

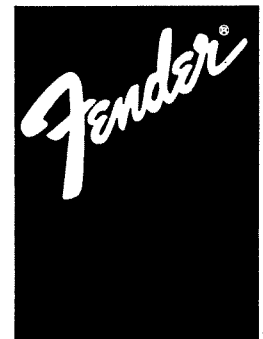
# Active Crossovers



From Fender Pro Audio

Owner's Manual for  
SPL-PCN4

P/N 050701 Rev. A





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 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,

A handwritten signature in black ink that reads "Bill Schultz". The signature is fluid and cursive.

Bill Schultz  
Chairman  
Fender Musical Instruments Corporation

# SPL-PCN4

## Active Crossover

### **Introduction**

**Thank you for your purchase!**

**The SPL-PCN4 is a professional stereo 3-way active crossover network which may also be used as a mono 4-way unit.**

**The SPL-PCN4 uses a unique, and highly accurate, 24dB per octave Linkwitz-Riley filter system. Additionally, the SPL-PCN4 is one of only a few units that provides flat summed response of the low and high frequency outputs, regardless of the crossover frequency chosen. (Not all Linkwitz-Riley 24dB/octave 4th-order crossovers provide truly flat summed response.) In the SPL-PCN4, this is made possible by the use of precision 2% resistors, carefully selected capacitors, and the industry's only precision-matched 1% four-gang frequency range potentiometers.**

**As a result of our dedication to perfection, we believe you will find the SPL-PCN4 exceeds your expectations.**

### **About This Owner's Manual**

This manual is arranged into four sections:

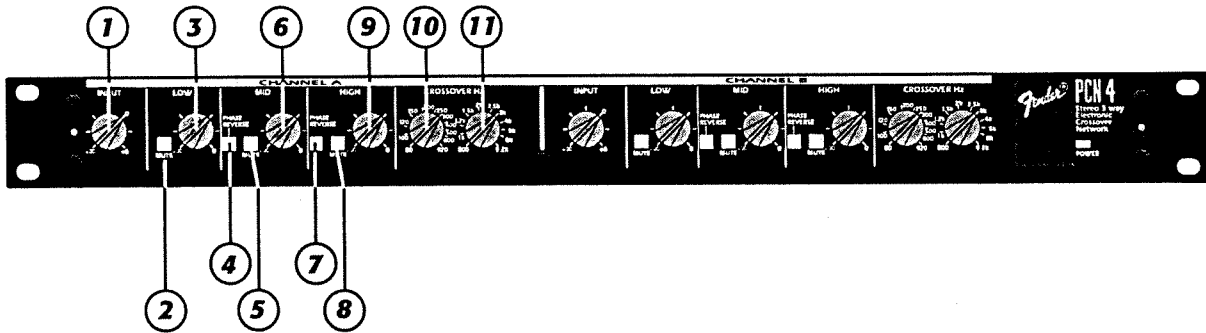
- SPL-PCN4 Front and Rear panel features
- Step-by-step set-up and operation guide
- Patch Diagrams
- Specifications

Please read each section carefully and then save this manual for future reference.

#### **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 unit must be earth grounded.*

## Front Panel - Channel A



### 1. Channel A Input Level

This controls the input to the first channel of the SPL-PCN4. It is variable from infinity to +6db above unity gain (0 position is unity).

### 2. Channel A Low Frequency Mute Switch

On the SPL-PCN4, mute switches are provided to mute (turn-off) each individual band in order to help with system set up and calibration. Be careful to never mute any band with signal playing, as a small signal transient can result which could damage certain drivers.

### 3. Channel A Low Frequency Output Level

This control varies the Channel A LOW frequency output. When turned to the 0 indicator, it is unity gain. This control is variable from infinity (fully counterclockwise) through unity gain (fully clockwise).

### 4. Channel A Mid Frequency Phase Reverse Switch

This switch changes the phase of the Channel A MID frequency output. When the switch is *out*, the output signal is in phase with the input signal. When the switch is *in*, the output signal is 180° out of phase with the input signal.

### 5. Channel A Mid Frequency Mute Switch

Mutes the Channel A Midrange output to aid in system calibration.

### 6. Channel A Mid Frequency Output Level

This control varies the Channel A MID frequency output. When turned to the 0 indicator, it is unity gain. This control is variable from infinity (fully counterclockwise) through unity gain (fully clockwise).

