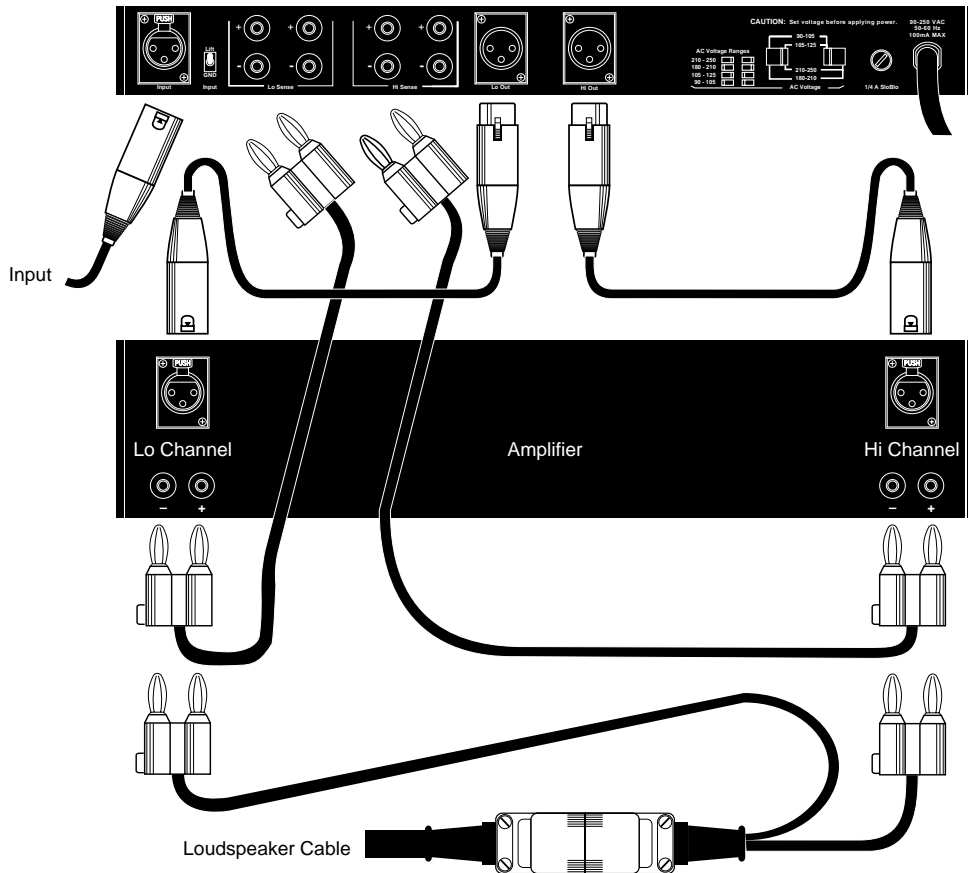


The Meyer Sound S-1 is a single-channel active signal processor designed for use with the USM-1 Loudspeaker. It occupies a single 1 3/4-inch rack space.

The functions of the S-1 are:

- Active crossover for bi-amplification
- SpeakerSense™ driver protection with MultiSense™ function
- True excursion limiting to protect the USM-1 drivers
- Loudspeaker frequency and phase response alignment



**Connections**

The S-1 operates at line level and is intended to be the final component in the signal chain before the power amplifier. Connections between the S-1 and the power amplifier should be made according to the diagram above.

**1. Signal inputs** to the S-1 may be either balanced or unbalanced. For best signal-to-noise ratio, use balanced connections operating at +4 dBu nominal. The S-1 will accept peak input levels up to +26 dBu balanced, or +20 dBu unbalanced.

**Note:** The S-1 utilizes Meyer Sound's exclusive ISO™ Input. Pins 1, 2 and 3 are transformer-isolated, and the connector shell is connected to earth ground. The Input GND/ Lift switch controls the connection between pin 1 and circuit common, which is tied to AC/chassis ground through a 500 ohm resistance. If hum problems occur, this switch may be used to control ground loops in the system.

**2. SpeakerSense™** connections are made from the output of the power amplifier back to the S-1 Sense inputs. The Hi output of the power amplifier must be connected to the Hi Sense input, and the Lo output of the power amplifier to the Lo Sense input .

