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# PMA450B

Audio Selector Panel

*With*

Multi-Bluetooth® Connectivity

Marker Beacon Receiver

IntelliAudio®

Flightmate®,

USB-C Charging System

and PS Streamer



## Pilot's Guide and Operation Manual

202-450-0600

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Covered under one or more of the following Patents  
4,941,187; 5,903,227; 6,160,496; 6,493,450; 7,391,877

FAA-TSO C139a, C35d, C71

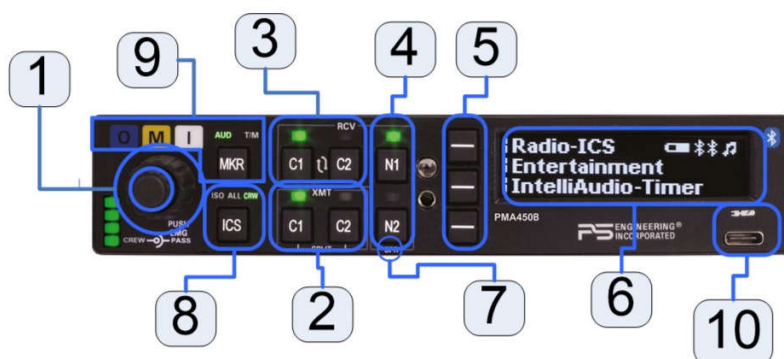
*Flying never sounded so good®*



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Welcome to the PS Engineering PMA450B, Audio Selector Panel/Marker Beacon Receiver/Intercom System. This Pilot Guide will introduce you to the PMA450B and all of its features and functions. Although the PMA450B is one of the most capable audio panels ever made, the controls and display make it the easiest to operate. Please read this guide carefully before using the equipment so that you can take full advantage of its capabilities.



### *PMA450B Operating Controls*

#### **Operating Controls**

Let's take a look at the front panel, what we call the Human-Machine Interface, but you can call it buttons and knobs.

##### **Volume (1)**

Starting from the left is Volume Control and on/off (or Emergency—Fail Safe). Pushing the knob turns the PMA450B off or on. It will come on when the avionics master is turned on. When the unit is turned off, the fail safe circuit will connect your pilot headset directly to COM 1. That way, you will never be “No Radio” (NORDO) because of an audio panel problem.

These knobs control the volume for the intercom. The larger knob controls the intercom volume for the passengers, and the small knob in the middle controls the volume for the pilot and copilot positions.

You will see that the green bars to the left of the knobs will light up when you turn the knobs, showing you the relative volume, so you don't have to guess the volume your passengers hear, or see them wince when you talk.

These volume controls do not affect the radio or music volume—unless you want them to. But we'll cover that later.

##### **Com Selector, Transmit (2) and Receive (3)**

There are four buttons that control the radios you will transmit and receive. The first thing to know is that you will never find yourself transmitting on a radio that you aren't listening to. The receiver selection is automatic.



The bottom row (2)(XMT) selects which radio you will transmit on, C1 (COM 1) or C2 (COM 2). When you push the button to select the transmitter, the XMT and RCV indicators turn green.

When you want to transmit on COM 2, just push the C2 XMT button, and both indicators will switch over.

If you want to listen to COM 2 while talking and listening on COM 1. Push the C2 (COM 2) RCV button (3). Its green indicator will light.

Here's a hint. The PMA450B will remember when you were listening to a radio only, and keep listening as you select it for transmit, and then switch back when the XMT is deselected.



## Menu Display (6)

The PMA450B has an Organic Light Emitting Diode (OLED) display and three line-select buttons to access the advanced functionality. Press the line select button to select a specific item on each menu. Items are also toggled on or off by pressing the line select button.

While you are navigating the menus, the screen automatically returns to the "home" screen after a period of inactivity. This delay time is configurable for between 1 and 30 seconds, on the initialization menu. A long press (>1 second) will back-up one menu level.

If you see a vertical **bar** next to a button, it indicates the button can perform a function on that menu screen.

A **split bar** on a line indicates that a *secondary* function is available when that button is held for more than 1 second. For example, on the home screen, this function is:



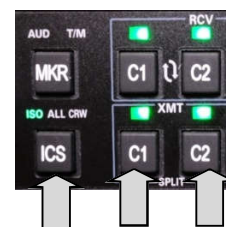
- Pilot Music on/off is a long press of the middle (Entertainment) button

## Split Mode

In the SPLIT mode, the pilot position transmits and receives on COM 1, and the copilot can transmit and receive on COM 2, independently.

