PS ENGINEERING® INCORPORATED

Sound Quality. Sound Engineering.

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PAR200A

Audio Selector Panel
High-fidelity Stereo Intercom System
VHF Communications Transceiver Controller

Flying Never Sounded So Good! ®

Pilot's Guide and Operation Manual

202-228-0200 Revision 1 February 2020
FAA-TSO Approved

This section provides detailed operating instructions for the PS Engineering PAR200A, Audio Selector Panel/Intercom/VHF Communication Control Systems. Please read it carefully before using the equipment so that you can take full advantage of its capabilities.
This section is divided into sections covering the basic operating areas of the PAR200A systems. They are Communications Transceiver Selection, Audio Selector, Intercom, VHF COM, entertainment, telephone, and display.

Power and Fail Safe (1)

Unit power is turned on and off by pushing the volume (left) knob. In the OFF or "**EMG**" 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 portion will revert to fail-safe mode.
The power switch controls all audio selector panel functions and the inter-com. All pushbutton selections and menu modes (except Bluetooth telephone association) will be remembered and return to the last state when turned on.

Radio power (as COM 1)

The power supply for the remote communication transceiver is separate from the audio panel power and control. When the TY91L is installed as COM 1, it can be controlled separately in the event of a problem in the audio panel portion, or audio panel power loss.
If the audio panel is turned off by the left knob (or the audio panel breaker is opened), the display will indicate "Push radio knob within 6 (counts down) seconds to keep radio on" If the knob is not pushed, the com radio will also turn off, but if the data knob is pushed within 5 seconds, the radio frequency display, volume and frequency control will remain active.

Communications Trans-mit (XMT) Selection (2)

The two buttons **C1** and **C2** (# 2)

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

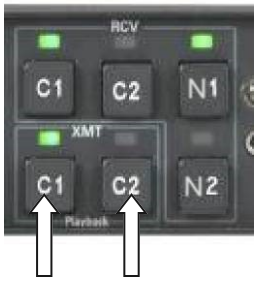
The PAR200A has an automatic com receiver selector system. Audio from the selected transceiver is automatically heard in the headsets and speaker (if selected). You can check this function by switching from Com 1 transmitter to Com 2 transmitter by pressing the COM 2 transmitter selector pushbutton. 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 PAR200A "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.

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.



Pilot on COM 2 and Copilot on COM 1 is not possible. In the split mode, the intercom between pilot and copilot is inhibited to avoid confusion. To restore intercom if desired, press the "ICS" button.

NOTE

Due to the nature of VHF communications signals, and the size of 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 guarantee of the suitability of Split Mode in all aircraft conditions.

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

With an *optional* yoke mounted, normally open momentary switch, the pilot can change from the current Com transceiver to the other by depressing this switch (C1 to C2). To cancel "Swap Mode," the pilot may either press the yoke mounted switch again, or select a different Com with the XMT buttons. This does NOT flip-flop the PAR200A Active and Standby frequencies.

COM Audio 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.

In SPLIT mode, only the pilot will hear selected navigation audio (**N1** & **N2**).

Navaid Audio selection (4)

VHF Navigation receiver audio is selected through two momentary, push-button, backlit switches.

The users can identify which receivers are selected by noting which green LEDs are lit above the button. Navigation aid audio push buttons are labeled **N1** and **N2**.

Any additional installed receiver audio (Marker, ADF, etc) is interfaced through an unswitched input.

VHF Transceiver control (5)

The right side of the PAR200A is dedicated to control of the VHF communications transceiver. Frequency selection is always directed to the STANDBY side of the display.

Frequency Selection (6)

Turn the large (outer) knob to change the frequency whole MHz, and the smaller, inner knob to change the .100 MHz frequency. It takes one click (serial number E01161 and above or two clicks D01160 and below) to change the digit one increment.
Push and release the small knob to transfer standby frequency to the active frequency.

Radio Volume (7)

The larger outer knob on the left side controls the volume of the remote TY91L radio.

Radio

Click and release

Squelch

To defeat the radio squelch, push and hold the frequency knob , until the top of the display changes to **ASQ, and release**. The display will then switch to **ASQ OFF**, which defeats the squelch to hear any weak signals. The next time the small right knob is pushed, the **ASQ ON** with receiver static quieted by automatic squelch. Power cycle and radio transmit (PTT) will reset ASQ to "on."

