

# SPL 9000 Owner's Manual

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P/N 041597



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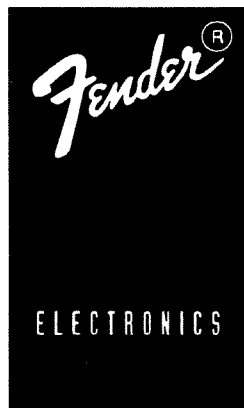
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## SPL-9000 Features

- Stereo, Dual mono, or bridged mono operation
- 450 Watts per channel at 4 ohms
- 900 Watts bridged mono at 8 ohms
- Rugged road worthy chassis with rear rack supports
- Dual speed forced air cooling with removable filter
- High current design for reactive loudspeaker loads
- Computer logic controlled short circuit protection with independent LED signal status indicators
- Soft clipping and gracious over load characteristics
- Silent delayed turn-on and turn-off
- Triac "crowbar" loudspeaker protection
- Full input connector compliment with TRS phone jack, and male and female XLR type connectors that work with balanced and unbalanced signals
- High current 5-way binding posts and phone jacks for speaker outputs

## **FENDER-SUNN SPL 9000 PROFESSIONAL DUAL CHANNEL POWER AMPLIFIER**

Your new Sunn SPL 9000 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 SPL 9000 can deliver more power into multiple loudspeakers than is possible with the more conventional approaches for VI, current limiting and load fuses. Other feature 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 SPL 9000 delivers sound quality equal to the most esoteric and expensive HiFi amplifiers on the market today.



**FENDER MUSICAL INSTRUMENTS CORP.,  
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# Description of Features

## 1. FRONT PANEL

### Signal LED Indicator

The green signal LED is a multifunction signal indicator that informs the operator as to whether or not the channel is in the active status. Upon turn on, the LED turns on after a several second timing cycle delay. The LED will turn off if either the short circuit protection circuitry is activated or if excessive heatsink temperature is reached. During short circuit conditions, or a load of too low an impedance, the circuitry will interrogate the load, turn off the power amplifier and automatically reset when the abnormal load is corrected. Thermal cycling times are somewhat longer, typically measuring in minutes rather than seconds. If for some reason a channel thermals off, the fan will be in the high speed mode of operation.

### 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.

### Input Level Controls

Two (2) 41-position attenuators control the amplifier's input sensitivity. Control settings can vary between zero attenuation (maximum clockwise rotation) and infinite loss (maximum counter-clockwise rotation). At the full clockwise rotation, a +5dBu input signal is required for rated output for two channel operation and for Mono Bridge operation. Each

gain control is independent except for the Mono Bridge mode of operation where Channel A is the active control & Channel B is defeated. Refer to the Amplifier Operation section (page 9) for additional information on proper adjustment of the input level controls.

### Power LED Indicator

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

### Removable Air Filter

The front air filter is user removable in the event that it becomes dirty and obstructs air flow. **MAKE SURE THAT THE AMPLIFIER IS UNPLUGGED BEFORE REMOVING COVER.** Simply remove the black air filter cover panel by removing the four Phillips head screws that hold it to the front panel.

## 2. REAR PANEL

### Output Connectors

Each channel is provided with a single 1/4" phone jack and a pair of five-way binding posts. 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.

### 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.

### Mode Switching

The amplifier is capable of three different operating modes via the "Stereo / Mono" switch and the "Bridge Mono / Stereo" switch. If the "Bridge Mono / Stereo" switch is "in" then the amplifier is in Bridge Mono operation regardless of the position of the "Stereo / Mono" switch. In Bridge mono mode, only the Channel A input connectors and Level Control are active. 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 Bridge operation only.

**CAUTION:** In Bridge Mode of operation, the load floats and is not chassis referenced.

If both of the switches are "out", then the amplifier is in Stereo Mode and each channel of the amplifier functions independently with Channel A's input feeding Channel A's amplifier and Channel B's input feeding Channel B's amplifier.

