

# Special Mission Audio Controllers

**FS ENGINEERING<sup>®</sup>**  
**INCORPORATED**  
*Sound Quality. Sound Engineering.*



**PAC45**

A New Approach to Audio Situational Awareness  
Digital Audio Controllers and Accessories



***Flying Never Sounded So Good<sup>®</sup>***

# PAC45



## A Game Changer for Special Mission Pilots

For the special mission pilot, where hearing many radios all at the same time is part of the job, and differentiating specific radio calls is not an easy task. That is until now.

MultiTalker™, a patented technology developed by the Wright Patterson Air Force and exclusively licensed to PS Engineering, allows the pilot and crew to take advantage of what is sometimes referred to as the “Cocktail Party Effect”. In a room crowded with many different conversations, our brain has the ability to filter out the un-important conversations while allowing pilots to pay attention to the conversation that is.

MultiTalker™ offers this unique capability to the special mission pilot, the ability to pay attention to the radio call that is important at any one instant in time. MultiTalker™ allows the pilot to place 6 individual com radio traffic, up to nine unique positions within a stereo headsets.

The PAC45 is pin compatible with the NAT AMS series making upgrading replacing legacy systems easy. The only additional wiring required is to accommodate the stereo channels for MultiTalker™ operation and the various control heads, if required.

The PAC45 include a powerful headset audio amplifier, our high-performance IntelliVox® automatic VOX circuit for very loud environments and front panel selection of Push-To-Talk Intercom. Up to three control heads can be mounted in strategic locations while the Hub can be mounted directly to the pilot’s control heads or mounted remotely.

Because this is an all digital audio controller, the connections to the various control heads are just a few wires, eliminating the need to parallel radio inputs and outputs.

The ability to pre-record audio alerts makes this audio controller an integral tool to help hear alerts that may be drowned out by the din of the cockpit environment. There are no computers required to configure the PAC45 or to record the 3 audio alerts, it’s all done from the front panel

The stereo audio amplifiers are capable of providing 100 mW into general aviation headphones providing the audio punch that special mission environments often times demand.

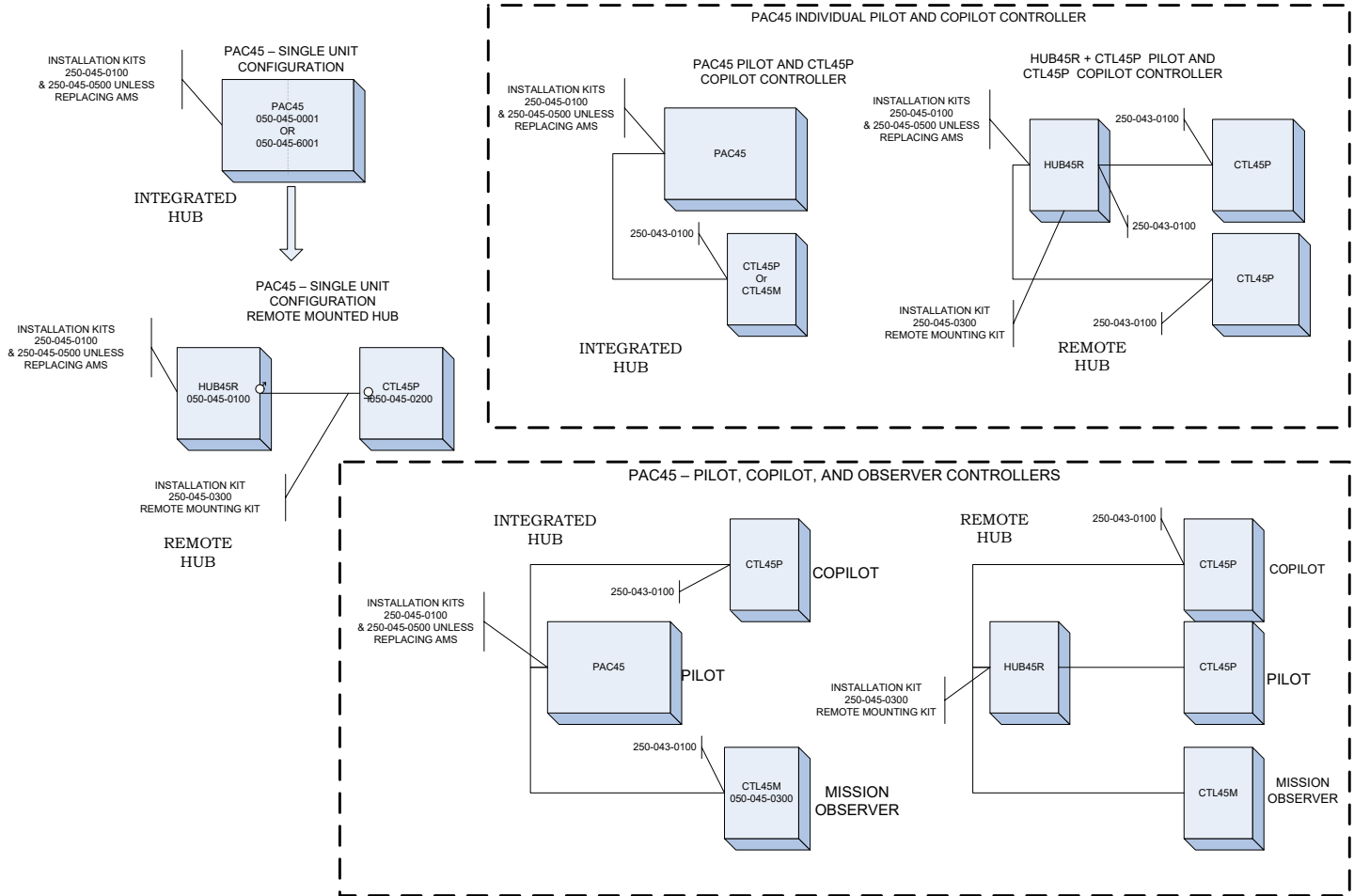
Using the PS Engineering Bezel Generator Application, the bezel can be customized to suit perfectly each aircraft’s special mission avionics suite. All of the Coms and the various switched inputs can be labeled accordingly. Ordering new decals for the bezel is as easy as using this bezel labeling configuration application.

