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# PMA9000EX

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

**with Bluetooth Phone interface & MP3 player**



## **Pilot's Guide and Operation Manual**

202-920-0100

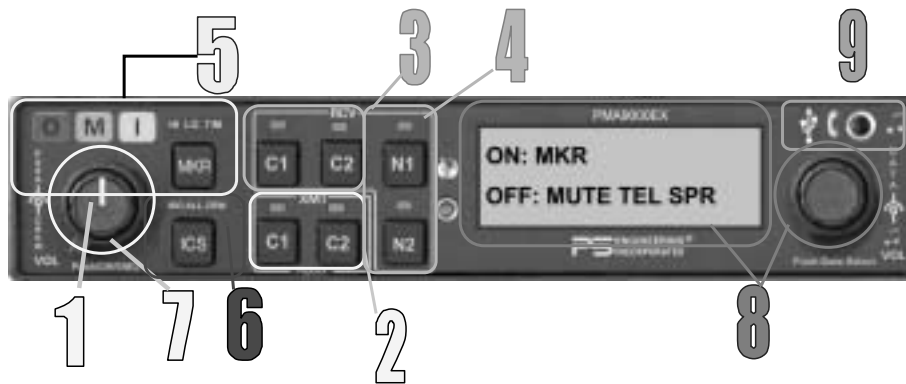
Revision 3

March 2008

This product is intended for **Experimental Aircraft** only.  
Covered under one or more of the following Patent No.  
4,941,187, 5,903,227, 6,160,496, 6,493,450

This pilot guide provides detailed operating instructions for the PS Engineering PMA9000EX, 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 PMA9000EX systems. They are: Com Transceiver Selection, Receive Audio Selector, Intercom, Marker Beacon Receiver, Music, Front Panel Utility Jack and Telephone.



**PMA9000EX Controls**

## **1.0 Audio Selector Panel**

### **1.1 Power and Fail-Safe (1)**

Unit power is turned on and off by pushing the volume knob. In the OFF or "EMG" fail-safe 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 and menu modes will be remembered and return to the last state when turned on.

### **1.1 Communications Transmit (XMT) Selection (2)**

The two buttons **C1** and **C2**, (# 2) in the XMT section control which

communications radio is selected for transmitting. Push the lower button to select the desired COM transmitter. A green LED above the button illuminates to indicate that the audio is selected. The top row of RCV pushbuttons (# 3) allows selection of the receiver audio.



The PMA9000EX-Series has an automatic com receiver 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. See 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 PMA9000EX “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 PMA9000EX 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.

#### **1.1.1.1 Split Mode**

The split mode can be activated at any time by pressing the **C1** and **C2 XMT** buttons at the same time. This places the pilot on COM 1 and the Copilot on COM 2. All four COM indicators will illuminate to indicate that the panel is in split mode.

In split mode, the intercom will remain active in the selected mode, however, and music will be muted in the crew positions.

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

Split Mode does not turn off Nav, ADF, or Aux selected audio to

pilot. However, the copilot will only hear the copilot-selected com receiver and unswitched inputs

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**NOTE**

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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.

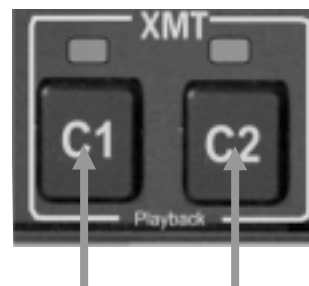
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### **1.1.1.2 Swap Mode (Switch from Com 1 to Com 2 remotely)**

With a yoke mounted, normally open 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.

### **1.1.1.3 Internal Recorder**

The PMA9000EX comes equipped with an internal recorder. This digital system stores the last incoming audio from the radio you have selected for transmit. It can store up to 60 seconds of audio. The pilot and copilot hear the playback.. Because of the continuous nature of AWOS recordings, these will not trigger the recorder circuits.



#### *1.1.1.3.1 Playback*

Recording is automatic. To play back the message, press and hold the XMT button for the communications radio that is selected for transmit for about 1 second or until the message plays back.

