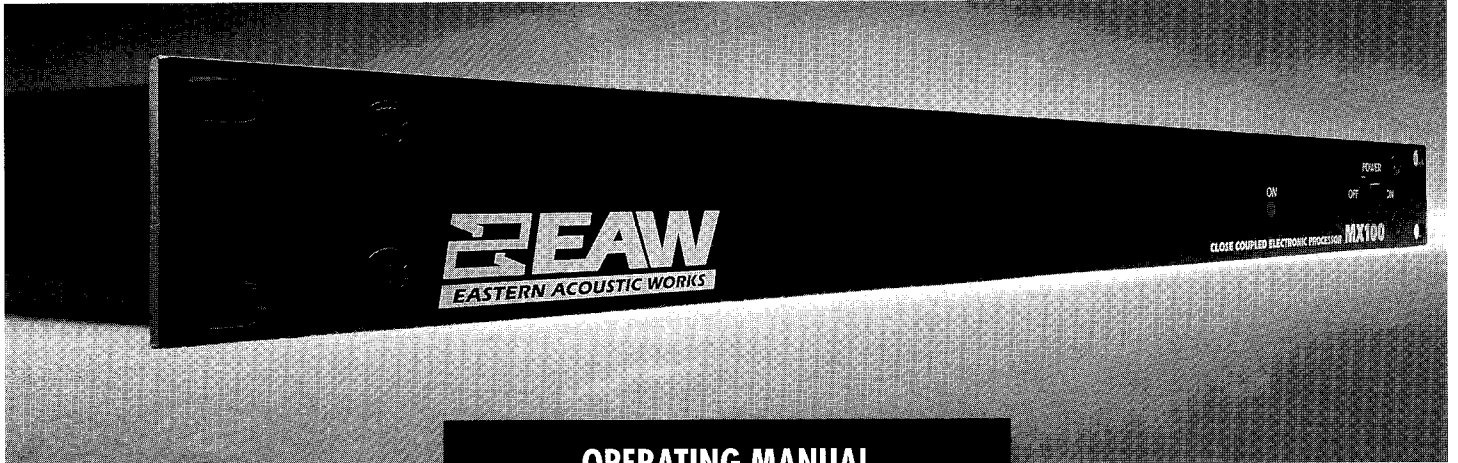


MX100



OPERATING MANUAL
for the MX100
Close Coupled Electronic Processor

Operating Manual MX100 Close Coupled Electronic Processor

v.1.0

EAW Pub # MX100MAN-242

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MX100 Close Coupled Electronic Processor



The MX100 Close-Coupled Electronic Processor™ (CCEP) is a two-channel, two-way electronic crossover designed for use in both fixed installations and touring sound systems. It is factory-configured for use with specific loudspeaker systems. This ensures optimum system performance under all conditions and removes from the end user the burden of “setting up.”

FEATURES OVERVIEW

The MX100 CCEP™ incorporates a unique combination of features and design innovations that set it apart from conventional crossover networks and allow it to be tailored to a particular EAW speaker system. EAW Engineering has done all the “trial and error” work – work that you would have to do with a conventional crossover – to determine the optimum parameters for each speaker system. You do not need to set any parameters – just “plug and play.”

Non-coincident Filters

When necessary, the MX100 CCEP uses a non-coincident filter system. This means that the high-frequency and low-frequency filters don't necessarily have the same corner frequency—contributing to the system's overall superior acoustic performance. The filter sections for both high frequencies and low frequencies are comprised of cascaded 2nd-order Butterworth filters. These effectively yield a 24 dB-per-octave Linkwitz-Riley response. Careful analysis of the MX100's electrical performance and the loudspeaker's acoustical performance are key elements in the close coupling of the crossover to a particular speaker system. The end result of the close coupling process is correct acoustic response at crossover rather than an idealized electrical response.

Optimum crossover frequencies and filter shapes have been determined for each speaker system configuration, and the MX100 CCEP has been preset accordingly at the factory. The configuration of your unit can be found on the rear of the unit.

