PS ENGINEERING® INCORPORATED

PMA7000B-Series

Audio Selector Panel
Marker Beacon Receiver and
Stereo IntelliVox® Intercom Sys-tem

Flying Never Sounded So Good®

Pilot's Guide And Operation Manual

Patent Nos. 4,941,187: 5,903,277: 6,160,496: 6,493,459
FAA-Approved TSO C50c, C35d
JAA-Approved JTSO 2C35d, C50c

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For units above Serial Number JXXXX

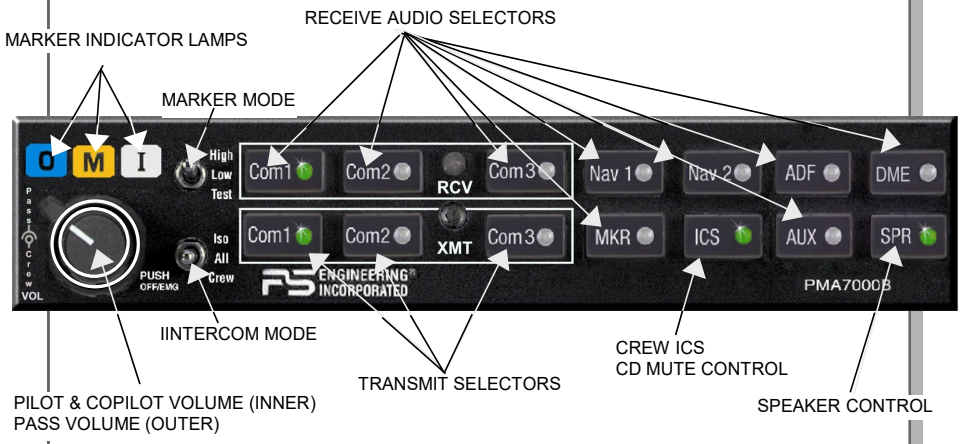
OPERATION

SCOPE

This section provides detailed operating instructions for the PS Engineering PMA7000B Audio Selector Panel/Intercom Systems. Please read it carefully before using the equipment so that you can take full advantage of its capabilities.

This chapter is divided into four sections covering the basic operating areas of the PMA7000B systems. They are Audio Selector, Transceiver Selection, Intercom, and Marker Beacon Receiver.

PMA7000B controls



Power Switch (EMG-Fail Safe Operation)

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

The power switch also controls the audio selector panel functions, intercom, and marker beacon receiver.

Microphone (XMT) Selection (All models)

There are six pushbuttons associated with the communications transceivers. The lower buttons control which transceiver is selected for transmit.

The PMA7000B gives priority to the pilot's PTT. If the copilot it transmitting, and the pilot presses his PTT, the pilot's microphone will be heard over the selected com transmitter.

The PMA7000B-Series has an automatic selector mode. 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 to COM 2 and watch the selected audio light on the selector change from COM 1 to COM 2. This ensures the pilot will *always* hear the audio from the transceiver he is transmitting on.

When switching 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 receiver audio.

When the duplex, or TELEPHONE mode is implemented, Com 3 becomes the "TEL" position. See page 8 for complete information.

NOTE: Selecting COM 3 –TEL– mode will disable pilot and copilot intercom, as the intercom circuit is transferred to the telephone use.

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 (Com 1 or 2) 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 (All models)

Receiver audio is selected through seven momentary, push-button, backlit switches. You will always hear the audio from the transceiver that is selected for transmit.

The users can identify which receivers are selected by noting which of the green switch LEDs are illuminated. Push buttons labeled **Nav 1**, **Nav 2**, **MKR** (Marker), **AUX** (auxiliary), and **SPR** (Speaker) are "momentary type switches. When one of these buttons is pressed, be active, and the LED will illuminate. Press the switch again and it be in the "off" position and remove that receiver from the audio.

Speaker Amplifier

The "**SPR**" in the push-button section stands for speaker. This switch will place all selected audio on the cockpit speaker when this switch is activated. The speaker amplifier will present the audio sources selected by the pilot, in "Split Mode." Unswitched audio, (autopilot disconnect, altimeter warning, etc.) will come through the speaker regardless of the speaker button position.