To stop the, hold the same button until the playback stops, about 2 seconds. Then the next 1-second press will play the next earlier message stored.

The playback will stop automatically when the selected com audio becomes active again. Press the button again to start the message again. The audio received during playback is NOT stored.

### 1.2 COM Audio Receive Selector (3)

Communication audio from the other radio, not selected for transmit, can be heard by pressing the associated RCV button. You will always hear the audio from the selected transceiver.



### 1.3 NAV Audio selection (4)

VHF Navigation receiver audio is selected through two momentary, push-button, backlit switches. VHF Navigation aid audio push buttons are labeled N1, N2.

The users can identify which receivers are selected by noting which green LEDs are lit above the button.

## 2.0 Marker Beacon Receiver (5)

### 2.1 Marker Beacon Operation (5)

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/ashes 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 MKR button controls audio selection, marker sensitivity, and audio muting, and lamp test.

- MKR button press of < 1 second: toggles between high and low receiver sense



- MKR button press between 1 and 2 seconds: Activates audio mute, and marker lamp test activated. The next beacon received will re-activate the audio.
- MKR button press > 2 seconds: toggle marker audio on/off. When the audio is selected, MKR will appear in the display. Marker audio can also be controlled using the same manner as Secondary Navaid Selection

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 two seconds activates marker test lamp, which illuminates all three lamps simultaneously to assure the lamps (internal and external) are in working order. Releasing the button returns to the last sensitivity. The marker audio level is preset at the factory, and a service adjustment is available if necessary.

### 3.0 Intercom (6)

#### 3.1 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.

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.

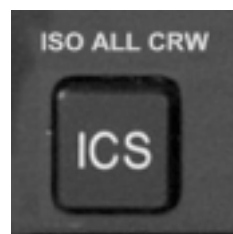
**Oregon Aero MicMuff Part Numbers**  
Note: For optimum microphone performance, we recommend use of a Microphone Muff Kit from Oregon Aero (1-800-888-6910). This will not only optimize VOX performance, but will improve the overall clarity of *all* your communications.

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

### 3.2 Intercom Modes

The “ICS” pushbutton switch on the left side of the PMA9000EX provides the selection of the three intercom modes.

This button cycles through the intercom modes, from left to right and then back, ISO, ALL, CRW (Crew), ALL, and ISO. The illuminated text 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.

**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. An Alternate Intercom Function is available that prevents the passengers from hearing aircraft radios in ALL mode. See Section XX.X for details.

**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 controlled in the music distribution setup.

### **3.3 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.



#### **3.1.3.1 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 PMA9000EX 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.

### **4.0 EnCoder And Push Switch interface (ECAPS) (8)**

ECAPS is a system that consists of two encoding **data knobs** and a push-push switched integral into the small data knob. These control the menu, submenus, and selection of items for control.

The primary menu contains frequently accessed items: **SPR** (cockpit Speaker), **TEL** (telephone) **MKR** (Marker audio), and **MUTE** (music mute control).

Pressing the small knob for two (2) seconds will activate the sub menu. Submenus contain: ADF, DME and AUX audio, MP3 and

**DEFAULT PAGE - TURNING ON/OFF FUNCTIONS**



**EXAMPLE #1: TURN MUTE FUNCTION ON**



DEPRESS THE SMALL DATA KNOB QUICKLY



TURN LARGE DATA KNOB UNTIL THE LINE IS AUDIO FUNCTION THAT NEEDS TO BE CHANGED



DEPRESS DATA KNOB QUICKLY TO LOCK IN CHANGE

**EXAMPLE #2: TURN OFF MARKER AUDIO FUNCTION**



DEPRESS THE SMALL DATA KNOB QUICKLY



TURN LARGE DATA KNOB UNTIL THE LINE IS AUDIO FUNCTION THAT NEEDS TO BE CHANGED



DEPRESS DATA KNOB QUICKLY TO LOCK IN CHANGE

other music selections and controls, Alternate Intercom mode control, Public Address, and LCD display controls.

