APOLLO

Model SL10
Audio Selector Panel
User's Guide

UPS Aviation Technologies

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To receive additional copies of the Apollo SL10 Installation Guide, order part #560-0978-00 and for the Apollo SL10 User's Guide, order part #560-0973-00a.

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Section I - General Information

1.1   SCOPE

This section provides detailed operating instructions for the UPS Aviation Technologies SL10, SL10S, SL10M, SL10M-S, SL10C, SL10S-C, SL10M-C, and SL10M-S-C Audio Selector Panel/Intercom Systems. Please read it carefully before using the equipment so that you can take full advantage of its capabilities.

This section is divided into four sections covering the basic operating areas of the SL10 systems. They are: Audio Selector, Transceiver Selection, Intercom, and Marker Beacon Receiver (SL10M and SL10MS only).
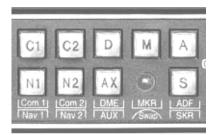
1.2   Audio Selector (All models)

Figure 1 Audio Selector

Through the use of two momentary and seven latched, push-button, back-lit switches, it is possible to select any or all receiver audio. C1 and C2 are momentary switches. When selected, an internal backlight will illuminate indicating which audio source is selected. Because the rotary switch controls what transceiver is being heard by the pilot and copilot (the crew), "Cl" (Com 1) and "C2" (Com 2) push-buttons are of the momentary type and do not remain in when selected. This is also part of the "auto function." You will <u>always</u> hear the audio from the transceiver that is selected by the rotary mic selector switch.

The users can identify which receivers are selected by noting which push-button switches are illuminated. Push buttons labeled **Nl** (Nav 1), **N2** (Nav 2), **D** (DME), **M** (Marker), **A** (ADF), **AX** (auxiliary), and **S** (Speaker) are "latched" type switches. When one of these buttons is pressed, it will stay in the "in" position. Press the switch again and it be in the "out" position and remove that receiver from the audio. While selected, the switch will also be annunciated by an internal lamp.

NOTE: In Split Mode, no pushbuttons will be active. The only audio selected is the com 1 and 2, as indicated by their respective lamps.

1.2.1 Speaker Amplifier

The "S" in the push-button section stands for speaker. This switch will place all selected audio on the cockpit speaker when this switch is selected. NOTE: with the exception of unswitched unmuted inputs (Altimeter warning), the speaker amplifier is not active in the "Split Mode." To reduce power consumption and internal heat buildup in the avionics stack, switch off the speaker amplifier when not in use.

1.3 Mic Selector Switch (Fail Safe Operation)

**Figure 2
Mic Selector**

Unit power is turned on and off by the Mic selector switch. In the OFF or "**FAIL-SAFE**" position, the pilot is connected directly to Com 1 allowing transmit and receive capability regardless of unit condition. Any time power is removed or turned OFF, the audio selector will be placed in the fail-safe mode. The first position clockwise from OFF is COM 1. Both pilot and copilot will be connected to the Com l transceiver. While in the COM 1 or COM 2 mode, the intercom functions normally. Both the pilot and copilot have transmit capabilities on the selected transceiver. All hear the selected audio if the intercom is in the ALL mode. Only the person who presses their Push To Talk (PTT), will be heard over the aircraft radio. Turning the rotary switch to the COM 2 position will place pilot and copilot on Com 2.

The SL10-Series has an automatic selector mode. Audio from the selected transceiver is automatically heard in the headsets and speaker (when selected). You can check this function by switching from COM 1 to COM 2 and watch the selected audio light on the selector change from C1 to C2. This ensures the pilot will never transmit on a radio is not listening to.

In SL10-series units, Serial Number **T03092 and above**, when switching the mic selector rotary switch from COM 1 to COM 2, while COM 2 audio had been selected, Com 1 audio will continue to be heard. This eliminates the pilot having to switch Com 1 audio back on, if desired. When switching from COM 1 to COM 2 while Com 2 has NOT been selected, Com 1 audio will be switched off. In essence, switching the mic selector will not effect the selection of Com audio.

> **Important**: When the mic selector is in the full counter clockwise position, the SL10 power is removed, and it is in the **FAIL-SAFE** mode. The pilot headset and microphone is connected directly to Com 1.

