SPL M-300 Owner's Manual

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Fender®

ELECTRONICS

P/N 040755

SPL M-300
MONITOR AMPLIFIER
OWNER'S MANUAL

Table of Contents

SPL M-300 Features

- 300 Watts into 2 ohms.
- Variable high pass filter (12dB per octave, sweepable from 12Hz to 150Hz).
- Variable low pass filter (12dB per octave, sweepable from 2.5kHz to 30kHz).
- 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 connection for versatility in larger monitor systems.
- Balanced TRS phone jack and female 3 pin XLR input connectors.
- Rugged "road proof" 14 gauge steel chassis construction.
- Two rack space high (3.50 inches) chassis.
- Optional security panel.
- Optional rear rack supports.

Thank you for purchasing the Fender M-300 Stage Monitor Power Amplifier. We are sure you will find the M-300 to be a very useful and unique product that will provide years of trouble free service in both permanent and portable applications. Although it is intended for portable stage monitor use, the M-300 is also very useful in sound reinforcement applications where a fixed microphone must be used in an acoustic environment where feedback is a problem.

Using a unique design, the SPL M-300 provides a powerful tonal control system for fighting feedback, and optimizing the sound of the system. This is comprised of a sweepable high pass filter, a sweepable low pass filter, and three advanced narrow band notch filters for feedback control. The SPL M-300 also provides an input gain control, an access patch point for the insertion of outboard equipment (and for using the SPL M-300 in bi-amplified systems), and a 300 watt into 2 ohm power amplifier with automatic two speed forced air fan cooling. This is all built into an attractive but road-worthy steel chassis. Rear rack ear supports, as well as an optional security cover are available as options.

This manual is broken down into six segments. They are

1. A primer on stage monitor systems. This is very helpful for beginning users, but may be skipped over by advanced professionals.
2. A description of the SPL M-300's features.
3. A section on basic connections and wiring.
4. A recommended hookup chart.
5. A guide to operating the SPL M-300.
6. A specification sheet.

The SPL M-300 is a powerful tool, and to extract the most out of it, one needs to know how to use it. So please, take a few minutes to read through this manual. Please also fill out the warranty registration card, and return it to us here, along with your comments and thoughts on the SPL M-300. We appreciate your input.

A Primer On Stage Monitor Systems

Remember the old expression, "If Mamma Ain't Happy, Ain't No Body Happy!" Well the same certainly holds true for stage monitors. Unless you as a musician can hear yourself and your band mates properly, you cannot be expected to perform properly. The magic of live music happens when people hear each other, interact with each other, and PLAY off of each other, building an overall level of energy that drives an audience wild. If you want to pack in the crowds, make sure you first have something for them to listen to. As important as a main P.A. system is for your audience, your stage monitor system is every bit as important for the musician, and unfortunately is one area that is often overlooked in smaller systems. For the band just starting out as well as for the experienced band, a good monitor system should be one of your first collective purchases. It is absolutely necessary for both rehearsals and performances. Set up properly, it can give you a consistent point of reference, regardless of where you play.

For the band, and for the band's sound engineer, having good stage monitoring equipment alone is not enough. Even the best equipment can sound terrible if not used properly, and can cause more problems than they solve (i.e. excessive feedback, muddy stage sound, fisticuffs over bad mixes, etc.). Getting a monitor mix that every one is pleased with is no easy task. In fact, mixing monitors in either a small club or on a touring concert level is probably the hardest job in audio! When a monitor system is "dimed in", and the music is better than ever before, the results are well worth the work and extra expense. By choosing the M-300 stage monitor amplifier, you have made a good start at assembling a first rate monitor system you will never outgrow.

The Purpose Of Stage Monitors.

At their simplest, stage monitors are basically complete sound systems turned around to face the performers, as opposed to the audience. They are intended to reinforce the level of certain performers and instruments, bringing them up to the level of other members in the band. This keeps them from being drowned out by louder instruments (such as drums, guitar and bass amps). This is particularly important in the case of vocals, certain acoustic instruments, and some electronic keyboards and percussion (where on stage keyboard amplifiers are not used). Monitors are also useful to help keep timing and pitch, and in general for the musician to know what is happening, and what they are putting out to the audience. This is particularly important in large halls, where all you may hear on stage are a few amplified instruments and drums, plus a delayed slapback of the house p.a. system off of the back and side walls.

What Does A Stage Monitor System Consist Of?

Stage monitor systems are comprised of a mixer capable of providing at least one separate mix (independent of the main "house" p.a. mix) for the stage monitors, usually some form of signal processing for tonal shaping and feedback control (graphic equalizers and narrow band notch filters are commonly used), one or more power amplifiers, and one or more stage monitor speaker cabinets.

In very simple systems, this could be no more than a monitor mix off of a powered mixer, and an amplifier and speaker. At a concert level, this can mean a separate on stage monitor mixing console and engineer (with up to sixteen or more mixes), racks of processing and amplifiers, and bunches of speakers. This is often due to the fact that the stage may be extremely large, and performers are often separated by some distances. Due to their location on stage (i.e. their proximity to another player), or due to their individual requirements to "play" off of another player (such as in the case of the drummer and bass player), different musicians may need a different "mix" than others in the band.

In other words, stage monitor systems, just like main p.a. systems, can range in size and complexity, based on the need of the performers and the venue they are performing in. Do not make the mistake however of thinking that the bigger and more powerful your monitor system is, the better it is. Instead, custom fit your monitor system for your needs, but make sure it is comprised of professional equipment you will not outgrow no matter how your requirements may change!