Turn the large data knob to view the sub menus. Turn the small knob to toggle selections on or off, or adjust levels.



Pushing the small data knob will activate the option, and exit the menu, or, the option will be selected automatically after five (5) seconds.

The menu function will always come up on the display with last used function first.

#### **4.1 Cockpit Speaker**

The speaker (SPR) can be turned on or off in the same manner as the MKR from the primary menu. This control 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, (the inputs dedicated to autopilot disconnect, altimeter warning, etc.) will 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.

#### **4.2 Standard/Alternate Intercom Function**

Alternate Intercom Function is a mode that allows everybody to talk on the intercom, but the passengers do NOT hear the aircraft radios. In addition, when the aircraft radios are active, the crew does not hear the passengers' microphones, although passengers continue to hear each other. This function is selected through the ECAPS system.

#### **4.3 Utility Jack (9)**

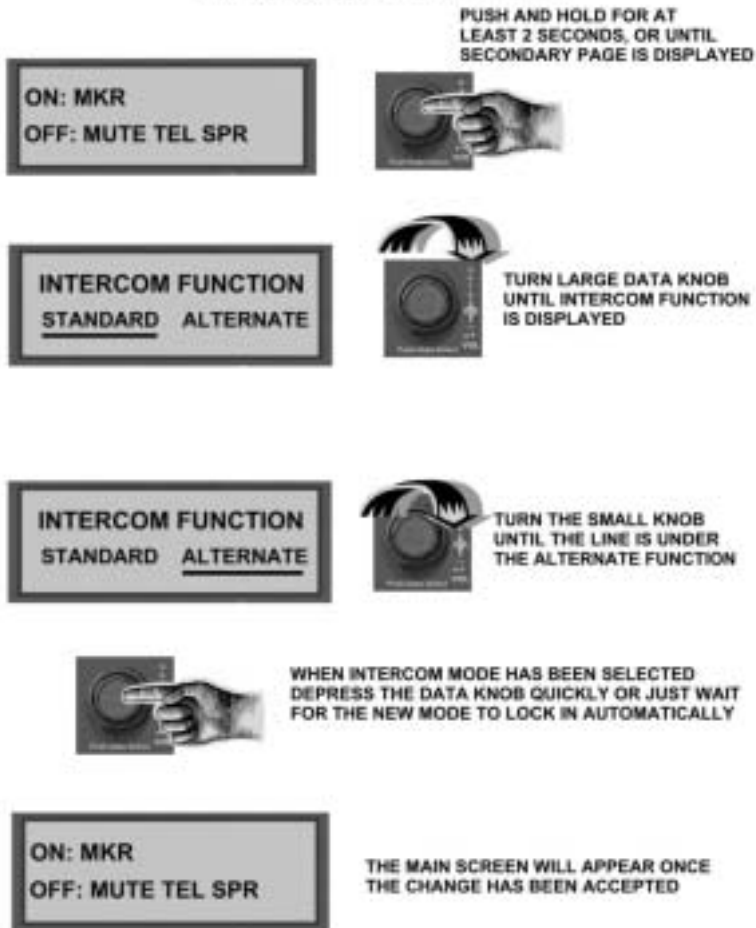
The 2.5-millimeter (3/32") jack on the front of the PMA9000EX has three distinct functions:

- Music input
- Advisory audio input
- Wired Cell phone input

##### **4.3.1 Front Jack Music Input**

When used as a music input, the front panel jack is treated as Music #1. However, thanks to the PMA9000EX controls, it can be

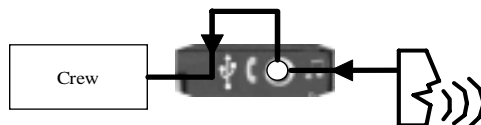
## INTERCOM FUNCTION



distributed to all users, regardless of the intercom mode. A patch cord is available with 2.5 mm to 3.5 mm (3/32" to 1/8" ) adapter cord (PS Part Number 425-006-2535).