### 7. Channel A High Frequency Phase Reverse Switch

This switch changes the phase of the Channel A HIGH frequency bandpass output. When the switch is *out*, the output signal is in phase with the input signal. When the switch is *in*, the output signal is 180° out of phase with the input signal.

### 8. Channel A High Frequency Mute Switch

Mutes the Channel A HIGH frequency output to aid in system calibration.

### 9. Channel A High Frequency Output Level

This control varies the Channel A HIGH frequency output. When turned to the 0 indicator, it is unity gain. This control is variable from infinity (fully counterclockwise) through unity gain (fully clockwise).

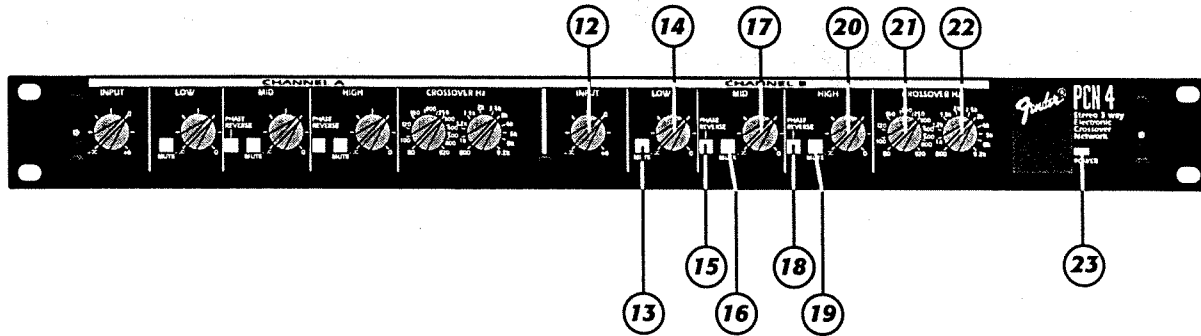
### 10. Channel A Low/Mid Crossover Frequency Control

This control varies the crossover frequency between the LOW and MID frequency bands on Channel A. This control is variable, and covers the range from 80 Hz to 920 Hz.

### 11. Channel A Mid/High Crossover Frequency Control

This control varies the crossover frequency between the MID and HIGH frequency bands on Channel A. This control is variable, and covers the range from 800 Hz to 9.2 kHz.

## Front Panel - Channel B



### 12. Channel B Input Level

This control varies the input to the second channel (Channel B) of the SPL-PCN4. It is variable from infinity to +6db above unity gain. When this control is set at the O position, it is unity gain.

### 13. Channel B Low Frequency Mute Switch

Mutes the Channel B LOW frequency output to aid in system calibration.

### 14. Channel B Low Frequency Output Level

This control varies the Channel B LOW frequency output. When turned to the O indicator, it is unity gain. This control is variable from infinity (fully counterclockwise) through unity gain (fully clockwise).

### 15. Channel B Mid Frequency Phase Reverse Switch

This switch changes the phase of the Channel B MID frequency bandpass output. When the switch is *out*, the output signal is in phase with the input signal. When the switch is *in*, the output signal is 180° out of phase with the input signal.

### 16. Channel B Mid Frequency Mute Switch

Mutes the Channel B Midrange output to aid in system calibration.

### 17. Channel B Mid Frequency Output Level

This control varies the Channel B MID frequency output. When turned to the O indicator, it is unity gain. This control is variable from infinity (fully counterclockwise) through unity gain (fully clockwise).

### 18. Channel B High Frequency Phase Reverse Switch

This switch changes the phase of the Channel B HIGH frequency bandpass output. When the switch is *out*, the output signal is in phase with the input signal. When the switch is pushed *in*, the output signal is 180° out of phase with the input signal.

### 19. Channel B High Frequency Mute Switch

Mutes the Channel B HIGH frequency output to aid in system calibration.

### 20. Channel B High Frequency Output Level

This control varies the Channel B HIGH frequency output. When turned to the O indicator, it is unity gain. This control is variable from infinity (fully counterclockwise) through unity gain (fully clockwise).

### 21. Channel B Low/Mid Crossover Frequency Control

This control varies the crossover frequency between the LOW and MID frequency bands on Channel B. This control is variable, and covers the range from 80 Hz to 920 Hz.