In a stage monitor system, since you are aiming a loudspeaker right at a microphone and a performer, feedback can be a royal pain. Later in this primer and in the operations guide, we will deal with the problem of feedback in depth, and offer suggestions on how to fight it. Even without the problem of feedback, it is important to remember that the purpose of a stage monitor system is to hear everyone at the right levels. It is not a challenge just to get the moni-

tors so loud that everyone's ears bleed! Nor is it like a main P.A., where you are trying to "throw" a signal to the rear seats in the hall. Once again, the purpose of stage monitoring is to "equalize" the band, and reinforce your signals to the point everyone can hear and play off of each other. Having excruciatingly loud stage monitors, and/or lots of them on stage can often cause ringing and feedback, or even just "muddy up" the entire sound of the band in the main p.a. as well as the monitors.

Whenever multiple speakers are used, spread across the stage, their signals overlap. Time delays will result based on the distance the speaker is from you. Although the same signal maybe fed to each speaker at the same time, the acoustic energy from the speaker nearest you will hit your ear first, followed by each successive speaker that is further away. These very short time delays cannot often be discerned as distinct sounds from an individual source, but instead are perceived as a "muddy" or "weird" sounding system, with a lack of detail and clarity. The technical term for this is "comb filtering", which results in phase cancellations at certain frequencies. Instead of a crisp clear signal to the performers, the exact opposite will result! Because of this it is often good to take a minimalist approach, i.e. less is more. Use just the number of speakers, and the on stage level you need for everyone to hear properly.

Types of Stage Monitor Loudspeakers

When most people hear the word "stage monitors", they immediately think of "wedge" style speakers on the floor, angled upwards and aimed at the performers. While floor wedges are the most common types of stage monitor, there are other types as well. Wide area "fill" speakers are often used, either on the sides of the stage (side fills), towards a group of players, and sometimes even flown over the stage (overhead fills). In certain applications, headphones, and even small "spot" monitor speakers may also be used.

Floor Wedge Monitors

One of the big advantages to floor wedges is that they are angled up directly at the musician, and many have a tighter horizontal "pattern" than a typical p.a. speaker (i.e. horizontal high frequency dispersion). That is why the H.F. horns on Fender-Sunn stage monitors are oriented vertically, giving more even coverage as the performer moves back and forth from the microphone, with minimum coverage side to side. This helps to eliminate overlap between speakers, allowing each performer (or groups of performers such as two vocalists right next to each other) to have their own monitor, with little interaction between speakers. As such, floor wedges are most often used as a form of "spot" (as opposed to "fill") monitoring. Floor wedges are often the most flexible type of cabinet to have, as most can be positioned two or three ways, and can double as side fills if needed.

Side Fill Cabinets

Any good sound reinforcement speaker can be used as a side fill cabinet. Usually these are larger cabinets than the floor wedges, and are often full range or multi-way p.a. speakers. Side fills can have many benefits. First, they can cover a larger area than a floor wedge, allowing several musicians to use a single speaker. Secondly, since they are often located right behind or below the main house p.a. speaker stacks, they can help alleviate the "empty" feel many stages have (especially in larger, more reverberant halls). Third, they can be used for a mix of those signals all the performers need more of, while "spot" monitors and separate mixes can be used to provide an individual player the specific instruments they need (such as a bass player and drummer in order to keep time). Used at a reasonable level, side fills can be very helpful, especially on larger stages and in larger halls.

Overhead Fills

Except in very special situations (and usually only in permanent installations), overhead fill monitors should be avoided. They are a pain to rig for a small band, and can be problematic if not set up properly.

Headphone or In-Ear Monitors

Stage monitoring with regular headphones is popular with some players, particularly drummers. Additionally, many larger touring groups now use "in ear" monitoring systems, comprised of a wireless receiver and small earpieces molded to an individuals ear shape. If the entire band is using headphone monitors, and there is little chance for feedback, this can be a good option. Using headphones can have tragic consequences however. Massive feedback, a dropped microphone, static pops, or feeding a high level tone burst accidentally into the monitor system could cause irreparable hearing damage. For this reason, the use of headphones AND stage monitor loudspeakers together is highly discouraged.

Stage Monitoring Electronics

In this section, we will deal with mixers, signal processors, and power amplifiers.

The Mixer

As we have previously stated, any mixer can be used, which can provide at least one mix separate from the main house P.A. mix. This could include a small powered box style mixer, a console style powered mixer, an unpowered mixer (with multiple sends, labeled as monitor, effects, aux., or reverb sends), or even a large dedicated stage monitor mixing console.

In smaller mixers, the stage monitor sends are usually "pre" the channel fader, and either "pre" the equalizer (so any input e.q. changes will not affect the sound of the monitors) or "post" the channel equalizer (thus allowing corrective equalization on that channel). The reason for using a pre-fader send, is that you can then use the channel fader to modify the house mix, without altering the level of the stage monitors! **This is extremely important.** If there is one thing musicians hate, it is a soundman who is trying to alter the stage monitor mix constantly. Once your monitors are set up to the bands satisfaction, DON'T FUTZ WITH IT! This makes performers extremely uneasy and unsure of their performance, makes timing impossible, and in general, really torques them off.

In smaller clubs and bands, usually the person running sound for the main house p.a. will also handle the stage monitor mix. One of the key things to remember in setting up a monitor mix is to start by talking to the band. Find out what they want and need in their monitors, and give them just that, starting with a good vocal mix. Keep it simple, keep it consistent, and people will usually be much happier.

Fighting Feedback.

Again, feedback can be a major pain, as anyone who has ever run a sound system knows. Feedback is the grating, piercing wail that occurs whenever a frequency from a sound source is picked up by a microphone, becomes resonant, and is caught in an infinite loop. It is fairly complex, and has many variables, such as the type of microphone used, stage volume, stage acoustics, etc. Feedback can be controlled by the following methods;

1. Electronic correction via filtering.

The most common method of eliminating feedback is with a graphic equalizer. When a specific frequency band begins to ring, the corresponding frequencies level can be reduced by "cutting" that frequency on a graphic equalizer. Common formats for graphic equalizers are ten band (nearly an octave per band), fifteen band (almost a half octave per band), and thirty band (a third octave equalizer). The more bands the equalizer has, the narrower the frequency range of coverage for a single slider, and the more effective the equalization.

