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**SPL 6000**  
**OWNERS MANUAL**

P/N 038866

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# OWNERS MANUAL

## SPL6000

### TWO CHANNEL POWER AMPLIFIER

Sunn is a product line of FMIC

## Table of Contents

|                                    |    |
|------------------------------------|----|
| Description of Features .....      | 4  |
| Basic Connections and Wiring ..... | 8  |
| Amplifier Operation .....          | 10 |
| Specifications .....               | 11 |

## SPL6000 Features

300 Watts per channel.

600 Watts into 8 ohms, mono bridge.

High current design for reactive loudspeaker loads.

Soft clipping and gracious overload characteristics.

Silent delayed turn-on and turn-off.

Triac "crowbar" loudspeaker protection.

Forced air cooling with automatic 2 speed fan.

Full input connector complement with TRS phone jacks and male and female XLR connectors. High current

5-way binding posts and phone jacks for speaker output.

Rugged "road proof" 14 gauge steel chassis construction.

Uniform gradient heat exchanger for high reliability.

Two rack space high (3.50 inches) chassis.

## SPL6000

### Two Channel Power Amplifier

Your new Sunn SPL6000 Power Amplifier is designed to provide you with years of trouble free service for both permanent and portable applications. Utilizing a unique proprietary cross coupled protection system, the SPL6000 can deliver more power into multiple loudspeakers than is possible with the more conventional approaches for VI, current limiting and load fuses. Other features also include silent delayed turn-on and off, Triac "crowbar" loudspeaker protection, full input/output connector complement, and a rugged "Road Proof" 14 gauge steel chassis construction. Designed for the most demanding professional applications, the SPL6000 delivers sound quality equal to the most esoteric and expensive Hi-fi amplifiers on the market today.

# Description of Features

## 1. FRONT PANEL

### A - PEAK LED INDICATOR

The red Peak LED Indicator illuminates when the output voltage of the amplifier reaches clipping (maximum output voltage). The threshold for the peak indicator automatically adjusts for load impedance and supply voltage variations.

### B - LIMIT SWITCHES

The Limit Switch is used to defeat the internal compressor circuit.

### C - INPUT LEVEL CONTROLS

Two continuously variable attenuators control the amplifier's input sensitivity. Control settings can vary between zero attenuation (maximum clockwise rotation) and infinite attenuation (maximum counter-clockwise rotation). At the full clockwise rotation, a +1.8dBv input signal is required for rated output. Each gain control is independent except for the Mono Bridge mode where Channel A is the active control and Channel B is deleted. Refer to the Amplifier Operation section (page 5) for additional information on proper adjustment of the input level controls.

### D - POWER LED INDICATOR

This LED is illuminated when the amplifier is turned on and main voltage is present. If this indicator does not light when the power switch is turned on (and does not trip the circuit breaker) then check the supply of AC power.

## 2. REAR PANEL

### E & F - OUTPUT CONNECTORS

Each channel is provided with a single 1/4" phone jack (E) and a pair of five-way binding posts (F) which will accommodate a single pair of dual banana plugs (multiple stacked banana plugs are not recommended as they tend to fall out), spade lugs or bare wire. If the speaker wire is terminated with spade lugs, make sure that the lugs are tin or gold plated brass or copper, not plated steel. Non-linear contact resistance phenomena will degrade the sonic integrity of any amplifier at the speaker/amplifier interface. The channel A and channel B outputs are spaced on 0.75 inch centers so that one "double banana plug" can be used for bridged operation. During performance verification measurements, use the five-way binding posts only.

### CAUTION:

**Do not operate the amplifier in the two channel (stereo) mode with a load impedance of less than 4 ohms connected to either channel.**

**Do not operate the amplifier in the Bridged Mode with a load impedance of less than 8 ohms.**

## **G - MODE SELECT, STEREO/MONO BRIDGED**

One two-position switch (left rear panel) selects either the normal stereo or mono bridge mode. With the button in the “out” position the amplifier is configured for the normal two-channel stereo mode of operation. With the button in the “in” position, the amplifier is in the mono bridged mode.