### 4.3.2 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, turn off the “**Mute**” function.

#### 4.2.2.1 Smart Jack Function

When the PMA9000EX 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.

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**NOTE**

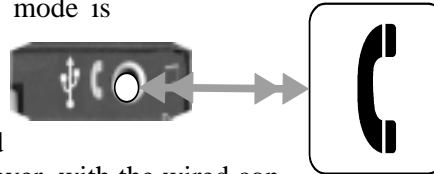
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The front jack is no substitute for the certified installation of alerts such as the GPS waypoint or autopilot tones. These still must be hard wired into the back by your installer.

### 4.3.3 Cellular phone

When a *wired* cellular telephone is connected to this jack using available 2.5 mm to 2.5 mm adapter cord (PS Part Number 425-006-7026), the PMA9000EX audio panel will connect the intercom to the cell phone when the “TELEPHONE mode is activated, and behave as described in section 3.7. The telephone ringer, if present, will be heard unless the input is muted



by other radio or intercom., however, with the wired connection, the TELEPHONE RINGING message will not be displayed.

### 4.3 Telephone (TEL) Mode

The TEL mode serves as a full duplex interface and distribution for compatible portable cellular phones with hands free jacks or Bluetooth capable.

#### 4.3.1 Bluetooth

##### 4.3.1.1 Bluetooth Telephone Connection

Before the PMA9000EX can be used in TEL mode with a wireless Bluetooth connection, the unit must be associated with a specific phone.

Activate the “seek device” function on the cell phone, and then enter the access code “0000” when the phone detects the “PMA9000EX” on the list of available devices.

This process will be necessary for any phone to be used, and only one cell phone can be associated with the audio panel at a time. If the



additional phones are associated with the PMA9000EX at the same time, only the *first* phone will transfer audio to the panel.

#### **4.3.1.2 Using Bluetooth**

When using Bluetooth, during an incoming call, the PMA9000EX will automatically display “TELEPHONE RINGING” and play a ring tone. Pressing the encoder knob will connect the call, if desired. The PMA9000EX exits the telephone mode automatically when the cellular phone hangs up.

To make an outgoing call, select TEL using the ECAPS system. Using the cell phone, dial the desired number and select “connect” on the cell phone. You now connected to the telephone. NOTE: you will continue to hear the selected Com. When you press the PTT, the cell phone will mute.

#### **4.3.2 Telephone Distribution**

Entering the TEL mode connects the telephone to the users as follows:

In **ALL** intercom mode, all crew and passengers will be heard on the phone. 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 PMA9000EX 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.

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

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#### **WARNING**

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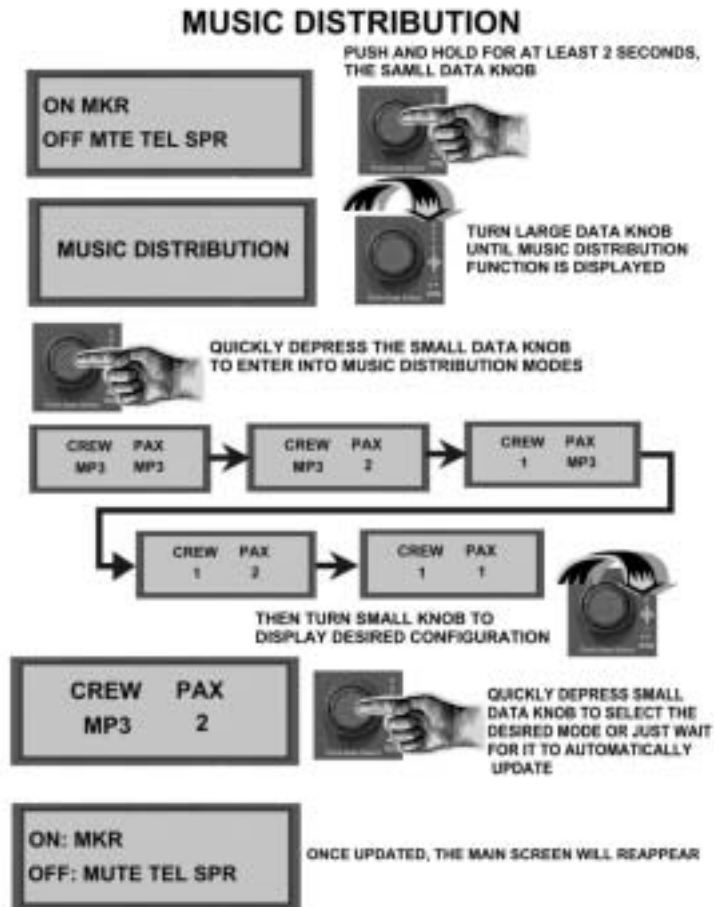
FCC regulation 47 CFR 22.925 prohibits the use of 800 MHz Cellular handsets in any aircraft that is airborne. Violation of this rule could result in suspension of service and/or a fine.