Pressing the C1 and C2 XMT buttons together (above the **SPLIT** legend), puts the PMA450B into SPLIT com mode.

- The intercom is deactivated automatically when you enter SPLIT mode.
  - If you want to talk to the copilot, just push the ICS button until the green LED lights up CRW to turn the intercom on between pilot and copilot.
- Intercom between crew and passengers is not possible in split mode
- Swap Mode is not possible in Split Mode





*The spatial component of IntelliAudio® is defeated in split mode.*

To exit SPLIT mode, simply press either the C1 or C2 XMT buttons.

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

With optionally installed remote swap switch, you can change from the current Com transceiver to the other by pressing this button.

The Swap switch can also serve as a remote intercom mode selector. By holding the swap button for more than 1 second, the ICS mode will change from ISO-ALL-CRW-ISO, etc. each time the button is pressed and held.

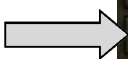
### **IntelliAudio® Dimensional Audio**

To activate IntelliAudio, press the lowest line select button, **IntelliAudio - Timer**, then the lower select **IntelliAudio off→on**.

This button offers three modes, **OFF**, **ON**, **AUTO**, and **Monitor**.

If *both* radios are not already selected for reception, the other receiver will be selected for you automatically when IntelliAudio is on.

With IntelliAudio on, radio communication audio signals are digitally processed to “appear” in a different location to the crew. This helps you to better comprehend speech by locating it in a manner easily differentiated by your brain.



Intercom and other audio is not spatially processed, only the pilot and copilot's VHF COM audio. Stereo headphones, in stereo mode, are **required**

#### **IntelliAudio: Auto**

In AUTO mode, IntelliAudio reverts to normal (straight ahead) when one of the radios is quiet for one second. Separation will return as soon as both radios are active.

**NOTE: In order for IntelliAudio to function properly, STEREO Headphones must be used, and in the STEREO mode.**  
**IntelliAudio should be OFF unless BOTH pilot and copilot have Stereo headsets in Stereo mode.**



#### **Com Monitor Mode**

The next function in this menu is the Monitor function, which allows a secondary com radio audio to be muted by the primary radio (selected for transmit). This allows you to get weather information while the ATC communication will instantly mute the weather broadcast.

To toggle the Monitor mode on and off, click the **IntelliAudio** button until **MONITOR** appears. The radio indicator selected as *monitored* will blink.



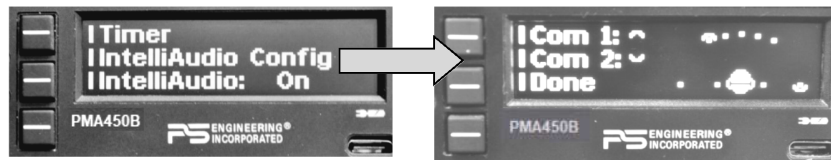
### IntelliAudio® Configuration (Com Audio Location)

The spatially-processed dimensional sound in the PMA450B is adjustable to accommodate your personal preferences.

This adjustment allows the radio audio inputs to be “relocated” on any of nine (9) defined “Head Related Transfer Function” (HRTF) locations.

Push **IntelliAudio –Timer** → **IntelliAudio Config** to access this menu. Then, repeatedly pressing the COM 1 or COM 2 line select buttons moves the corresponding half-circle cursor to the locations relative to the listener graphic in sequence. These positions are: 10 o’clock, 11 o’clock, 12 o’clock, 1 o’clock, 2 o’clock, 3 o’clock and 3 o’clock near, 9 o’clock, and 9 o’clock near.

After selecting your favorite locations, press **Done** to exit the configuration setting mode. This setting is remembered by the audio panel.



### Navaid Selection (4)

Your VHF Navigation receiver audio can be selected directly from the front panel with the N1 and N2 (VHF Navigation receiver 1 and 2) buttons. The selected source is indicated by a green LED.

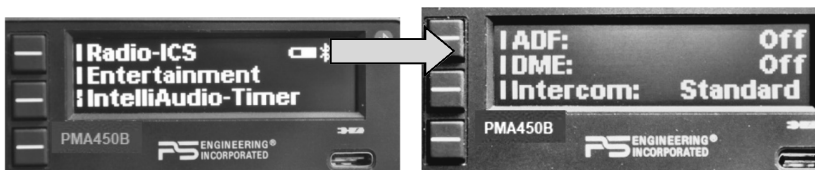
Additional navigation aid or other audio sources can be selected using the LCD menus.

Press the top line select **RADIO-ICS** and select the desired audio source.