Public Address Function

To access PA function, an external switch must be installed, and activated. This places the *pilot* microphone on the speaker output when the PTT is pushed. The copilot can continue to use the selected com radio.

We recommend that the switch transfer the audio from the cockpit speaker to a cabin speaker for public address. This will prevent feedback.

Split Mode

The split mode can be activated at any time by pressing the desired combination of XMT buttons. For instance, to activate a Com 1/Com 2 split, press and hold the com 1 button, and then press the Com 2 button while holding the Com 1 button. This places the pilot on Com 1 and the Copilot on Com 2.

Split mode for Com 3, in normal (not TEL/Duplex) is possible with pilot on Com 1, copilot on Com 2 or 3. Pilot on Com 2 or Com 3 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 <u>not</u> turn off other (Nav, ADF, etc.) selected audio to pilot. However, the copilot will only hear the selected communications receiver.

Split Mode ICS

In split mode, the pilot and copilot are usually isolated from each other on the intercom while simultaneously using their respective radios. Depressing the **ICS** button in Split Mode will activate VOX intercom between the pilot and copilot positions. This permits intercommunication when desired between the crew. Pressing the ICS button again disables this crew intercom function.

Intercom Operation

IntelliVox® VOX-Squelch

No adjustment of the *IntelliVox*® squelch control is necessary. There is no field adjustment. Through 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 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). It loves airplane noise! Therefore, it has a tendency to miss initial syllables in a quiet cabin, such as in the hangar, or without the engine running. This is normal, for best performance, go fly!

For optimum microphone performance, PS Engineering recommends installation 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.

Intercom Volume Control

The intercom volume control for pilot and copilot is the smaller concentric knob on the left side of the unit. This volume control knob adjusts the loudness of the intercom for the pilot and copilot only. It has no effect on selected radio levels, music input levels or passengers' volume level.

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

The outer knob is the passenger volume control. This volume control knob adjusts the loudness of the intercom for the passengers only. It has no effect on selected radio levels, music input levels or crew's volume level.

Mono headsets in Stereo Installation

All passenger headsets are connected in parallel. Therefore, if a monaural headset is plugged in to a PMA7000B 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 for details.

Intercom Modes

The lower switch on the left side is a 3-position mode switch that allows the pilot to tailor the intercom function to best meet the current cockpit situation. 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 ICS button.

Iso: (Up Position): 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). Copilot will hear passengers' intercom and Entertainment 1, while passengers will hear copilot intercom

and Entertainment 2. Neither will hear aircraft radio receptions or pilot transmissions.

ALL: (Middle Position): All parties will hear the aircraft radio and intercom. Crew will hear Entertainment 1, passengers will hear Entertainment 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 (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 interrupting the Crew and also may listen to Entertainment 2.

Anytime the PMA7000B is in either the Split Mode ("COM 1/COM 2, COM 1/COM 3"), the pilot and copilot intercom is controlled with the ICS button. The passengers will maintain intercommunications, but never hear aircraft radios.

Alternate Intercom Mode

If an external switch is installed for the purpose, the PMA7000B can enter "Alternate Intercom Mode." When the intercom is in **ALL** mode, with alternate mode enabled the passengers will NOT hear the aircraft radios, but they will hear the crew on the intercom. In addition, the crew microphones will be blocked from the crew headsets while the radio audio is active.

Entertainment Input

The audio selector panel has provisions for two separate entertainment input devices. Music 1 feeds the pilot and copilot positions, music 2 feeds the passenger positions. They operate independently in the PMA7000B.

While in the ISO (Isolate) mode, the copilot will hear Entertainment 1 while the four passengers will hear Entertainment #2. In normal operation, whenever a person speaks, or if the aircraft radio becomes active, the music will automatically mute and then will gradually return to the original listening level when the intercom or radio conversation ceases.

It is also possible to use a single input device for both entertainment inputs. However, we suggest that a switch (DPDT) be installed between the entertainment device and entertainment input #1. This will allow the pilot to direct the music as desired.

Soft Mute and Soft Mute inhibit

The Soft Mute feature assures that the aircraft radio transmissions will not be missed due to entertainment playing. When there is radio reception or intercom conversation, the music level is dropped to a low, or background level. When the radio or intercom traffic ceases, the level gradually returns to normal.

