



# OPERATION MANUAL

## PS24

### INFRARED POWER SUPPLY



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## INTRODUCTION

The Infrared Listening System 600 is a wireless assistive listening device which may be used as an aid for the hard of hearing, sight description, or simultaneous translation. As an assistive listening device, the Infrared Listening System 600 meets the Americans with Disabilities Act standards to aid the hearing impaired. Also, infrared technology meets international standards for wireless interpretation equipment. The system 600 consists of three major components: the transmitter, the emitter, and the receiver.

The Sound Associates PS24 is a low voltage infrared emitter power supply for new and existing infrared emitter panels. The PS24 is a regulated 24-30 volt power supply that can power up to four Sound Associates SA611, two SA612, or one SA613 and one SA611 emitter panels. This emitter power supply combines low voltage with a modulated audio signal supplied by an infrared transmitter. The emitter and power supply are connected via a single two conductor - shielded cable terminated at the power supply with either a 5 pin XLR connector or bare wire. This single cable supplies a modulated audio signal and power to the emitter, eliminating the need for an electrical outlet at each emitter location.

The following instructions should be read completely before attempting to install any equipment to ensure proper set up and use of the system. If you require further assistance, please call our Customer Service Department Monday-Friday 10:00 am – 5:30 pm at (888) 772-SOUND (7686).

## INFRARED LISTENING SYSTEM 600 FEATURES

### Infrared Technology

Feature	Advantage
Wireless receivers	No pre-registered seating No “deaf section” Easy distribution
Wireless signal transmission by Infrared light as compared to RF transmission	Confidentiality; signal will not pass through walls or curtains No interference from common radio signals Superior audio quality
The audio signal is frequency modulated at 95 kHz or 250 kHz	Industry standard Headsets are interchangeable with other home and large area systems

### Power Supply PS24

Feature	Advantage
Worldwide AC input	Capable of operating on either 115 VAC at 60 Hz, or 230 VAC at 50 Hz
Power Supply can be linked with existing infrared transmitters via BNC connection	Can be used with Sound Associates or other low voltage transmitters/base stations
High level push-pull output stage	Capable of driving long cable runs with no signal loss
Half rack space design	Allows power supply to mount side by side with 600 Series infrared transmitter in standard 19” rack
Connects to emitter panels via a single 16-gauge, 2-conductor shielded cable	Supplies low voltage and signal via one cable Saves on installation time and cost
Full three-year warranty	Insures years of trouble free use

## UNPACKING UNIT

As soon as the shipment is received, inspect the unit and all components for damage incurred by shipping. Also, check to see if all components are enclosed.

Equipment enclosed:

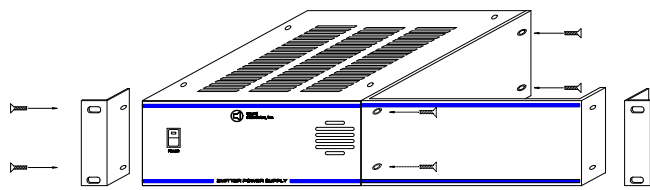
- 1 PS24 Emitter Power Supply
- 1 BNC003 3ft RG59u BNC to BNC cable
- 1 AC power cord
- 1 Instruction manual

If the unit is damaged due to shipping, please keep all packing material and contact the shipping company as soon as possible. Only the consignee may institute a claim against a carrier if damage has occurred in shipping however, Sound Associates will assist the client in any such event.

If the unit fails to operate up to specification please contact your nearest Sound Associates dealer or Sound Associates' Customer Service Department at (888) 772-SOUND (7686).

## RACK MOUNTING

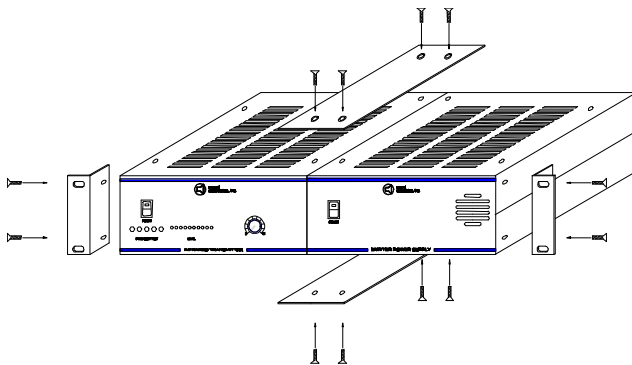
### Rack Mounting One Power Supply:



To mount a single power supply in a standard 19" rack, use a RK1 single rack mount kit. Fix the blank half space bracket to the side of the power supply with the four enclosed flat head 8/32 screws (see figure). Attach the rack ears to the power supply and to the blank panel with the four enclosed flat head 8/32 screws. All screw lengths should not exceed 1/2 inch.