## **H - MODE SELECT, DUAL MONO/STEREO**

This switch (right hand rear panel) connects the amplifier inputs together to allow channel A and B to be summed (mixed) for non-bridged mono operation. In the dual mono and the stereo mode of operation, both input attenuators control their respective channels.

In the Bridged Mode of operation, speaker output is taken across the two red (positive) output terminals. The Channel A terminal is the positive output terminal and the Channel B terminal is the negative terminal for Bridged operation only.

### **CAUTION:**

**In the Bridged Mode of operation, the load floats and is NOT chassis ground referenced.**

## **I, J & K - INPUT CONNECTORS**

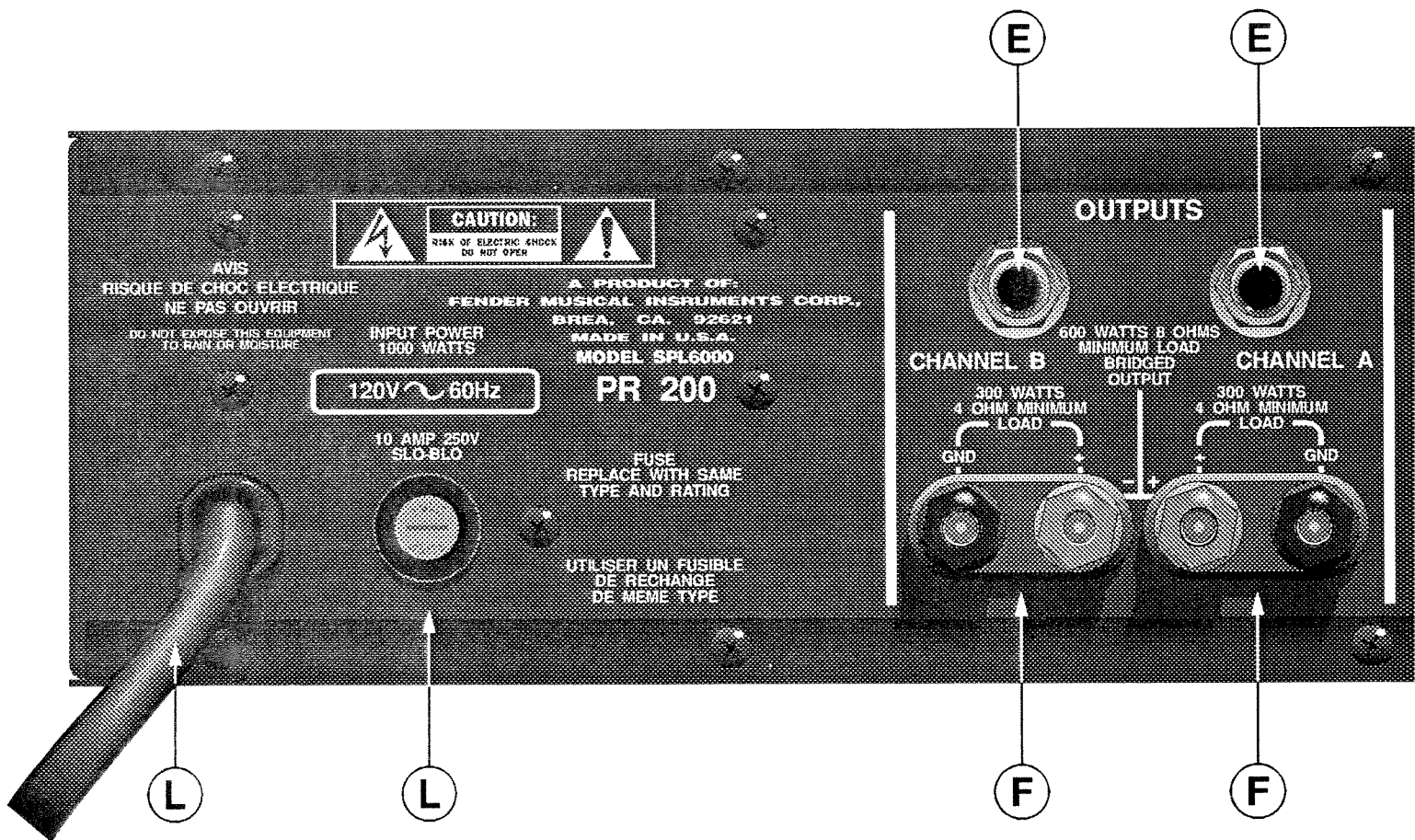
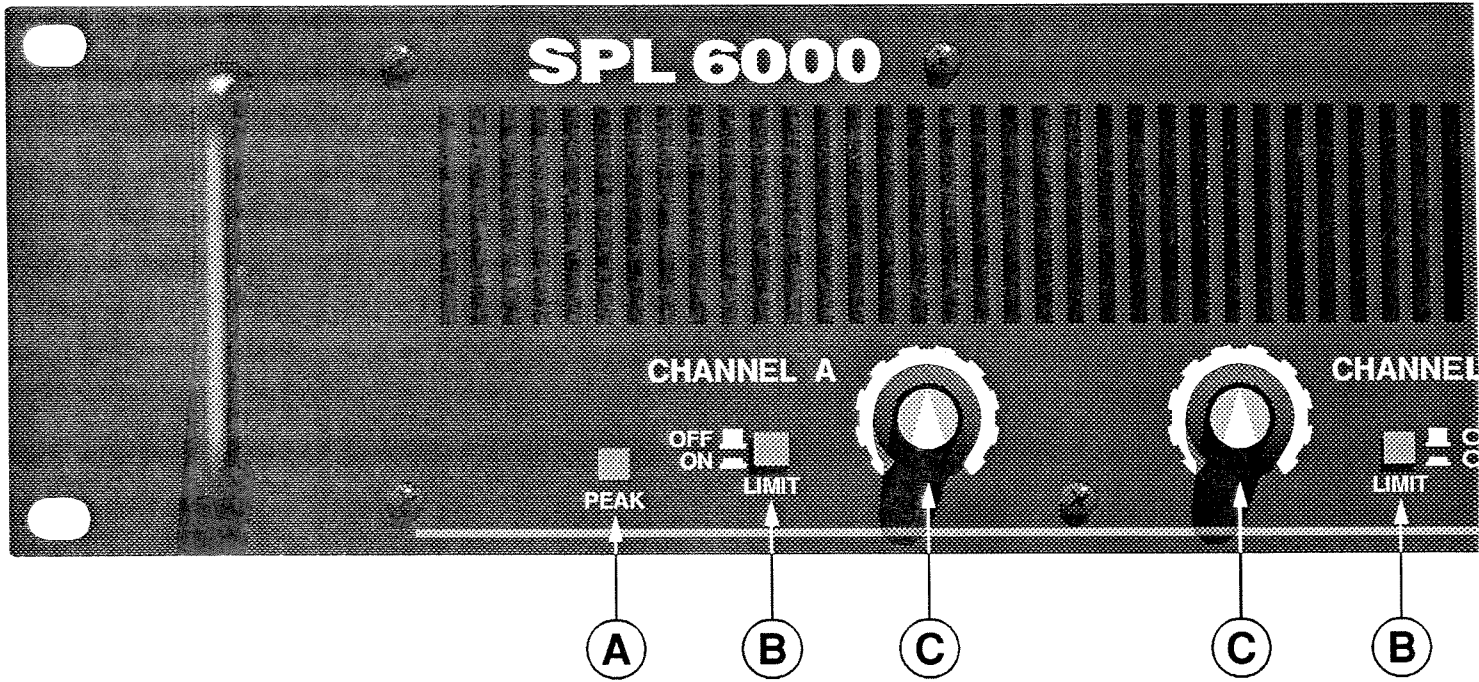
Each channel is provided with a Female XLR (I) and Male XLR (J) connectors for easy “Daisy Chain” operation of multiple channels in large systems, and a 1/4 inch tip-ring-sleeve (stereo) phone jack (K). Each input is electronically balanced and will accept signals from balanced sources (either active or transformer) or from unbalanced circuits. Pin #2 is the positive pin on the XLR connectors.