Frequency Storage

The PAR200A will store five frequencies for future recall.
To store frequencies:

1. Enter the desired frequency into the **STBY** frequency.
2. Press and hold the **C1 RCV** button until the display changes **FREQ SELECT**, to show only the **STBY** side.
3. Momentarily push the small (kHz) knob to display the list of locations.
4. Turn the small knob to select location 1 through 5 (requires two clicks for each increment in serial D01160 & below).
5. Either momentarily push the small knob again, or do nothing; the display will revert and the frequency is stored in that location.

To recall stored frequencies:

1. Press and Hold the **C2 RCV** button until the display changes to **FREQ RECALL**.
2. Using the small knob, select the desired location in **MEM** field.
3. Push the small knob to accept this as STBY frequency.

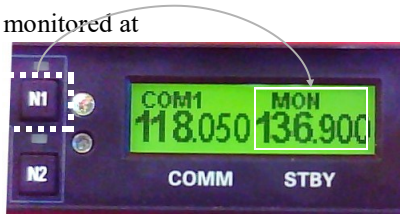
NOTE: If you do not push the small knob the frequency will not change to the stored, and reverts to last STBY frequency.

Tuning 8.33 kHz channel Spacing

Hold the "MUTE" button on the left side for 3 seconds, which will toggle between either 25 kHz spacing or 8.33 kHz spacing. This will be displayed on the LCD screen.

Monitor Mode

When interfaced with the TY91L VHF COM radio, the standby frequency can be monitored by holding the **N1** button for more than one second (or until the **MON** indicator becomes active).
Both active and standby frequencies are monitored at the same time for a signal. A signal can be received on either the active or the standby frequency.



While receiving a signal on the active frequency - the standby channel is **NOT** monitored.
While receiving a signal on the standby frequency - the active channel is periodically monitored. If a signal is found on the active frequency the **TY91** will revert to the active frequency. After a signal has been received, the **TY91L** will return to monitoring both frequencies.

It will be important to remember which station is active and which is standby, to avoid answering a transmission on the standby frequency by transmitting a response on the active frequency. You may notice a slight "ticking" in the audio as the frequencies are being scanned in Monitor Mode.

If the active and standby frequencies are transferred, the Monitor mode is canceled.

Cockpit Speaker

When the cockpit speaker is turned on, any receiver audio selected will be heard in the speaker. Any unswitched audio will always be present in the cockpit speaker.

To activate the cockpit speaker, push and hold the **N2** for about 1 second or until the display shows **SPR**. Repeat to turn the speaker off.

Radio Sidetone & Radio Squelch Adjustment

To change the automatic squelch threshold and sidetone level for the Trig TY91 transceiver: Enter the Radio Volume mode by pressing the **ICS** button until the setup screen appears
Turn the rights side outer knob to set the squelch threshold to low (weak signals open), medium (normal operation) or high (blocks RF noise, requires stronger signals to open).
Turn the right side smaller inner knob to increase or decrease the radio sidetone. Typically, the radio sidetone is adjusted slightly lower volume than he received radio signals.

Intercom Operation (8)

IntelliVox® VOX-Squelch

No manual adjustment of the *IntelliVox*® squelch control is possible. Through individual signal processors, the ambient noise appearing in all four 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)*).

NOTE

It is also a good idea to keep the microphone out of a direct wind path. Moving your head through a vent air stream may cause the *IntelliVox*® to open momentarily. This is normal.

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

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 (7)

The left side, smaller, inner volume control knob adjusts the loudness of the intercom for the pilot copilot and passengers. It has no effect on selected radio levels, or music levels.
The larger, outer volume control knob controls TY91L radio volume.
Adjust the radios and intercom volume for a comfortable listening level.

Manufacturer	Model	Mic Muff™ Part Number
Bose	Dynamic Electret M87 Dynamic	90010 90015 90020
David Clark	H10-30 H10-20, H10-40 H10-13.4	90010 90015 90015
Lightspeed	All	90015
Peltor	7003 7004	90010 90015
Pilot	11-20 & 11-90	90015
Sennheiser		90015
Telex	Airman 750, Echelon AIR3000	90015 90010

Mic Muff ™ Part Numbers

Most general aviation headsets today have built-in volume controls; therefore, volume also can be further adjusted at the individual headset.