The front panel ICS switch controls muting of entertainment source #1 (for

pilot and copilot). Pushing this button places the ICS in Karaoke (or sing along) mode, which inhibits the soft mute feature. This allows the music to continue uninterrupted by intercom or radio traffic when cockpit workload is appropriate. Pushing the button again will release the mute inhibit function.

The passenger music, source #2, can be placed in the Karaoke mode if a remote switch is installed in the aircraft.

Telephone Mode

The **Com 3** input can serve as a full duplex interface for telephone systems if the installation is correctly configured. PS Engineering does not guarantee compatibility with all cellular or wireless telephone products.

When interfaced with an approved airborne telecommunications system, the PMA7000B can serve as a audio control and distribution center. Each intercom station should have a "hook switch." The pilot's hook switch is the "**Com 3**" button on the audio panel, while the copi-

Mode	Pilot Hears	Copilot Hears	Passengers Hear	Telephone	Comments
ISO	A/C Radios Pilot Sidetone (during radio transmission) Entertainment 1 is Muted	Passengers Copilot Music Input 1	Copilot Passengers Music 2	"Phone Booth" mode Pilot has exclusive use of the telephone	This mode allows the pilot to communicate without the others being bothered by the conversations. Copilot and passengers can continue to communicate and listen to music
ALL	Radios Copilot Passengers Music 1	Radios Pilot Passengers Music 1	Radios Pilot Copilot Passengers Music 2	All have access to phone through Hook Switch. Pilot access through TEL switch. All hear telephone audio if off hook.	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 Copilot Music 1	Radios Pilot Music 1	Passengers Music 2	Pilot and copilot don't have phone access unless in TEL mode. Passengers have phone through Hook Switch Passengers hear phone audio	This mode allows the pilot and copilot to concentrate on flying while the passengers can communicate amongst themselves

lot and passengers are discrete switches mounted adjacent to the headset jacks. When Com 3 is active in the duplex mode, the TX button will blink about twice as fast as the normal transmit rate.

The pilot can speak on the phone when the **Com 3 is selected for transmit (Com 3 Xmt button activated).** In the **All** intercom mode, everyone hears the telephone and selected radio audio. The pilot and copilot will have full transmit capability on the selected transceiver Com 1 or 2, simply by using their respective PTT switch. If any passenger places his or her switch into the “off-hook” position, all passengers will then be on the phone.

In **CREW** mode, the pilot and copilot may use the telephone with their respective hook switch (the pilot selects Com 3 on the Xmt selector). Passengers will not hear telephone or other radios. If the copilot is “off hook” and the pilot is not, the copilot will the sole person on the telephone, and no one else will hear the conversation, sort of a “phone booth.”

The pilot or any passenger who places their switch into the off-hook position will then access to the phone. If one passenger is “off-hook” all four passengers will enter the conversation.

In **ISO** intercom mode, when the PMA7000B is in the **Com 3** mode, the pilot position is in the "Phone Booth." He will also have access to Com 1 or 2, and will transmit on that radio using the PTT. All selected audio is provided. If any other passenger goes “off hook” they will connect to the phone.

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

Marker Beacon

The Marker Beacon Receiver (if equipped) 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 three-position switch is used to set the receiver sensitivity and to test the indicator lamps. Use "**HI**" sensitivity initially. This allows you to hear the outer marker beacon about a mile out. Then select the “**LO**” sensitivity to give you a more accurate location of the Outer Marker. The momentary down switch position is marker test, 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 sense output.

Pressing the marker mode select down (to "**T/M**") will cause the marker audio to mute for that beacon. The next beacon received will reactivate the audio.

Warranty

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 two (2) years from the date of sale. During the first **twelve (12) months** of the 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 **twelve (12) months** of the PMA7000-series three-year warranty period, PS Engineering, Inc., at its option, will send a replacement unit at the customer's expense if the unit should be determined to be defective after consultation with a factory technician.

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 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.

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

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

PS ENGINEERING® INCORPORATED

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: support@ps-engineering.com

NOTE: PS Engineering will not be responsible for any product returned to us by US Mail, or in other than the original or UPS approved equivalent packaging. Units without an RMA or detailed description of problem AND a contact phone number will be refused.

Record

PMA7000 Serial Number:_____

Date of Purchase:_____

Installed by: _____

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