Beware the traps of over equalization using graphic equalizers! Often, a monitor mixer will reduce one band as feedback occurs, boost the overall monitor system level until the next feedback frequency occurs, reduce that, boost the level until the next feedback frequency causes trouble, reduce that, and so on and so forth. What you wind up with, is a lot of frequencies reduced significantly, across the board, thus reducing the overall level. The same thing could have been accomplished by just turning the overall system gain down a few dB, and leaving the controls relatively flat.

One of the other common complaints from an over equalized system is that the system "sounds funny". Using severe equalization (when cutting or boosting) can often significantly alter the tonal balance, especially when there are only a limited number of equalizer bands. One of the major problems with graphic equalizers is that they alter not just the offending frequency, but many of the nearby frequencies above and below the slide control frequency. Quite often, the frequency that is feeding back will be in between two or more bands on a graphic e.q., resulting in a decrease not only at the feedback frequency, but across a wide part of the audio band. This is particularly a problem in equalizers with a limited number of bands (such as single octave graphics). Using a graphic equalizer to fight feedback is like trying to use a screwdriver in place of a chisel. Sure it may work, but you might hurt yourself, and your sound will certainly suffer. You will get better results by using the right tool for the job, a narrow band notch filter.

Using any graphic equalizer, the maximum boost or cut will be around 12 or 15 dB per band. Often, this is not enough to really get rid of a problem frequency. Sometimes, a cut of 20 dB or more, at only a specific frequency (a very narrow "Q") is required to

eliminate the problem. A more effective method of filtering out feedback (as opposed to using a graphic equalizer) is to use a multiband (low, medium, and high frequency bands), narrow bandwidth, sweepable frequency (covering a broad range of frequencies, not locked in at one frequency like a graphic e.q.) notch filter. This kind of powerful feedback killing filter set is what is used in the Fender SPL M-300 Stage Monitor Power Amplifier.

To use this notch filter, you simply listen to the feedback, determine if it is mostly mid frequency howl (which it almost always will be at first, usually between 1 to 2 KHz), or low frequency booming, or high frequency ringing. Once you have guessed at which band to change, pull the "notch depth" slide control all the way down, and rotate the "frequency sweep" control until the right feedback frequency is found and the feedback stops. Then, slowly bring the notch depth slider back up until feedback or ringing begins to occur. Back the notch depth control down until the ringing is totally eliminated. and away you go. Usually, not more than three bands will be required to totally, and quickly wring out your monitor system. One important note: **The notch filter depth controls do not work like the slider on a graphic equalizer. They are CUT only controls!** DO NOT put these controls in the center of their travel, and attempt to cut or boost frequencies! **Always start with these controls all the way up, at the top of the sliders travel, then lower them as needed.**

Once you have solved your feedback problems, you can then use a graphic equalizer the way it works best, by performing slight adjustments for tonal compensation. Use it to tailor the sound to make it pleasing to your performers, as opposed to fighting feedback.

In addition to the narrow band notch filters, the SPL M-300 also has two other valuable controls. They are the sweepable frequency –12 dB per octave filters which are labeled "low frequency rolloff" and "high frequency rolloff". These controls limit the frequency response of the amplifier, enabling the user to "roll off" all frequencies below the indicated point on the "low frequency rolloff", and above the point indicated by the "high frequency rolloff" knob. For example, lets say microphone leakage is a problem on stage. The bass players amp is too high, and that (along with the drums) is getting into all the open mics. The end result is a muddy sounding monitor system. By simply rotating the "low frequency rolloff" control clockwise, you can "tune" the system to where the bass frequencies disappear, and only the vocals are in the wedges. If for example, the singers complain that their monitors sound harsh, edgy, or splashy, then you can trim the high frequencies in the same manner, by rotating the "high frequency rolloff" control counter-clockwise until your players start grinning again.

Before the band ever hits the stage, or the house ever opens, when and wherever possible, buzz the system out and wring out the monitors prior to the sound check. Have one person (preferably with ear plugs or other hearing protectors on stage to help you buzz out the system. Playback a CD you know in the house system, and equalize it until it sounds right to you. Once that is done, bring up all the mics in the house p.a. system to a rough estimation of the level they will have to be at during the performance. Use a graphic equalizer as desired to correct for room acoustics and feedback in the house system. Have your on stage person check each microphone, making sure they are plugged into the correct input channels. Correct for feedback in the house system as necessary, using an equalizer or notch filter.

After the house system sounds right and is free of feedback, bring up the vocal mics in the monitors one at a time (leaving each one up as you go), have your on-stage helper do the "check, one, two" routine, to the point where the level in the monitors is comfortable and free of feedback and ringing. If you cannot get enough gain in the monitors without feedback and ringing, lower the overall monitor mix master gain, set the mics to approximately the desired mix ratio, then bring the master gain up until feedback occurs. It is helpful to have a person standing in front of each mic (with earplugs), so as to most closely approximate the conditions you will have during a performance. Use the narrow band notch filters of the SPL M-300 to eliminate feedback, and the "low rolloff" and "high rolloff" filters to "trim" in the sound of the monitors. If you have a graphic equalizer, use it to smooth out the sound of the monitor system (slightly cutting or boosting frequencies to correct for tone, not feedback control). After you have the system maxed out to the point it doesn't do anything ugly (feedback, etc.) and sounds right, but you can't add any more gain without feedback, bring down the M-300 input level control to a comfortable on stage monitor volume level. Now, no matter how loud it gets on stage, your monitor system will not start feeding back, and you are ready to soundcheck with the band. They will think you are a wizard for having great sounding monitors right from the start.

Microphone placement and microphone technique.

