

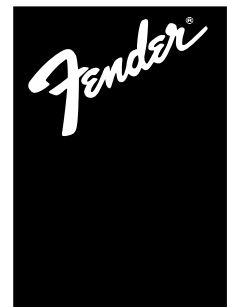
CONTRACTOR SERIES LOUDSPEAKER SYSTEMS



From Fender Pro Audio

Owner's Manual
for CS-18 Subwoofer

P/N 051342
REV A





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

Fender knows the importance of sound reinforcement. From the loudspeaker enclosure to today's professional touring concert systems, the need to communicate, to make the connection between the person speaking and the audience is foremost in our mind.

Moreover, we understand that **how** your message is delivered is just as important as the message itself. You see, your sound system is more than just a combination of dials, wires and speakers. It plays an integral part in ensuring that your thoughts and ideas are heard. Thus, your sound system 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 simply need loudspeaker systems to compliment your existing setup or a complete sound system, Fender has the sound reinforcement equipment that will 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

CONTRACTOR SERIES CS-18 PROFESSIONAL SUBWOOFER LOUDSPEAKER

INTRODUCTION

13-Ply Baltic Birch Cabinet

800W Program Power Handling

40 Hz to 400 Hz Frequency Response

98 dB Sensitivity @ 1W / 1m

One 18" (46 cm) Cast Frame Woofer with 4" (10 cm) Voice Coil and 109 Ounce Magnet

4-pole Speakon™ Connectors and High Current 1/4" Phone Jacks

Reinforced for Flying Applications

Thank you for purchasing a Contractor Series CS-18 Professional Subwoofer from Fender® Pro Audio. We are sure you will find it both a unique and effective sound reinforcement product, providing years of trouble-free service.

Designed for the most demanding sound contracting requirements, the cabinet's internal wood bracing helps eliminate side wall movement. This design results in low distortion, very high power handling and very high SPL output. Likewise, large ports on the CS-18 and cabinet prevent compression at high SPL due to large exit velocities.

Housed in a sanded unfinished cabinet, the CS-18 offers the flexibility of painting and varnishing the cabinet to your specifications. Also, the CS-18 is equipped with flypoints to attach rigging hardware for flying applications. By using the Fender® RigSafe™ rigging and flying hardware system, the CS-18 can be safely suspended overhead. Likewise, the RigSafe™ system is compatible with both the JBL S.A.F.E.™ and ATM Fly-Ware™ components. With its trapezoidal shape, the CS-18 fits well in a tight cluster with either the CS-12 or CS-15 enclosures. When used in this configuration, the CS-18 effectively reproduces the low-end frequencies; the CS-12 or CS-15 is then used as a mid-high cabinet.

CAUTION: Almost all speakers produce strong magnetic fields which may interfere with the normal operation of nearby electronic devices, including televisions and computer video monitors. To reduce or eliminate interference, increase the distance between this product and other nearby electronic devices.

CONNECTIONS

The two 4-Pole Speakon™ connectors and the two 1/4" phone jacks are wired in full parallel so that any one of the connectors may be used as an input and the other connector as an output to another subwoofer. This allows the multiple cabinets to be "daisy chained", eliminating the need for several long runs of speaker cable.

Note: A single CS-18 subwoofer represents an 8Ω load to the amplifier. Daisy chaining two of them in parallel will represent a 4Ω load to the amplifier. Only amplifiers rated for 4Ω output should be used in this configuration.

The following polarity convention should be used when making connections to the CS-18:

<u>Polarity</u>	<u>Phone Jack</u>	<u>Speakon™</u>
Positive (+)	Tip	1+ and/or 2+
Negative (-)	Sleeve	1- and/or 2-

USING THE CS-18 IN A SYSTEM

The CS-18 is designed to augment the low frequency performance of the main P.A. speakers using bi-amplification. By reproducing high levels of the low bass frequencies, the CS-18 relieves the smaller main speakers from having to supply this energy.

In order to split frequencies and send certain frequencies to one type of speaker and other frequencies to another type, a line-level electronic crossover, such as a Fender® PCN-2™ or PCN-4™, is required.