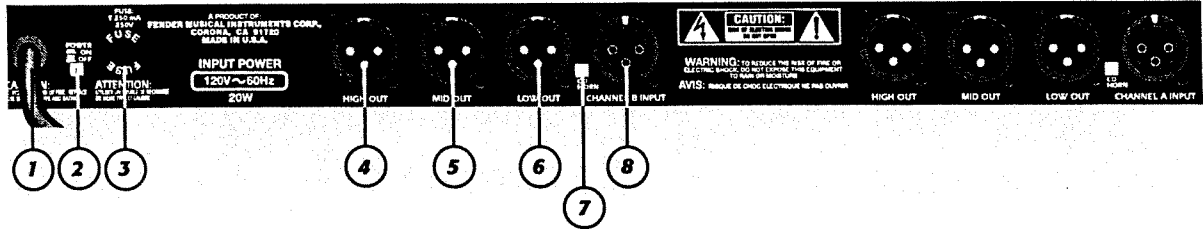
### 22. Channel B Mid/High Crossover Frequency Control

This control varies the crossover frequency between the MID and HIGH frequency bands on Channel B. This control is variable, and covers the range from 800 Hz to 9.2 kHz.

### 23. Power On LED

Turns green when the SPL-PCN4 is switched on.

## Rear Panel - Channel B



### 1. A.C. Mains Line Cord

For domestic units (U.S.A. – model number 071-5520-000), this should only be plugged into 120 V.A.C., @ 60 Hz. Do not plug this into any other voltage or damage will result.

Note: For export models (model numbers 071-5520-030, 071-5520-040, 071-5520-050, 071-5520-060), the primary mains voltage can be between 220 V.A.C. @ 50 Hz. to 240 V.A.C., @ 50 Hz. Do not plug these units into any other voltage or damage may result.

### 2. Power On/Off Switch

This turns the unit on and off.

### 3. A.C. Mains Fuse

In case of failure, replace only with the same type of fuse, as indicated.

### 4. High Out Channel B

Feed this output into the input of the Channel B HIGH frequency amplifier. This is a male 3-pin XLR style jack with a balanced output. This output is fully balanced and floating. If you wish to use this output unbalanced, you should connect the unused pin (either 2 or 3) to ground (pin 1 of the XLR connector). No reduction of signal level will occur, and no headroom will be lost.

### 5. Mid Out Channel B

Feed this output into the input of the Channel B MID frequency amplifier. This is a male 3-pin XLR style jack with a balanced output. This output is fully balanced and floating. If you wish to use this output unbalanced, you should connect the unused pin (either 2 or 3) to ground (pin 1 of the XLR connector). No reduction of signal level will occur, and no headroom will be lost.

### 6. Low Out Channel B

Feed this output into the input of the Channel B LOW frequency amplifier. This is a male 3-pin XLR style jack with a balanced output. This output is fully balanced and floating. If you wish to use this output unbalanced, you should connect the unused pin (either 2 or 3) to ground (pin 1 of the XLR connector). No reduction of signal level will occur, and no headroom will be lost.

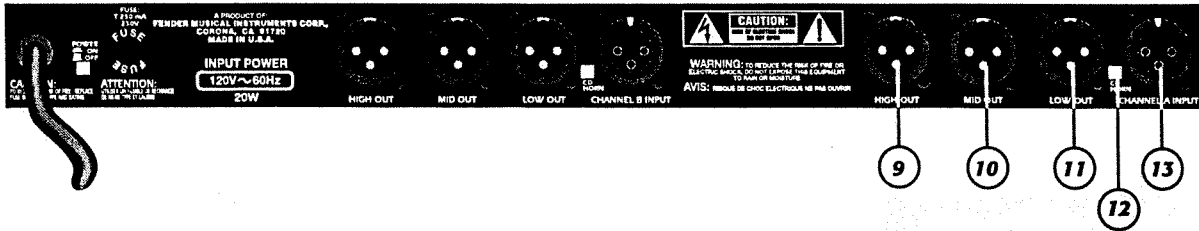
### 7. Channel B - C.D. Boost Switch

This switches the Constant Directivity Horn Equalization (In or Out) which provides a gradual high-frequency boost to compensate for the rolloff inherent in CD horns. The CD Boost is +3 db per octave starting at 3.5 kHz, rising 6 db per octave to 22.5 kHz.