Often, just moving a microphone slightly, changing how you use the microphone, or actually changing the microphone will reduce feedback by a large degree. Experiment to find what works best. Be aware of the differences in microphones, their polar patterns, and how sensitive they are off axis (when speaking on the sides as opposed to straight into the mic). Be aware of reflective surfaces that can bounce the sound from the monitors off of them and directly into the microphone. Sometimes even sound reflections off of the performers face or body can affect feedback, especially if the system is on the hairy edge. Show your singers how to work the mic, approaching it slightly from the side, but still mostly on axis for the best sound. A little bit of experimentation and teamwork will yield great results.

Other microphone tips can include;

A. One of the most effective ways to get better sound is to close mic whenever possible. Close miking increases the mics output.

B. Be sure to never let a performer drop their mic downward towards the monitor speaker while not singing. Many inexperienced vocalists will relax, and proceed to point their mic right into the stage monitor speaker, with the obvious result, massive feedback!

C. Always try to keep the main house P.A. speakers in front of the mics.

D. Whenever possible, use cardioid or directional microphones, with good rejection ratios. Old standbys like Shure SM-58's and SM-57's always work. Condenser mics will usually have more presence, but may be more susceptible to feedback.

E. Whenever possible, use similar microphones. A chain is only as strong as it's weakest link. One cheap mic that is sensitive to feedback can totally screw it up for any good mics you may have.

F. Be sure to use as few mics as possible. The less the number of open mics, the less leakage, and accordingly, the lower the chance for feedback. As the number of microphones increase, the amount of gain before feedback decreases

G. Don't get caught in stage wars on volume. The single biggest problem most bands have is ego, manifested in one player wanting their instrument louder than anyone else's! Once one person cranks it up, the others will too, until the system is just blasting, and no monitor system, no matter how good can keep up with it. The best thing possible is to keep the overall stage levels at a reasonable point. Loud enough to get the sound and get the players off, but controllable, to where the monitors can equal out everything else.

H. If the stage is really live, use sound absorbing materials such as rugs, packing blankets, or sound isolating panels to control leakage. This is done all the time in the recording studio, and works well on stage also.

I. Whenever possible, use direct boxes, contact pickups, amplifier line outputs, or other direct injection means to reduce the number of live mics on stage.

J. If possible, selectively use signal processors, such as noise gates, to automatically turn off unused mics below a certain signal level.

By using one, or all of these techniques, feedback and leakage can be easily controlled. When combined with a good monitor system, great sound, happy performers, and happy audiences will result.

Inserting Additional Signal Processing Devices

Although the SPL M-300 by itself offers a great deal of control for feedback elimination and monitor voicing, sometimes it is desirable to insert other pieces of equipment, such as limiters and graphic equalizers, into the signal path. This can easily be accomplished in one of two ways. First, additional processors can be inserted ahead of the SPL M-300, and their outputs plugged into the SPL M-300's input. The other way to accomplish this, is to use the "Patch Point" send and return jacks on the rear of the SPL M-300. Plug a 1/4" audio cable (unbalanced, tip=hot, sleeve=ground) into the send jack. Plug this cable into the input jack of the device you wish to insert. Take another 1/4" audio cable, plug one end into the output jack of the inserted device, and plug the other end of the cable into the patch point return jack of the SPL M-300. By doing this, you break the internal connection ("normalled" jacks) between the preamp/filter sections of the SPL M-300, and it's power amp section.

Using The SPL M-300 With Multi-Way Active Systems (Bi or Tri-Amplified Systems).

The SPL M-300 may be used in active multi-way systems (Bi or tri amplified systems) by using the patch point send and return jacks to access the control section and the power amp section of the unit. Since most bi-amped or tri-amped systems will use a larger power amp for lower frequencies, you will probably want to use the SPL M-300's amplifier section for your high frequency speaker.

To do this, plug the output of your monitor feed into the input jack of the SPL M-300. Plug a 1/4" audio cable into the patch point send jack, and plug the other end of this cable into the input of your electronic crossover network. Using another cable, take the High Frequency output of the electronic crossover network, and plug this into the patch point return jack of the SPL M-300. Take another cable from the Low Frequency output of the electronic crossover network, and plug this into the input of a second power amplifier, which is then used for driving the monitor speakers woofer. Plug the speaker output of the SPL M-300 into the high frequency driver of the monitor speaker. See the Bi-Amped system Setup diagram for more information).

1. FRONT PANEL

A. INPUT LEVEL CONTROL. This variable attenuator controls the input sensitivity (volume) of the pre-amplifier section of the unit. The control settings can vary between +6dB (fully up) and infinite attenuation (fully down). If this control is set to "0", then a 260 mV. R.M.S. input signal is required for rated output.

B. NOTCH FREQUENCY CONTROLS. 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 "Note and Hints" found on page 17 for details concerning this feature.

C. NOTCH DEPTH CONTROLS. 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 20dB of attenuation at the selected frequency. Refer to the "Note and Hints" for details concerning this feature.

D. LOW FREQUENCY ROLL OFF CONTROL (HIGH PASS FILTER). This is 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 150Hz are permitted to enter the power amplifier. Start with this control set at 12 Hz If your performers want less "muddy" or "crisper" sounding monitors slowly rotate this control clockwise until they are happy with the sound.

E. HIGH FREQUENCY ROLL OFF CONTROL (LOW PASS FILTER). This is useful for smoothing out "edgy" sounding speakers. When this knob is fully in its clockwise position, all signals below 30kHz are allowed to enter the power amplifier. If set fully counter clockwise, only signals below 2.5kHz will be permitted to pass through. Start with this control set at 30 KHz. If your performers complain of "edgy" sounding monitors, and want them "smoother" slowly rotate this control counter clockwise until they are happy with the sound.

F. POWER LED INDICATOR. This LED is illuminated when the monitor amplifier is turned on, and the AC mains voltage is present (ie. is the amp plugged in?). 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 and fuse.

