SPLIT mode, only the pilot will hear selected navigation audio.

Telephone (TEL) (9)

The TEL mode serves as a full duplex interface and distribution for telephone systems such as AirCell or portable cellular phones with earpiece jacks. Pressing the TEL button activates the telephone mode.

This connects the telephone to the users as follows:

In **ALL** intercom mode, all crew and passengers will be heard on the phone when they speak. Com and other selected radio audio is also heard in the headsets. If the pilot or copilot pushes the radio PTT, their mic will be transferred to the selected Com radio.



The telephone party will not hear ATC communications, and vice versa.

In **CREW** mode, only the pilot and copilot are connected to the telephone. Passengers will not hear the telephone. The pilot and copilot will also have transmit capability on the other selected transceiver.

In **ISO** intercom mode, when the PMA8000B is in the **TEL** mode, the pilot position is in the "Phone Booth." Only the pilot will hear the telephone, and only he will be heard. He will also have access to Com 1 or 2, and will transmit on that radio using the PTT. All selected audio is provided to the pilot.

Note: Because the cell-phone uses an intercom circuit, all stations on that circuit will lose intercom capability when the cell phone is in use.

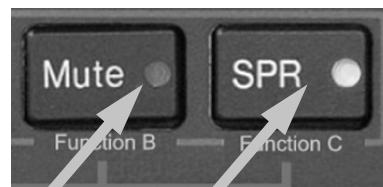
Speaker Amplifier (5)

The **SPR** in the lower right section stands for speaker. This switch will place all selected audio on the cockpit speaker when this switch is selected. Except for the unswitched audio, the speaker amplifier is not active in the "Split Mode".



Unswitched audio 1, 3 and 4 (the inputs dedicated to autopilot disconnect, altimeter warning, etc.) may come through the speaker regardless of the speaker button position.

Depending on installation, important audio annunciations such as radar altimeter or autopilot disconnect will come over the speaker even if it is not selected, while other unswitched, but muted inputs, such as GPS alerts, will only be present if the **SPR** button is selected. Consult your professional avionics installer for these important configuration details.



Public Address Function

To access PA function, press the **Mute** and **SPR** buttons simultaneously. The **Mute** and **SPR** LEDs will blink to indicate the audio panel is in PA mode. The copilot can continue to use the selected com radio while the pilot will now be heard over the speaker. To exit PA mode, push **Mute** and **SPR** again.



Intercom Operation

IntelliVox® VOX-Squelch

No adjustment of the *IntelliVox*® squelch control is necessary. There is no field adjustment. Through three individual signal processors, the ambient noise appearing in all six microphones is constantly being sampled. Non-voice signals are blocked. When someone speaks, only their microphone circuit opens, placing their voice on the intercom.

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

For consistent performance, any headset microphone **must** be placed within **¼-inch** of your lips, preferably against them. (ref: *RTCA/DO-214, 1.3.1.1 (a)*). It is important to have the microphone element parallel to your mouth, and not twisted inside the cover.

Note: For optimum microphone performance, we recommend use of a Microphone Muff Kit from Oregon Aero (1-800-888-6910). This will not only optimize VOX performance, but will improve the overall clarity of *all* your communications.

Oregon Aero MicMuff Part Numbers

Headset Manufacturer	Model	Part Number
Bose	Dynamic Electret M87	90010 90015 90020
David Clark	H10-30 H10-20, H10-40 H10-13.4, 13X H20-10X	90010 90015 90015 90015
Lightspeed	All	90015
Peltor	7003 ANR Pro, 7000	90010 90015
Pilot	11-20, 11-90, 1776, DXL	90015
Sennheiser	All	90015
Telex	Airman 750, AIR4000 AIR3000, Echelon 100	90010 90015

It is also a good idea to keep the microphone out of a direct wind path. Moving your head through a vent air stream may cause the *IntelliVox*® to open momentarily. This is normal.