### 8. Channel B Input

Use this balanced female 3-pin XLR style jack for the Channel B input. It may be used with an unbalanced input as well.

## Rear Panel - Channel A



### 9. High Out Channel A

Feed this output into the input of the Channel A HIGH frequency amplifier.

This is a male 3-pin XLR style jack with a balanced output. This output is fully balanced and floating. If you wish to use this output unbalanced, you should connect the unused pin (either 2 or 3) to ground (pin 1 of the XLR connector). No reduction of signal level will occur, and no headroom will be lost.

### 10. Mid Out Channel A

Feed this output into the input of the Channel A MID frequency amplifier.

This is a male 3-pin XLR style jack with a balanced output. This output is fully balanced and floating. If you wish to use this output unbalanced, you should connect the unused pin (either 2 or 3) to ground (pin 1 of the XLR connector). No reduction of signal level will occur, and no headroom will be lost.

### 11. Low Out Channel A

Feed this output into the input of the Channel A LOW frequency amplifier.

This is a male 3-pin XLR style jack with a balanced output. This output is fully balanced and floating. If you wish to use this output unbalanced, you should connect the unused pin (either 2 or 3) to ground (pin 1 of the XLR connector). No reduction of signal level will occur, and no headroom will be lost.

### 12. Channel A - C.D. Horn Equalization Switch

This switches the Constant Directivity Horn Equalization (In or Out) which provides a gradual high-frequency boost to compensate for the rolloff inherent in CD horns. The CD Boost is +3 db per octave starting at 3.5 kHz, rising 6 db per octave to 22.5 kHz.

### 13. Channel A Input

Use this balanced female 3-pin XLR style jack for the Channel A input. It may be used with an unbalanced input as well.

### IMPORTANT NOTE:

**When you are using any of the SPL-PCN4's outputs unbalanced, always be sure to connect Pin 3 to Pin 1 (thus grounding Pin 3), otherwise gain loss will occur. On a mid or high frequency output, if one side of the balanced line is allowed to float (not grounded to Pin 1), and the phase reverse switch is pushed on, the output could have no signal at all!**

## **Step-by-Step Set-up and Operation Guide**

In this section you'll find instruction on the basic set-up and operation of your Fender active crossover. Some steps relate to general system details, while other steps are specific to the SPL-PCN4. Please follow each step carefully.

### **STEP 1** *Out of the box*

Remove the SPL-PCN4 from its box and packing material. Please take a moment to make sure the serial # is the same as on your receipt. Save your receipt in a safe place - you may need it later for tax or insurance purposes. **YOU MUST HAVE THE RECEIPT TO VALIDATE FENDER'S TRANSFERRABLE WARRANTY.**

### **STEP 2** *Gather System Elements*

Whether you're planning a Mono or Stereo system, you'll need some equipment in addition to the SPL-PCN4. The following lists include the basic necessities needed to complete a simple system. Please gather these items now.

#### **Stereo 3-way System**

- Non-powered Mixing console
- Fender SPL-PCN4 Active Crossover
- Stereo Power Amplifier (Lows)
- Stereo Power Amplifier (Mids)
- Stereo Power Amplifier (Highs)
- (2) Low-frequency Speaker Enclosures
- (2) Mid-frequency Speaker Enclosures
- (2) High-frequency Speaker Enclosures
- All connecting cables

#### **Mono 4-way System**

- Non-powered Mixing console
- Fender SPL-PCN4 Active Crossover
- Power Amplifier (Low frequency)
- Power Amplifier (Low-Mid frequency)
- Power Amplifier (High-Mid frequency)
- Power Amplifier (High frequency)
- Low frequency Speaker Enclosure
- Low-Mid frequency Speaker Enclosure
- High-Mid frequency Speaker Enclosure
- High frequency Speaker Enclosure
- All connecting cables

#### **The Big Deal About Cables**

Okay, so you've invested hundreds, maybe even thousands of dollars into your sound system - and you've bought the best console, amps, and speaker enclosures that money could buy. With the little money you had left, you bought some cheap cables to hook everything together, right? Does this sound familiar?

All too often, we neglect the very lifelines of our systems - the cables! In any system, the cables are like the arteries in our bodies. They carry the "juice" that brings your system alive with the dynamic throb of music or program material.