G. PEAK LED INDICATOR. This LED is turned on by the power amplifier when maximum output is reached, and clipping begins to occur.

H. DELTACOMP SWITCH. This switch is used to activate the internal compressor circuit. Peak clipping is minimized when the compressor circuit is active. This will also "clamp" feedback, helping to protect your monitor speakers. For normal operation, keep this switch engaged.

2.REAR PANEL

I. EXTERNAL FUSE. When necessary, replace the external fuse using ONLY the same type and rating as shown on the label above the external fuse holder.

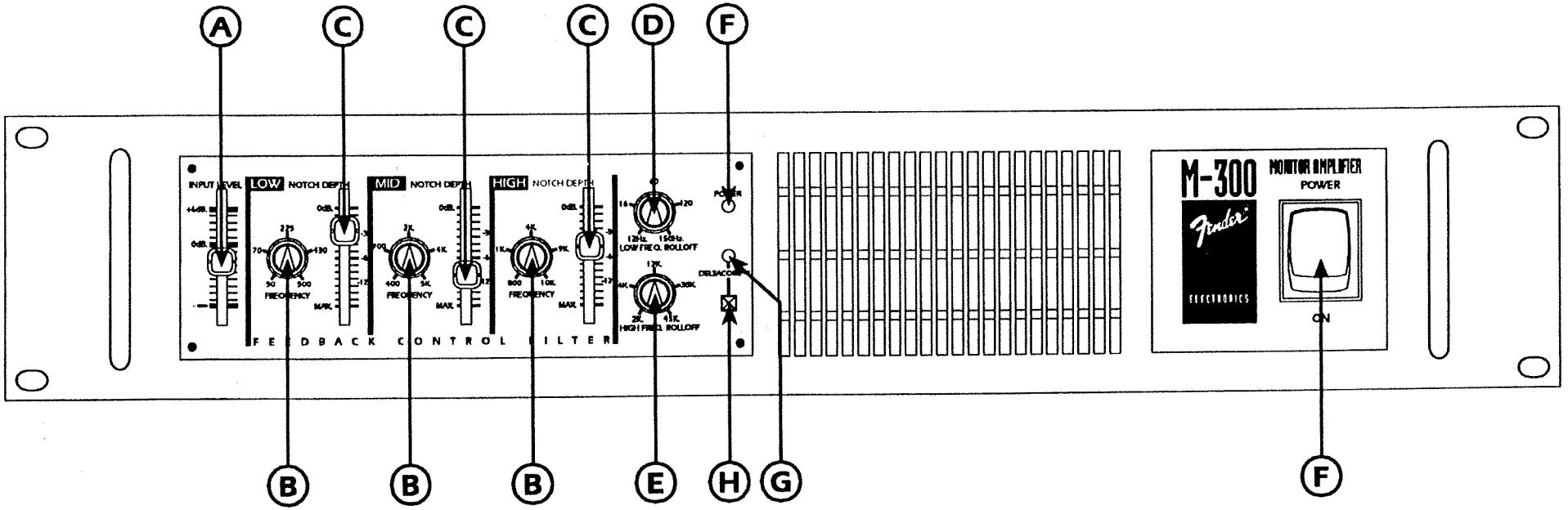
J. OUTPUT SPEAKER JACKS. Two parallel-wired, 1/4" output connectors are provided. They can handle 300 Watts of power into a 2 ohm minimum load.

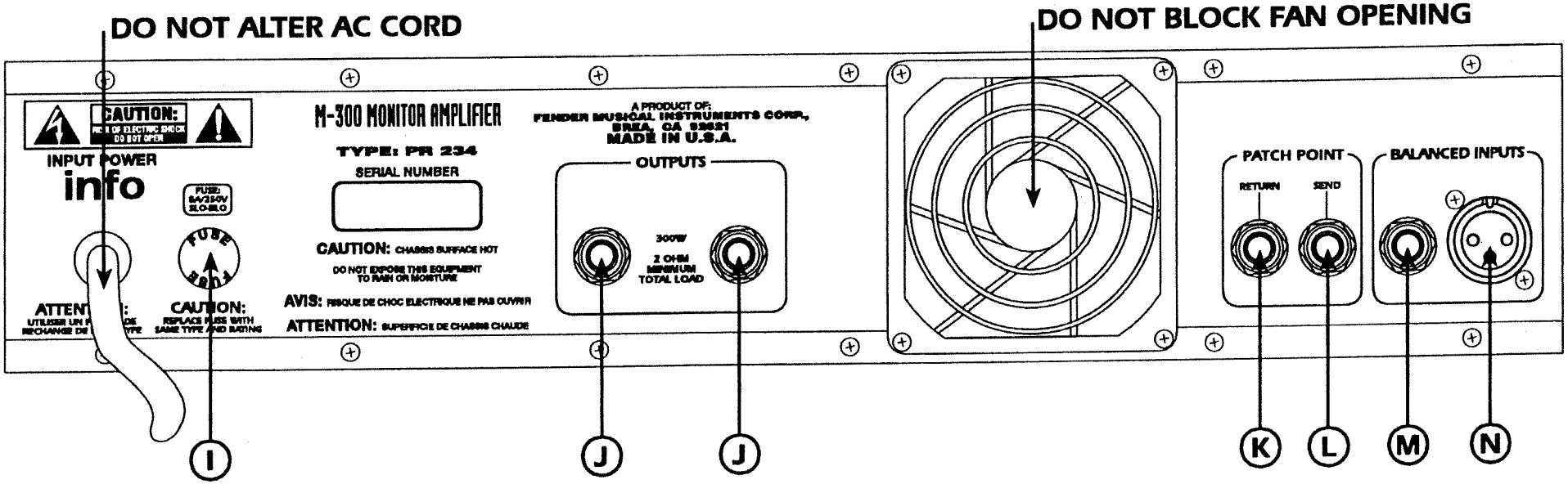
K. PATCH POINT RETURN CONNECTOR. Provides the possibility of using the power amplifier by bypassing the preamp section of the unit. When this connector is used, the preamp section is totally disconnected from the power amplifier section. If nothing is plugged into this jack, it normally takes its signal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

L. PATCH POINT SEND CONNECTOR. This connector can be used with the 'PATCH POINT RETURN connector'(item E), 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 (see "bi-amp system setup" on page 5) 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.

