

Section III OPERATION

GENERAL INFORMATION

3.1 SCOPE

This section provides detailed operating instructions for the PS Engineering PMA7000M-S, and PMA7000S Audio Selector Panel/Intercom Systems, CAP versions. Please read it carefully before using the equipment so that you can take full advantage of its capabilities.

This section is divided into four sections covering the basic operating areas of the PMA7000M-S systems. They are Audio Selector, Transceiver Selection, Intercom, and Marker Beacon Receiver (7000M-S only).

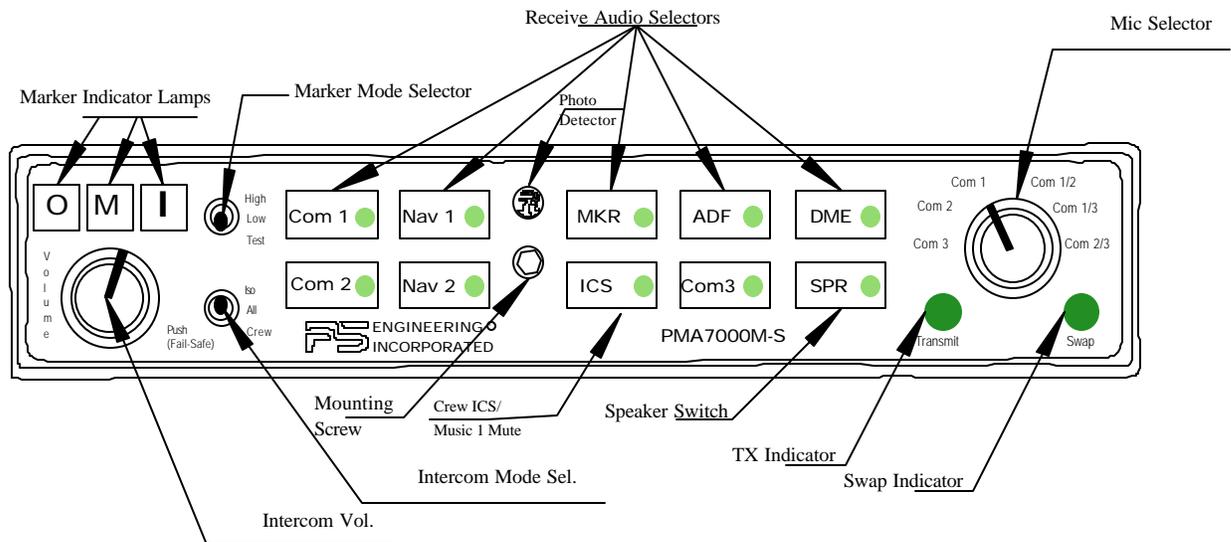


Figure 3-1 PMA7000M-S controls (CAP Version)

3.2 Audio Selector (All models)

Receiver audio is selected through two momentary and six latched, push-button, backlit switches. **Com 1** and **Com 2** are the momentary switches.

Because the rotary microphone selector switch controls what transceiver is being heard, the **Com 1** and **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 always hear the audio from the transceiver that is selected for transmit by the rotary mic selector switch.

The users can identify which receivers are selected by noting which of the switch LEDs are illuminated. Push buttons labeled **Nav 1**, **Nav 2**, **COM 3**, **DME**, **MKR** (Marker), **ADF** and **SPR** (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 be in the "out" position and remove that receiver from the audio.

3.2.1 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 selected. NOTE: The speaker amplifier is not active in the "Split Mode."

3.3 Power Switch (Fail Safe Operation)

Unit power is turned on and off by pushing the volume knob. In the OFF or "**FAIL-SAFE**" 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. Unless the mic selector is in Com 3 mode, at least one of the selected audio LEDs will be on (Com 1 or Com 2).

3.4 Microphone Selector

When the mic selector switch is in the **Com 1** position, both pilot and copilot will be connected to the Com 1 transceiver. 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 the Com 2 transceiver.

The PMA7000M-S gives priority to the pilot's PTT. If the copilot is transmitting, and the pilot presses his PTT, the pilot's microphone will be heard over the selected transmitter.

Turning the mic selector fully counterclockwise places the pilot and copilot on Com 3. Com 3 receive audio is automatically placed in the headset (and speaker if selected). Com 1 and/or Com 2 receiver audio can be selected to monitor those transceivers. The COM 3 button will illuminate, indicating that Com 3 receive audio is present.

The PMA7000M-S-Series has an automatic selector mode. Audio from the selected transceiver is automatically heard in the headsets and speaker. You can check this function by switching from COM 1 to COM 2 and watch the selected audio indicator change from COM 1 to COM 2. This ensures the pilot will *always* hear the audio from the transceiver he is using.

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

When switching from COM 1 to COM 2 while Com 2 receiver audio 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.

3.5 Split Mode

Turning the rotary switch to COM 1/COM 2 places the PMA7000M-S into "Split Mode." This places the pilot on Com 1 and the copilot on the Com 2 transceiver. An example of this useful feature is when the pilot may want to talk to Air Traffic Control, while the copilot/observer may be speaking to the Flight Watch. Although this mode has limitations (see below) we believe you will find this to be a useful feature.