The unit will mount in a 2 space rack. When racked with other equipment the emitter power supply should be separated by one rack space for ventilation

### Rack Mounting Two Power Supplies or Transmitter and Emitter Power Supply Side by Side:

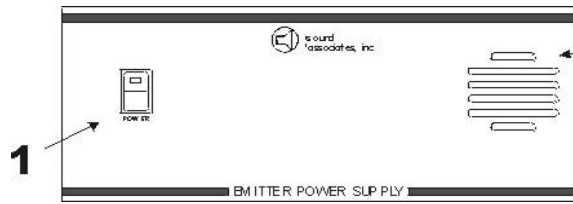


To mount two emitter power supplies or a transmitter and emitter power supply side by side in a standard 19" rack, use a RK2 double rack mount kit. Place the power supplies or transmitter and power supply side by side on a flat surface. Fix the top support plate to the units with four flat head 8/32 screws (see figure on previous page). Once the support plate is tightened, flip the units and attach the bottom support plate with four flat head 8/32 screws, then attach

the rack ears to the units with four 8/32 screws enclosed. All screw lengths should not exceed

1/2 inch. The unit will mount in a 2 space rack. When racked with other equipment, the emitter power supply should be separated by one rack space for ventilation.

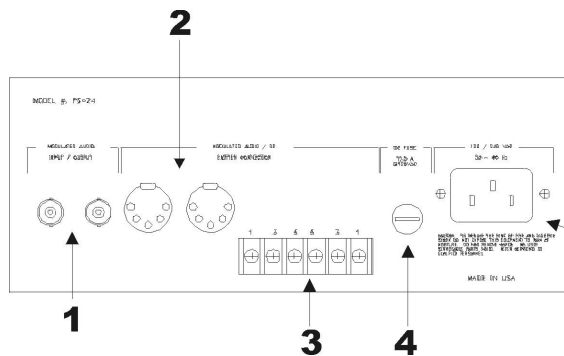
## FRONT PANEL CONTROLS



**1 – Power Switch:** Applies line power. Rocker switch with LED to indicate on/off modes. The LED on switch also indicates DC voltage is present. If LED on switch does not light, check if AC power and DC power are working properly.

**2 – Fan Intake:** Forced air cooling intake. Do not block or hinder air flow.

## REAR PANEL CONTROLS



**1 – Modulated Audio Input/Output:** BNC connection allows input to receive modulated audio signal from infrared transmitter and output to link to additional power supplies via RG58u cable (RG59u cable for short runs).

**2 – 5-pin XLR modulated output / DC:** Connection to emitters via 5-pin XLR,

supplies low voltage plus modulated audio signal. Pin 1 = Shield = Ground; Pin 2 = Ground; Pin 3 = White / Red = Signal; Pin 4 = Positive DC; Pin 5 = Black = Positive DC.

**3 – Terminal Block Modulated Audio / DC:** Connection to emitters via “stakeon” or bare wire, supplies low voltage plus modulated audio (same as 5-pin XLR). Pin 1 = Shield = Ground; Pin 3 = White / Red = Signal; Pin 5 = Black = Positive DC.

**4 – DC Fuse:** Prevents excessive current flow on DC output. Timed 2.5A 5x20 mm European Fuse.

**5 – AC Power:** Connects to power source via AC power cord.

## POWER CONNECTION

The power supply is shipped with the input voltage set to 115 volts 50-60 Hz unless otherwise specified. The transmitter is furnished with a detachable AC power cord rated for 10 A at 120 volts that plugs into a 15 A plug. The input voltage may be changed internally from 115 volts AC to 230 volts AC. To change the voltage, first disconnect power and remove the top chassis cover. The input voltage switch is located in the back left-hand corner near the transformer. Simply slide the switch from 115-volt position to the 230-volt position. In the 115 volt position, the Mains fuse marked should be a T500 mA fuse. In the 230-volt position, the Mains fuse

should be a T250 mA fuse. Voltages over 135 volts in the 115 volt position or over 255 volts in 230 volt position are potentially damaging to the PS24 power supply circuit.