## CHECKLIST OF CAPABILITIES:

- Six (6) Com radio interfaces with True Dimensional Spatial Processing
- Up to 3 individual control heads via RS-422
- Custom legends are quick and easy to order for professional tailored form and function
- Satellite Radio interface with full duplex phone
- Seven-place intercom with Auto and PTT-ICS VOX
- flightmate® field recordable audio alerts system
- Six (6) switched inputs Note: AUX switches 3 inputs
- Bluetooth interface for wireless phone and A2DP
- 1.88” DZUS mount backward compatible NAT AMS
- Night Vision compliant to ANVIS III
- Radio volume controls with pop-out switches
- Public Address Output

| TSO COMPLIANCE                                   |                                                                                               |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Audio Selector/Intercom                          | FAA TSO C139a                                                                                 |
| Applicable Documents                             | RTCA/DO-214A, RTCA/DO-160G<br>RTCA/DO-178C, DO-254                                            |
| ENVIRONMENTAL QUALIFICATIONS                     |                                                                                               |
| Operating Temperature Range: Hub                 | -55° C to +70° C                                                                              |
| Control head                                     | -20° C to +55° C                                                                              |
| Altitude                                         | Up to 50,000 feet in a non-pressurized area                                                   |
| Dimensions                                       | Height: 1.88 in. (3.3 cm) Width: 5.75 in. (15.9 cm)<br>Depth behind panel: 5.5 in. (18.16 cm) |
| Weight                                           | 2.0 lb. (kg)                                                                                  |
| POWER REQUIREMENTS (Including Internal Lighting) |                                                                                               |
| Voltage                                          | 27.5 VDC Systems                                                                              |
| Maximum Current                                  | 0.5 Amp (Externally protected by a 1A pull-type breaker)                                      |
| AUDIO SELECTOR SPECIFICATIONS                    |                                                                                               |
| Audio selector panel input impedance             | 510 Ω                                                                                         |
| Input Isolation                                  | -60 dB (min.)                                                                                 |
| Switched Receiver Inputs                         | 13 (COM 1 – COM 6, TEL, NAV 1, NAV 2, Marker, AUX (Can be relabelled as desired))             |
| Unswitched Inputs                                | 4                                                                                             |
| Transmitter Selections                           | 7 (COM 1, COM 2, COM 3, COM 4, COM 5, COM 6 plus Telephone) (Can be relabelled as desired)    |
| Headphone Impedance                              | 150 – 600 Ω                                                                                   |
| Headphone Output                                 | 100 mW into 150 Ω each side (left and right) headset, no clipping <.5% THD typical            |
| Microphone Impedance                             | 150 - 600 Ω                                                                                   |
| Bluetooth Radio                                  | Class 3, FCC ID Q0QWT32AE                                                                     |
| INTERCOM SPECIFICATIONS                          |                                                                                               |
| Intercom Positions                               | 7 places (with individual IntelliVox® circuits)                                               |
| Music Inputs                                     | 1 (Stereo) plus Bluetooth                                                                     |
| Music Muting                                     | >-30 dB “Soft Mute” when Com or intercom active.                                              |
| Distortion                                       | <1% THD @ 100 mW into 150 Ω                                                                   |
| Mic Freq. Response, 3 dB                         | 300 Hz – 6000 Hz                                                                              |
| Music Freq. Response, 3 dB                       | 10 Hz – 16 kHz                                                                                |