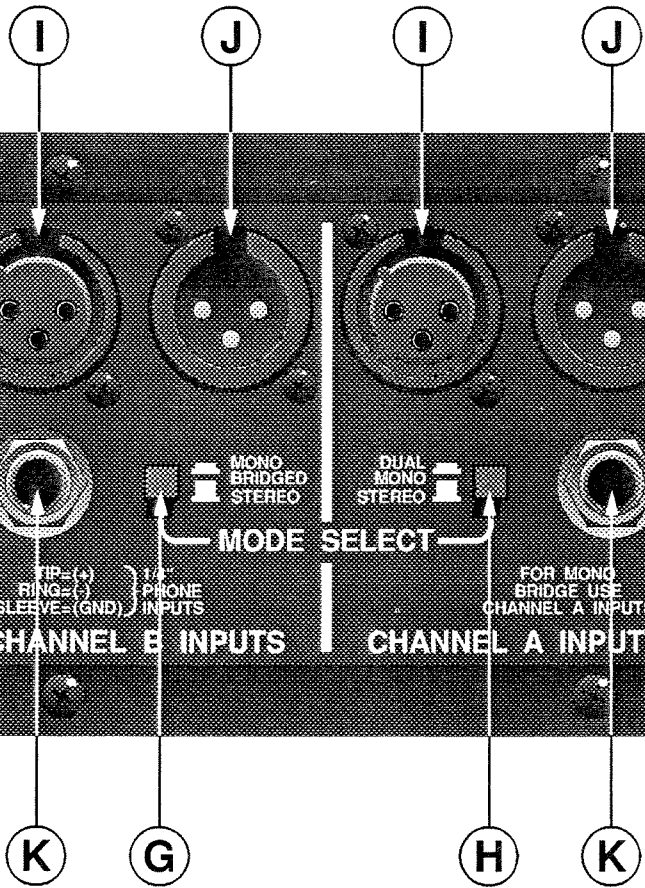
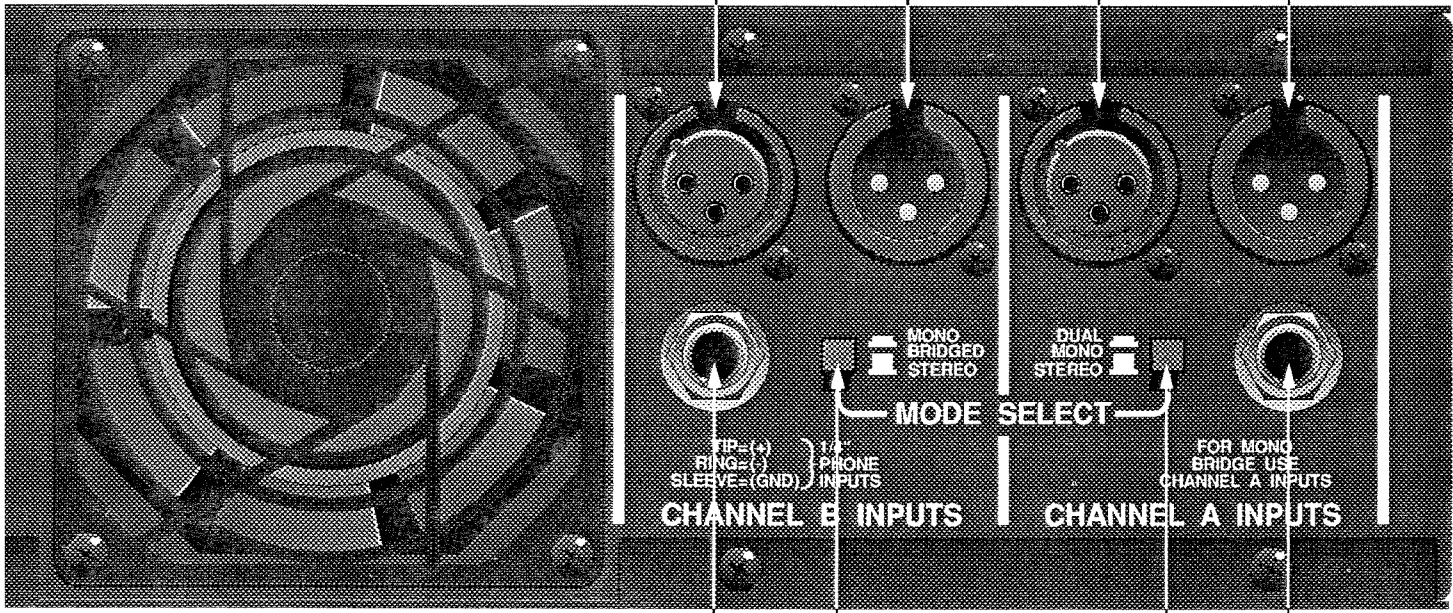
