

POWER AMPLIFIERS



From Fender Pro Audio

Owner's Manual for
SPL-M500

P/N 050253
REV B





Fender Musical Instruments
7975 North Hayden Road, Scottsdale, Arizona 85258 U.S.A.

Fender knows the importance of sound reinforcement. From the simple box-top mixer to today's professional touring concert systems, the need to communicate, to make the connection between the performer and the audience is foremost in Fender's mind.

Perhaps no other single piece of gear can make or break your band's sound. You see, your sound system is more than just a combination of dials, wires and speakers. It is an integral part of the audio chain and should be treated with special care and attention to detail.

At Fender, we know what building quality musical instruments and sound reinforcement equipment is all about. In fact, many of the world's best sounding electric musical instruments and sound reinforcement equipment proudly wear the Fender name.

Whether you need a simple box top powered mixer for your Saturday afternoon jam, or a professional full-size concert system, Fender has the sound reinforcement equipment to meet your needs. Likewise, your decision to purchase Fender pro audio gear is one you will appreciate with each performance for years to come.

Wishing you years of enjoyment and a heartfelt *thank you*,

Bill Schultz

Bill Schultz
Chairman
Fender Musical Instruments Corporation

SPL-M500™ STAGE MONITOR POWER AMPLIFIER

INTRODUCTION

500 Watts into 2Ω

Variable high pass filter (12 dB per octave, sweeping from 12 Hz to 150 Hz)

Variable low pass filter (12 dB per octave, sweeping from 2.5 kHz to 30 kHz)

Three independent variable notch filters for feedback control

Built in switchable DELTACOMP™ Compressor

Forced air cooling with automatic 2-speed fan

Bi-amp patch point connect for versatility in larger monitor systems

Balanced TRS phone jack and female 3-pin XLR input connectors

Rugged "road proof" 14 gauge steel chassis

Two rack space (3.5 in, 8.8cm) chassis

Optional rear rack supports (P/N 040661)

Thank you for your purchase of a Fender SPL-M500 Stage Monitor Power Amplifier. We are sure you will find it to be a useful and unique product, providing years of trouble free service in both permanent and portable applications. Although intended primarily for portable stage monitor use, the SPL-M500 is also effective in sound reinforcement applications where fixed microphones are used and feedback is a problem.

Employing a unique design, the SPL-M500 provides a powerful tonal control system which fights feedback while optimizing sound. This design is comprised of a sweepable high pass filter, a sweepable low pass filter and three advanced narrow band notch filters.

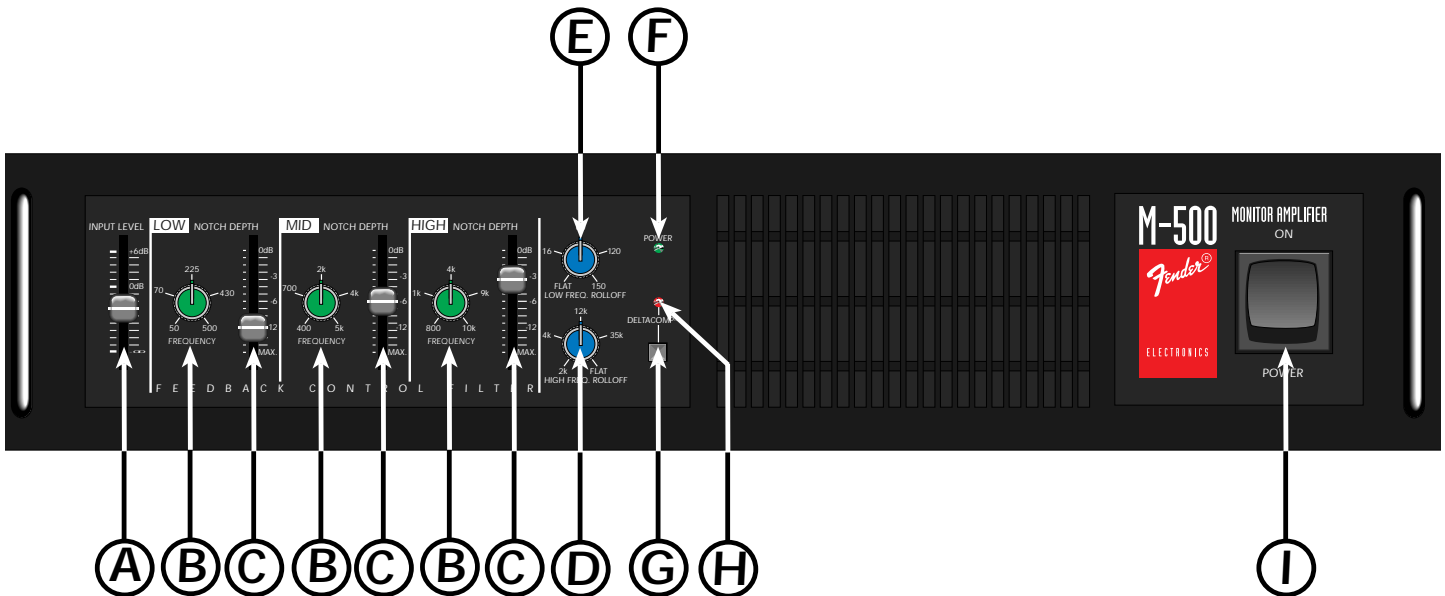
This manual is arranged into four sections:

- A description of the SPL-M500 panel features.
- A section on basic connections and wiring.
- A guide on operating the SPL-M500.
- Product specification sheet.

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



FRONT PANEL

A. INPUT LEVEL CONTROL - Variable attenuator controls the amplifier's input sensitivity. Control settings can vary between +8dB (fully up) and infinite attenuation (fully down). At the full up position, a 360mV input signal is required for rated output. At 0, a 360mV input signal will yield an output power of 1/8th rated power.

B. NOTCH FREQUENCY CONTROL - Higher notch frequencies are selected as the knobs are rotated in the clockwise direction. Each knob covers a specified frequency range, but two adjacent knobs do have overlapped frequencies. This feature is intentional. Refer to the "Hints and Precautions" found on page 7 for details concerning this feature.

C. NOTCH DEPTH CONTROL - These sliders provide attenuation control for each notch filter frequency band. At the highest position, 0dB of attenuation is obtained. At the lowest position, they can provide more than 25 dB of attenuation at the selected frequency. Refer to the "Hints and Precautions" found on page 7 for details concerning this feature.

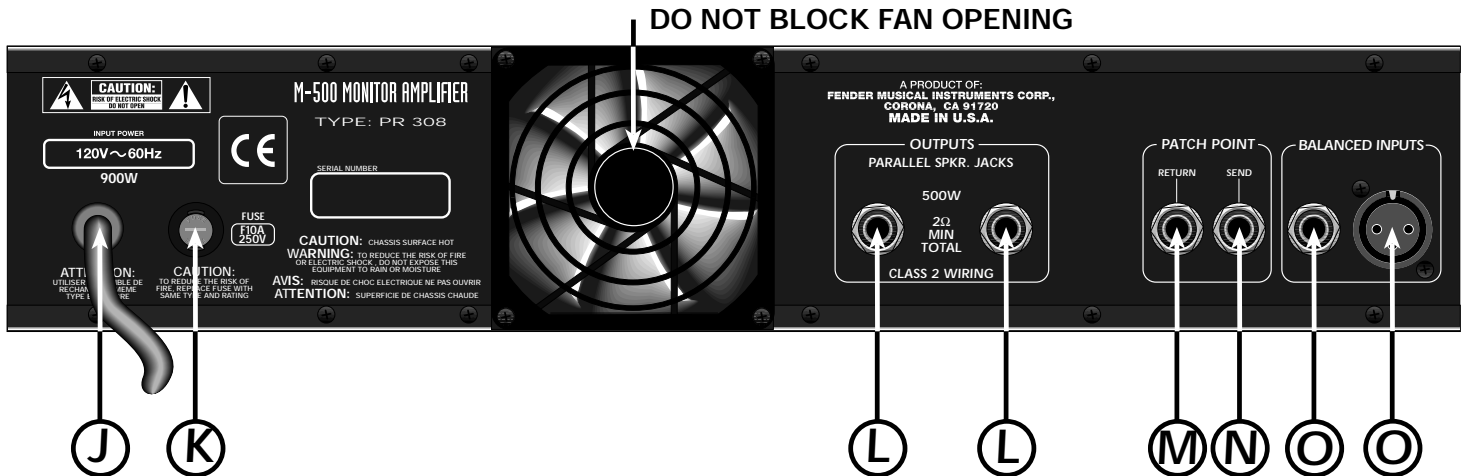
D. HIGH FREQUENCY ROLL OFF CONTROL (LOW PASS FILTER) - Useful for smoothing out "edgy" sounding speakers. When this knob is fully in its clockwise position, all signals below 30 kHz are allowed to enter the power amplifier. If set fully counter clockwise, only signals below 2.5 kHz will be

permitted to pass through. Start with this control set at 30 kHz. If the performers complain of "edgy" sounding monitors and want smoother sounding ones, rotate this control counter clockwise until they are pleased with the sound.