# CONFIGURATIONS



| Model No                                                | Part No.     | Special Mission Audio Selector Panels                                            | \$ List    |
|---------------------------------------------------------|--------------|----------------------------------------------------------------------------------|------------|
| <b>Remote Hub</b>                                       |              |                                                                                  |            |
| PAC45R Hub Only                                         | 050-045-0101 | Digital Audio Panel without Control Head includes connectors and mounting brack. | \$3,934.95 |
| <b>PAC45 - Single Unit Configuration</b>                |              |                                                                                  |            |
| PAC45                                                   | 050-045-0001 | Includes 1 Hub (050-045-0101) attached to 1 Control Head (050-045-0200)          | \$6,998.00 |
| Customized Label                                        | 575-045-XXXX | Customize front panel label                                                      | \$199.95   |
| PAC45-NVG                                               | 050-045-6001 | Same as above but Night Vision Goggle Compliance (Aero Dynamix)                  | \$7,195.00 |
| Customized Label                                        | 575-045-XXXX | Customize front panel label                                                      | \$199.95   |
| <b>PAC45 - Individual Pilot and Copilot Controllers</b> |              |                                                                                  |            |
| PAC45                                                   | 050-045-0001 | Includes 1 Hub (050-045-0101) and 1 Control Head (050-045-0200)                  | \$6,998.00 |
| CTL45P                                                  | 050-045-0200 | Copilot Control Head                                                             | \$3,399.00 |
| Customized Label                                        | 575-045-XXXX | Customize front panel label (2)                                                  | \$249.00   |
| PAC45-NVG                                               | 050-045-6001 | Same as 050-045-0001 but Night Vision Goggle Compliance (Aero Dynamix)           | \$7,195.00 |
| CTL45-NVG                                               | 050-045-6200 | Same as 050-045-0200 but with Night Vision Goggle Compliance (Aero Dynamix)      | \$3,599.00 |
| Customized Label                                        | 575-045-XXXX | Customize front panel label (2)                                                  | \$249.00   |
| <b>PAC45 - Pilot, Copilot, and Observer Controllers</b> |              |                                                                                  |            |
| PAC45                                                   | 050-045-0001 | Includes 1 Hub (050-045-0101) and 1 Control Head (050-045-0200)                  | \$6,998.00 |
| CTL45P                                                  | 050-045-0200 | Copilot Control Head                                                             | \$3,399.00 |
| CTL45M                                                  | 050-045-0300 | Observer Control Head                                                            | \$3,399.00 |
| Customized Label                                        | 575-045-XXXX | Customize front panel label (3)                                                  | \$299.00   |
| PAC45-NVG                                               | 050-045-6001 | Same as 050-045-0001 but Night Vision Goggle Compliance (Aero Dynamix)           | \$7,295.00 |
| CTL45-NVG                                               | 050-045-6200 | Same as 050-045-0200 but with Night Vision Goggle Compliance (Aero Dynamix)      | \$3,599.00 |
| CTL45M-NVG                                              | 050-045-6300 | Same as 050-045-0300 but with Night Vision Goggle Compliance (Aero Dynamix)      | \$3,599.00 |
| Customized Label                                        | 575-045-XXXX | Customize front panel label (3)                                                  | \$299.00   |