The *IntelliVox*® is designed to work with normal aircraft cabin noise levels (70 dB and above). Therefore, it may not always recognize speech and clip syllables in a quiet cabin, such as in the hangar, or without the engine running. This is also normal.

Intercom Volume Control (7)

The small volume control knob adjusts the loudness of the intercom for the pilot and copilot. It has no effect on selected radio levels, music input levels or passengers' volume level.

The larger, outer volume control knob controls intercom volume or the passengers. It has no effect on radio or music levels.

Adjust the radios and intercom volume for a comfortable listening level. Most general aviation headsets today have built-in volume controls; therefore, volume also can be further adjusted at the individual headset.



Mono Headsets in Stereo Installation

The pilot and copilot positions work with stereo or mono headsets. All passenger headsets are connected in parallel. Therefore, if a monoaural headset is plugged in to a PMA8000B Stereo installation, one channel will be shorted. Although no damage to the unit will occur, all passengers will lose one channel, unless they switch to the "MONO" mode on the headset. PS Engineering modifies headsets to add stereo capability, using high-fidelity speakers. Contact factory (865-988-9800) for details.

Intercom Modes (8)

The "ICS" pushbutton switch on the left side of the panel provides the selection of the three intercom modes. The description of the intercom mode function is valid only when the unit is not in the "Split" mode. Then, the pilot and copilot intercom is controlled with the **Mute** button.



This button cycles through the intercom modes, from top to bottom and then back up, ISO, ALL, Crew, ALL, and ISO. An LED shows the active mode .

ISO: The pilot is isolated from the intercom and is connected only to the aircraft radio system. He will hear the aircraft radio reception (and sidetone during radio transmissions). The copilot and passengers will hear the music sources as configured by the audio panel configuration Function keys. See page 11—Smart Function Keys for more details.

ALL: All parties will hear the aircraft radio and intercom. Crew will hear Entertainment 1, passengers can hear Entertainment 1 or 2. During any radio or intercom communications, the music volume automatically decreases. The music volume increases gradually back to the original level after communications have been completed.

CREW: Pilot and copilot are connected on one intercom channel and have exclusive access to the aircraft radios. Again, the music that the crew and passengers will hear is determined by the Smart Function Keys.

Marker Beacon Operation (10)

The Marker Beacon Receiver uses visual and audio indicators to alert you when the aircraft passes over a 75 MHz transmitter.



The Blue lamp, labeled “O”, is the Outer Marker lamp and has an associated 400-Hertz 'dash' tone. The lamp and tone will be keyed at a rate of two tones/ flashes per second when the aircraft is in the range of the Outer Marker Beacon.

The Amber lamp, labeled “M”, is the Middle Marker lamp and is coupled with a 1300 Hertz tone. It is keyed alternately with short 'dot' and long 'dash' bursts at 95 combinations per minute.

The White lamp, labeled “I”, is the Inner marker and has a 3000 Hertz 'dot' tone. The lamp and tone will be keyed at a rate of six times per second.

The audio from the Marker Beacon Receiver can be heard by selecting the "MKR" push-button switch. To adjust the volume level, there is a service adjustment located on the top of the unit.

A pushbutton is used to set the receiver sensitivity and to test the indicator lamps mute the marker audio.

Use "**HI**" sensitivity initially. This allows you to hear the outer marker beacon about a mile out. Then touch the smaller MKR button to switch into Low Sensitivity mode. "**LO**" sensitivity gives you a more accurate location of the Outer Marker. Holding the MKR button for one second activates marker test lamp, labeled "T/M" and illuminates all three lamps simultaneously to assure the lamps (internal and external) are in working order. TST does not activate MM autopilot sense output. Releasing the button returns to the last sensitivity.

Pressing the marker mode select ("T/M") for one second will also cause the marker audio to mute for that beacon. The next beacon received will re-activate the audio.