## INPUT/LINK CONNECTION

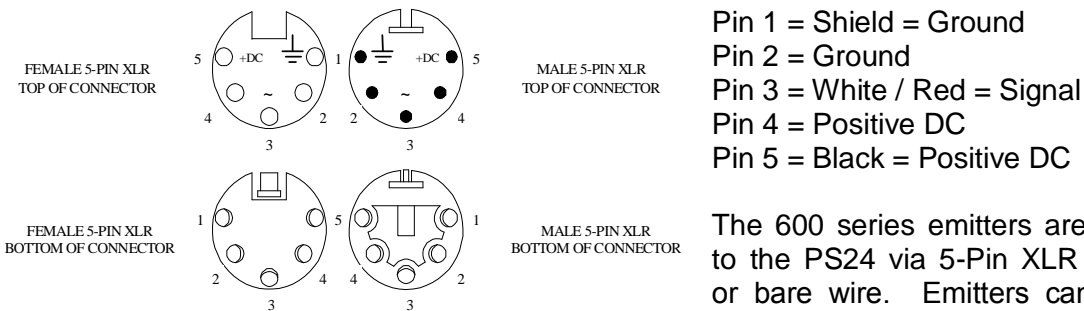
The input signal should be a modulated audio signal from an infrared transmitter or base station >55 kHz and <300 kHz with a nominal peak to peak voltage of 8V at 95 kHz or 4V at 250 kHz. The connection is made via an RG58u (RG59u for short runs) cable terminated with a BNC connector. The modulated audio input and output (link) are independent of the power source. Therefore, if power to the PS24 is cut, other power supplies in the chain will not be affected.

## OUTPUT CONNECTION

The PS24 supplies low voltage and signal to 600 series emitter panels. The power supply is set to 30 VDC output, but can be adjusted from 24.0 VDC to 30.0 VDC +/- 1.0 VDC. The adjustment is made internally on the internal power supply at the pot marked "r11/V. ADJ." Each PS24 can power up to 200 diodes, which includes one of the following combinations: four SA611s, two SA612s, or one SA613 and one SA611. The modulated audio output plus DC voltage connects to the emitter panel via a 2 conductor shielded cable terminated with a 5-pin XLR connector or bare wire. The 5-pin XLR connector is used mainly when plugging and unplugging the emitter cable is necessary, such as quick installations, portable systems, or rental systems. The terminal block supplies the same signal as the 5-pin XLR connector but is used in more permanent installations where the emitter connection will not be removed on a constant basis.

## CABLING

The emitter is connected to the emitter power supply via one 2 conductor shielded cable. This single cable supplies low voltage 17-30 VDC plus the modulated audio signal. The emitter cable pin configurations are as follows:



The 600 series emitters are connected to the PS24 via 5-Pin XLR connectors or bare wire. Emitters can be "daisy chained" or linked together and up to 50 power supplies can be added to increase the number of emitter panels and ultimately coverage. Refer to the table below to determine the maximum cable length between the power supply and last emitter.

NOTE: The formula to calculate the maximum distance is:  
 $(1/\text{DCR1}) + (1/\text{DCR2}) \cdot (\text{Vdrop} / \text{Load}) \cdot (1/4)$

Alpha Model #/Gauge	Max. Load	Maximum Distance from Power Supply to Last Emitter Panel (24 VDC supply)	Maximum Distance from Power Supply to Last Emitter Panel (30 VDC supply)
20 AWG	2.4 amps	140 ft.	250 ft.
2421 18 AWG	2.4 amps	150 ft.	280 ft.
2432 16 AWG	2.4 amps	200 ft.	350 ft.

Where: DCR1 = DC resistance of the 2 conductors.  
 DCR2 = DC resistance of the drain wire.  
 Vdrop = Maximum Voltage drop [supply voltage (24 or 30 VDC) - minimum operating voltage (17 VDC)], in this case is 7 V for the 24 VDC or 13 V for the 30 VDC at power source.  
 Load = Maximum load on the line, in this case the maximum load at 24 VDC is 2.4 Amps.

NOTE: The two unused pins on the 5 Pin XLR are linked internally on the PCB of the emitter and power supply to the ground and positive DC respectively. Therefore, in the 5-Pin XLR connector pin 2 is linked to pin 1 (ground) and pin 4 to pin 5 (positive DC).

NOTE: The wiring of the emitter is very important. Most problems with the infrared system stem from incorrect wiring. Before powering the system, check to make sure: 1) no crosses exist between conductors and 2) the positive DC is not placed on the ground or signal terminals.

## THEORY OF OPERATION

The PS24 is simply a power source and modulated audio router for the 600 series emitter panels. The PS24 maintains a constant modulated audio signal due to a high level push-pull output circuit. This circuit allows many emitter panels and emitter power supplies to be utilized without signal loss. The internal power supply is a regulated 24-30 volt DC power supply rated at >85 watts. The maximum power consumption by 200 diodes and normal cabling is <60 watts. This design includes a large factor of safety for steady operation even in the harshest of environments.