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

With a yoke mounted, momentary switch, the pilot can change from the current Com transceiver to the other by depressing this switch. When "Swap Mode" is active, an LED annunciator will illuminate, indicating that the Mic Selector switch position is no longer valid. To cancel "Swap Mode," the pilot may either press the yoke mounted switch again, or turn the Mic Selector Switch to the Com that is active.

1.4 Split Mode

Turning the rotary switch to COM 1/COM 2 places the SL10 into "Split Mode". This places the pilot on Com 1 and the copilot on Com 2. Pilot and copilot are isolated from each other on the intercom, but can use their respective radios simultaneously. An example of this useful feature is when the pilot may want to talk to Air Traffic Control, while the copilot may be speaking to Flight Watch.

The "Split Mode" radio selection can be reversed by switching to COM 2/COM l. The pilot will be on Com 2 and the copilot will be on Com 1. A third "Split Mode" selection is TEL/COM l. This will place the pilot on airborne radiotelephone, HF or other transceiver (if installed), while the copilot will be on Com 1.

> Note: In all SL10s, Split Mode turns off all other (Nav, ADF, etc.)selected audio to pilot and copilot. Additionally, there is no intercom function between pilot and copilot. Passengers still have intercom capability among themselves.

1.5 Intercom

1.5.1 Volume Control, Monaural (SL10M SL10)

Figure 3 Volume Controls Mono

The pilot volume control knob adjusts the loudness of intercom and music in the pilot's headphones only. It has no effect on selected radio audio levels. The copilot volume control adjusts the loudness of the intercom and music in the copilot headset only. The passenger volume is factory set at a comfortable level. This is a service adjustment that can be

accessed by the avionics technician. Most general aviation headsets have a built-in volume control, so volume can be adjusted "locally."

1.5.2   Volume Control, Stereo, (SL10S, SL10MS)

The volume control knob adjusts the loudness of the intercom and music for the pilot and copilot only. It has no effect on selected radio levels or passengers' level. The passenger volume level is factory set for a comfortable listening level. Most general aviation headsets today have a built-in volume controls, therefore, volume can be adjusted at the headset. There is a service adjustment that can be accessed by

Figure 4 Volume Control Stereo

the avionics technician. This will allow adjustment of the passenger's volume for a comfortable listening level.

1.5.2.1 Mono headsets in Stereo Installation

All passenger headsets are connected in parallel. Therefore, if a monaural headset is plugged in to a SL10 Stereo installation, one channel will be shorted. Although no damage to the unit will occur, all passengers will lose one channel.

1.5.3   Adjusting the VOX-Squelch control, Monaural (SL10, SL10M)

The SL10 provides adjustable VOX squelch controls for the pilot and copilot (the copilot's VOX control also adjusts the passengers VOX squelch) Since the number of microphones open at any one time is reduced, the amount of background noise is diminished. This also allows the use of dissimilar headsets with the same intercom. The user can adjust the trip level of the VOX to fit the individual's voice and mic, which helps eliminate the frustration of clipping the first syllables. With the engine running, set the VOX control knob by slowly rotating the SQL control knob clockwise until you no longer hear the engine noise in the headphones. When the microphone is positioned properly near your lips, normal speech levels should open the channel. When you have stopped talking, there is a delay of about ½ second before the channel closes. This helps prevent choppy communications.

1.5.4 Adjusting the VOX- Squelch control, Stereo (SL10S, SL10MS)

The stereo versions of the SL10 incorporate a single VOX Squelch control for all positions. Like all UPS Aviation Technologies intercoms, since the number of microphones active at any one time is reduced, the unwanted background noise in the headphones is diminished. This also allows the use of dissimilar headsets with the same intercom.

With the engine running, set the VOX trip level by slowly rotating the SQUELCH control knob clockwise until you no longer hear the engine noise in the headphones. When the microphone is positioned properly near your lips, normal speech levels should open the channel. When you have stopped talking, there is a delay of about ½ second before the channel closes. This prevents closure between words and prevents choppy communications.