Switching to Com 1/Com 3, the pilot will be on Com 1 and the copilot will be on Com 3. In Com 2/3, the pilot is on Com 2, and the copilot on Com 3. The split mode is reversed by the swap button (see section 3.5.2).

Note:

Due to the nature of 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 other (Nav, ADF, etc.) selected audio to pilot. However, the copilot will only hear the selected communications receiver.

3.5.1 Split Mode ICS

In split mode, the pilot and copilot are usually isolated from each other on the intercom, 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.

3.5.2 Swap Mode

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 annunciator in the lower right corner of the unit will illuminate, indicating that the Mic Selector switch position is no longer current. 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.

In the PMA7000MS CAP version the swap mode can be used to reverse transceiver selection in the split mode. If the mic selector is in the Com 1/2 mode, pressing the SWAP button will place the pilot on com 2 and the copilot on com 1.



Figure 3-2 CAP Version Mic Selector

Mic Selector	Normal		Swap	
	Pilot	Copilot	Pilot	Copilot
Com 1	Com 1	Com 1	Com 2	Com 2
Com 2	Com 2	Com 2	Com 1	Com 1
Com 3	Com 3	Com 3	No Swap	No Swap
Com1/2	Com 1	Com 2	Com 2	Com 1
Com 1/3	Com 1	Com 3	Com 3	Com 1
Com 2/3	Com 2	Com 3	Com 3	Com 2

Table 3-1 Transmitter Combinations

3.6 Intercom

3.6.1 IntelliVox®VOX-Squelch

No adjustment of the *IntelliVox*® squelch control is necessary. 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, 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 best performance, the headset microphone must be placed within ¼ inch of your lips, preferably against them. 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.

For optimum microphone performance, PS Engineering, Inc. 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.

Table 3-2 Mic Muff ®Part Numbers

Manufacturer	Model	Mic Muff®Part Number
Bose	Dynamic	90010
	Electret	90015
	M87 Dynamic	90020
David Clark	H10-30	90010
	H10-20, H10-40	90015
	H10-13.4	

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LightSpeed	15K 20K	90015
Peltor	7003 7004	90010 90015
Pilot	11-20 11-90	90015
Sennheiser		90015
Telex	Airman 750 AIR3000	90015 90010

3.6.2 Volume Control

The 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. If desired, passenger volume level can be adjusted by a screwdriver adjustment at the top of the tray (see figure 2-1).

3.6.2.1 Mono headsets in Stereo Installation

All passenger headsets are connected in parallel. Therefore, if a monaural headset is plugged in to a PMA7000M-S Stereo installation, one channel will be shorted. Although no damage to the unit will occur, all passengers will lose one channel. PS Engineering modifies headsets to add stereo capability, using high-fidelity speakers. Contact factory for details.

3.6.3 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 PMA7000M-S is in either the COM 1/COM 2, COM 1/COM 3, or COM 2/3 ("Split Mode"), the pilot and copilot intercom is controlled with the ICS button. The passengers will maintain intercommunications, but never hear aircraft radios.

3.6.3.1 Entertainment Input

The audio selector panel has provisions for two separate entertainment input devices. They operate independently in the PMA7000M-S. The volume control does not affect music level.

While in the ISO (Isolate) mode, the copilot will hear Entertainment 1 while the four passengers will hear Entertainment #2. The pilot will hear Entertainment 1, at a muted level. 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.

When in the ALL mode, pilot and copilot will hear Entertainment 1 input while all passengers will hear the Entertainment 2 source. 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. It is suggested however, that a switch (DPDT) is 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.

3.6.3.2 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. Pushing this button places the ICS in "Karoake" 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 Karoake mode if a remote switch is installed in the aircraft. See wiring information for details.

Table 3-3 Intercom Modes

Mode	Pilot Hears	Copilot Hears	Passengers Hear	Comments
Isolate	A/C Radios Pilot Sidetone (during radio transmission) Entertainment 1 is Muted	Copilot and passenger intercom Entertainment #1	Passenger and Copilot intercom Entertainment #2	This mode allows the pilot to communicate without the others bothered by the conversations. Copilot and passengers can continue to communicate and listen to music
All	Pilot Copilot A/C Radio Passengers Entertainment #1	Copilot Pilot A/C Radio Passengers Entertainment #1	Passengers Pilot Copilot A/C Radio Entertainment #2	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	Pilot Copilot A/C Radio Entertainment #1	Copilot Pilot A/C Radio Entertainment #1	Passengers Entertainment #2	This mode allows the pilot and copilot to concentrate on flying, while the passengers can communicate amongst themselves.

3.7 P-T-T Intercom Mode

In high noise environments the PMA7000MS can be set to a push to talk intercom. A PTT enable switch and individual PTT buttons must be installed. See section 2.4.13.

3.8 Marker Beacon (PMA7000M-S)

The optional 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/flushes 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 "M" push-button switch. To adjust the volume level, there is a service adjustment located on the top of the unit. See Section 2.5

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A three 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.