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#### 4.4 Music Input & Distribution

There are three music sources available to the PMA9000EX: MP3, Music 1, and Music 2. Music 1 input can be either on the front jack, OR the Music 1 input at the rear connector. Music 2 is wired into the rear connector only.

The PMA9000EX has two music channels, which can use any of three sources. One music channel is provided to the crew, and can be distributed to the passengers. Another music input is dedicated to the Passengers stations. The three sources, Music 1, Music 2 and MP3 can be directed via the ECAPS to these channels.



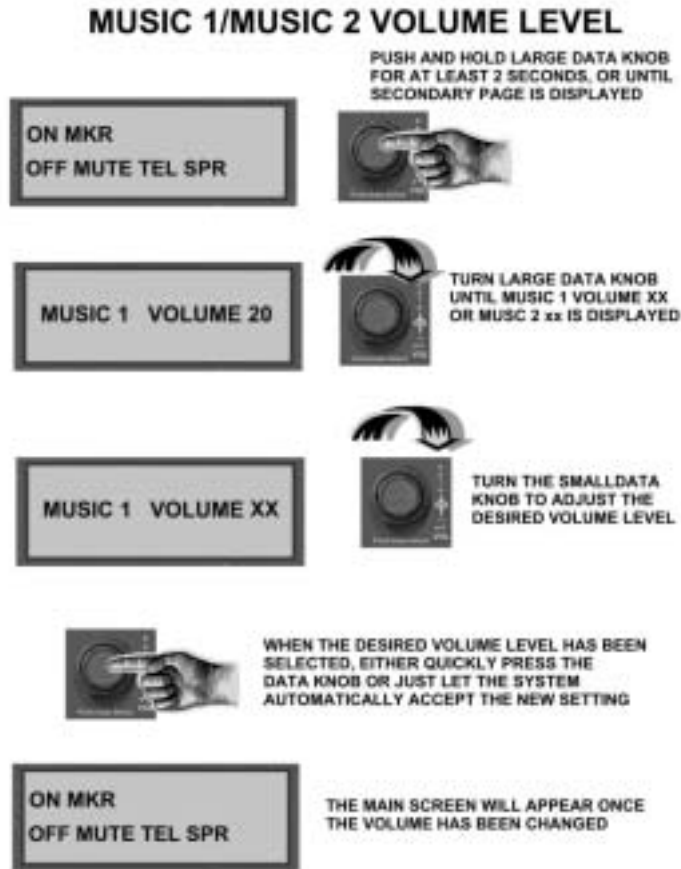
**Note:** If you don't hear the music device as expected, verify which sources is selected for the crew.

If the MP3 player is selected for the crew, and music is playing in the front panel jack or Music 1, BOTH sources will be heard, because the front panel jack can also be used for alert audio and telephone.

Select MUSIC DISTRIBUTION submenu, push the knob, and select the desired configuration from that menu.

#### 4.4.1 Music Volume

Music #1 volume is controlled by the small data knob at all times, unless the MP3 player is active, in which case the small data knob controls MP3 Volume.





