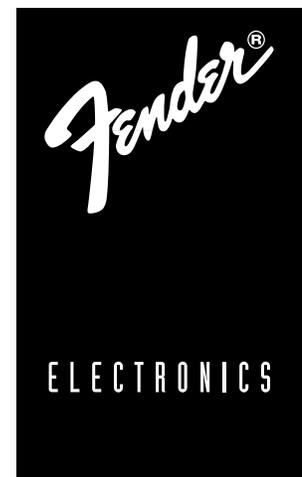


# Power Amplifiers



From Fender Pro Audio

Owner's Manual for  
SPL-6000  
P/N 038866



# OWNER'S MANUAL

## SPL-6000

### TWO CHANNEL POWER AMPLIFIER

## **SPL-6000**

### **INTRODUCTION**

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Your new Fender SPL-6000 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-6000 delivers more power into multiple loudspeakers than more conventional approaches for VI, current limiting and load fuses. Other features include silent delayed turn-on and off, triac "crowbar" loudspeaker protection, full input/output connector compliment, and a rugged "Road-Proof" 14 gauge steel chassis construction.

In order to thoroughly understand the operation, features and functions of your power amplifier, please read and refer, as needed, to this owner's manual. By doing so, your amplifier is sure to provide you with years of trouble-free service.

### **AMPLIFIER OPERATION**

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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-6000 in a multi-amplifier 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 power source.
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).

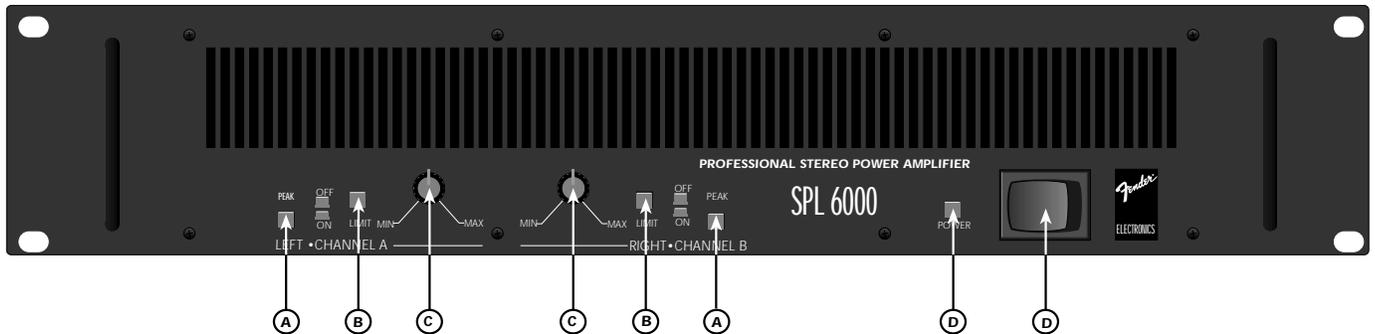
9. Turn the amplifier ON.

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 "juggle" 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 signal source, and poor signal-to-noise performance caused by excessive amplifier gain.

#### **WARNING:**

- **To reduce the risk of fire or shock hazard, do not expose this amplifier to rain or moisture.**
- **No user serviceable parts inside, refer servicing to qualified personnel only.**
- **This amplifier must be earth grounded.**

## 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 circuits.

#### 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 counterclockwise rotation). At the full clockwise rotation, a +1.8 dBV 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 the Channel B control is inactive. Refer to the Amplifier Operation section for additional information on proper adjustment of the input level controls.

#### D - POWER LED INDICATOR AND SWITCH

The power switch turns the unit on and off. To turn the unit on, push the power switch to the right. The 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 AC power supply.

### 2. REAR PANEL

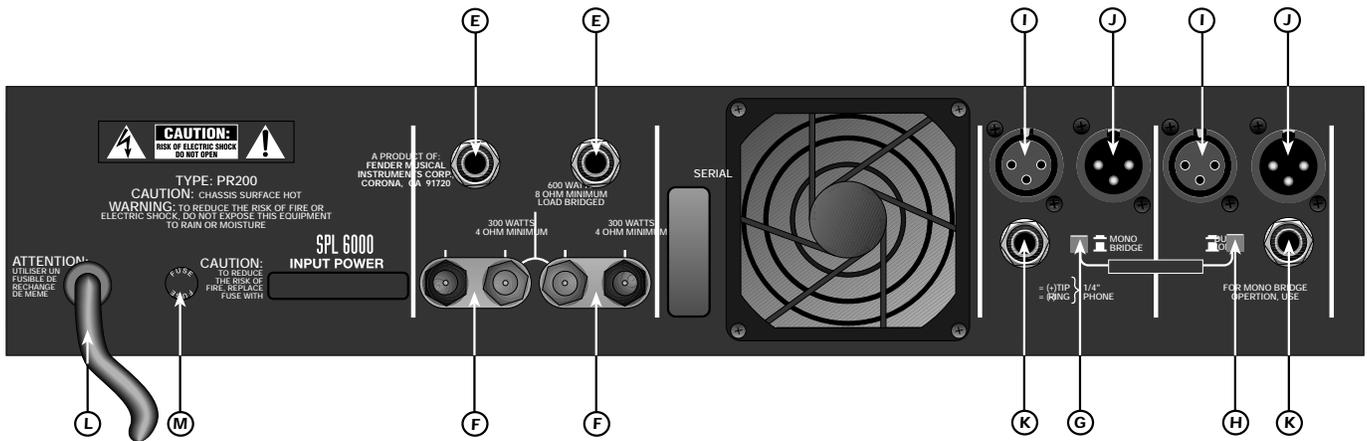
#### E & F - OUTPUT CONNECTORS

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 (19 mm) 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  $\Omega$  connected to either channel.**

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



## G - MODE SELECT MONO BRIDGED/STEREO

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

## H - MODE SELECT, DUAL MONO/STEREO

This two-position switch 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 attenuators control their respective channels.