## TROUBLESHOOTING

Symptom	Cause/Remedy
Only white noise or static is heard in the headset	Headset is not receiving the infrared transmission  <i>Make sure...</i> ...power supply is powered (The red LED on the emitter panel should light when transmitter is off) ...transmitter is powered (The red LED should flicker out and the green LED on the emitter panel should light) ...cable is not interrupted or crossed ...the photo cell on the headset is in direct view of the emitter panel

<b>Symptom</b>	<b>Cause/Remedy</b>
No static and no audio in the headset	<p>The headset is not powered or the infrared light is being received with no audio signal on its back</p> <p><i>Make sure...</i></p> <ul style="list-style-type: none"> <li>...the audio input is plugged into the transmitter and functioning properly</li> <li>...the volume on the transmitter is turned up</li> <li>...the volume on the headset is turned up</li> <li>...the headset battery is charged and secured firmly in place</li> </ul>
Signal is received but with some static in the headset	<p>The infrared signal is too weak or high levels of infrared light are interfering with the transmission</p> <p><i>Make sure...</i></p> <ul style="list-style-type: none"> <li>...all emitters are connected and being powered</li> <li>...emitters are in direct sight and not blocked</li> <li>...emitter fault indicator light is not on</li> <li>...intense light is not shining on the photo cell on the receiver</li> <li>...energy efficient fluorescent lights are not in use (they cause interference with the 95 kHz subcarrier)</li> </ul>
Both Green (Signal) and Red (DC Power) Indicator Lights are illuminated on the emitter panel	<p>Voltage is too low or modulator signal is not functioning properly</p> <p><i>Make sure...</i></p> <ul style="list-style-type: none"> <li>...voltage is greater than 17 VDC at emitter</li> <li>...modulation conductors are not interrupted</li> <li>...95/250 kHz sinewave is present at emitter</li> </ul>

## SERVICE OR REPAIRS

Contact Sound Associates' Customer Service Department at 888-772-SOUND (7686) 10:00-5:30 Monday through Friday for any service or repairs.



## TECHNICAL SPECIFICATION

Modulation	Connector Number of inputs/outputs (links)	Chassis mount BNC 2
Output	Connector Number of outputs  Wiring of 5-pin XLR Wiring of terminal strip Output voltage Load regulation Output ripple Short circuit and overload protection	5-pin female XLR/terminal strip (2) 5-pin female XLR or (2) terminal strips 1, 2 – ground; 3 – signal; 4, 5 – positive DC 1 – ground; 3 – signal; 5 – positive DC 24-30 $\pm$ 0.5 VDC $\pm$ 0.05% for a 50% load change approximately 3.6 mV PK-PK maximum Automatic current limit/foldback
Power	Fuse Power Power consumption with (4) SA611 emitters Fuse	T2.5 A (5 x 20) located on back panel 120/240 ACV internally switchable  < 60 W T250 mA (5 x 20 mm) @ 120V; T125 mA @ 240 V internal
Mechanical	Mechanical dimensions Weight Finish/material	8.5" w x 3.5" h x 9" d 9lbs. Black anodized aluminum

## ACCESSORIES

- RK1 - single rack mount kit
- RK2 - double rack mount kit
- BNC003 - RG59u BNC to BNC cable (3ft)

## **SOUND ASSOCIATES**

### **FULL THREE YEAR WARRANTY**

We, Sound Associates, Inc., warrant to you the original owner or any subsequent owner of each new Sound Associates infrared transmitter, emitter power supply, or emitter panel, that the unit is free of defects in workmanship and materials for a period of three years from date of original purchase. If the infrared product fails due to defects in materials or workmanship, or does not meet specifications enclosed with the product, Sound Associates will repair or replace the unit, whichever Sound Associates chooses, free of charge. All repairs will be conducted by trained personnel at Sound Associates' facility in reasonable time. All expenses on remedying the defect, including return shipping will be borne by Sound Associates. All shipping fees, taxes, duties, and other customs fees incurred by products being shipped between foreign countries will be borne by the purchaser.

Sound Associates is not responsible for malfunctions due to misuse, accident, or neglect. This warranty does not cover damage to other products resulting from Sound Associates product failure. It does not cover defects or damage caused by unauthorized modifications or service. Sound Associates reserves the right to change the design of any product without notice and with no obligation to make corresponding changes in products previously manufactured.

# Typical System Schematic