Intercom Modes (8)

The "**ICS**" pushbutton switch on the lower left side of the panel provides the selection of the three intercom modes. The description of the intercom mode function is valid only when the unit is not in the "Split" mode.
This button cycles through the intercom modes, from left to right, then right to left as: ISO, ALL CRW and CRW, ALL, ISO. A green LED behind the text shows which mode is currently active.
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). Copilot will hear passengers' intercom and entertainment, while passengers will hear copilot intercom and entertainment. Neither will hear aircraft radio receptions or pilot transmissions.

ALL: All parties will hear the aircraft radio and intercom. Crew and passengers will hear selected entertainment. 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: 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 may listen to entertainment #2.

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 monaural headset is plugged in to a PAR200A Stereo installation, one channel will be shorted. Although no damage to the unit will occur, passengers with stereo headsets will only hear in one ear, unless they switch to the "MONO" mode on their headset.

Bluetooth® Telephone Connection

Before the PAR200A can be used in TELEPHONE 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**" (if necessary) when the phone detects the "PAR200A" 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 PAR200A at the same time, only the *first* phone will transfer audio to the panel.

Telephone Operation

When the Bluetooth-enabled phone receives an incoming call, the PAR200A will play a ring tone. Answer the call from your telephone handset On some Bluetooth devices you will have to select PAR200A manually as an audio source on the phone.

The PAR200A exits the telephone mode automatically when the cellular phone hangs up.

In TELEPHONE mode, the PAR200A intercom is connected to the cell phone, acting as another person on the airplane.

The pilot PTT will switch the pilot mic to the selected com transceiver, and allow aircraft communications to continue normally.

The copilot will also be able to transmit on the selected radio with his PTT as well.

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 when they speak. 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 PAR200A is connected to the Bluetooth telephone, 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.

NOTE

Because the cell-phone uses an intercom circuit, all stations on that circuit will lose intercom capability when the cell phone is in use. There will not be any cell sidetone or telephone for passengers in split mode.

WARNING

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

Music Distribution

Music input 1 from the rear connector, or Bluetooth music, is presented to the pilot and copilot positions. Music 2 from the rear connector is ONLY presented to the passenger positions.
Music 1 can be presented to all aircraft occupants in All or ISO if the Music 1 all headset switch (optional) is used at the rear connector control pin.

Music Muting (9)

There are two SoftMute™ muting circuits. The front panel "Mute" button has four modes, and controls the Mute function for music 1. Music 2 muting is controlled by an external switch, and has two modes.
The SoftMute™ circuit will cut the music out whenever there is conversation on the radio, the intercom, or both, depending on the “Mute” mode selected. When that conversation stops, the music returns to the previous level comfortably, over a second or so.
The mute mode functions are controlled through sequential pushes of the Mute button, and include LED indication of the mode selected.

MUTE ON: Music **will** mute with *either* intercom *or* radio – MUTE ON button is lit.

RADIO MUTE: Intercom will **not** mute music, radio *will* mute music. RAD LED indicator is on

INTERCOM MUTE: Radio will **not** mute music, intercom *will* mute music - MUTE ICS LED is ON.

MUTE OFF: "Karaoke" mode - music will not mute except during outgoing transmissions.- All Indicators off.

Music 2 Mute Control

The passengers' intercom also has a SoftMute™ circuit. If the passengers hear the radio, or talk on the intercom, the music will mute. If the audio panel is in CREW mode, then the radio reception will not affect the passenger music.
Passengers also have a Karaoke Mode. When the passengers are listening to the music 2 input, their Karaoke Mode is activated by an external switch.

Liquid Crystal Display Control

The intensity of the LCD is automatically controlled by the photo sensor. In low light, the display contrast automatically inverts for easy viewing.

Contrast on the LCD display can be controlled by using a service adjustment inside the unit. See installation Manual for details.

Mode	LED	Intercom	Radio
Mute On	ON	Muted	Muted
Radio Mute	RAD	♫	Muted
Intercom Mute	ICS	Muted	♫
Mute Off	None	♫	♫

PAR200A Serial Number: _____

TY91 COM Serial Number: _____

Installed by: _____

Installation date: _____