## 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

**WARNING: This amplifier is equipped with a 3-prong, grounding type supply cord. To reduce the possibility of shock hazard, be sure to connect the unit to a grounded AC receptacle. DO NOT ALTER THE AC PLUG!**

## 100-120V OPERATION

This must be connected to a source of 100V or 120V, 50 to 60 Hz AC power with a current capability of at least 10 A. As a general guideline, it is accepted to connect two (2) SPL-6000 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.

## 220-240V OPERATION

This must be connected to a source of 220-240V, 50 to 60 Hz AC power with a current capability of at least 5 A.

## M - EXTERNAL FUSE

When necessary, replace the external fuse only with one of the same type and rating as shown on the label next to the external fuse holder.

## ***BASIC CONNECTIONS and WIRING***

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Power and audio signal cables are the most common sources of sound system failure. Well-made and carefully maintained cables are essential to the reliability of the entire system. If long speaker cables are required, make sure the wire is of sufficient size to transfer all of 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 numbers").

Below, we have listed the smallest wires (the highest numbered gauges) recommended for best results. To make it simple, we'll assume you are operating under worst case conditions with 4 ohm loads. 8 ohm operation will improve results with the same wire.

Larger 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 are fed all of the amplifier's power without the need for heavy cables. This 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 and 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 (a mixer or a preamp), balanced line" signal cables are a wise choice.

### ***SPEAKER WIRE GAGING TABLES***

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**SPEAKER WIRE GAUGE**

<b>SPEAKER WIRE LENGTH</b>	100'-UP (30.5 m-UP)	10	12	14
	50'-100' (15.25-30.5 m)	12	14	16
	*25'-50' (7.60-15.25 m)	14	*16	18
	10'-25' (3.05-7.60 m)	16	18	18
	0'-10' (0.00-3.05 m)	18	18	18
		4Ω	*8Ω	16Ω

<b>CROSS REFERENCE TABLE</b>	
<b>AWG</b>	<b>CROSS SECTION [mm<sup>2</sup>]</b>
18	0.83
16	1.32
14	2.10
12	3.32
10	5.27

**SPEAKER IMPEDANCE [z]**

\*Example - The length of the speaker wire required is between 25-50 feet (7.60-15.25 meters) and the speaker impedance is 8 ohms. The minimum recommended speaker wire gauge is 16.

**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 causing a fire hazard and possible damage to the amplifier. As a general rule, both straight and coiled guitar-type connecting cords make poor speaker cables.

The SPL-6000 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 have 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 Fender amplifiers. Be sure to check the finish in an inconspicuous place to determine the suitability of any cleanser.

Assuming you are 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 that could possibly damage speakers. The reverse logic should also be applied -- turn OFF the amplifier FIRST -- when shutting down the system.

The SPL-6000 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 SPL-6000 can draw a lot of AC power. Be sure the AC power source for your AC distribution system has adequate current capability.**

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 voltages 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 lines loss, smaller power lines cause loss. The effect of small AC lines is one of the intermittent clipping under severe conditions.

## SPECIFICATIONS

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<b>DESIGNATION TYPE</b>	PR 200
<b>OUTPUT POWER</b>	Stereo Continuous sine wave output power, both channels driven +/- 1dB, 20 Hz to 20kHz, THD < 0.03% 150 W into 8 $\Omega$ , each channel 300 W into 4 $\Omega$ , each channel
<b>MONO BRIDGE</b>	300 W into 16 $\Omega$ 600 W into 8 $\Omega$
<b>SINGLE CHANNEL DRIVEN @ 1 kHz, 1% THD</b>	8 $\Omega$ 179W 4 $\Omega$ 312W
<b>POWER BANDWIDTH</b>	10 Hz to 68 kHz (3 dB down from rated power at less than 0.1% THD)
<b>FREQUENCY RESPONSE</b>	+0 -3dB; 5 Hz to 68 kHz (at rated power, 8 $\Omega$ )
<b>RISE TIME</b>	Less than 5.2 $\mu$ Sec
<b>SLEW RATE</b>	Greater than 13.5 V/ $\mu$ Sec
<b>TOTAL HARMONIC DISTORTION (THD)</b>	20 to 20 kHz at rated power, 4 $\Omega$ . Less than 0.03%
<b>HUM AND NOISE</b>	Below rated output, 4 $\Omega$ 20 Hz to 20 kHz broad band 95 dB IEC A Weight 102 dB
<b>DAMPING FACTOR</b>	Reference, 8 $\Omega$ 5 Hz to 20 kHz Greater than 30 1 kHz Greater than 175
<b>INPUT IMPEDANCE</b>	Differential 33 k $\Omega$
<b>CHANNEL SEPARATION</b>	Below rated power, single channel operating 1 kHz, Greater than 65 dB
<b>SENSITIVITY</b>	Referenced 1 kHz, +/- 0.25 dB Stereo Mode +1.8 dBV (1.23V) Bridged Mode +1.8 dBV
<b>STATUS INDICATORS</b>	Each channel-Peak LED (red) Power LED (green)
<b>COOLING</b>	Two speed fan
<b>GAIN CONTROLS</b>	Continuously variable attenuator, one per channel
<b>MODE SWITCHING</b>	Stereo-Mono Bridge, Stereo-Dual Mono, two push button switches
<b>POWER REQUIREMENTS</b>	1000W
<b>DIMENSIONS</b>	
Weight	25 lbs. (11.3 kg)
Height	3.5 in. (8.9 cm)
Width	19 in. (48.3 cm)
Depth	15 in. (38 cm)



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