ENGINEERING®
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PMA6000-Series

PMA6000M, PMA6000M-C
Audio Control Panel

with Monaural Intercom
and optional Marker Beacon
Pilot's Guide
and
Operation Manual

FAA-TSO C50c, C35d
US Patent 4,941,187: 5,903,277: 6,160,496: 6,493,459

202-066-0002   **Revision 3**   **August 2007**

OPERATION

GENERAL INFORMATION

SCOPE

This section provides detailed operating instructions for the PS Engineering PMA6000C, and PMA6000M-C, Audio Selector Panel/Intercom Systems. Please read it carefully before using the equipment so that you can take full advantage of its capabilities.

This guide is divided into four sections covering the basic operating areas of the PMA6000 systems. They are: Audio Selector, Audio Selection, Intercom, and Marker Beacon Receiver (PMA6000M-C only).

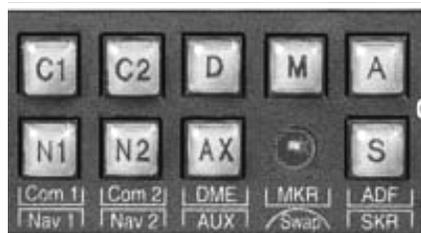## Audio Selector (All models)

Figure 1 Audio Selector

Through the use of two momentary and seven latched, push-button, back-lit switches, it is possible to select any or all receiver audio. C1 and C2 are momentary switches.

When selected, an internal backlight will illuminate indicating which audio source is selected. Because the rotary switch controls what transceiver is being heard by the pilot and copilot (the crew), "Cl" (Com 1) and "C2" (Com 2) push-buttons are of the momentary type and do not remain in when selected. This is also part of the "auto function." You will <u>always</u> hear the audio from the transceiver that is selected by the rotary mic selector switch.

The users can identify which receivers are selected by noting which push-button switches are illuminated. Push buttons la-

beled **Nl** (Nav 1), **N2** (Nav 2), **D** (DME), **M** (Marker), **A** (ADF), **AX** (auxiliary), and **S** (Speaker) are "latched" type switches. When one of these buttons is pressed, it will stay in the "in" position. Press the switch again and it will be in the "out" position and remove that receiver from the audio. While selected, the switch will also be annunciated by an internal lamp.

NOTE: In Split Mode, no pushbuttons will be active. The only audio selected is from Com 1 and Com 2, as indicated by their respective lamps.

Speaker Amplifier
The "S" in the push-button section stands for speaker. This switch will place all selected audio on the cockpit speaker when this switch is selected. NOTE: with the exception of unswitched unmuted inputs (Altimeter warning), the speaker amplifier is not active in the "Split Mode." To reduce power consumption and internal heat buildup in the avionics stack, switch off the speaker amplifier when not in use.

Mic Selector Switch (Fail Safe Operation)

Figure 2 Mic Selector

Unit power is turned on and off by the Mic selector switch. In the OFF or "**FAIL-SAFE**" position, the pilot is connected directly to Com 1 allowing transmit and receive capability regardless of unit condition. Any time power is removed or turned OFF, the audio selector will be placed in the fail-safe mode. In fail-safe mode, the pilot headset is connected directly to Com 1. The first position clockwise from OFF is COM 1. Both pilot and copilot will be connected to the Com l transceiver.

Both the pilot and copilot have transmit capabilities on the selected transceiver. All hear the selected audio if the intercom is in the ALL mode. Only the person who presses their Push To Talk

(PTT), will be heard over the aircraft radio. Turning the rotary switch to the COM 2 position will place pilot and copilot on Com 2.

The PMA6000-Series has an automatic selector mode. Audio from the selected transceiver is automatically heard in the headsets and speaker (when selected). You can check this function by switching from COM 1 to COM 2 and watch the selected audio light on the selector change from C1 to C2. This ensures the pilot will never transmit on a radio that he is not listening to.

When switching the mic selector rotary switch from COM 1 to COM 2, while COM 2 audio had been selected, Com 1 audio will continue to be heard. This eliminates the pilot having to switch Com 1 audio back on, if desired.

When switching from COM 1 to COM 2 while Com 2 has NOT been selected, Com 1 audio will be switched off. In essence, switching the mic selector will not effect the selection of Com audio.

Placing the mic selector switch in the COM 3 position connects the pilot and copilot to that radio. This is similar to COM 1 and COM 2, except that the swap mode is not active.