E. LOW FREQUENCY ROLL OFF CONTROL (HIGH PASS FILTER) - Useful for removing rumble (mechanical noise) or resonance and L.F. leakage. When this knob is fully in its counter clockwise position, all input signals above 12Hz are allowed to pass. When it is positioned fully clockwise, only frequencies above 150 Hz are permitted to enter the power amplifier. Start with this control set at 12 Hz. If the performers want crisper sounding monitors slowly rotate this control clockwise until they are pleased with the sound.

F. POWER LED INDICATOR - LED is illuminated when the monitor amplifier is turned on, and the AC mains voltage is present. If the indicator does not light when the power switch is turned on (and does not trip the circuit breaker), check the AC power supply and fuse.

G. DELTACOMP™ SWITCH - This switch activates the internal compressor circuit. Peak clipping is minimized when the compressor circuit is active. This will also "clamp" feedback, helping protect your monitor speakers. During normal operation, keep this switch engaged.



H. 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.

I. POWER SWITCH - The power switch turns the unit on and off. The LED (item F) is illuminated when the amplifier is turned on and main voltage is present.

REAR PANEL

J. POWER CORD - The SPL-M500 is equipped with a grounding type supply cord to reduce the possibility of shock hazard. Be sure to connect it to a grounded AC receptacle. **DO NOT ALTER THE AC PLUG.**

K. 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.

L. OUTPUT SPEAKER JACKS - Two parallel-wired, 1/4" output connectors are provided capable of providing 500 Watts of power into a 2Ω minimum load total. (One 2Ω speaker or two speakers at 4Ω each).

M. PATCH POINT RETURN CONNECTOR - Provides the possibility of using the power amplifier by bypassing the preamp section of the unit. When this connector is used, the preamp is totally disconnected from the power amplifier section. If nothing is plugged into this jack, it normally takes its signal from the preamp output, via the PATCH POINT SEND jack. (See section N).

N. PATCH POINT SEND CONNECTOR - This connection can be used with the patch point return connector, if further signal processing by an external unit is desired. Processing could include the insertion of a 1/3 octave graphic equalizer for tonal shaping, an external compressor/limiter and/or the insertion of an active electronic crossover network for bi-amped monitor systems. The output of this jack is normally tied to the patch point return connector. Using this connector will not disconnect the preamp section from the power amplifier section.

O. BALANCED INPUT CONNECTORS - This unit provides two types of input connectors: a 1/4 inch TRS and an XLR female connector. The 1/4 inch TRS connector polarities are: tip (+), ring (-), and sleeve (ground). The XLR female connector polarities are: pin 2 (+), pin 3 (-), and pin 1 (ground).

BASIC CONNECTIONS and WIRING

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 are two charts listing speaker wire gauges and recommendations for best results.

SPEAKER WIRE GAUGE					
SPEAKER WIRE LENGTH	100'-UP (30.5 m-UP)	8	10	12	14
	50'-100' (15.25-30.5 m)	10	12	14	16
	*25'-50' (7.60-15.25 m)	12	14	*16	18
	10'-25' (3.05-7.60 m)	14	16	18	18
	0'-10' (0.00-3.05 m)	16	18	18	18
		2Ω	4Ω	*8Ω	16Ω
SPEAKER IMPEDANCE [z]					
*Example - If the speaker wire length required is between 25-50 feet (7.60-15.25 meters) and the speaker impedance is 8Ω, the minimum recommended speaker wire gauge is 16.					
AWG	mm ²	Resistance in Ω per foot (30.5 cm) @ 77°F (25°C)			
18	0.83	.00651			
16	1.32	.00409			
14	2.10	.00258			
12	3.32	.00162			
10	5.27	.00102			
8	8.38	.00064			

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. In cases where speakers and power amplifiers are located far away from the signal source, "balanced line" cables are a wise choice. Doing so can actually save money.

The use of stranded wire is highly recommended since it is flexible and less prone to metal fatigue breakage. If an end is nicked while insulation is being stripped for connection, only one or two strands will break and not the entire wire.



Important 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. Unfortunately, these types of cord 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-M500 can produce enough power output to damage electronic equipment connected to its output. Besides being capable of destroying speakers, shock and / or fire hazards are also possible. High power amplifiers should always be properly applied and used with care in a clean and dry environment.

Be sure to turn on all other equipment before turning on the SPL-M500 power amplifier. This will prevent turn-on "thumps" from the mixer or other pieces of gear that could possibly damage speakers. Likewise, the reverse logic should also be applied -- turn OFF the amplifier FIRST -- when shutting down the system.