1.5.5 Intercom Modes (All versions)

The center switch is a 3-position mode switch that allows the pilot to tailor the intercom function to best meet the situation. The description of the intercom mode function is valid only when the unit is either in the COM 1 or COM 2 position of the Mic Selector switch. When the unit is in the "Split" mode, only the passengers have intercom function.

ISO: (Up Position): The pilot is isolated from the intercom and is connected only to the aircraft radio. He will hear the aircraft radio reception (and sidetone during radio transmissions). Copilot and passengers will hear the intercom and music on Entertainment 1, but not the aircraft radio receptions or pilot transmissions.

ALL: (Middle Position): All parties will hear the aircraft radio, intercom, and music from entertainment input #1. However, during any intercom communications, the music volume automatically decreases when SoftMute is active (See section 3.6.5.1). The music volume increases gradually back to the original level after communications have been completed.

CREW (Down Position): Pilot and copilot are connected on one intercom channel and have exclusive access to the aircraft radios. They may also listen to Entertainment 1. Passengers can continue to communicate with themselves without interrupting the Crew and also may listen to Entertainment 2. Anytime the SL10 is in either the COM 1/COM 2, COM 2/COM 1, or TEL/COM 1, ("Split Mode") the pilot and copilot do not have any intercom function. The passengers will maintain intercommunications.

1.5.5.1 Soft Mute (Mono)

Soft Mute must be enabled during installation by jumpering top connector pins 12 and N. A SPST switch can be installed between these pins for a pilot selectable mute mode. Without this connection, music is not muted during intercom activation. This "Karaoke Mode" prevents the music muting when a sing-along is desired. "Soft Mute" mode only applies to entertainment input #1. Entertainment #2 does not mute.

1.5.5.2 Soft Mute (Stereo)

Both entertainment devices have the "Soft Mute" mode. In units earlier than a "G" intercom board serial number (second set of numbers), only entertainment input #1 has the mute inhibit capability. "Soft Mute" mode for the Crew positions (Entertainment 1) can be selected by pressing in the Volume control knob once. In later units the SQL knob controls the Soft Mute of the passengers entertainment (#2).

1.5.5.3 Entertainment Input

The audio selector panel has provisions for up to two separate entertainment input devices. Which device is heard is determined by the position of the three position mode switch located in the center of the intercom section of the audio panel. (See Table 3-1 for overview.) While in the ISO (Isolate) mode, only the copilot and the four passengers will hear entertainment device #1. In normal operation, whenever a person speaks or if the aircraft radio becomes active, the music will automatically mute and then will gradually return to the original listening level when the intercom or radio activity ceases.

Which entertainment device will be heard is determined by the mode selector switch. When in the ALL mode, all parties will hear the entertainment input #1. While in the CREW mode, pilot and copilot will hear entertainment input #1 while the passengers may listen to entertainment input #2.

It is also possible to use only one entertainment input device for both entertainment inputs. It is suggested however, that a switch (DPDT) be installed between the single entertainment device and entertainment input #1. This will allow the pilot and copilot decide if they hear entertainment while in the Crew mode.

Table 1 Intercom Modes

Mode	Pilot Hears	Copilot Hears	Passenger Hears	Comments
Isolate	A/C Radio Pilot Sidetone (during radio transmission)	Copilot and passenger intercom Entertainment #1	Passenger and Copilot intercom Entertainment #1	This mode allows the pilot to communicate with the ground without the copilot or passengers bothered by the conversations. Copilot and passengers can continue to communicate and listen to music
All	Pilot Copilot A/C Radio Passengers Entertainment #1	Copilot Pilot A/C Radio Passengers Entertainment #1	Passengers Pilot Copilot A/C Radio Entertainment #1	This mode allows all on board to hear radio reception as well as communicate on the intercom. Music and intercom is muted during intercom and radio communications
Crew	Pilot Copilot A/C Radio Entertainment #1	Copilot Pilot A/C Radio Entertainment #1	Passengers Entertainment #2	A second music source is automatically enabled for the passengers.

1.5.6 Push to talk intercom mode

SL10-series audio selector/intercom systems with serial number beginning with the letter "M" (monaural version) or "G" (stereo version). In some extremely high noise environments, it may be desirable to have a push to talk (PTT) intercom, instead of relying on voice-activation (VOX).