Important: When the mic selector is in the full counter clock-wise position, the PMA6000 power is removed, and it is in the FAIL-SAFE mode. The pilot headset and microphone are connected directly to Com 1.

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. When "Swap Mode" is active, an LED annunciator will illuminate, indicating that the Mic Selector switch position is no longer valid. To cancel "Swap Mode," the pilot may either press the yoke mounted switch again, or turn the Mic Selector Switch to the Com that is active.

Split Mode

Turning the rotary switch to COM 1/2 puts the PMA6000 into "Split Mode". This places the pilot on Com 1 and the copilot on Com 2. Pilot and copilot are isolated from each other and do not have intercom capability, but can use their respective radios simultaneously. An example of this useful feature is when the pilot may want to talk to Air Traffic Control, while the copilot may be speaking to Flight Watch.

The "Split Mode" radio selection can be reversed by switching to COM 2/COM l. The pilot will be on Com 2 and the copilot will be on Com 1.

Turning the mic selector clockwise to the COM 3 position places both pilot and copilot on Com 3, and exits the split mode. All selected audio inputs and intercom function return.

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 transmission 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:
In all PMA6000-series, Split Mode turns off all other (Nav, ADF, etc.) selected audio to pilot and copilot. Additionally, there is no intercom function between pilot and copilot. Passengers still have intercom capability among themselves.

Intercom Operation

Volume Control

The pilot volume control knob adjusts the loudness of intercom and music in the pilot's headphones only. It has no effect on selected radio audio levels. The
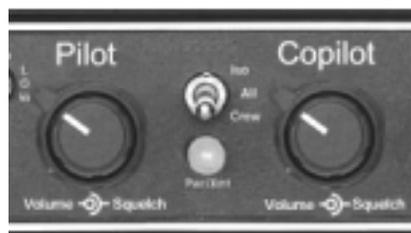

Figure 4 Volume Controls

copilot volume control adjusts the loudness of the intercom and music in the copilot headset only. The passenger volume is factory set at a comfortable level. This is a service adjustment that can be accessed by the avionics technician. Many general aviation headsets have a built-in volume control, so volume can be reduced "locally."

Adjusting the VOX-Squelch control

The PMA6000 provides adjustable VOX squelch controls for the pilot and copilot (the copilot's VOX control also adjusts the passengers VOX squelch). Since the number of microphones open at any one time is reduced, the amount of background noise is diminished. This also allows the use of dissimilar headsets with the same system. The user can adjust the trip level of the VOX to fit the individual's voice and mic, which helps eliminate the frustration of clipping the first syllables.

With the engine running, set the VOX control knob by slowly

Intercom Mode Table

Mode	Pilot Hears	Copilot Hears	Passenger Hears	Comments
ISO	A/C Radio Pilot Sidetone (during radio transmission)	Copilot Passengers Music 1	Copilot Passengers Music 1	This mode allows the pilot to communicate with the air traffic control without the copilot or passengers bothered by the conversations. Copilot and passengers can continue to talk and listen to music
All	Radios Sidetone Pilot Copilot Passengers Music 1	Radios Sidetone Pilot Copilot Passengers Music 1	Radios Sidetone Pilot Copilot Passengers Music 1	This mode allows all on board to hear radio reception as well as communicate on the intercom. Music and intercom is muted during intercom and radio communications
Crew	Radios Sidetone Pilot Copilot Music 1	Radios Sidetone Copilot Pilot Music 1	Passengers Music 2	A second music source is automatically enabled for the passengers

rotating the SQL control knob clockwise until you no longer hear the engine noise in the headphones. When the microphone is positioned properly near your lips, normal speech levels should open the channel. When you have stopped talking, there is a delay of about ½ second before the channel closes. This helps prevent choppy communications.

Some PMA6000 installations may include an intercom Push-to-talk button, located n a yoke or stick. In these installations, turn the squelch control fully clockwise, and then use the associated ICS P-T-T to talk on the intercom.

Intercom Modes

The center switch is a 3-position mode selector that allows the pilot to tailor the intercom function to best meet the situation. The description of the intercom mode function is valid only when the unit is either in the COM 1 or COM 2 position of the Mic Selector switch. When the unit is in the "Split" mode, only the passengers have intercom function.

ISO: (Up Position): The pilot is isolated from the intercom and is connected only to the aircraft radio. He will hear the aircraft radio reception (and sidetone during radio transmissions). Co-pilot and passengers will hear the intercom and music on Entertainment 1, but not the aircraft radio receptions or pilot transmissions.