Internal Recorder System

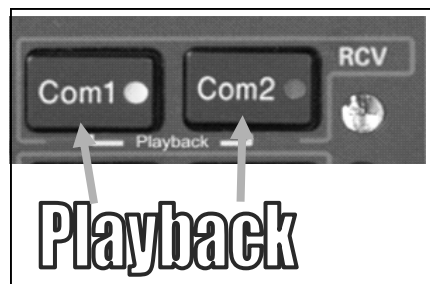
The Intercom Recording System is a digital recording system allowing automatic storage and playback of aircraft radio traffic.

Operating as a continuous loop recorder, (first message received will be the last heard), the recorder has 30 seconds of recording time, or up to 16 messages. With its own built in VOX circuit, there are no buttons to press to start recording. The system automatically begins to record the instant the radio becomes active. Only the com radio selected for transmit is recorded, and only the pilot and copilot will hear the playback audio.

Operation

Recording is automatic. To playback the last recorded message, press and hold the COM Receive pushbutton associated with the selected radio transmitter for about one (1) second. You must wait for the message to finish playing before accessing the prior message. To cancel the playback, press and hold the playback button for two seconds (2). The next time the button is pressed for one (1) second, the next earlier message will be heard.

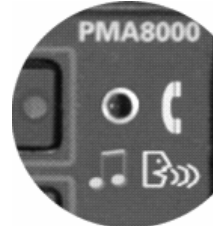
The playback will stop whenever there is more incoming selected com audio, and the message can be replayed from the beginning.



Utility Jack

The 2.5 millimeter (3/32”) jack on the front of the PMA8000B has three distinct functions:

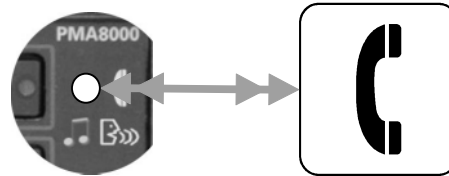
- Cell phone input
- Advisory audio input
- Music input



The use of this jack is controlled by three Smart Function Keys (SFK) controlled from the front panel. See Page 11—Smart Function Keys.

Cellular phone

When a cellular telephone is connected to this jack using a 2.5 mm to 2.5 mm adapter cord (PS Part Number 425-006-7026), the PMA8000B audio panel will connect the intercom to the cell phone when the “TEL” button is pressed (9). When the TEL mode is off, the telephone ringer audio will be heard if it is present on the telephone’s output (ringer may be muted by radio and intercom).



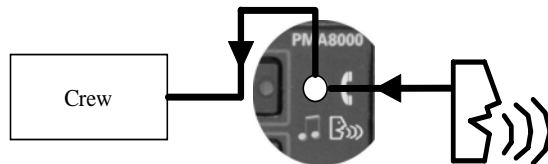
Audio Advisory Input

The front jack can be used as a priority advisory input for auxiliary systems such as a GPS terrain advisory or portable traffic watch system. To prevent radio or intercom from muting this input, press the “Mute” button.

NOTE

The front jack is no substitute for the certified installation of alerts such as the GPS waypoint or autopilot tones. These still must be hard wired into the back by your installer.

We’ve built some intelligence into the PMA8000B, too.



Smart Jack Function

When the PMA8000B has a signal on music #1 input coming in from the rear connector, the front panel



jack automatically becomes a Priority Advisory input, and is heard in the crew headphones.

This input will NOT be muted by radio or intercom.

Music Input

When used as a music input, the front panel jack is treated as Music #1. However, thanks to the function controls, it can be distributed to all users, regardless of the intercom mode.