With the "Stereo / Mono" switch in the "in" position and the "Bridge Mono / Stereo" switch in the "out" position, the two inputs are passively summed together before the level controls. Therefore, if a signal is only applied to the "A" input, this

# Front Panel

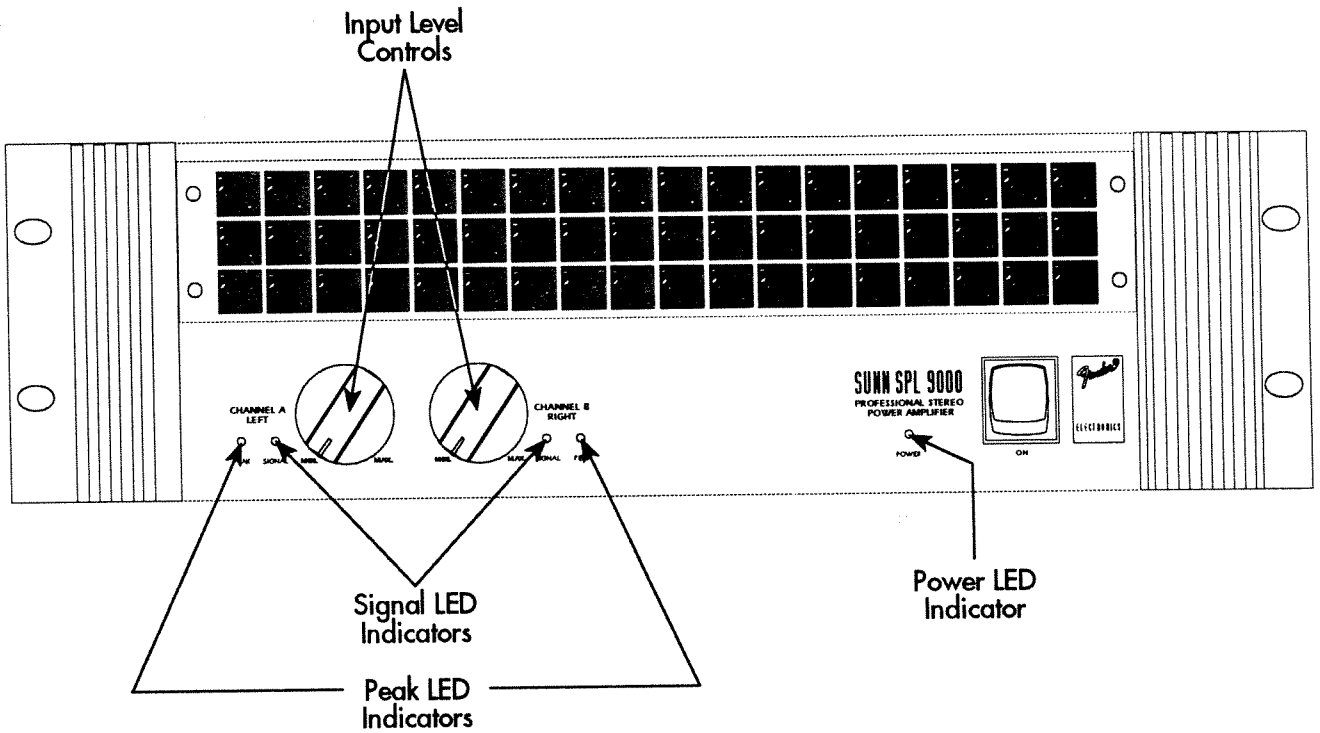


FIGURE 1

# Rear Panel

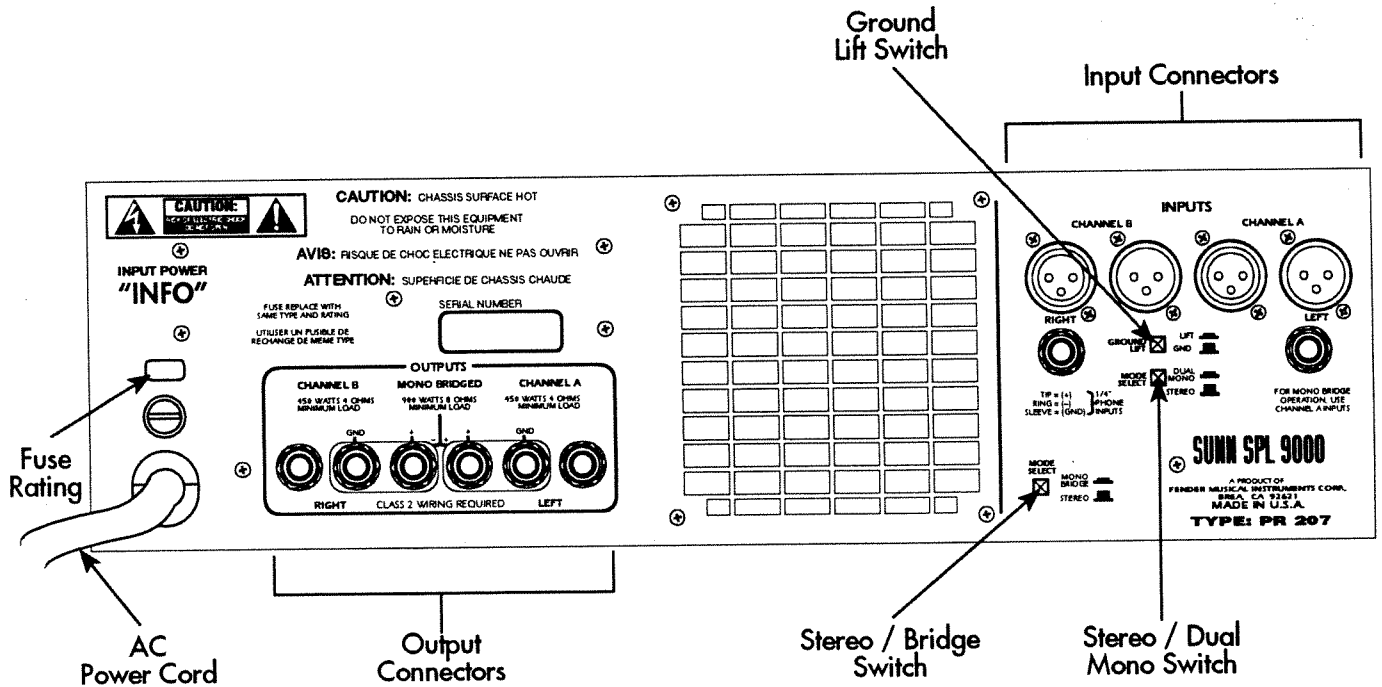


FIGURE 2

signal will be sent to both level controls and amps so that patch cords are not required for two-channel mono operation.

If different signals are connected to each of the inputs in dual mono operation, the signals will be passively summed and sent the level controls.

Summing two signals at the power amp in this manner is not recommended.

Instead, any summing (mixing) should be performed at the mixer.

#### Ground Lift

Occasionally, a ground loop can develop around two pieces of audio equipment which will cause a humming noise to be amplified and fed to the speakers. If the equipment (like the SPL 9000) and cables used are balanced, any hum induced by the ground loop should be eliminated. If one of the devices or cables in the ground loop is not balanced, however, the sound system may hum. With the Ground Lift switch "out", the SPL 9000 already provides some protection against ground loops in most situations.