ALL: (Middle Position): All parties will hear the aircraft radio, intercom, and music from entertainment input #1. However, during any intercom communications, the music volume automatically decreases when SoftMute™ is active. The music volume increases gradually back to the original level after communications have been completed.

CREW (Down Position): Pilot and copilot are connected on one intercom channel and have exclusive access to the aircraft radios. They may also listen to Entertainment 1. Passengers can continue to communicate with themselves without inter-

rupting the Crew and also may listen to Entertainment 2. Anytime the PMA6000 is in either the COM 1/COM 2, COM 2/COM 1, or TEL/COM 1, ("Split Mode") the pilot and copilot do not have any intercom function. The passengers will maintain intercommunications.

Soft Mute

Soft Mute must be enabled during installation by jumpering top connector pins 12 and N. A SPST switch can be installed between these pins for a pilot selectable mute mode. Without this connection, music is not muted during intercom activation. This "Karaoke Mode" prevents the music muting when a sing-a-long is desired. "Soft Mute" mode only applies to entertainment input #1. Entertainment #2 does not mute.

Entertainment Input

The audio selector panel has provisions for up to two separate entertainment input devices. Which device is heard is determined by the position of the 3-position mode switch located in the center of the intercom section of the audio panel. (See Table 1 for overview.)

While in the ISO (Isolate) mode, only the copilot and the four passengers will hear entertainment device #1. In normal operation, whenever a person speaks, the music will automatically mute and then will gradually return to the original listening level when the radio or intercom activity ceases.

When in the ALL mode, all parties will hear the entertainment input #1. While in the CREW mode, pilot and copilot will hear entertainment input #1 while the passengers may listen to entertainment input #2.

It is also possible to use only one entertainment input device for both entertainment inputs (1 and 2). A switch (DPDT) should be installed between the single entertainment device and entertainment input #1. This will allow the pilot and copilot decide if they hear entertainment while in the Crew mode.

Internal Recorder System (Option 1, only)

The recorder function is automatic. Pressing the momentary switch will cause the last message to play (incoming radio and transmit sidetone). This will be heard in the pilot headset only. To hear older messages, push the playback button repeatedly to "back up" the recorder, until the desired message is heard.

The recorder is a continuous loop, and newest ones will over-write the oldest messages. The IRS has an internal squelch that prevents storing 'dead' air. A radio signal of more than 1 VRMS is needed to trigger the IRS. Therefore, if the IRS does not seem to be recording, increase the aircraft radio volume slightly. Holding the button for more than two seconds stops playback. The next button push will acess the prior message.

Marker Beacon (PMA6000M-C)

The Marker Beacon Receiver included in the PMA6000M-C 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 air-craft 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.

Figure 5 Marker Beacon

The White lamp, labeled "I" is the Airway/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 "M" push-button switch.

A 3-position switch is used to set the receiver sensitivity and to test the indicator lamps. Use "HIGH" sensitivity initially.

This allows you to hear the outer marker beacon about a mile out. Then select the "LOW" sensitivity to give you a more accurate location of the Outer Marker. The momentary down switch position is labeled "TEST" and illuminates all three lamps simultaneously to assure the lamps are in working order.

Early PMA6000M units incorporated a Marker Self Test. Upon first application of power to the unit, the Marker enters a self test mode. The flickering blue marker light indicates a test in process. If the test continues for more than 10 seconds, or the lamps do not extinguish, return the unit for service.

Warranty and Service

In order for the factory warranty to be valid, the installations in a certified aircraft must be accomplished by an FAA- certified avionics shop and authorized PS Engineering dealer. An FAA Form 337 must also be accompanied by the warranty card for this warranty to be in effect. If the unit is being installed in an experimental aircraft by the owner/builder, a factory-made harness must be installed 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 one (1) year from the date of purchase from PS Engineering Dealer. During the twelve (12) months of this 1-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.

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 or unreasonable use or maintenance as determined by us. This warranty is void if there is any attempt to dissemble 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.

Factory Service

The unit is covered by a 1-year limited warranty. See warranty information. Contact PS Engineering, Inc. at (865) 988-9800 or www.ps-engineering.com/support.shtml before you return the 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 (RMA), ship product to:

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

Note: PS Engineering will not be responsible for units shipped using US Mail. Units that are received without an RMA number, or a detailed description of the problem and a contact phone number will be refused.

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Record

PMA6000 Serial Number: _____

Date of Purchase: _____

Installed by: _____