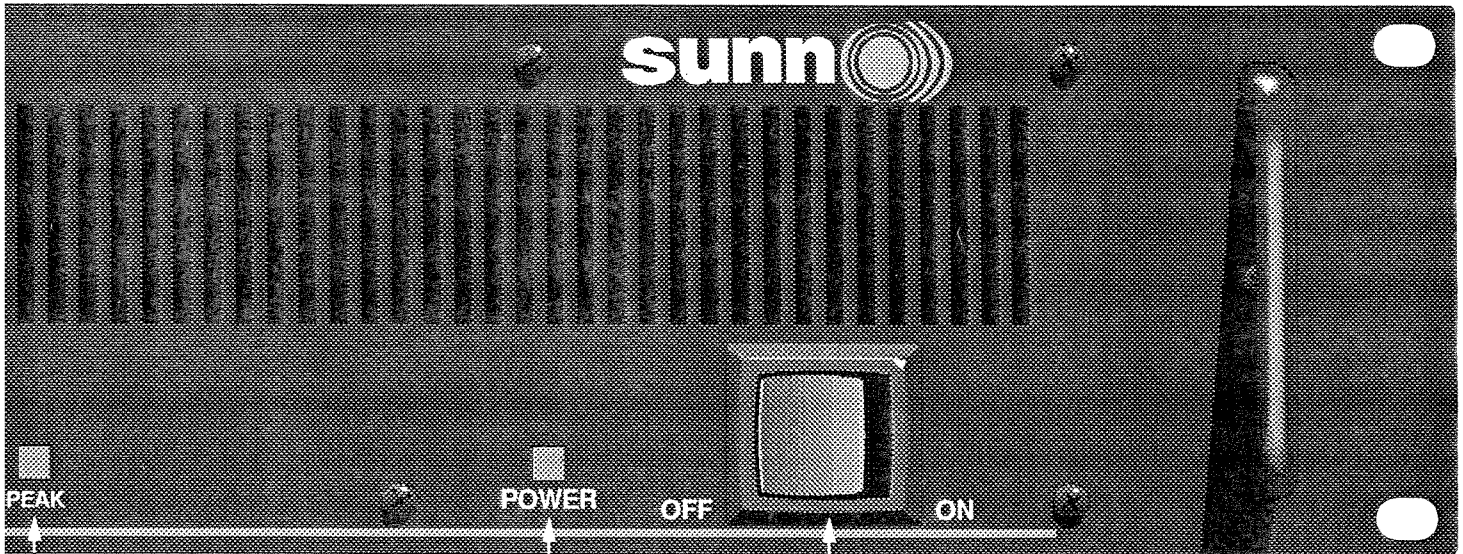
## **L - AC POWER CORD**