The SPL-M500 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 application.



The SPL-M500 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, a sequential turn-on (either manually or via timed relays) is recommended to avoid a sudden major drain on the AC line. Remember, 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.

AMPLIFIER OPERATION

1. Turn all equipment OFF.
2. Plug the AC cord into a power source with the correct voltage. In the U.S. and Canada, this is a 120 Volt, 60 Hz AC. In other countries, this voltage may vary from 100 to 240 Volts, 50 to 60 Hz AC.
3. Connect the wiring from the signal source to the amplifier's input jack(s).
4. Connect the speaker(s) to the to the output terminals.
5. Adjust the input control level to the minimum (infinity) setting. Set the notch sliders at 0 dB (top).
6. Turn all other equipment ON first, then the SPL-M500 monitor amplifier.
7. Slide the level control slowly up and listen for any feedback problem(s) that may occur.

8. If feedback is encountered, slide the appropriate (LOW, MED or HIGH band) notch depth control down to its lowest position. Next, turn the frequency control knob to pinpoint the location of the problem frequency and cancel it.

9. Slide the control level up until feedback or ringing is heard, then move down until the feedback or ringing stops.

10. Step 8 may need to be performed more than once if several feedback problems occur simultaneously.



HINTS AND PRECAUTIONS

A. To reduce the chance of unwanted noise in your system, keep all patch cables and input signal cables away from all AC power cords, lighting cables and speaker wires. Always use shielded cables for all low level (input and patch point) connections to this unit. Never use shielded cable for speaker wires.

B. When a problem frequency occurs within the overlapping part of the two adjacent frequency bands, the notches can be dialed to have the same center frequency. By doing so, the resulting notch depth provided by the two notches will be deeper than a single notch depth.

C. When two notches are juxtaposed, the result will be a wider notch. This can be helpful in some cases, but may not be desirable in normal operation of the unit as audible frequency loss will occur.

D. When notches are not in use, all the notch sliders must be at the top of their travel. A narrow band is NOT a graphic equalizer. Do NOT put the notch depth sliders in the middle of their travel to boost or cut frequencies. These are CUT ONLY controls.

E. To help prevent overdriving this unit and unwanted distortion, keep the Deltacomp™ switch "in".

F. If you wish to obtain either the optional rear rack ear supports (P/N 040661), please contact your local authorized Fender Pro Audio dealer.

SPECIFICATIONS

DESIGNATION TYPE	PR 308
PART NUMBER	071-5000-070 100V 071-5000-000 120V 071-5000-060 230V 071-5000-040 230V (UK) 071-5000-030 240V (AUSTRALIA)
POWER SPECIFICATION	100V version: 100 VAC, 50-60 Hz 900W 120V version: 120 VAC, 60 Hz 900W 230V versions: 230 VAC, 50 Hz 900W 240V versions: 240 VAC, 50 Hz 900W
OUTPUT POWER At 1 kHz, 0.20% THD	200W into 8 Ω 330W into 4 Ω 500W into 2 Ω
POWER BANDWIDTH	20 Hz to 50 kHz, 500W +0, -3dB into 2 Ω
FREQUENCY RESPONSE	12 Hz to 28 kHz @ +0, -3dB
SLEW RATE	6.55V / μ s
TOTAL HARMONIC DISTORTION	<0.2% THD, 20 Hz to 20 kHz at rated power into 2 Ω
DELTACOMP COMPRESSOR RANGE	18 dB
HUM AND NOISE	200 μ V into 2 Ω 105dB below 500W unweighted
SENSITIVITY (PATCH POINT LEVEL) (INPUT LEVEL)	1.2V for 500W into 2 Ω @1kHz 360mV for 500W into 2 Ω @ 1kHz
NOTCH FILTER BANDS	50 Hz to 500 Hz 400 Hz to 4 kHz 1 kHz to 10 kHz
HIGH PASS FILTER RANGE	Corner frequency variable between 12 Hz and 150 Hz
LOW PASS FILTER RANGE	Corner frequency variable between 2.5 kHz and 30 kHz
FILTER ALIGNMENT	Sub-Bessel
NOTCH FILTER ATTENUATION	Better than -20 dB at any selected notch frequency
FILTER SELECTIVITY FACTOR	Q = 8
INPUT IMPEDANCE	1/4 in Phone Jack: 21 k Ω unbalanced input 32 k Ω balanced input XLR Connector: 27 k Ω balanced input
DIMENSIONS	Weight 25 lbs. (11.3 kg) Height 3.5 in. (8.9 cm) Width 19 in. (48.3 cm) Depth 12.3 in. (31.2 cm)



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