In addition, music input 1 and music input 2 have individual volume controls that are accessible through the ECAPS system. Push the small data knob for 2 seconds, and then turn the large data knob until MUSIC 1 or MUSIC 2 is shown. Then turn the *small* data knob to change the volume. The display will revert and store the values after 3 seconds.

#### **4.4.2 Music Mute Control**

PMA9000EX controls the music muting allowing the user to tailor the SoftMute™ to their taste and situation. There are two SoftMute™ muting circuits. 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.

For those occasions when the music musing isn't necessary or desired, the SoftMute can be disabled from the front panel.

Push the small knob to highlight the cursor. Select the MUTE by turning the small knob, and push the knob again to toggle mute on or off. This mute control is for the Crew music only. Passenger music muting is controlled through a switch installed in a location convenient to the passengers.

**MP3 PLAYER ON/OFF**

PUSH AND HOLD FOR AT LEAST 2 SECONDS, OR UNTIL SECONDARY PAGE IS DISPLAYED




MP3 PLAYER  
 ON OFF



TURN LARGE DATA KNOB UNTIL MP3 PLAYER IS DISPLAYED

MP3 PLAYER  
ON OFF



TURN SMALL KNOB TO TURN ON THE MP3 PLAYER



WHEN THE MP3 PLAYER HAS BEEN TURNED ON, EITHER DEPRESS THE DATA KNOB QUICKLY OR JUST LET THE SYSTEM AUTOMATICALLY EXCEPT THE NEW SETTING

ON MKR  
 OFF MUTE TEL SPR

WHEN THE MAIN SCREEN REAPPEARS, THE MP3 PLAYER HAS BEEN TURNED ON. TURNING SMALL DATA KNOB CHANGES MUSIC VOLUME WHILE TURNING THE LARGE KNOB WILL CHANGE SONG TITLE

**4.4.3 MP3 On/Off**

The internal MP3 player can be turned on and off and the order of play can be either sequential or random. Each of these functions has a sub-menu item in the ECAPS system.

The MP3 player resets to off when the PMA9000EX is turned off.

**4.4.4 MP3 Volume**

The volume of the internal MP3 player can be adjusted at any time the player is on and main menu is displayed, by turning the small data knob.

#### 4.4.5 MP3 Music Track selection

The track can be changed whenever the MP3 player is operating by turning the large data knob. The track title is displayed momentarily. The display also changes to show the title when the track changes.

#### 4.4.6 MP3 Random Mode

The PMA9000EX MP3 player can be set to play the files in sequence, or in a random order. The MP3 Random Mode is on the submenu.