M&N. BALANCED INPUT CONNECTORS. This unit provides two types of input connectors— a 1/4" TRS (Polarities are: tip (+), ring (-), sleeve (ground)), and an XLR female connector (Polarities are: pin 2 (+), pin 3 (-), pin 1 (ground)).

Front Panel / Rear Panel





Basic Connections & Wiring

Power and audio interconnect 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 the power itself. As a rule of thumb, the larger the wire, the better (larger wire has a smaller gauge number).

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 amplifiers' 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.

CAUTION: Never use coiled guitar cords for speaker hookup, even in an emergency. Coiled guitar-type cords usually have higher internal resistance then the speakers themselves. This is due to the light-gauge wire used to keep the coiled cords flexible. These cords will prevent most of the power from reaching the speakers. In high power operation, a coiled 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 unit should always be properly applied and used with care in a 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 the adhesive can be removed with alcohol or rubber cement thinner without damaging the paint on most front panels. 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 the speakers. When shutting down, reverse logic should be used. Turn off the amplifier first when shutting the system down.

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 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 line is one of intermittent clipping under severe conditions.

Basic System Setup

From mixer stage monitor output

(for tonal shaping, not for feedback control)

Input

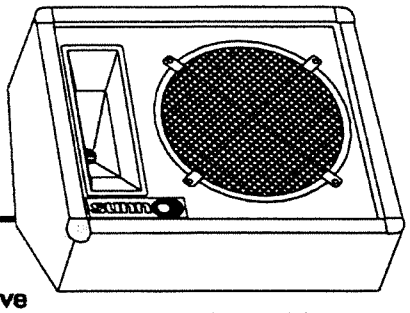
Graphic EQ (optional)

Output

Input

M-300

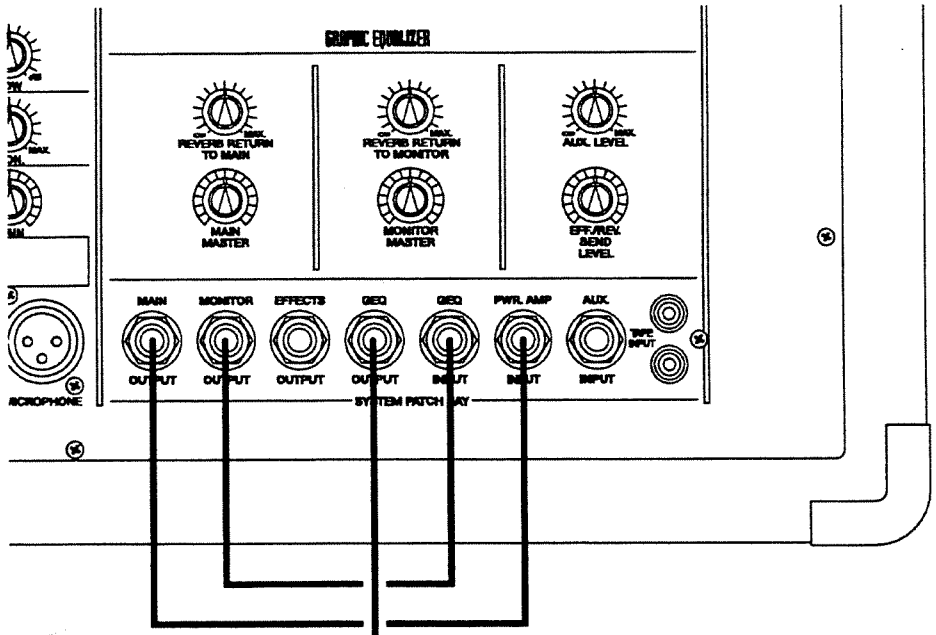
Speaker Output



full range input using passive crossovers Fender-Sunn 1272, 1275, 1282 or 1285

Use with Boxtop style powered mixer

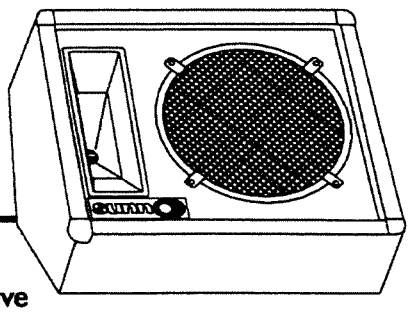
Boxtop mixer with built in GEQ patched to stage monitors.