Smart Function Keys (SFK)

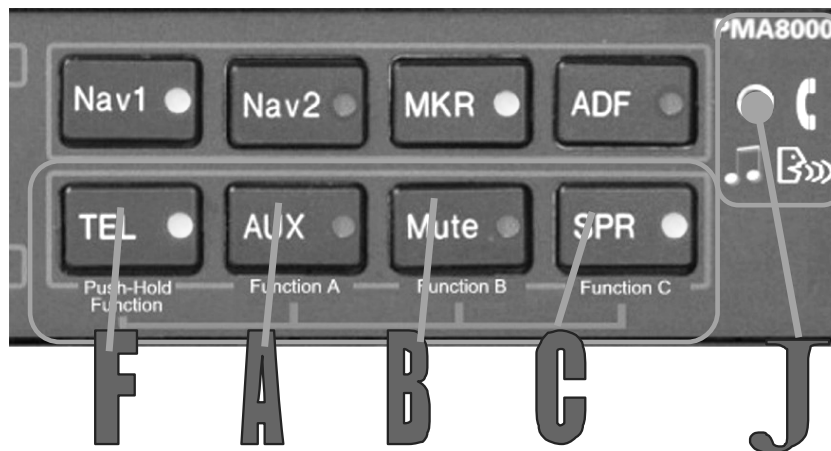
With Virtual Tech Support, the configuration process is self-directed. Once you've set up your system, you don't need to change it again, unless you want to. The unit will always remember your settings.

Note: VTS annunciations will be stopped by any audio received on the com radio selected for transmit.

These functions are non-essential and non-required and as such are only an accessory capability. They don't affect the audio panel's primary function as a selector panel, aircraft intercom, or marker beacon receiver. You can't do anything with these buttons to prevent the PMA8000B from doing its main job.

Looking at the front panel you'll notice that the TEL, Aux, Mute and SPR buttons have "Function" assignments.

To use these function keys A, B, C – press and hold "F" and then press the desired key, "A" "B" or "C".





There are three special functions. Function Button “A” is related to the intercom function, and allows the crew to mute passengers’ intercom feed when radios are active.

Function Buttons “B” and “C” control how music is distributed in your airplane.

Function A AUX		Function B MUTE		Function C SPR	
Intercom Mode		Music 1 Propagation		Music Distribution	
State 1	State 2	State 1	State 2	State 1	State 2
“Alternate intercom function”	“Standard Intercom Function”	“Music #1 all head-sets”	“Music #1 distribution crew.”	“Standard Music Distribution”	“Alternate music distribution ”

Button Function Table

There are two music sources available to the PMA8000B. Music 1 input can be either on the front jack, OR the Music 1 input at the rear connector (Pins 23 and 24, J2). Music 2 is wired into the rear connector, only (Pins 26 and 27, J2)

The volume of the audio annunciations and recorder playback can be adjusted through a hole on the top of the unit marked “ANN VOL.”

Function “A”

Function “A” controls the distribution of aircraft radio within the intercom, as well as passenger intercom muting. In the “standard intercom function” mode, aircraft radios are distributed to all, when the intercom is in the ALL mode. In CREW mode, only the pilot and copilot positions will hear aircraft radios.

When Function A is toggled into “Alternate Intercom Function,” the passengers will NOT hear aircraft radios, even in the **All** mode. In addition, when in the ALL mode, passengers will be able to converse with the crew. However, when the aircraft radio becomes active, the intercom audio from the passengers is muted, allowing the crew to focus on the radio. Passengers will be able to talk to each other, unless the radios are active **AND** the crew speaking on the intercom, in this case the passengers will only hear the crew intercom, and their microphone will be muted.