*NOTE: Switched Inputs can be renamed at the configuration set up. See page 17 for more information.*

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



### Speaker Amplifier (7)

If you want to listen to your radios over the cockpit speaker, press and hold the **N2** button (**SPR** is labeled under it) for 1 second or until **SPR** appears in the display.



In “Split Mode,” audio that the pilot hears will also be present in the speaker. Unswitched audio #1 & #2, (the inputs dedicated to autopilot disconnect, altimeter warning, etc.) will come through the speaker regardless of the speaker button position. *Use of a cell phone will mute the radio audio over the speaker.*

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 and hold the **N1** button for more than 1 second, until the display adds **PA**.

When the pilot is speaking on the PA through his microphone, all intercom except for the Pilot will be disabled for complete and uninterrupted announcements.

The pilot microphone will be heard on the speaker and headsets when the pilot PTT is used, and **PUBLIC ADDRESS** is displayed.



The copilot can continue to use the selected com radio while the pilot will be heard over the speaker.

To exit PA mode, push and hold the **N1** button again until **PA** is off or cycle power on the audio panel.



### Marker Beacon Operation (9) (050-450-0601 Only)

The Marker Beacon Receiver uses visual and audio indicators to alert you when you cross over an ILS Marker Beacon transmitter.

The Marker receiver is always on, Push the “**MKR**” button to hear the tones. **AUD** will light up green when the marker audio is on.

The Blue lamp, labeled “**O**”, is the Outer Marker 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.

If you want to test the marker lights, press and hold the **MKR** button for 1 second, which turns on the indicator labeled “**T/M**” and illuminates all three lamps simultaneously to assure the lamps (internal and external) are in working order. Releasing the button returns to the last sensitivity.

If you want to mute the audio over a marker station, pressing the **MKR** for one second causes the marker audio to mute for that beacon. The next beacon received will be heard.

Marker Beacon sensitivity can be changed from Low to High sensitivity by pressing and holding the MKR button until “**H**” appears in the display, indicating High sensitivity is activated. Hold the MKR button again to set to Low sensitivity.



### **Intercom Operation (8)**

The PMA450B uses our patented *IntelliVox*® squelch control. It is completely automatic. Through individual signal processing, 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.

Since *IntelliVox* is designed to block continuous tones, people humming or whistling in monotone may be blocked after a few moments.

For consistent performance, any aircraft headset microphone **must** be placed within ¼-inch of your lips, preferably against them. (ref: *RTCA/DO-214A, 1.3.1.1 (a)*).

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#### **NOTE**

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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.

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

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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 (1)

The smaller inner volume control knob adjusts the loudness of the intercom for the pilot and copilot. It has no direct effect on selected radio levels, music input levels or passengers' volume level. Go to page 12 to see how to adjust the music volume.

The outer, larger volume control knob controls intercom volume for the passengers. It has no effect on radio or music levels. When you turn the volume knobs, the green volume bar indicator will show the level of the changing intercom volume.

Adjust the radios (at the radio itself) and intercom volume for a comfortable listening level.

### Mono headsets in Stereo Installation

*Not recommended*, because the benefit of IntelliAudio® is lost. However, if desired, the PMA450B can be installed monaurally by using the LEFT audio connections only (left side contains Fail-Safe audio). Do NOT short left and right together.

**NOTE: Mono headsets that short the tip and ring (i.e. older models) will introduce some audio distortion when used. Modern, stereo headsets are recommended in ALL positions. Do not use IntelliAudio unless both pilot and copilot have stereo headsets.**

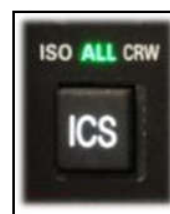
### Intercom Modes (8)

The **ICS** button cycles through the frequently used intercom modes, from left to right, then right to left as: **ISO**, **ALL**, **CRW** and **CRW**, **ALL**, **ISO**. The green indicator shows which mode is currently active.



**ISO** (Pilot Isolate): The pilot is isolated from the intercom and connected only to the aircraft radio system. Pilot will hear the aircraft radio reception (and sidetone during radio transmissions). Copilot and passengers can talk together but neither will hear aircraft radio receptions or pilot transmissions. The pilot can hear music if desired.

**ALL:** Everybody hears the aircraft radio and intercom. Crew and passengers will hear selected Music. During any radio or intercom communications, the music automatically mutes, and increases gradually back to the original level when it is quiet. The music muting can be triggered by radio only, radio and intercom, or nothing, for a "Karaoke" mode.