Input

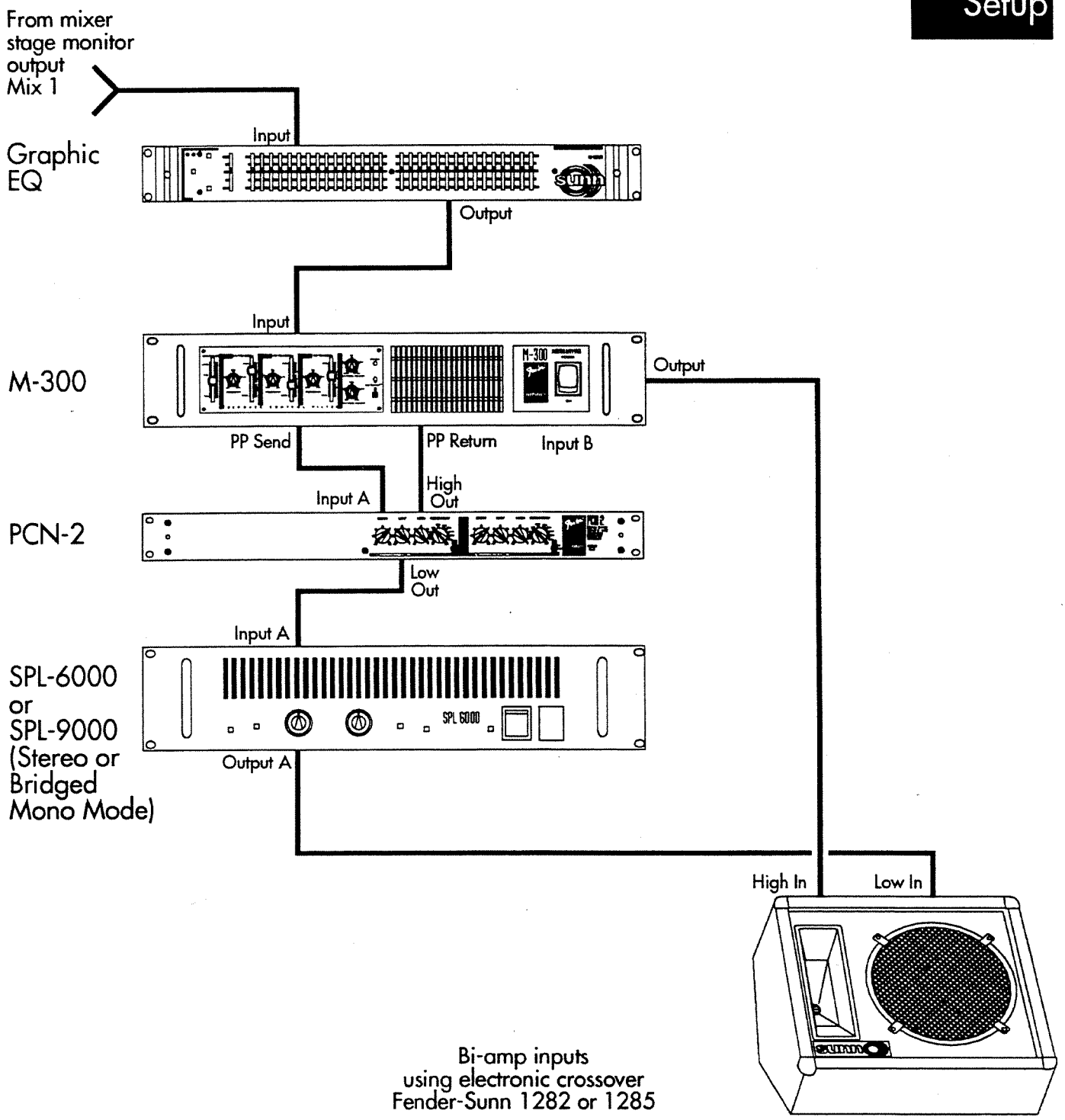
M-300

Speaker Output



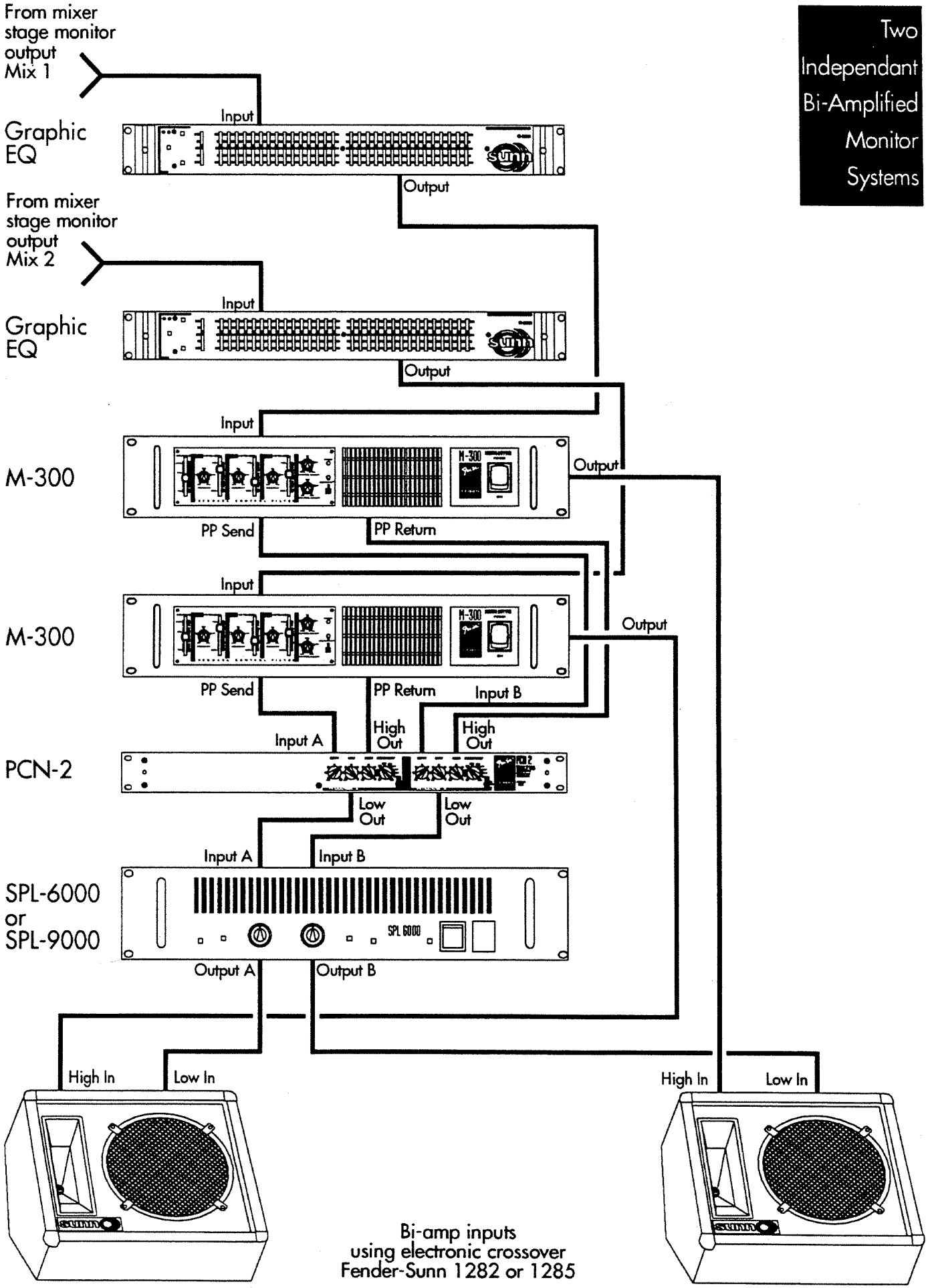
full range input using passive crossovers Fender-Sunn 1272, 1275, 1282 or 1285