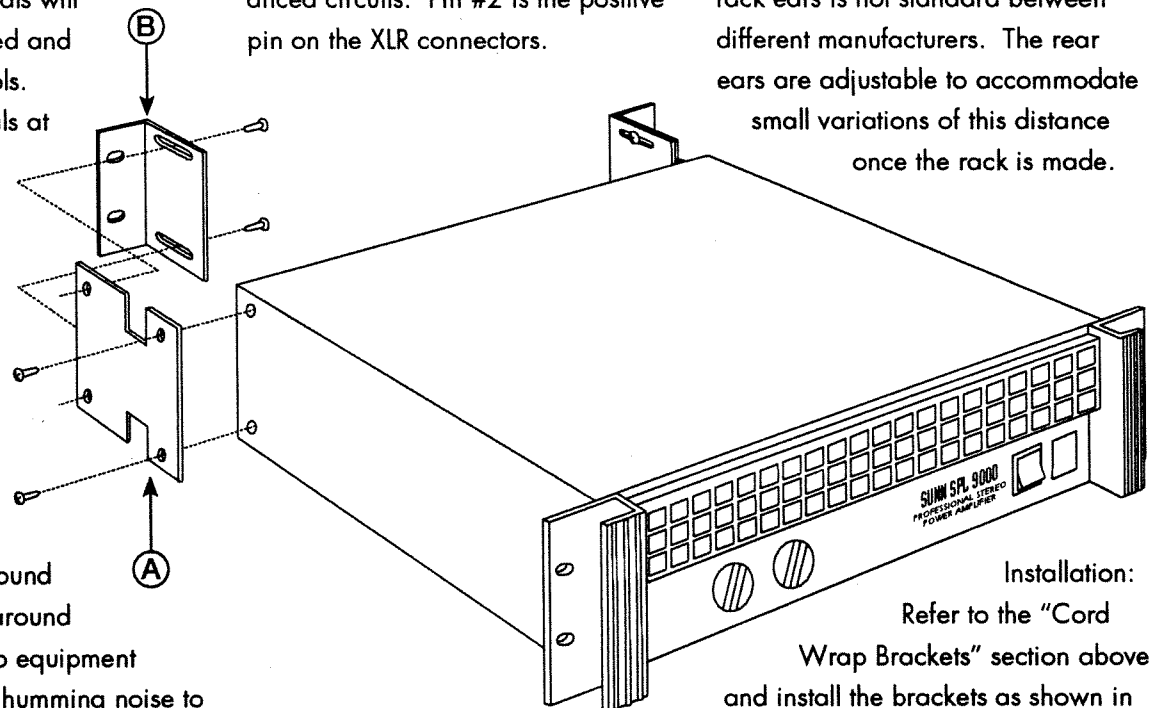
If humming due to ground loops persists, more isolation can be obtained by setting this Ground Lift switch in the "in" position.

#### Input Connectors

Each channel is provided with Female and Male XLR connectors for

easy "Daisy Chain" operation of multiple channels in large systems, and a 1/4 inch tip-ring-sleeve (stereo) phone jack. 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.

the included stamped metal "L" shaped rear rack ears be used to support the back of the amplifier. In order to use the rear rack rails, a rack normally has to be designed around the amplifier because the distance between the front and rear rack ears is not standard between different manufacturers. The rear ears are adjustable to accommodate small variations of this distance once the rack is made.



**Figure 3**

### 3. CORD WRAP BRACKETS

Brackets are supplied with the amplifier to act as a cord wrap. Using four of the supplied screws, the two stamped metal "H" shaped brackets (part A) can be attached to the amplifier as shown in figure 3 and the cord can be wrapped around the two brackets during transport. These brackets also serve to protect the amplifier's rear terminals in the event that it is turned up on it's back.

### 4. REAR RACK EARS

If the SPL 9000 is to be mounted in a rack, it is highly recommended that

Installation:  
Refer to the "Cord Wrap Brackets" section above and install the brackets as shown in Figure 3. Next install the Rear Rack Ears (part B) to the rear rack rails in the orientation shown. If installed correctly, the oblong holes will be used to attach the ears to the rear rails and the sides with the slots will be inside the rack, parallel to the sides. Place the amplifier into the rack and screw it down using only the front rack ears (handles). Go to the rear of the rack and insert screws (supplied) through each of the slots in the ears and screw them into the threaded holes in the cord wrap brackets.

## 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 SPL 9000 in a multi-amplified system with an electronic or low-level passive crossover, the INPUT LEVEL controls on the amplifier are generally set to maximize (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 AC power.
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 speakers(s) to the output terminal, as appropriate for the setting of the MODE switches.
6. Adjust the INPUT LEVEL controls to their minimum (infinity) setting.
7. Turn everything 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. After a short delay, the OPERATE indicator should illuminate.
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 system 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) by one "click" and repeat this step. You must "juggle" the settings of the source's controls and the amplifier'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.

**WARNING: NO USER SERVICEABLE PARTS INSIDE, REFER SERVICING TO QUALIFIED PERSONNEL ONLY.**

**THIS AMPLIFIER IS EQUIPPED WITH A GROUNDING TYPE SUPPLY CORD TO REDUCE THE POSSIBILITY OF SHOCK HAZZARD. BE SURE TO CONNECT IT TO A GROUNDED AC RECEPTACLE. DO NOT ALTER THE AC PLUG.**

## 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 (see table below). 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 several 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,

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 coax cord can melt, cause a fire hazard, and possibly damage the amplifier. As a general rule, guitar-type (coax) connecting cords, both straight and coiled, make poor speaker cables.