**MP3 RANDOM MODE**

ON: MKR  
OFF: MUTE TEL SPR



PUSH AND HOLD FOR AT LEAST 2 SECONDS SMALL DATA KNOB, OR UNTIL SECONDARY PAGE IS DISPLAYED

MP3 RANDOM  
ON    OFF




TURN LARGE DATA KNOB UNTIL MP3 RANDOM MODE IS DISPLAYED

MP3 RANDOM  
ON    OFF



TURN THE SMALL KNOB UNTIL THE LINE IS UNDER ON



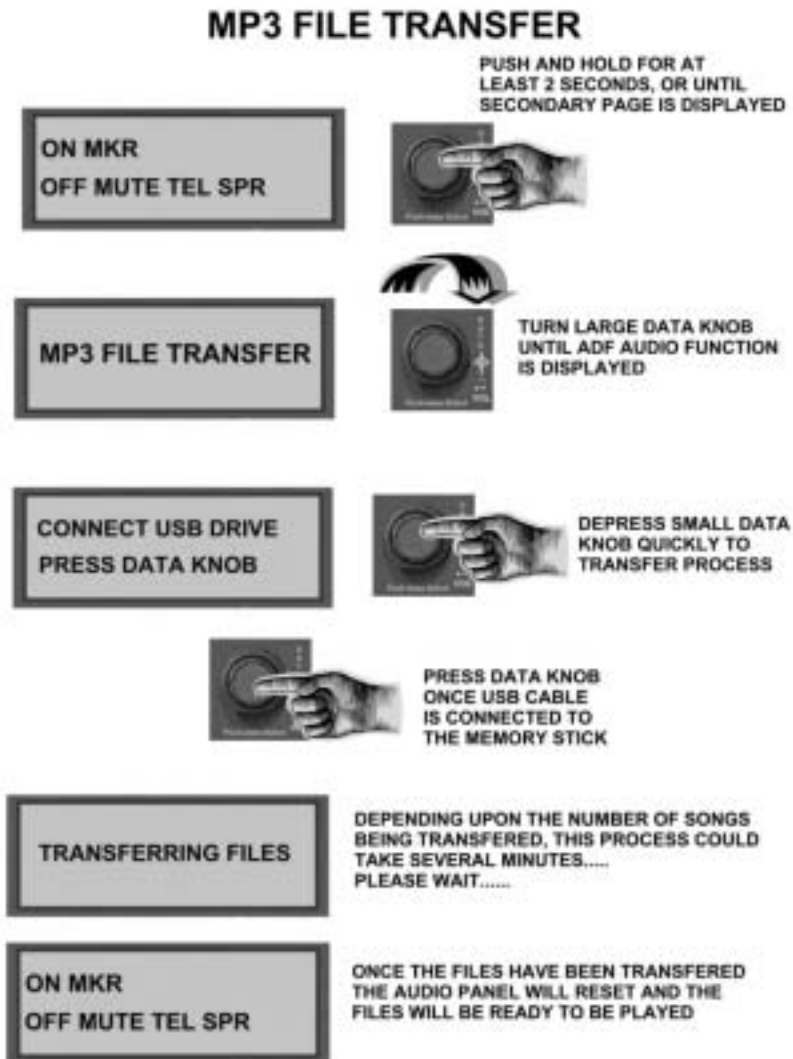
WHEN THE RANDOM MODE HAS BEEN TURNED ON DEPRESS QUICKLY THE SMALL DATA KNOB OR JUST WAIT FOR THE NEW MODE TO LOCK IN AUTOMATICALLY

ON: MKR  
OFF: MUTE TEL SPR

THE MAIN SCREEN WILL APPEAR ONCE THE CHANGE HAS BEEN ACCEPTED

#### 4.4.7 MP3 File Transfer

The PMA9000EX has 1 GB of internal storage (512 MB before S/N B01094). The program inside the unit will recognize and import any compatible audio files (.wav, .mp3, unprotected .wma) from an external data source, through the USB cable. These files must be in the device's *root directory* to be recognized, and not located in any subfolders.





To upload from a USB memory device, select the “Music Transfer” function on the submenu. Follow the onscreen instructions, and connect the memory device to the 2.5mm to USB cable, and then plug the cable into the front of the PMA9000EX when prompted. It will take about 30 minutes to transfer 1Gigabyte of data.

Files are loaded from the USB in the order that they are stored. We recommend that you only store 1G (512MB before Serial Number B01094) of files on the USB drive, to ensure that all the desired songs are loaded into the PMA9000EX.

After the music transfer is complete, the PMA9000EX will automatically reset to store the files and create the new play list. Therefore it is not advisable to upload files in flight or when the audio panel is otherwise in use.

Note: Different types of files, and different music file programs may result in variation in the volume level of the stored music.

#### **4.4.7.1 Laptop connection**

Using the supplied 2.5mm-to-USB cable, along with the supplied USB-to-USB adapter cord (PS Part number 425-003-1454), connect this set of cables from the PMA9000EX front panel jack to a Personal Computer USB port.

With the PMA9000EX turned off, push and hold the small data knob while powering the PMA9000EX on. Wait until the audio panel displays "USB drive mode" before releasing. You then can access the PMA9000EX as if it were an external USB drive. This mode allows for file transfer rates nearly four times *faster* than the direct USB connection.

#### 4.5 Backlighting & Contrast

The PMA9000EX has an automatic photocell dimming of the annunciation LEDs and marker lamps. Control of the text backlighting is through the aircraft avionics dimmer.