| Model No                                | Part No.     | Special Mission Audio Selector Panels                                                    | \$ List    |
|-----------------------------------------|--------------|------------------------------------------------------------------------------------------|------------|
| <b>PAC45 Pilot/Copilot and Observer</b> |              |                                                                                          |            |
| PAC45                                   | 050-045-0001 | Includes 1 Hub (050-045-0101) and 1 Control Head (050-045-0200)                          | \$6,998.00 |
| CTL45M                                  | 050-045-0300 | Observer Control Head                                                                    | \$3,399.00 |
| Customized Label                        | 575-045-XXXX | Customize front panel label (2)                                                          | \$249.00   |
| PAC45-NVG                               | 050-045-6001 | Same as 050-045-0001 but Night Vision Goggle Compliance (Aero Dynamix)                   | \$7,295.00 |
| CTL45M-NVG                              | 050-045-6300 | Same as 050-045-0300 but with Night Vision Goggle Compliance (Aero Dynamix)              | \$3,599.00 |
| Customized Label                        | 575-045-XXXX | Customize front panel label (2)                                                          | \$249.00   |
| <b>Optional Installation Kits</b>       |              |                                                                                          |            |
| Install Kit                             | 250-045-0500 | Includes 50 and 37 pin connector that are required if NOT upgrading from an existing AMS | \$239.00   |

| Model No | Part No.     | Marker Beacon Receiver                            | \$ List    |
|----------|--------------|---------------------------------------------------|------------|
| MB-10    | 050-023-0100 | Stand Alone TSO'd Marker Beacon Receiver          | \$1,195.00 |
| MB-10R   | 050-023-0101 | Same as 050-023-0100 but as a remote mounted unit | \$1,195.00 |

| Model No      | Part No.     | Audio Accessories - NON-TSO                                         | \$ List  |
|---------------|--------------|---------------------------------------------------------------------|----------|
| PRD60         | 050-160-0200 | 6-Channel Digital Audio Annunciator with 4 Unswitched Inputs        | \$736.43 |
| Radio Adapter | 12100        | Tactical Radio Adapter (interfaces non-standard aviation radios)    | \$399.00 |
| PA50          | 14100        | 4 channel summing amplifier                                         | \$195.00 |
| IntelliPax    | 11636R       | 6-place Remote Mounted expansion unit                               | \$399.00 |
| Mono Jacks    | 11910        | 4-place mono jack kit including music jack and insulation washers   | \$35.00  |
| Stereo Jacks  | 11910S       | 4-place stereo jack kit including music jack and insulation washers | \$45.00  |
| iPhone Cable  | 425-006-0354 | iPhone and Blackberry Interface cable NOTE: TELEPHONE ONLY          | \$39.95  |
| Music cord    | 425-006-2535 | 3.5mm to 2.5mm Interface cord for cell phones or music device       | \$28.50  |
| Music cord    | 425-006-7026 | 2.5mm to 2.5mm Interface cord for cell phones or music device       | \$28.50  |

# ACCESSORIES

## Marker Beacon Receiver (MB10)



| MC10 SPECIFICATIONS    |                                                                                                                                                       |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| FAA-Approval           | TSC C35d<br>RTCA DO-143                                                                                                                               |
| Frequency:             | 75 MHz Crystal Controlled                                                                                                                             |
| Sensitivity:           | Capable of: (preset at factory for field application)<br>Low: 1000 µVolts (Hard) (360 to 570 µV soft)<br>High: 200 µVolts (Hard) (130 to 200 µV soft) |
| Selectivity:           | -6 dB at ±10 kHz<br>-40 dB at ±120 kHz                                                                                                                |
| External Lamp Output:  | 7.5 (±4 VDC unloaded, at maximum brightness) VDC positive when active, max. current 125 mA                                                            |
| MM Sense:              | Active high (4.5 ± 1.0VDC)                                                                                                                            |
| Output impedance:      | 510 Ω                                                                                                                                                 |
| Audio Output:          | 38 mW <1% THD typical                                                                                                                                 |
| Operating Temperature: | -15° to +55° C                                                                                                                                        |
| Altitude:              | 55,000' unpressurized                                                                                                                                 |
| Power:                 | 11-33 VDC, <0.25 A                                                                                                                                    |
| Weight:                | 6.5 oz.                                                                                                                                               |

The MB10 is a 75 MHz Marker Beacon receiver with 3-lamp indication that provides the Marker Beacon signal for ILS Systems. A front panel mode switch allows the pilot to select high or low sensitivity, lamp test, and audio mute.