This must be connected to a source of 120V, 50 to 60 Hz AC power with a current capability of at least 15 amps. Normal electrical code in the U.S. specifies a 20-amp limit on normal wall outlets. Therefore, each SPL6000 should be connected to an independent circuit if continuous full power operation is required. As a general guideline it is accepted to connect two (2) SPL6000 amplifiers to one (1) 20-ampere circuit provided the load is limited to 4-ohm loudspeakers on each channel and the signal source is full range music or speech. If you are going to heat up resistors with a sine wave, you will need a separate 20-ampere circuit for each amplifier.

## **M - EXTERNAL FUSE**

When necessary, replace the external fuse ONLY with one of the same type and rating as shown on the label directly above the external fuse holder.





## ***Basic Connections and Wiring***

Power and audio signal cables are the most common sources of sound system failure. Well made and carefully maintained cabling is essential to the reliability of the whole system. If long speaker cables are required, make sure the wire is of sufficient size to transfer all the available amplifier power to the speakers rather than absorbing power itself. As a rule of thumb, the larger the wire, the better (larger wire has smaller “gauge number”).

We have listed the smallest wires (the highest numbered gauges) recommended for best results. To make it simple, we'll assume you're operating under worst case conditions, with 4 ohm loads; 8 ohm operation will improve results with the same wire, and 2 ohm operation requires still heavier wire because the cable resistance is a higher percentage of the total load on the amplifier.

Large diameter (small gauge number) wire is expensive and long cables made from it are heavy. Rather than running long speaker cables, it is better to locate power amplifiers near speakers and run a line-level signal cable over the long distance to the amplifier. This approach eliminates most of the signal loss due to speaker cable resistance so the speakers will be fed all the amplifier's power without the need for heavy cables. It can actually save money in many instances.

Always use stranded wire for three reasons:

- (1) It is more flexible and less prone to metal-fatigue breakage.
- (2) If an end is nicked while insulation is being stripped for connection, only one or two strands will break, not the entire wire.
- (3) There is some evidence, though disputed, that higher frequency audio signals flow along the outside of each conductor (skin effect): if this is so, the more strands, the lower the effective cable resistance to high frequencies.

In cases where speakers and power amplifiers are located far away from the signal source (be it a mixer or a preamp), “balanced line” signal cables are a wise choice.

### **CAUTION:**

Never use coiled cords for speaker hookup, even in an emergency. Coiled guitar-type cords usually have higher internal resistance than the speakers themselves. This is due to the light-gauge wire used to keep the coil cords flexible. These cords will prevent most of the power from reaching the speakers. In high power operation, a coil cord can melt, cause a fire hazard, and possibly damage the amplifier. As a general rule, guitar-type connecting cords, both straight and coiled, make poor speaker cables.

The SPL6000 can produce enough power output to damage electronic equipment connected to its output. Besides being capable of destroying speakers, under certain circumstances shock and/or fire hazards are possible. High power amplifiers should always be properly applied and used with care in clean and dry

environment.

If you've mounted all your sound equipment in a rack or portable case, you can ensure that everything stays calibrated by marking the settings of the necessary controls. Small pointers made from masking tape are visible in dim light, and can be removed with alcohol or rubber cement thinner without damage to the paint on most front panels, including those of the SUNN amplifiers. However, be sure to check the finish in an inconspicuous place to determine the suitability of any cleanser.

Assuming you're NOT turning all the equipment on at once with a switched power receptacle "strip," be sure to turn on the power amplifier last. This will prevent turn-on "thumps" from the mixer or other pieces of gear from possibly damaging speakers. The reverse logic should be used--turn OFF the amplifier FIRST--when shutting the system down.

The SPL6000 is timed to turn on the speaker outputs after the amplifier's power supply is fully charged up, thus preventing any turn-on noise. Timing of the amplifier's turn-on circuit is usually sufficient to accommodate all the turn-on anomalies from other pieces of gear in a system, making it acceptable to use a single switched power string in a permanent or semi-permanent system.

#### CAUTION:

The SPL6000 can draw a lot of AC power. Be sure the AC power source for your AC distribution system has adequate current capability to bear the entire load with an extra margin of safety. If you use a power strip with a built-in circuit breaker, make sure the breaker is rated for sufficient current to handle its load as well.

In multiple amplifier installations, we recommend sequential turn-on (either manually or via timed relays) to avoid a sudden, major drain on the AC line.

You should keep in mind that the severe reduction of power line voltage affects the amount of power you can get FROM the amplifier. If you need to run long AC extension cords, make sure their conductors are as large as practical (small gauge number). Just as smaller diameter wire causes speaker line loss, smaller power lines cause loss. However, the effect of small AC lines is one of the intermittent clipping under severe conditions.