Two different configurations are shown on pages 5 and 6, demonstrating how easy it is to add a subwoofer to a system. Figure 3, on page 7, shows a more extensive configuration for those set-ups requiring additional power.

SETUP SUGGESTIONS

The placement of any speaker can dramatically affect its sound. Thus, there are three primary considerations to review when placing subwoofers.

The **first** is time alignment. The mid/high racks should be as close as possible to the subwoofer so the sound from the subwoofer reaches the audience at the same time as the sound from the mid/high packs. If the subwoofer is placed too far from the mid/high packs, a slight smearing of the lower bass frequencies may occur. While ideal placement for this consideration would involve stacking the mid/high pack on top of the subwoofer, this effect is quite subtle and an obvious effect may not be heard until the separation between the two cabinets is large enough to cause an audible time delay.

The **second** consideration is to try to obtain as much bass as possible from the subwoofer. A subwoofer hanging in free air is referred to as operating in "full space" since the subwoofer is free to radiate in all directions (omnidirectionally). A speaker in the middle of the floor or up in the air with its back against a wall is referred to as operating in "half space". Full space operation will result in about a 3 dB decrease in output as compared to half space. In order to compensate for the decrease in output using a full space configuration, the power amplifier may need to be turned up. Placing a speaker near a large, flat wall and on the floor (quarter space) will boost the bass performance by about 3 dB as compared to half space. The more surfaces the subwoofer is placed against, the fewer the number of subwoofer enclosures are needed to achieve a desired SPL.

The **third** consideration is convenience and the visual aspect of the speaker array. For temporary installations, the subwoofer can be used as a support for a mid/high pack mounted directly on top of the subwoofer. In permanent installations, the CS-18, for example, can be placed under a stage, table, or podium.

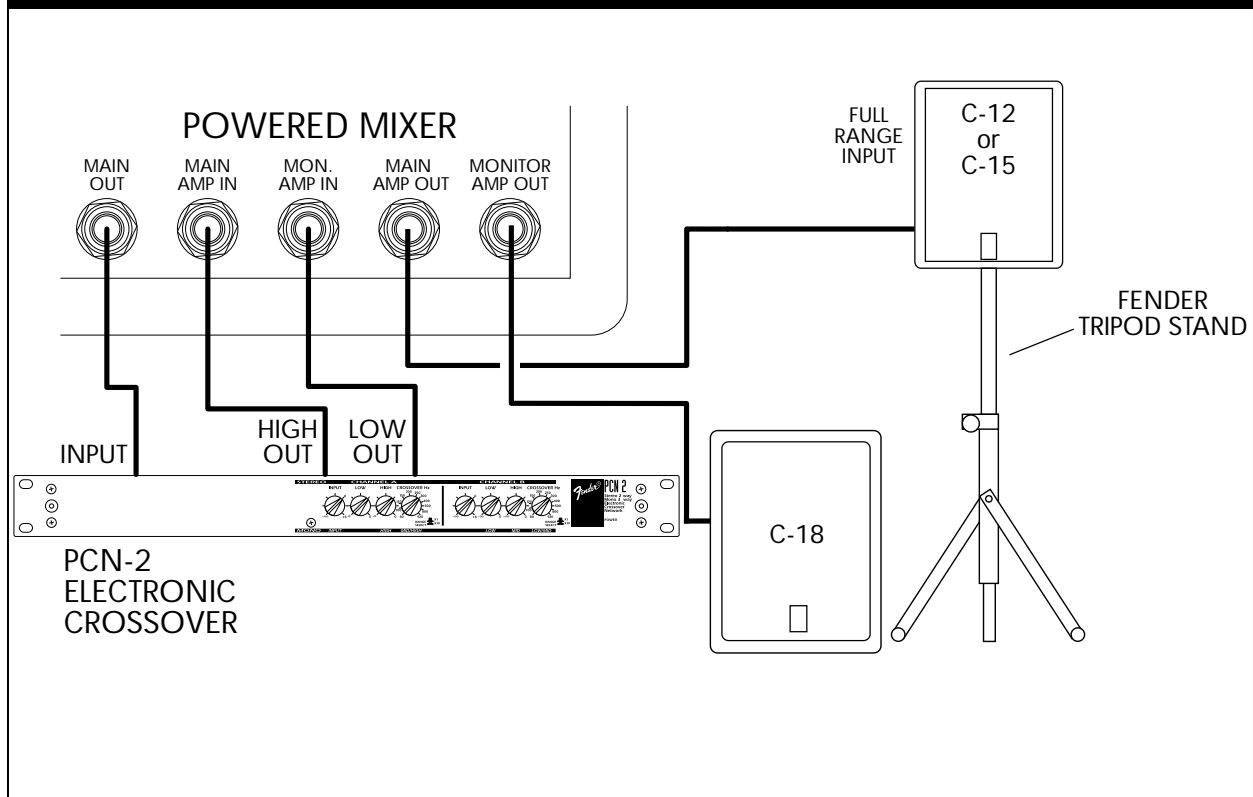
For each particular situation, a compromise among these three factors should yield the best solution possible.