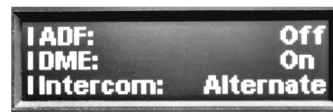




**CRW (CREW):** Pilot and copilot can talk to each other and have exclusive access to the aircraft radios. They may also listen to Music sources. Passengers can continue to communicate with themselves without interrupting the crew and may listen to music as configured.

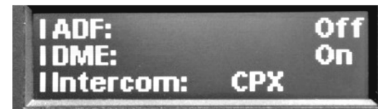
### Alternate Intercom and Copilot as Passenger (CPX) Modes

What if the folks in back do not want to listen to the radio chatter, but want to converse with the pilot and copilot positions? That is where our Alternate Intercom Mode comes in handy. This mode allows intercom conversations between crew and passengers, without affecting the crew's radio communications. The passengers do not hear the aircraft radio audio, and passengers microphones are blocked from the crew while the radio is active. Passengers can still talk to each other while the crew is listening to the radio.



To activate the Alternate Intercom Mode, press **RADIO-ICS** → **Intercom**: to switch between Standard, **Alternate** modes and CP Pax modes.

Okay, now the person in the copilot seat does not wish to interact with the aircraft operation. When you configure the PMA450B as “Copilot as Passenger,” the intercom station wired as copilot will be a passenger only.



To enable the Copilot as PAX Mode, press **RADIO-ICS** → **Intercom**: to switch between Standard, Alternate and **CP Pax** modes. This is indicated by **CPX** on the display.



The position will have intercom with the pilot, except when there is radio traffic, and never hear any radio audio. The intercom microphone to the pilot position will not be heard while there is radio audio present. Copilot seat becomes “front” and passenger becomes “rear” for the Music distribution menu. In this configuration, CREW mode cannot be activated. CPX shows on the home screen to remind you that your copilot is not normal.

*Both* of these modes will reset to normal at power off, unless you change the option in the user setup menu (see page 16).

### Music Control, Distribution and Muting

Push and hold the middle line select button on the main menu to toggle the music on or off for the pilot. When music is active for the pilot, a music icon (🎵) appears in the display. If you don't hear your mu-





music in the pilot seat, look for that icon.

The PMA450B has two independent music inputs at the rear connector, *and* the ability to receive streaming music from either of two Bluetooth modules available in the PMA450B, depending on how you have configured the audio panel.

The Music 1, Music 2, Bluetooth or a combination of inputs can be selectively delivered to the pilot, copilot and/or passengers using the music distribution menu.

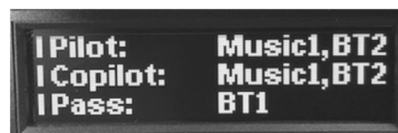
Press **Music** → **Music Distribution** → and select desired combination.

If you do not have a Bluetooth music device paired to the audio panel, the Bluetooth option will not appear.

Because of the unprecedented flexibility of the PMA450B with 2 Bluetooth modules, you can stream music from one, and receive audio alerts from another. Shown to the right, BT 2 is music, while the crew also uses BT 1, connected to an iPad with a flight application. For the crew, the combination of Music 1 (for alert audios) and BT 2 (for entertainment) is also available only if BT 2 is configured as music input.

NOTE: **BT1** should be used for applications that provide voice announcements or checklists to avoid clipping of words.

Refer to the section on user setup on page 16 for information on using the second Bluetooth module as an audio input or audio streaming output.



#### NOTE:

All music devices should be turned off for takeoff, landing, or any critical phase of flight. FAA Regulation 14 CFR 91.21 restricts the use of portable electronic devices.

§91.21 “(a) Except as provided in paragraph (b) of this section, no person may operate, nor may any operator or pilot in command of an aircraft allow the operation of, any portable electronic device on any of the following U.S.-registered civil aircraft. . .

“(b)(5) Any other portable electronic device that the operator of the aircraft has determined will not cause interference with the navigation or communication system of the aircraft on which it is to be used.”

You can refer to Advisory Circular 91.21-1C for more information, at [www.faa.gov](http://www.faa.gov).

#### Music Muting

The PMA450B SoftMute™ circuit mutes the music whenever there is conversation on the radio, the intercom, or both, depending on the “Mute”





mode you have selected. When that conversation stops, the music returns to the previous level over a second or so.

The mute mode functions are controlled through Music Mute Menu which has **three** modes for music inputs, **ALL**, **Mute Off** & **Radio** mute.

- **ALL** – music **will** mute with *either* intercom *or* radio
- **Mute Off** – music will *not* mute except during outgoing radio transmissions.
- **Radio** – *Radio* will mute music, but intercom will **not** mute music.

The PMA450B defaults to *Mute ALL* when turned on, unless Mute Recall mode is enabled in setup (See page 18).