It doesn't matter how much you spent on gear if your cables fail, or are sub-standard in their materials or construction. So do yourself, and your system a big favor - be as particular and choosy with your cables as you are with your equipment. Spend what it takes and get the best you can afford. After all, your system is only as good as the cables that you use to patch it together!



# STEP 3 *Making the Connections*

In this step you'll find simple instructions on how to "patch" your system together. For our example, we'll detail a Stereo 3-way system. Your specific system may be slightly different, but the basic "in's and out's" will remain the same.

## About the Inputs and Outputs

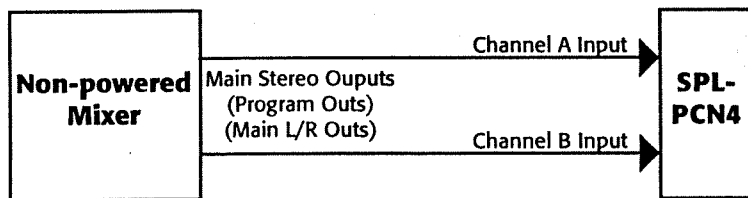
All of the SPL-PCN4 inputs and outputs may be connected to the rest of the system using either balanced or unbalanced cables. For optimum performance, it is recommended that balanced cables be used whenever possible.

**Plase see the important note concerning the use of unbalanced output cables on Page 7.**

(For detailed information regarding the benefits and applications of balanced cables, refer to our "Making the Connection" manual – p/n 991-7000-000)

### 3.1 Where Do You Start?

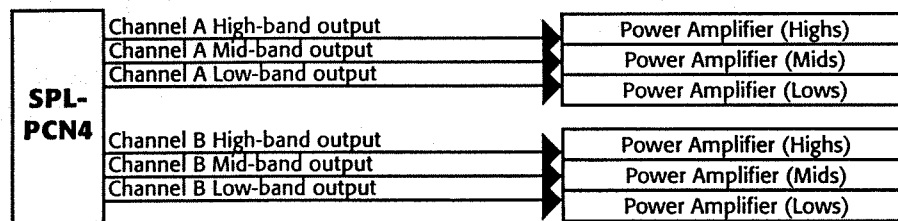
Let's start at the mixer and work our way "out" to the speakers...so first patch the mixer to the PCN4.



**Application Note:**  
For Mono systems, use the SPL-PCN4 Channel A Input only.

### 3.2 SPL-PCN4 Crossover Output

Each channel of the SPL-PCN4 has 3 "bandpass" outputs. That means that for each channel, the signal that came "in" as one input can now be divided into 3 separate "bands" of output. (It's kind of like a rainbow: One rainbow - yet made up of three "bands" of colors.) Each output "band" requires its own amplifier, and ultimately its own speaker or "driver". Here's how it looks for our Stereo 3-way system.