Single Channel Bi-amp System Setup



Bi-amp inputs
using electronic crossover
Fender-Sunn 1282 or 1285

Two Independant Bi-Amplified Monitor Systems



Bi-amp inputs
using electronic crossover
Fender-Sunn 1282 or 1285

PRECAUTIONS

1. Avoid exposure to moisture (rain, drink, vapor, etc.)

2. To reduce the chance of introducing unwanted noise into 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 & patch points) connections to this unit. Never use shielded cable for speaker wires.

3. Do not overdrive this unit. This will cause unwanted distortion to this unit and all other units patched into it. Keep the Deltacomp™ switch pushed in to help prevent overdriving.

4. This unit is equipped with three prong AC plug for use in USA and Canada. In applications where a grounded AC output is not available, use a three prong to two prong adapter. DO NOT REMOVE THE GROUND PIN OR ALTER THE AC CORD IN ANY WAY.

Operation

1. Turn all equipment off.

2. Plug in the AC cord of the SPL M-300. Be careful to only plug it into AC mains with the correct voltage. In the U.S. and Canada, this is 120 Volt, 60 Hz., AC. In other countries, this voltage may vary from 100 to 240 Volts, 50 to 60 Hz. AC. Using the SPL M-300 in countries with the wrong AC mains will damage the unit, and void the warranty. Please contact the factory for information on using the SPL M-300 in foreign countries.

3. Connect the wiring from the signal source to the amplifier's input jack(s).

4. Connect the speaker(s) to the output terminals.

5. Set the input control level at its lowest position (-)

6. Turn everything else on first, then the monitor amplifier.

7. Slide the level control slowly up and listen for any feedback problem(s) that may be introduced into the system.

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

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

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

NOTES AND HINTS

A. 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.

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

C. When the notches are not in use, you must slide all the notch depth sliders fully up to the top of their travel. A narrow band notch filter <u>IS NOT</u> a graphic equalizer! Do NOT put the "notch depth" sliders in the middle of their travel, and attempt to "boost or cut", these are <u>CUT ONLY</u> controls!

D. If you wish to obtain either the optional rear rack ear supports, or the optional smoked lexan security cover, please contact your local authorized Fender-Sunn pro audio dealer.

Part number:	120V Version 230V Version	071-3000-000 071-3000-060
Type specification:	PR234	
Power specification	120V Version: 230V Version:	120VAC,60Hz,8A max. 230VAC,50Hz,5A max.

POWER AMPLIFICATION SECTION:

OUTPUT POWER At 1kHz,120VAC line voltage 0.20% THD	135 Watts into 8 ohms 220 Watts into 4 ohms 300 Watts into 2 ohms
POWER BANDWIDTH	10Hz to 40kHz, 300W +0, -2dB into 2 ohms
FREQUENCY RESPONSE	8Hz to 23kHz @ +0,-3dB
SLEW RATE	6.55v/uSec
TOTAL HARMONIC DISTORTION (THD)	No more than 0.2% THD,20Hz to 20kHz at rated power into 2 ohms
DELTACOMP COMPRESSOR RANGE	20dB
HUM AND NOISE	260uV into 2 ohms 99.5 dB below 300 Watts unweighted
SENSITIVITY (Patch point level)	940mV (approx. 1V) for 300 Watts into 2 ohms at 1kHz

PREAMPLIFICATION SECTION

NOTCH FILTER BANDS:	50Hz to 500Hz, 400Hz to 4kHz and 1kHz to 10kHz
HIGH PASS FILTER RANGE	Corner frequency can be varied between 12Hz and 150Hz
LOW PASS FILTER RANGE	Corner frequency can be varied between 2.5kHz and 30kHz
FILTER ALIGNMENT	Sub-Bessel
NOTCH FILTERS ATTENUATION	Better than -20dB at any selected notch frequency

FILTER SELECTIVITY FACTOR	Q = 8
INPUT IMPEDANCE:	
1/4 PHONE JACK:	21k ohms unbalanced input 32k ohms balanced input
XLR CONNECTOR:	27k ohms balanced input

OTHER CHARACTERISTICS:

STATUS INDICATIONS	Peak LED (red) Power LED (green)
THERMAL PROTECTION	Thermal shut-off switch 248 F
COOLING	Two speed fan forced air cooling
GAIN CONTROL	Continuously variable attenuator

PHYSICAL SPECIFICATIONS:

WEIGHT		21 lbs
DIMENSIONS		
	Width	19 inches including rack ear
	Height	3 1/2 inches
	Depth	12 5/16 inches (12 9/16 inches including connectors in rear)

A PRODUCT OF:
FENDER MUSICAL INSTRUMENTS CORP.,
BREA, CA 92621