In addition to the panel mute menu, a remote switch may be installed to allow the passengers local access to their Mute Off mode. When this switch is grounded, the menu choice is overridden.

### Music Volume (1)

You can adjust the music volume for crew and passengers from the Entertainment menu of the PMA450B:

Press **Entertainment** → **Music Volumes** → set desired user's volume for using the small knob. The LED Volume bar and the numeric volume will show the volume level.



### Music in Pilot ISO mode

When the isolate (ISO) mode is activated, the music for the pilot is automatically disabled. If desired, the pilot can elect to hear Bluetooth, Music #1 or #2, in the ISO mode by toggling the Music line select with a long press or holding the ICS button, while in the ISO mode.

### Bluetooth® connections

The first thing to know is that the PMA450B with a PS Streamer (Part numbers 050-450-0601 and -0701) has two Bluetooth Modules, (BT1 and BT2 by default). When you search from your Bluetooth-equipped phone or music source you will see 450B BT1 and 450B BT2 (these can be renamed in the user settings menu. The last four digits are the unit serial number by default).

BT2 can be configured in the user menu as either a Music input, or a Audio Streaming output to a compatible video camera or other device. The factory default is Music Input.

## Pairing Bluetooth devices

The audio panel is discoverable, and will not require a PIN unless you set up that function in the user menu.



When Bluetooth is paired, Bluetooth icons and the battery status of a device is displayed in the upper right corner of the home display.

The picture at right shows the PMA450B paired for music/audio/phone input from two Bluetooth devices.

Once paired, the audio panel will accept streamed music and telephone calls from the music source and/or smartphone.

The PMA450B can be paired with up to eight individual devices, and will automatically reconnect with the first two it finds. When more than eight are paired, the PMA450B will drop a device to allow the new device to be added.

*When the PMA450B is first powered on, an auto connect sequence attempts to connect the BT to previously paired devices. During this period connection times may vary from 10 seconds to 1 minute. Although the PMA450B can store up to eight devices, we recommend limiting the number if practical. During start-up, the PMA450B will look for each previously paired device which may slow connection time.*

*Hint, if your old phone is not recognized by the PMA450B, you may need to reset from the Bluetooth menu.*

*If you see a Bluetooth symbol with a little flag, it means the BT2 has been configured as a PS Streamer output, and it will not show up as a music distribution option.*



## Pairing separate music and telephone devices

It is possible to use a different music source (iPad, iPod with Bluetooth adapter, Bluetooth enabled laptop, etc.) and telephone.

*NOTE: A previously paired iOS Hands Free device may experience from one to several connect/disconnects sequences when the PMA450B is first powered on. This is normal and will result in the device remaining connected when the auto connect process is completed.*

*If two iOS devices are paired and connected to the PMA450B, and one of them does not auto connect on the next power cycle (perhaps it isn't in the airplane, or the Bluetooth is turned off), it will be ignored until it is reconnected manually.*

## Bluetooth® Telephone Mode

The PMA450B serves as a full duplex interface for telephone systems such as portable cellular phones with Bluetooth connectivity.

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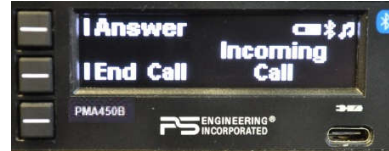
### Warning:

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United States FCC Regulations contained in 47 CFR § 22.925 currently contain prohibition on airborne operation of cellular telephones.

“Cellular telephones installed in or carried aboard airplanes, balloons or any other type of aircraft must not be operated while such aircraft are airborne (not touching the ground). When any aircraft leaves the ground, all cellular telephones on board that aircraft must be turned off.”



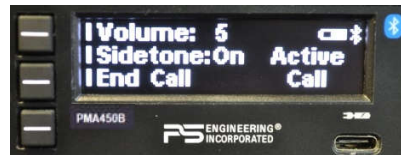
When the Bluetooth-enabled cell phone rings, the incoming call menu opens, showing caller ID (if provided), and you can answer by pushing the top line-select button.

The ICS button controls who is on the telephone.

In **ALL** intercom mode, all crew and passengers will be heard on the phone when they speak. Everybody will hear selected audio. Com audio is automatically heard in the headsets.

In **CREW** mode, the pilot and copilot are connected to the telephone. The pilot and copilot will have transmit capability on the other selected transceiver Com 1 or 2, simply by using their respective PTT switch.

In **ISO** intercom mode, when the PMA450B 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. There will not be telephone sidetone in ISO. The pilot will also have access to Com 1 or 2, and will transmit on that radio using the PTT. All other selected audio is provided.