CROSSOVER SUGGESTIONS

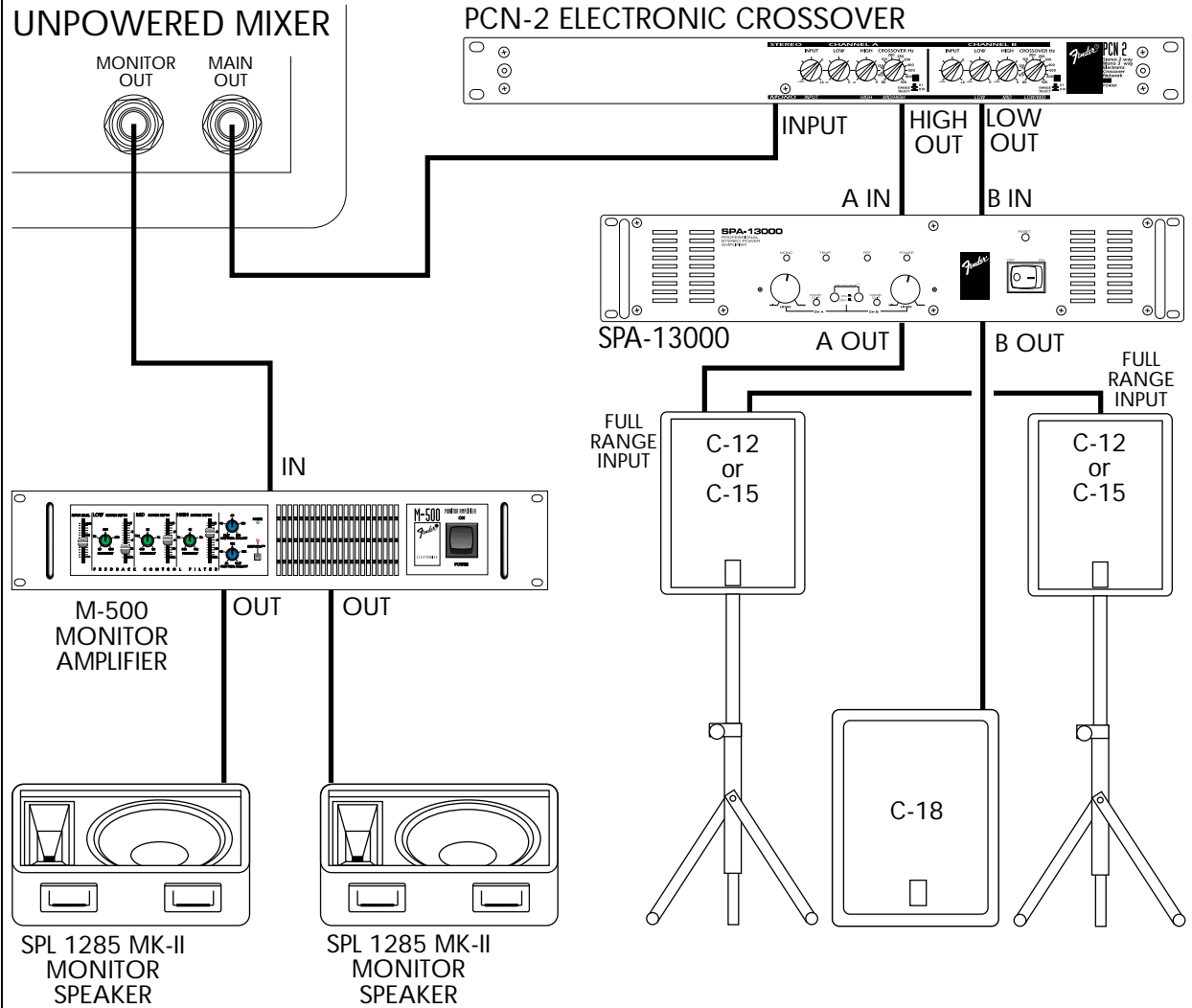
After the speaker system has been placed, the crossover point needs to be set for maximum benefit. While the 18" driver in the CS-18 is fully capable of accurately reproducing frequencies above 400 Hz, setting the crossover point this high makes time alignment very difficult and the large 18" woofer will start to "beam". Beaming occurs when lower frequencies are emitted in an approximately omnidirectional pattern while higher frequencies are emitted more on-axis. For the CS-18, this occurs above the crossover point of 400 Hz. If the crossover point is set too high and the subwoofer is placed far from the mid/high packs, bass frequencies will sound like they are being produced in two different locations. Most listeners cannot locate the origin of frequencies below 150 Hz. Setting the crossover point too low (below 80 Hz) will not take full advantage of the subwoofer because it places too high of a demand on the mid/high packs. For these reasons, a crossover point of ranging between 80 and 200 Hz is recommended depending upon the placement of the speakers.