The MB10R is a remote mounted receiver capable of activating either panel mounted lamps (not included), an electronic display system.

## Tactical Radio Adapter (12100)

Headphone and microphone signals from non-General Aviation applications are not compatible with FAA compliant audio device designed standards. The use of the 12100 converts these non-GA radios into the appropriate inputs and outputs so they will work with GA audio systems.

The 12100 audio input can be configured for inputs of either a 150W or 8W speaker while the microphone output will change non-carbon mic equivalent types to carbon mic equivalent.

The 12100 also provides the required mic bias source, if required. The 12100 is capable of providing side tone so to be present during transmissions.



| 12100 SPECIFICATIONS –NOT FAA APPROVED |                                                        |
|----------------------------------------|--------------------------------------------------------|
| Input Power:                           | 12 or 28 VDC, Current drain: <250 mA                   |
| Aircraft Radio Impedance:              | 510 Ω                                                  |
| Weight:                                | 10 Oz.                                                 |
| Dimensions:                            | 1.5" h x 4.0" W x 5.50" D<br>Including mounting flange |

The audio input to the radio adapter, in some installations, may require a common ground to prevent loss of signal or distortion, the 12100 has this capability as well.

## Intercom Expansion Unit (11636R)

The IntelliPax is a 6 channel, hi-fi stereo expansion unit that can be add 6 additional stereo headset intercom positions specific PS Engineering's intercoms and audio panels. A single shielded cable is connected to the device to be expanded and to the specific IntelliPax unit. IntelliPax has our much lauded IntelliVox, which is an automatic VOX circuit which eliminates any VOX adjustments.



| 11636R SPECIFICATIONS     |                                              |
|---------------------------|----------------------------------------------|
| Input Power:              | Unit powered by PS Engineering audio device  |
| Headphone Impedance:      | 150-600 Ω typical                            |
| Audio Distortion:         | <10% @ 35mW into 150 Ω                       |
| Aircraft Radio Impedance: | 600 Ω typical                                |
| 3 dB Mic Freq Response:   | 350Hz – 6000Hz                               |
| 3 dB Music Freq Response: | 200Hz – 15kHz                                |
| Unit Weight:              | 7.2 Ounces (0.20 kg)                         |
| Dimensions:               | 1.25"H x 3.00"W x 5.50"D (3.2 x 6.6 x 14 cm) |

## PRD60 Audio Alert Unit

The PRD60 contains six stored messages. An outside annunciator, such as an electronics engine instrument, can triggers these messages. When there is an announcement, it will be repeated every two seconds until the remote-mounted ACK button is pushed. This stops the played annunciation, until the next announcement is required (the next falling edge). For an additional fee, custom messages can be created.



| PRD60 SPECIFICATIONS – NOT FAA APPROVED |                                                                         |
|-----------------------------------------|-------------------------------------------------------------------------|
| ENVIRONMENTAL CONDITIONS                |                                                                         |
| Temperature Range:                      | Operating: -15° C to 55° C<br>Storage: -40° C to 85° C                  |
| Altitude:                               | Up to 50,000 feet in an unpressurized area of the aircraft.             |
| Dimensions:                             | Height: 1.25 in. Length: 5.5 in<br>Width: 4.0 in. (w/ mounting flanges) |
| POWER REQUIREMENTS                      |                                                                         |
| Voltage:                                | 11 to 33 VDC                                                            |
| Number of Discrete Inputs               | 6 (rising or falling edge)                                              |
| Maximum Current:                        | 250 mA (Externally protected by a 1 Amp circuit breaker.)               |
| AUDIO SPECIFICATIONS                    |                                                                         |
| Audio selector panel input impedance:   | 510 Ω                                                                   |
| Input Isolation:                        | -60 dB (min.)                                                           |
| Unswitched Audio:                       | 4 inputs                                                                |
| Audio Output Impedance:                 | 150 - 600 Ω                                                             |
| Audio Output:                           | 38 mW into headset, no clipping into 150 Ω                              |
| Distortion:                             | <1% THD @ 38 mW into 150 Ω                                              |
| Audio Freq. Response, 3 dB:             | 300 Hz - 6000 Hz                                                        |

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