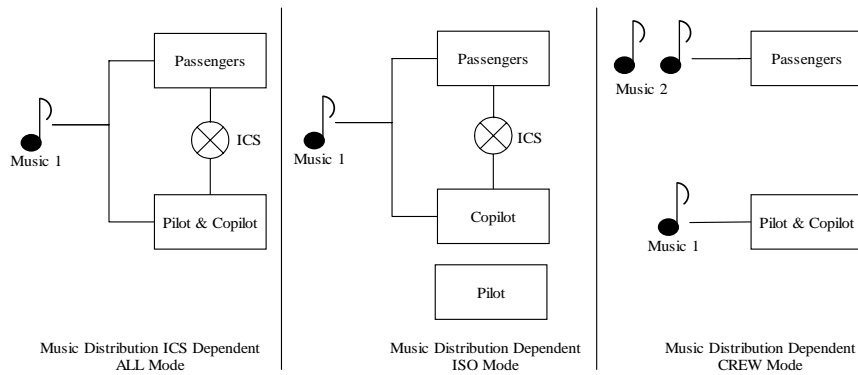
Function “B”

Function Button “B” allows you to either send the music 1 input to all intercom stations, all of the time, **or** have the normal rules apply to our music inputs.

When “*Music number one distribution, all headsets*” is selected, music 1 (or the front panel utility jack) will be distributed to all headsets and is independent of the intercom mode switch. Therefore, even in the CREW mode, the passengers will hear Music 1, even though they will not hear the intercom or radios.

This mode allows you to use a single in-flight entertainment source aboard, and to send it everywhere, even in crew mode. The music muting will be normal, and follow the selected mode of the crew or passengers.

When you select Function “B,” for the alternate function, you hear “*Music number one distribution, Crew.*” Now, music input 2 will follow the modes in Function “C.”



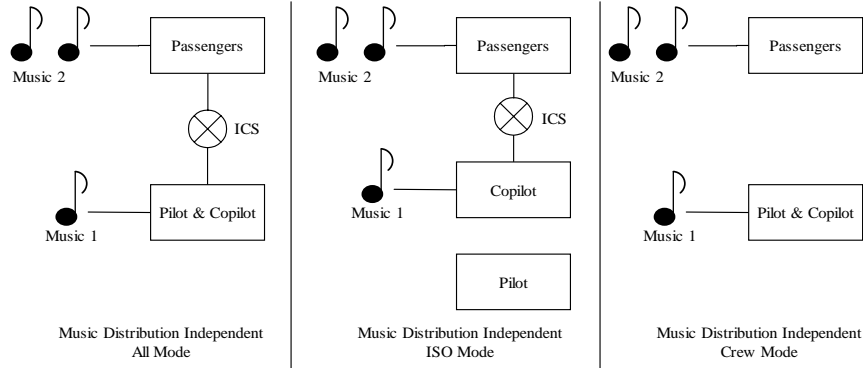
Music Distribution Depends on Intercom Mode

Function “C”

Function “C” allows you to configure your music to be either *independent* of the intercom mode, or to make Music 2 *dependent* on the intercom mode.

When you press Function “C,” you’ll hear, “*Alternate Music distribution.*” In this case, Music 2 will be active *only* when the intercom is in the CREW mode, and only the passengers will hear it. This distribution is similar to other brands of audio panels. It allows the passengers

to have their music source come on only when they are not hearing the crew.



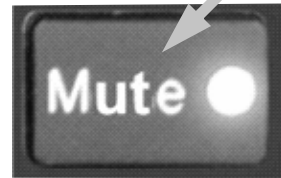
Music Distribution Independent of Intercom Mode

Press again, and you will hear “*Standard Music Distribution.*” In this mode, the music inputs are independent. Music 2 becomes active, and will always be presented only to the passengers on the intercom. Music 1 is only available to the pilot and copilot. The intercom mode switch doesn’t have any affect on the music distribution.

When the music is independent, Music 1 will always go to the pilot and copilot positions, and is never heard by the passengers. Music 2 is always heard by the passengers, and never by the pilot and copilot. This mode is useful if your passengers have a different interest in entertainment or are watching a DVD, but do not want to be excluded from the intercom conversations.

Music Muting

There are two SoftMute™ muting circuits. The front panel "Mute" button will always control the Mute function for music 1. It will also control the muting of the front panel utility jack, when Music 1 is NOT active.