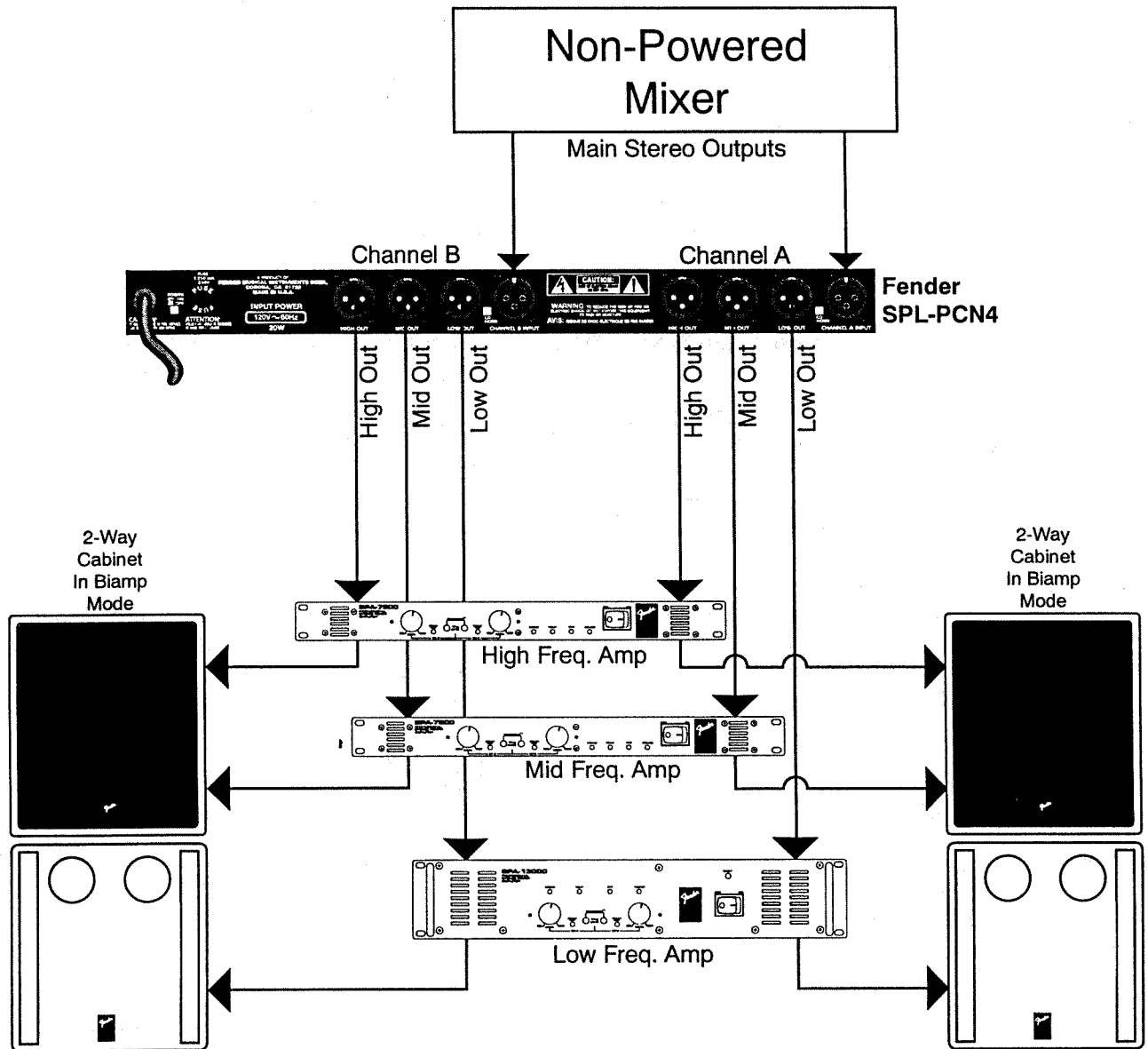


**Application Note:**  
Although this example may look like it requires 6 power amps, you could actually use 3 stereo power amps instead.