The Sense connection **must** be made in order for the driver protection circuitry to operate properly.

**Note:** The S-1 Sense inputs incorporate Meyer Sound's exclusive MultiSense™ function, which allows use of multiple power amplifiers driven in parallel from a single S-1 and having different voltage gains and/or power ratings. The S-1 accommodates up to two power amplifiers, and provides a separate Sense input for each. The MultiSense circuit automatically tracks the power amplifier with the greatest output swing to control the system protection circuitry. **These inputs are polarity-sensitive: be certain that they are connected with correct polarity, as indicated on the S-1 rear panel.**

**3. Signal outputs** from the S-1 are active balanced at +4 dBu nominal operating level, with pin 1 tied to earth/chassis ground through a 500 ohm resistance. The maximum output level is +26 dBu balanced (+20 dBu unbalanced).

**4.** Connections between the power amplifier output and the USM-1 should be made in accordance with the **USM-1 Operating Instructions**. These connections **must** be verified for correct polarity and correct channel assignment (Hi to Hi, Lo to Lo).

**Operation**

Once all the connections have been made and verified, the system is ready to operate.

- The S-1 **Attn dB** level control should be set at minimum.
- Switch on the AC power to the S-1 first, then to the power amplifier.
- Set the power amplifier level controls (If any) to maximum.

- Advance the S-1 **Attn dB** level control to set the system sensitivity. If the system is not operating properly, recheck all connections.

**Note.** The Attn dB level control markings are merely a visual aid and should not be used to balance two systems. The output of the S-1 is calibrated only when the level control is fully clockwise.

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**Preset Panel  
Controls**

The setup controls on the S-1 Preset Panel are designed to be used to tailor the system response for particular applications. Remove the Preset Panel cover plate to adjust the controls.

**Safe Switch.** The S-1 incorporates three limiters in the SpeakerSense driver protection circuitry (see detailed description, below). When the **Safe** switch is engaged the RMS limiters come on at 6 dB lower power levels, affording added protection when heavy continuous power demands are placed on the system (the VHF peak limiter threshold is unaffected). For operator convenience, a green LED indicator is provided on the S-1 front panel and when the Safe switch is engaged, this indicator will light. **Note:** It is recommended that the **Safe** switch be engaged until the operator is familiar with the system's capabilities.

**VHF Switch and Control.** The **VHF** Switch affects the very high frequency response of the system. It selects either a preset (**CAL**) high frequency response or variable response (**VAR**). In the **VAR** position, system response around 16 kHz is adjustable (3/4 turn screwdriver adjustment) from +3 dB to -3 dB around the preset point (CW for increased level at 16 kHz). This feature may be used to emphasize or de-emphasize sibilants, compensate for room acoustics, etc.

**Lo Cut Switch.** This switch introduces a 6 dB/octave high pass filter at 160 Hz. It is designed to provide an alternative crossover slope when using Meyer Sound subwoofers, and can also be used to compensate for the proximity effect of cardioid microphones. For additional information, see **Use with Meyer Sound Subwoofers**.

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**SpeakerSense™  
Driver Protection**

Through the **Sense** connections back to the S-1 from the power amplifier, the **SpeakerSense** circuitry of the S-1 continuously monitors the voltage across both the high and low frequency drivers. If the amplifier output exceeds the safe operating limits of the drivers, independent high- and low-frequency limiters are automatically activated, holding down the power level of the S-1 outputs.

The operation of the SpeakerSense circuitry is indicated by a set of five LEDs located on the front panel.

**Sense** indicators. These function as signal presence indicators, and verify that the **Sense** connections to the S-1 are made. These indicators will be lit whenever a signal is present, or will flicker at low signal levels.

**Limit Indicators.** These indicators will come on whenever the corresponding limiter is activated, and a moderate amount of flashing of these indicators is acceptable. The HF and LF limiters have an attack time of 100 msec so they will **not** affect peaks in the program material, nor will they prevent momentary amplifier clipping on peaks.