In SL10 series with later configuration boards, the PTT intercom capability is added. To operate the PTT, simply rotate the SL10 squelch control to maximum (fully CW). Grounding the appropriate pin on the top connector through a momentary switch will open only that intercom channel. The pilot and copilot are individually. All passenger mics are controlled with pin 20.

The same pins are used for both mono and stereo SL10 Systems. This applies ONLY to units with applicable serial numbers.

1.6   Marker Beacon (SL10M, SL10M-S

The optional Marker Beacon Receiver uses visual and audio indicators to alert you when the aircraft passes over a 75 MHz transmitter.

The Blue lamp, labeled "O," is the Outer Marker lamp and has an associated 400 Hertz 'dash' tone. The lamp and tone will be keyed at a rate of two tones/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 "A," is the Airway/Inner marker and has a 3000 Hertz 'dot' tone. The lamp and tone will be keyed at a rate of six times per second.

The audio from the Marker Beacon Receiver can be heard by selecting the "M" push-button switch. To adjust the volume level, there is a service adjustment located on the top of the unit. See Section 2.5

A 3-position switch is used to set the receiver sensitivity and to test the indicator lamps. Use "HIGH" sensitivity initially. This allows you to hear the outer marker beacon about a mile out. Then select the "LOW" sensitivity to give you a more accurate location of the Outer Marker. The momentary down switch position is labeled "TEST" and illuminates all three lamps simultaneously to assure the lamps are in working order. Upon first application of power to the unit, the Marker enters a self test mode. The flickering blue marker light indicates a test in process. If the test continues for more than 10 seconds, or the lamps do not extinguish, return the unit for service.

1.6.1   Middle Marker Sense

A Middle Marker sense output signal is available to automatically reduce the autopilot sensitivity after the aircraft has passed over the Middle Marker. This function will not operate during the test mode. This output will go to +4.75 VDC (± 0.25 VDC) when a valid Middle Marker signal is received.

1.6.2   External Marker Lights (SL10, SL10S)

For installations that require external marker beacon lights, there are three outputs that can drive 12 Volt lamps only. The external output lamps are driven high (+9 VDC ±0.5 VDC) when active. Maximum source current per lamp is 125 mA.

If using an external marker receiver, the audio input is lower connector, pin 11 (Aux. input).

1.6.3 Receiver Sensitivity

Although the SL10M meets FAA TSO-C35d sensitivity specifications, the sensitivity of the receiver has been adjusted to meet real world requirements (150μV and 1400μV Soft). This will usually eliminate the need for the avionics shop to reduce the sensitivity in the field so as to prevent early detection of the marker beacons. If your particular installation requires more or less sensitivity, please call the factory for details on how to adjust the receiver sensitivity in the field.

Section II- Warranty and Service

2.1   Warranty

In order for the factory warranty to be valid, the installations in a certified aircraft must be accomplished by an FAA- certified avionics shop and authorized UPS Aviation Technologies dealer. An FAA Form 337 must also be accompanied by the warranty card for this warranty to be in effect. If the unit is being installed by in an experimental aircraft by the owner/builder, a factory-made harness must be installed for the warranty to be valid.

UPS Aviation Technologies, Inc. warrants this product to be free from defect in material and workmanship for a period of three (3) years from the date of installation (on units shipped after Jan 1, 1999). During the first twelve (12) months of this three-year warranty period, UPS Aviation Technologies, 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. In the following twenty-four (24) months the unit must be returned to UPS Aviation Technologies, or a *certified* UPS Aviation Technologies **Service Center**, for repairs.

This warranty is not transferable. Any implied warranties expire at the expiration date of this warranty. UPS Aviation Technologies SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. This warranty does not cover a defect that has resulted from improper or unreasonable use or maintenance as determined by us. This warranty is void if there is any attempt to dissemble 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.

2.2   Factory Service

The unit is covered by a 26-month limited warranty. See warranty information. Call UPS Aviation Technologies, Inc. at (800) 525-6726 before you return the 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 the product to:

UPS Aviation Technologies, Inc.
2345 Turner Road, S.E.
Salem, OR 97302   U.S.A. Toll Free   800.525.6726

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