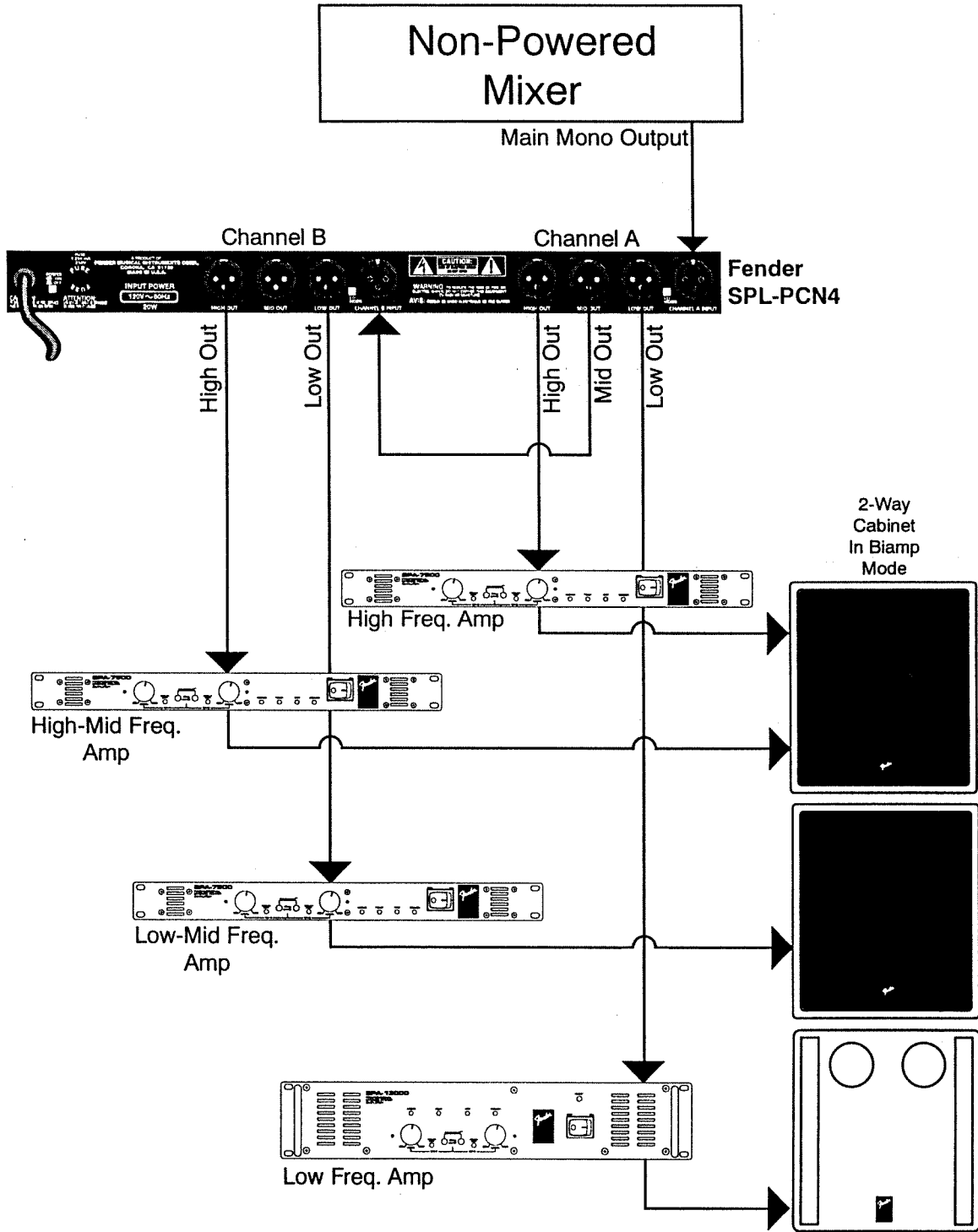
# STEP 4 *Finishing the Set-up*

From each power amp output you will connect the appropriate and corresponding speaker enclosure. On the next page you'll find an example of how the SPL-PCN4 might be used.

# Patch Diagram - Stereo 3-way System



# Patch Diagram - Mono 4-way System



# SPL-PCN4 Specifications

**Part Number:** 120V 071-5520-000 240V Aust./NZ 071-5520-030  
230V U.K. 071-5520-040 230V Euro 071-5520-060

**Crossover Filter Type:** 4th Order State Variable Linkwitz-Riley design  
24 db/octave slopes

**Crossover Frequency Range:** Low-Mid: 80 to 920 Hz  
Mid-High: 800 to 9.2 kHz

**Frequency Response:** 10 Hz to 20 kHz

**Constant Directivity Horn EQ:** +3 db @ 3.5 kHz rising 6 db/octave to 22.5 kHz

**Total Harmonic Distortion:** RL > 2k ohms  
Low Frequency Output <0.01% THD  
High Frequency Output <0.02% THD

**Maximum Output Level:** RL > 2k ohms, +21 dbu @ <0.05% THD 20-20 kHz

**Maximum Voltage Gain:** 6 db

**Hum and Noise:** Av = 0db, fc = 230, 2.3k Hz  
Low Frequency Section Output @ 0db <-98 dbu  
Mid Frequency Section Output @ 0db <-95 dbu  
High Frequency Section Output @ 0db <-93 dbu

**Signal to Noise Ratio:** 114 db

**Input Type:** Balanced Differential

**Input Impedance:** 20k ohms

**Output Type:** Floating and Balanced Line Drivers

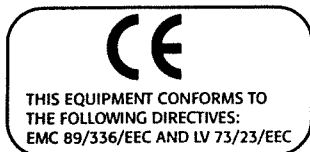
**Output Impedance:** 300 ohms

**Controls:** Input Levels Continuously variable  
Output Levels Low, Mid, High continuously variable  
Phase Mid, High front panel switches  
Mute Input, Low, Mid, High switches  
CD Boost Rear panel switch  
Power Rear panel switch, LED indication

**Dimensions:** (WxHxD) 19" x 1.75" x 7.5"  
482mm x 44mm x 190mm

**Net Weight:** 8 pounds 13.8 kg

0 dbu = 0.775 V rms



*Features & Specifications are subject to change without notice.*

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**CORONA, CA 91720 USA**