## ***Amplifier Operation***

This procedure applies to stereo, mono, or bridged operation into a full-range loudspeaker system which uses a passive high-level crossover (or none at all). If you are using the SPL6000 in a multi-amplified system with an electronic or low-level passive crossover, the INPUT LEVEL controls on the amplifier are generally set to maximum (zero loss), and all level controlling is done at the crossover (skip step 10):

1. Turn all equipment OFF.
2. Plug the amplifier into a source of 120 volt, 50-60Hz AC power. Follow the precaution mentioned earlier in this manual about the current capability of the power circuit.
3. Connect the wiring from the signal source(s) to the amplifier's input jack(s).
4. Select the appropriate settings for the MODE switches.
5. Connect the speaker(s) to the output terminals, as appropriate for the setting of the MODE switch.
6. Adjust the INPUT LEVEL controls to their minimum (infinity) setting.
7. Turn everything else ON except the amplifier.
8. Adjust the controls on the signal source for "normal" indications on the source's meter or level indicator. If there is no metering, then set the master control at zero (minimum).
9. Turn the amplifier ON.
10. Adjust the INPUT LEVEL control(s) to maximum. Carefully advance the master control on your signal source until the sound level from the speaker is just past the "correct" level; i.e. just a little bit too loud. Remove the input signal from the source, leaving the master control (and any input controls on the source) set as they were. If the system is noisy (hissy), reduce the setting of the INPUT LEVEL control(s) slightly and repeat this step. You must "jiggle" the settings of the source's controls until you find a combination that gives you the desired amplifier output, freedom from clipping caused by excessive output demands placed on the signal source, and poor signal-to-noise performance caused by excessive amplifier gain.

# Specifications

## OUTPUT POWER

Stereo Continuous sine wave output power,  
both channels driven +/- 1dB, 20 Hz to 20 kHz  
with 120 VAC line voltage:

8 ohms 150 watts each channel  
4 ohms 300 watts each channel

## Mono Bridge

16 ohms 300 watts  
8 ohms 600 watts

## Single channel Driven @ 1 kHz, 1% THD:

8 ohms 179 watts  
4 ohms 312 watts  
2 ohms 250 watts

## POWER BANDWIDTH

10 Hz to 68 kHz  
(3 dB down points from rated power at less than 0.1% THD)

## FREQUENCY RESPONSE

+0 -3 dB; 5 Hz to 68 kHz (at rated power, 8 ohms)

## RISE TIME

Less than 5.2 uSec

## SLEW RATE

Greater than 13.5V/uSec

## TOTAL HARMONIC DISTORTION (THD)

20 to 20 kHz at rated power  
4 ohms Less than 0.03%

## HUM AND NOISE

Below rated output, 4 ohms  
20 Hz to 20 kHz broad band 95 dB  
IEC A Weight 102 dB

## DAMPING FACTOR

Ref., 8 ohms  
5 Hz to 20 kHz Greater than 30  
1 kHz Greater than 175

## INPUT IMPEDANCE

Differential 33k ohms

## CHANNEL SEPARATION

below rated power, single channel operating  
1 kHz Greater than 65 dB.

## SENSITIVITY

Reference 1 kHz, +/- 0.25 dB  
Stereo Mode +1.8 dBv (1.23v)  
Bridged Mode 1.8 dBv

## STATUS INDICATORS

Each channel  
Peak LED (red)  
Power LED (red)

## THERMAL PROTECTION

## COOLING

Two speed fan

## GAIN CONTROLS

continuously variable attenuator. One per channel.

## MODE SWITCHING

Stereo-Mono Bridge Dual Mono Two push button switches

## POWER REQUIREMENTS

120v, 50 to 60 Hz, 10 amps

## WEIGHT

25 lbs.

## DIMENSIONS

### Width

19 inches

### Height

3 1/2 inches

### Depth

14 7/8 inches (13 3/8 inches behind the front panel not including connectors)

SUNN IS A PRODUCT LINE OF  
**FENDER MUSICAL INSTRUMENTS CORP.,**  
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