The SPL 9000 can produce enough power output to damage electronic equipment connected to its output.

Besides being capable of destroying speakers, under certain circum-

stances shock and/or fire hazards are possible. High power amplifiers should always be properly maintained and used with care in clean and dry environments.

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 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 SPL 9000 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 perma-

Length* up to:	25 Feet	25 to 50 Feet	50 to 100 Feet
Minimum Wire Size	#16 AWG	#14 AWG	#12 AWG
Cross Section	1.31 mm <sup>2</sup>	2.08mm <sup>2</sup>	3.31mm <sup>2</sup>
<p>* Length of dual conductor cable ( i.e. the 100-foot run specified here from amplifier to speaker represents a 200-foot round trip ).</p> <p>** Small diameter wire = high gauge #, large wire = low gauge #, AWG is an abbreviation for American Wire Gauge</p>			



nent or semi-permanent system.

**CAUTION:**

The SPL 9000 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 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 intermittent clipping under severe conditions.

# Specifications

TYPE:	PR 207
PART NUMBER	120V~60Hz: 071-9000-000 230V~50Hz: 071-9000-060 240V~50Hz: 071-9000-040
OUTPUT POWER	Continuous sine wave output power, both channels driven, +/- .5dB 20Hz with 120 VAC line voltage:
Stereo	250 watts 450 watts
8 ohms	
4 ohms	
Mono Bridge	500 watts 900 watts
16 ohms	
8 ohms	
Single channel	Driven @ 1kHz, 1% THD:
8 ohms	300 watts
4 ohms	532 watts
POWER BANDWIDTH	22Hz to 25 kHz (3 dB down points from rated power at less than 0.1% THD)
FREQUENCY RESPONSE	+0.3dB; 22Hz to 25kHz (at rated power, 8ohms)
RISE TIME	Less than 6.0uSec
SLEW RATE	Greater than 25V/uSec
TOTAL HARMONIC DISTORTION (THD)	20Hz to 20kHz at rated power
8 ohms	Less than 0.03% No filters
4 ohms	Less than 0.03% No filters
SMPTE INTERMODULATION DISTORTION (MD)	60Hz and 7kHz; 4:1, at rated output power
8 ohms	Less than 0.02%
4 ohms	Less than 0.1%
TRANSIENT INTERMODULATION DISTORTION (TIM)	DIM 100
8 ohms	Less than 0.025%
4 ohms	Less than 0.05%
HUM & NOISE	Below rated output, 8 ohms
20Hz to 20kHz broad band	100dB
IHF A rated	105dB
DAMPING FACTOR	Ref., 8 ohms
10Hz to 20kHz	Greater than 50
1kHz	Greater than 240

# Specifications

INPUT IMPEDANCE Differential	20K ohms
CHANNEL SEPARATION 1kHz	Below rated power, single channel operating Greater than 80dB
SENSITIVITY Stereo Mode, 8 ohms Stereo Mode, 4 ohms Bridged Mode, 8 ohms Bridged Mode, 16 ohms	Reference 1kHz, +/-0.5dB +6dBu (1.53V) +5dBu (1.40V) +5dBu (1.38V) +5dBu (1.45V)
VOLTAGE GAIN Stereo Mode Bridged Mode	Reference 1kHz, +/-0.5dB 31dBu (28.24V/V) 37dBu (58.00V/V)
STATUS INDICATORS Peak LED Signal LED Power LED	Each channel (red) (green) (green)
THERMAL PROTECTION	Independent LED indicates thermal shutdown
COOLING	Two speed fan
GAIN CONTROLS	41 position attenuator, One per channel
MODE SWITCHING Stereo-Mono Bridge	Two push button switches
POWER REQUIREMENTS	100-120VAC, 50 - 60Hz, 12 amps 230-240VAC, 50Hz, 6 amps
WEIGHT	40 lbs.            ( 18 kg )
DIMENSIONS Width Height Depth	19 inches            ( 48.3cm ) 5-1/4 inches        ( 13.3cm ) 14-7/8 inches       ( 37.8cm ) (13-3/8 inches       ( 33.9cm ) behind the front panel not including connectors)

# Notes

**Notes**

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**BREA, CA 92621**