#### NOTE

**PS Engineering does not guarantee compatibility with personal cellular telephones.**

### Cellular telephone sidetone

Some cell phones do provide sidetone, and when combined with audio panel sidetone audio distortion may occur. In PMA450B Telephone sidetone can be enabled or disabled on the Telephone menu which is active when a call is in progress.

### Bluetooth Reset

If your Bluetooth devices have trouble connecting, it may be necessary to reset the Bluetooth Module. The PMA450B Bluetooth Reset function is accessible from the user setup menu. (See also User Setup Menu, page 16)

During the unit boot up process (while the version numbers appear on the screen), hold the lower line select button until the setup screen appears.

This places the unit into the “User Setup Mode→**Bluetooth**→**BT 1 Config.**”, and allows resetting the Bluetooth Module.

When **Unpair All** is pushed, BT 1 is reset and **ALL** Bluetooth devices are erased from BT1. To reset BT2, change the configuration to “Streamer”, and then back to Music, if desired. Cycle the PMA450B power to exit setup screen.



## Wired telephone/Satcom mode

The PMA450B can accommodate a wired telephone input as well as a Bluetooth connection. However, only one can be active at a time. The Bluetooth icons are absent from the wired menu.

The wired telephone screen menu is activated when audio is detected from the phone. Sidetone and telephone volume can be controlled from this menu. The telephone audio distribution is the same as Bluetooth, above.

This menu will switch off 25 seconds after the *incoming* conversation ends, or press End Call.

NOTE: The PMA450B does NOT answer or hang up the wired phone from this menu.

## Recorder and playback

The PMA450B has an internal recorder. This digital system stores the last incoming audio from the radio you have selected for transmit. It can store as many as 8 incoming messages, and up to 45 seconds of audio. The pilot and copilot hear the playback.

The radio recording is automatic.

To play back the last recorded message, press and hold the COM Receive pushbutton associated with the selected radio transmitter. You can either wait for the message to finish playing before accessing the prior message, or cancel the current playback and step backward. To cancel the playback, press and hold the COM receive button for two seconds. The next time the button is pressed for one second, the next earlier message is received.

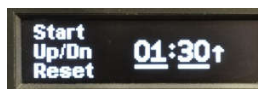
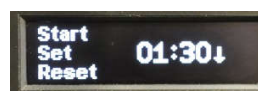
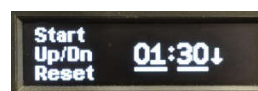
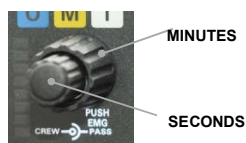
The screen displays a status message to indicate that playback is in progress. The playback will stop whenever there is more incoming selected COM audio, and the message can be replayed from the beginning by pressing the selected COM receive button again.



## Timer Operation

The PMA450B contains a timer function with count down, or count up functions. This can be used as a convenient reminder for timed instrument approaches, fuel tank switching, flight elapsed time, etc.

The Timer is accessed from the main menu, bottom button.







Press the SET button and adjust the desired time using the outer knob for minutes, and the inner knob for seconds, up to 99:99.

Press Start to begin counting down.

The display reverts to normal after a few seconds. Then as the countdown progresses, the display will momentarily show remaining time as the interval is divided in half (from 1 minute, then 30 seconds, then 15 seconds, etc.). At one minute remaining, an audio alert says "One Minute." The display shows remaining time at 10 seconds, and an audio alert says "Time Expired."

The set time is remembered until changes, and can be reset to the last value.

The count up timer simply shows elapsed time since START, and counts to 99 minutes, 99 seconds.

### **USB Charging Port (10)**

The PMA450B contains a USB-C charging port that is capable of providing 5VDC, 3 amps of current (15W) to charge the batteries in smart phones and tablets used as Personal Electronic Devices. This is NOT a data transfer jack.

## **User Setup menus**

The PMA450B has many user adjustable functions accessible from a setup menu.

During the unit boot up process, press the lower line select button until the setup screen appears. This will place the unit into the "User Configurable Mode- home screen". This allows adjustment for:

- Adjust Screen (OLED) & Timeout
- Rename Switched Inputs
- Bluetooth functions
- Adjust radio volumes
- Recall Mute Modes
- Recall Alternate and Copilot as passenger Intercom Modes

Cycle the PMA450B power to exit setup screen.

### ***OLED Screen Adjustment***

The first items are adjustments to the display, allowing the installer or user to tailor the display to suit the cockpit conditions.

There are two functions: Display Brightness & Display Timeout.