**Limiter Operation**

To verify limiter operation in the field:

- Disconnect loudspeakers, leaving the amplifier and the S-1 in their standard connection configuration.
- If your amplifier requires a load, use resistive loads sufficient to dissipate the full power of the amplifier.
- Turn on both the S-1 and the amplifier.
- Set the **VHF** switch to **VAR**, the **Lo Cut** out, and the **Safe** switch in.

- Supply an input to the S-1, preferably a sine-wave oscillator. If you do not have an oscillator, use a microphone and a mixer to produce a line level signal. Set the input frequency according to this table:

	<b>Oscillator</b>	<b>Microphone</b>
LF limiter	200 Hz	low growl
HF limiter	5,000 Hz	loud whistle
VHF limiter	16,000 Hz	loud hiss

- Bring up the input until you see the corresponding limit indicator come on. Since the indicator will light only if the limiter actually operates, it provides a positive indication that the limiter is functioning.

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**Balancing  
Amplifier Gain**

The standard connection configuration for the S-1 Control Electronics Unit uses a single two-channel amplifier as a biampifier, one channel for the lows and one for the highs. In large systems where a number of S-1's are used, some may prefer to assign one or more amplifiers only to the lows, and other amplifiers only to the highs. In either case, the Lo and Hi amplifiers must have equal voltage gain. If they do not, you may balance your system using an oscillator and an RMS-reading voltmeter.

- Connect the S-1 and amplifiers as you wish to use them, **leaving speakers disconnected**.
- If an amplifier requires a load, use an 8-ohm resistor sufficient to dissipate the full power of the amplifier.

- Input the oscillator to the S-1 and set its frequency to 1400 Hz  $\pm$ 5 Hz (Use a frequency counter if possible).
- Set the S-1 **Lo Cut** switch out, the **VHF** switch to **CAL**, and the **Safe** switch out.
- Measuring with the voltmeter at the **Hi** amplifier output, advance the S-1 **Attn dB** control to a convenient reading (a few volts).
- Now measure at the **Lo** amplifier output, If the level is different, adjust the input level control of the amplifier whose output voltage is higher until the Hi and Lo outputs are equal.

<b>Specifications</b>	Input Type <sup>1</sup>	Balanced ISO-Input™; 10k ohms, 5k ohms per leg
	Output Type	Active push-pull, 600 ohms output impedance
	Maximum Input Level	
	Balanced	+26 dBu
	Unbalanced	+20 dBu
	Maximum Output Level	
	Balanced	+26 dBu
	Unbalanced	+20 dBu
	Hum and Noise <sup>2</sup>	<-90 dBV
	Dynamic Range <sup>3</sup>	108 dB
<b>Note 1:</b>	Sense Inputs	10k ohms true differential, opto-isolated
<b>ISO™ Input: Pins 1, 2 and 3 are transformer-isolated, and shell is connected to chassis/AC earth ground.</b>	Electronic Crossover Frequency	1400 Hz
	Low Frequency Delay Type	Active all-pass
<b>Note 2:</b>	Driver Protection Circuitry	
“A”-weighted, unbalanced.	Low Frequency	RMS limiter, 100 msec. integration time LF excursion limiter (instantaneous)
<b>Note 3:</b>	High Frequency	RMS limiter, 100 msec. integration time VHF peak limiter, 2 msec. on-time, 35 msec. release time HF excursion limiter (instantaneous)
	Indicators	
	Sense/Amplifier Gain Detect; Hi and Lo	Green/Red LEDs
	RMS Limiter, Excursion Limiter; Hi, Lo and VHF	Red LEDs
	Safe	Green LED
	Power Supply	Green/Red LED
	Controls	
	Front Panel	Input attenuator, AC power switch
	Preset Panel	Lo Cut switch, Safe switch, VHF var/cal switch VHF control (3/4-turn screwdriver adjust)
	Rear Panel	Ground lift switch, AC range switches
	Connectors	
	Balanced Input/Output	3-pin XLR (A-3) female/male
	Sense Inputs	Banana jacks (4 dual)
	Power	90-125/180-250V AC, 50/60 Hz (rear-panel switchable)
	Physical Dimensions	19" W x 1¾" H x 7¾" D, standard rack mount
	Weight	8 lbs (3.6 kg)