The SoftMute™ circuit will cut the music almost completely out whenever there is conversation on the radio or intercom. When that conversation stops, the music returns to the previous level comfortably, over a second or so.

The pilot and copilot have one muting circuit, which is controlled by the front panel button labeled “Mute.” When this button is pressed, the PMA8000B goes into the Karaoke Mode, and the music will not



mute for incoming radio or intercom conversation.

The passenger's intercom also has a SoftMute™ circuit. It behaves the same way as the crew; if the passengers will hear the radio, or talk on the intercom, the music will mute. If the audio panel is in CREW mode, then the radio reception will not affect the passenger music.

Passengers also have a Karaoke Mode. If the passengers are listening to the music 1 input or front panel input, their Karaoke Mode is controlled by the front panel button labeled "Mute". If the passengers are listening to the music 2 input, their Karaoke Mode is activated by an external switch installed either in the panel, or connected to the AUX button logic output pin on the PMA8000B.

Music 1 Volume

In general, we recommend adjusting the entertainment volume at the sources, and only using this as a master gain control. However, the Music 1 PMA8000B input can be adjusted from the front panel, if desired, by pressing the combinations of keys listed.

Hold the AUX button, and repeatedly push the Mute (volume up) or SPR (volume down) to step the volume level. There are 32 steps.

- AUX + Mute, increase volume
- AUX + SPR, decrease volume

Warranty & Service

In order for the factory warranty to be valid, the installations in a certified aircraft must be accomplished by an FAA-(or other ICAO agency) certified avionics shop and authorized PS Engineering dealer. If the unit is being installed by a non-certified individual in an experimental aircraft, a factory-made intercom harness must be used for the warranty to be valid.

PS Engineering, Inc. warrants this product to be free from defect in material and workmanship for a period of three (3) years from the date of retail sale by authorized PS Engineering dealer. During the first **twelve (12) months** of the three-year warranty period, PS Engineering, Inc., at its option, will send a replacement unit at our expense if the unit should be determined to be defective after consultation with a factory technician. For the remaining **twenty-four (24) months** of the three-year warranty period, PS Engineering will send a no-cost replacement unit at customer shipping expense.

All transportation charges for returning the defective units are the responsibility of the purchaser. All domestic transportation charges for returning the exchange or repaired unit to the purchaser will be borne by PS Engineering, Inc. The risk of loss or damage to the product is borne by the party making the shipment, unless the purchaser requests a specific method of shipment. In



this case, the purchaser assumes the risk of loss.

This warranty is not transferable. Any implied warranties expire at the expiration date of this warranty. PS Engineering SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. This warranty does not cover a defect that has resulted from improper handling, storage or preservation, or unreasonable use or maintenance as determined by us. This warranty is void if there is any attempt to disassemble this product without factory authorization. This warranty gives you specific legal rights, and you may also have other rights, which may vary from state to state. Some states do not allow the exclusion of limitation of incidental or consequential damages, so the above limitation or exclusions may not apply to you.

All items repaired or replaced under this warranty are warranted for the remainder of the original warranty period. PS Engineering, Inc. reserves the rights to make modifications or improvements to the product without obligation to perform like modifications or improvements to previously manufactured products.

Factory Service

The units are covered by a three-year limited warranty. See warranty information. Call PS Engineering, Inc. at (865) 988-9800 before you return any unit. This will allow the service technician to provide any other suggestions for identifying the problem and recommend possible solutions.

After discussing the problem with the technician and you obtain a Return Authorization Number, ship product to:

PS Engineering, Inc.
Attn: Service Department
9800 Martel Rd.
Lenoir City, TN 37772
(865) 988-9800 FAX (865) 988-6619
Email: contact@ps-engineering.com

Units that arrive without an RMA number, or telephone number for a responsible contact, will be returned un-repaired. PS Engineering is not responsible for items sent via US Mail.

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