The display will vary in real time while adjustments are made. LED bar & numeric indication will vary.

To change the display:







Press the line select for the desired item

Turn the small, inner knob to change the brightness as desired.

Cycle the PMA450B power to exit setup screen.

### Display Timeout

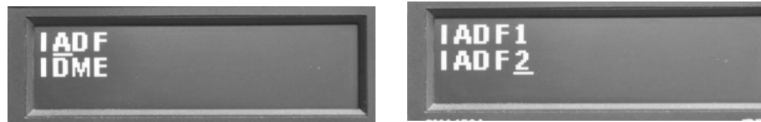
This is a feature that allows the user to adjust how quickly the screen menus timeout (revert to main menu) and can be configured from 1 second to 30 seconds by turning the inner knob.

For a user who is unfamiliar with the product, this will give them enough time to learn the system. After becoming more familiar, the user can speed up the menu screen timeout as desired. A long press of the line select will also back up a menu level.

Cycle the PMA450B power to exit setup screen.

### Rename “Switched” Inputs

The system is factory set to default as ADF, DME as shown.



The two inputs are from top to bottom:

- Switched input #1 J1, Pin 7 with respect to (wrt) Pin 8 (Default ADF)
- Switched input #2 J1, Pin 21 wrt Pin 22 (Default DME) which is combined with input #3 J1, Pin 23 wrt Pin 43

You can rename these inputs. There is a maximum 9 letters per line, and *A — Z, a — z and 0 — 9* are available.

- Press the line select for desired input.
- Turn the large outer knob to select the letter to change.
- Turn the small, inner knob to increment or decrement the letter.
- You can clear the whole line quickly by turning the outer knob to move the cursor all the way to the right until the line clears.

Cycle the PMA450B power to exit setup screen.

### Bluetooth Setup (BT1 and BT2)

There are two Bluetooth modules in the PMA450B. There are three Bluetooth 1 functions that can be changed in the user setup screen, Unpair All, Pair PIN code, and device ID.



**Unpair All (Bluetooth Reset)** When this is pushed, all Bluetooth devices are erased from the audio panel, and can then



be added back as desired. This is useful in some cases where the unit or operator lose track of the devices paired, and cannot get them to connect.

To Reset BT 2, change the function from Music to Streamer, and back if desired. All devices are cleared when the function is changed.

**PIN:** The 4 digit pass code can be changed to any number desired. The default is 0000. This is useful if the owner wants to restrict access to the audio panel Bluetooth functions.

Some phones will not pair if a Personal Identification Number (PIN) is required. To disable the PIN Enter configuration menu, select Bluetooth. Select PIN code for editing. Press PIN button one more time. “Bluetooth Reset” will appear on screen. When the menu returns, the PIN code will report “Disabled”.



To re- enable the PIN code for a different device, press the PIN button. “Bluetooth Reset” will appear on screen. When the menu returns, the last stored PIN code will be shown.

**ID:** As shipped from the factory, the modules are labeled as BT 1 and BT 2, with the last four numbers of the serial number.



The PMA450B can be renamed using this mode to show up on the devices with a personalized identifier.

### Recall Options

As shipped by the factory, the PMA450B automatically defaults to “Mute On.” This ensures that the music will always be muted until intentionally changed by the pilot. The PMA450B defaults to Standard Intercom from Alternate Intercom on power up.



Owners who want the PMA450B to remember the last music mute state can set the “Recall Mute.”



The intercom mode options Standard, Alternate Intercom and CPX mode set can



“Recall ICS” in the user setup menu.



## Volume Adjustments

The Marker Beacon receiver Switched receiver and speaker audio volume can be adjusted from the menu.

## *flightmate®*

The PMA450B has four discrete messages that can be played when triggered by an external event from stimuli wired into the aircraft.

You will hear this alert audio in the pilot's headset.

- Alert number 1 has been designed as a priority alert and will continue to play until the trigger has cleared.
- Alerts 2, 3 and 4 can be stopped if the “Acknowledge” button is pushed while the audio is playing. The ACK appears on the screen.

Alert 1	Alert 2	Alert 3	Alert 4
Chime	“Check Oil Pressure”	“Master Caution”	“Check Fuel”

The default messages are:

## **Storing Messages:**

The audio in these alerts can be changed in the user setup menu by recording new messages with the pilot's microphone.

To access the user Setup - During the unit boot up process, press the lower line select button until the setup screen appears.



Press **More** . . .



Press **More** . . .



Press **More** . . .



Press **Flightmate**



The first Flightmate screen allows you to modify Alerts 1 & 2:



You can listen to Alert 1 by pressing the top button.