The LCD display has backlighting controlled by the automatic photocell dimming. In addition, the text inverts for nighttime mode when the ambient light is low. As the light decreases to a dim sunlight, the LCD backlighting will turn on, and you may notice a brightening of the LCD under some conditions.

The contrast on the LCD display can be controlled for individual preference. Activate the LCD CONTRAST submenu, and turn the outer knob to adjust the level. There are 10 steps, with 10 as the lowest contrast.

**NOTE:** A contrast level of 3 or 4 is optimal.

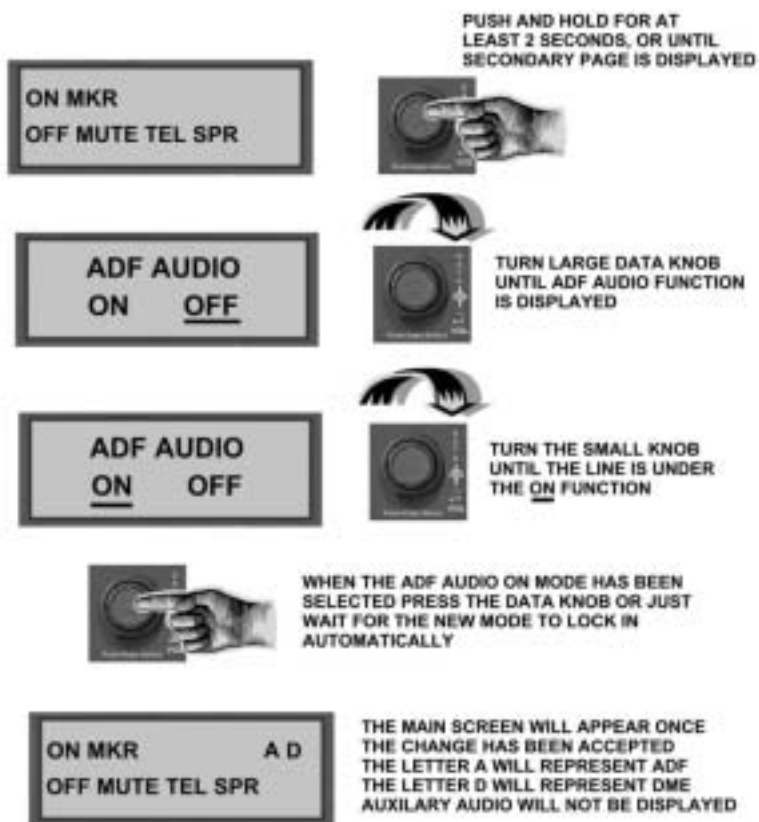


#### 4.6 ADF/DME/AUX Monitoring

ADF, DME and AUX (auxiliary) audio is available when selected through the ECAPS graphical and data control system.

Press and hold the small data knob to activate the sub menu, rotate the large data knob to find the AUX, ADF or DME page. Rotate the small knob to toggle the audio on or off. When on, the letter A or D will appear in the primary display. Unlike ADF or DME, AUX is not annunciated on the primary display.

### ADF/DME/AUX MONITORING





#### **4.7 Public Address Function**

The Public Address (PA) can be activated through the ECAPS Public Address submenu. The pilot microphone will be heard on the speaker when the pilot PTT is used. The copilot can continue to use the selected com radio while the pilot will now be heard over the speaker.

The C1 and C2 receive indicators blink to indicate that the pilot microphone is no longer connected to the radio or intercom.

#### **4.8 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 two (2) years from the date of purchase from an 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 **twelve (12) months** of the two-year warranty period, the shipping costs for the exchange unit will be borne by the customer.

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.



## 4.9 Factory Service

The units are covered by a two-year limited warranty. See warranty information. Call PS Engineering, Inc. at (865) 988-9800 before you return any unit. 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 authorization number, or telephone number for a responsible contact, will be returned un-repaired. PS Engineering is not responsible for loss of items in transit.**

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