The output level of the subwoofer(s) should be matched by ear to the output level of the full range cabinets by adjusting the level control at the crossover (if it has one) or at the power amplifiers. Normally, the output of the full range cabinets is subjectively higher than that of the subwoofers so a balance can be achieved by turning down the mid/high frequency signal at or before the power amplifiers.

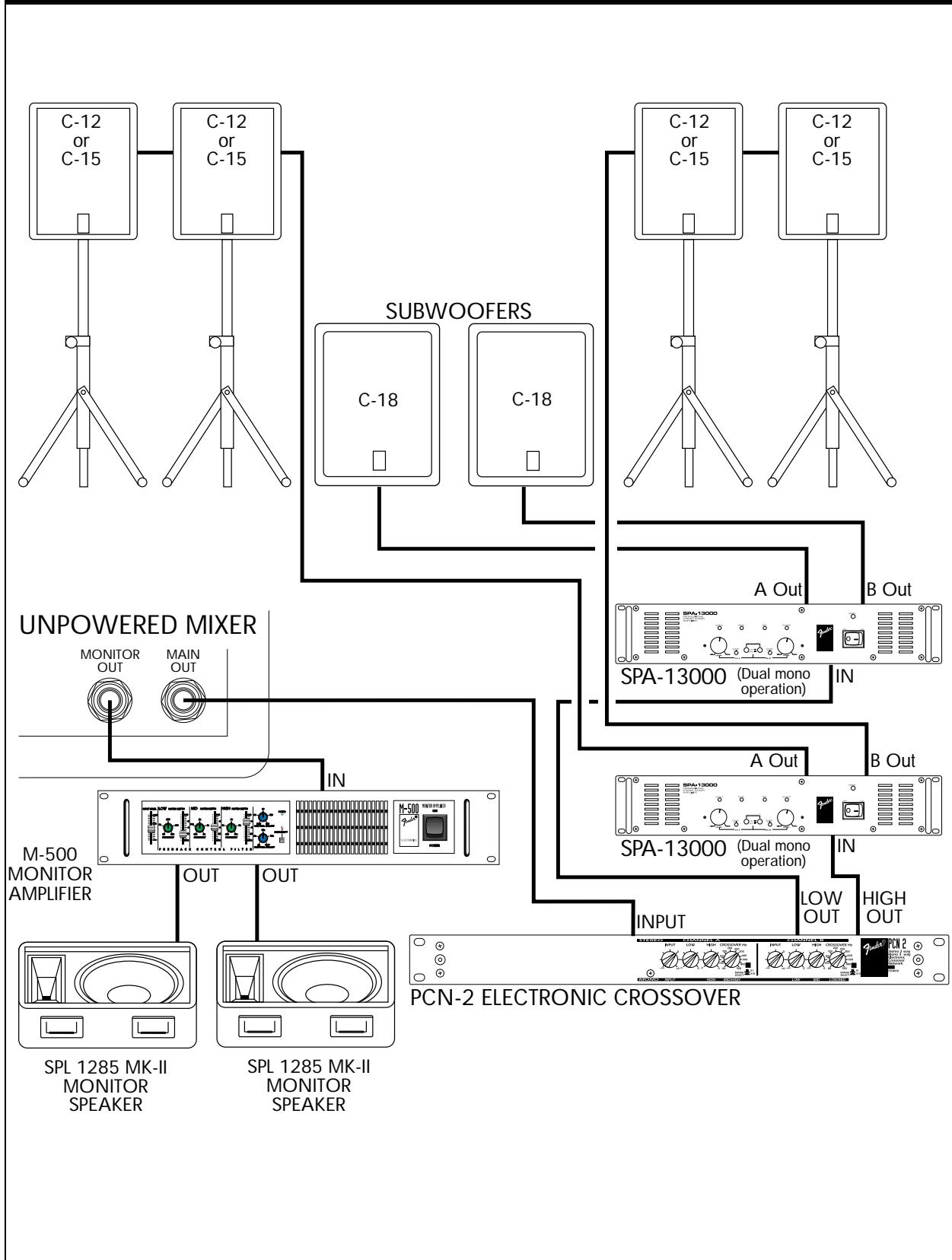
BI-AMP SYSTEM USING A FULL RANGE CABINET AND SUBWOOFER



BI-AMPED MAIN SYSTEM WITH MONITORS



MULTIPLE SPEAKERS IN BI-AMPED SYSTEM WITH MONITORS



SPECIFICATIONS

MODEL		CS-18
PART NUMBER		071-1310-300
MAXIMUM dB SPL OUTPUT LONG TERM		124 dB
DRIVER		18" (46 cm) cast frame woofer 4" (10 cm) voice coil 109 ounce (3.1 kg) magnet
CABINET		3/4" (1.9 cm) 13-ply Baltic birch (unfinished)
FREQUENCY RESPONSE	Axial +/- 3 dB: LF Limit +/- 3 dB:	42 Hz to 400 Hz 42 Hz
AXIAL SENSITIVITY	SPL @ 1W/1m: 1/2 Space Efficiency:	98 dB 2.25 %
POWER HANDLING	E.I.A. RS 426-A Noise: Program: Peak: Nominal Impedance:	400W, for 8 hours 800W 1600W 8 Ω
DIMENSIONS	Weight Height Width (front) Width (rear) Depth	85 lbs. (37 kg) 28.5" (72.4 cm) 24.6" (62.4 cm) 8.8" (22.2 cm) 24.1" (61.3 cm)

Product specifications are subject to change without notice.

WARNING: The length of the useful life of this cabinet will depend in substantial part upon how this cabinet is treated in use. The user of this cabinet must periodically have this cabinet inspected to ensure that continued use has not weakened the cabinet's structure, including the various joints which are fastened with glue and/or screws. Because this cabinet is in some instances, suspended from heights in use and could cause serious injuries or fatalities if it falls, this determination is important and must be attended to by the user.

For questions concerning flying your CS-18, please refer to the "Flying with Fender RigSafe™" booklet (P/N 049646) or contact ATM Fly-Ware™ at (310) 834-5914.

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