Hold the center button to record a new message using the pilot's microphone  
Pressing the bottom button will replace the user-stored message with the factory message. In the case of Alert 1, it is a simple chime sound.  
Modifying Alerts 2, 3 and 4, is similar.  
You cycle power on the audio panel to exit setup screen and return to normal operation.

**NOTE:**

**These messages are strictly supplemental and pilot option, and shall not replace any existing alerts in the aircraft.**



# PS Streamer Operation

The PMA450B is equipped with a PS Streamer audio module. This module provides a Bluetooth® output of selected signals from the audio panel. These can be streamed to compatible devices such as a GoPro camera equipped with a SENA adapter.

## Set the PMA450B to Stream Audio Out

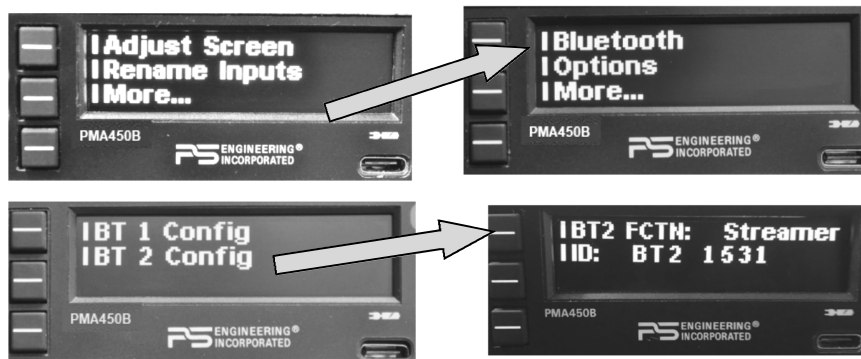
In order to have the audio panel stream audio out, you need to configure Bluetooth Module #2 as an output, in the user setup page.

During the unit boot up process, press the lower line select button until the setup screen appears. This will place the unit into the “User Configurable Mode- home screen”.

When Bluetooth 2 is set as a Streamer, exit the user setup function by cycling power on the PMA450B

## Pairing to External Device

It is a good idea to turn off any Bluetooth Devices in the area. This will speed up the process and prevent the module from pairing to a device other than the desired one. It is also good to turn off the device you want to use, until you are ready to pair it.



To pair the PMA450B PS Streamer with a compatible device, access the streamer menu from Radio-ICS → More → Streamer → Config → Pair. Now, turn on the desired device and initiate the pairing on the device as well.

This may take 60 seconds to complete.

You will not need to manually connect each time the device and PMA 450B are disconnected.

Depending on the Bluetooth device receiving the audio, pairing may



have to be initiated on the device, or the audio panel first.

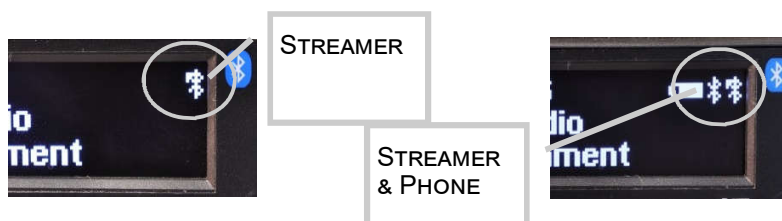


**NOTE:** During the time that the Streamer module is in the pairing process, BT1 is disabled, so music and telephone will not be available. When paired, a Bluetooth “OUT” symbol (a small flag in the symbol) will appear in the display.

**NOTE:** If the device has not paired in about a minute, press “Cancel” on the PMA450B. Wait 2 seconds, and press “Pair” again. Repeat until the device connects.



### Streamer on/off



From the main menu, Select: Radio-ICS → More → Streamer → Source

Press the middle line select button to select the PS Streamer source.

The PS Streamer remembers this setting when the audio panel is turned off. You will not need to activate the PS Streamer for each flight and the module will reconnect when activated.



## Steamer Source Selection

The output can contain either the audio heard by the pilot (radio, intercom, music, etc.) or only communications radio audio.

From the PS Streamer menu, push the middle line select button to toggle between communication radio audio and all audio heard in the pilot headset, including radio, intercom, music and telephone.



## Streamer Volume

The volume of the radio output to the PS Streamer module can also be adjusted, press Radio-ICS → More → Streamer → Volume, and use the small knob to set the level. We recommend starting at 10, the highest level.





## 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 retail sale by authorized PS Engineering dealer. During the first **twelve (12) months** of the two-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, 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 two-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](mailto: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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