TECHNICAL DESCRIPTION

Operational Summary

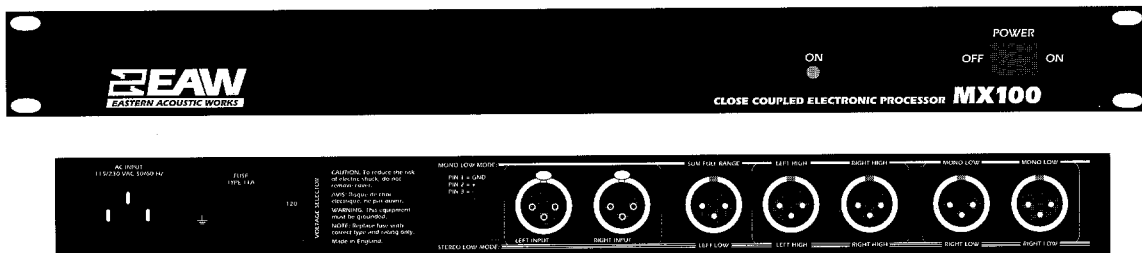
The MX100 CCEP functions as a stereo two-way crossover or as a stereo two-way crossover with summed monaural LF outputs. This selection is preset by EAW as part of the configuration process. Unlike most outboard crossover devices, it is optimized for powering a particular combination of EAW subwoofers and full-range speakers or for bi-amping a specific EAW full-range system. The configuration of your unit is indicated on a label on the back of the MX100 CCEP chassis.

The crossover filters use 4th order Linkwitz-Riley alignments, which yield a 24 dB per octave slope. By measuring the actual acoustical output of the various combinations of EAW speakers, EAW's engineering department has calculated the optimal crossover frequencies for each configuration. Your MX100 CCEP has been preset at the factory using separate high-pass and low-pass filter modules. The low-frequency (subwoofer) configuration is also preset at the factory.

If you wish to reconfigure your MX100 CCEP for a different speaker system, a different low-frequency configuration, or both, contact the EAW Service Department at 800/992-5013 (fax 508/234 3376). The MX100 CCEP is not intended to be modified in the field.

Enclosure

The steel chassis of the MX100 CCEP is designed and built to withstand the abuse and jostling of portable and mobile applications while ensuring reliable operation. The chassis is one rack space tall (1.75 in; 44.4 mm) and has a depth of 5.8 inches or 147 mm.



MX100 front and back panels

The inputs and outputs are 3-pin XLR connectors on the rear panel of the chassis; two females for the inputs, and five males for the outputs. The connectors are labeled according to the low-frequency configuration of the MX100 CCEP; for a unit with stereo low-frequencies, use the connector labels that are along the bottom of the rear panel. For mono lows, use the labels printed along the top of the rear panel.

AC Power

The MX100 CCEP has a universal power supply that is compatible with virtually any AC power source in use throughout the world today. A 2-position switch sets the power supply for either 120 VAC (50 to 60 Hz) or 240 VAC (50 to 60 Hz) operation.

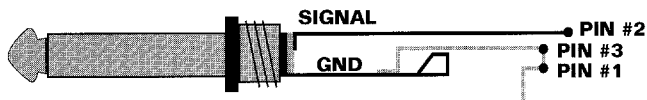
The mains power cable AC line cord attaches to the MX100 CCEP chassis via an IEC-230 connector on the rear panel. Make sure the AC line cord mains cable and voltage switch setting are correct for the power source. An incorrect voltage switch setting could cause damage to the unit.

The fuse holder next to the voltage switch is for a type T1A fuse. To open the fuse holder, turn off the power switch and use a flat-blade screwdriver to turn the fuse holder cap counter-clockwise. Use only the same type fuse (type T1A) as a replacement.

The power switch on the front panel switches the AC on and off. No current flows when this switch is in the Off position. A red power LED on the front panel indicates that the unit is powered up.

CONNECTING THE MX100 CCEP

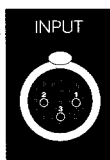
Care should be taken to insure that pin #3 of the MX100 input XLR is always connected. If connected to a balanced (differential) signal source, pin #3 should be connected to the negative (i.e., inverting or “-”) signal line. If driven by an unbalanced (single-ended) source, pin #3 must be tied to ground in order to avoid a significant loss in signal. The following diagram illustrates one example of how this is done.



Input Signal Connection

Input signal connections are through the female XLRs. The MX100's inputs have actively balanced differential amplifiers. Whenever possible, use the inputs in a balanced configuration. This helps minimize hum and noise pickup from the input signal cables by maximizing the common-mode rejection (cancelling voltages common to both the + and - input terminals).

The input XLRs are wired as follows:



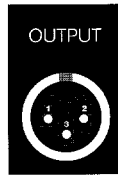
- 2+ non-inverting input
- 3- inverting input
- 1 ground

All XLR connectors are wired pin 2 hot (positive). The MX100 CCEP maintains polarity throughout from input to output. The input impedance of the MX100 CCEP is 20 k Ω balanced, 10 k Ω or greater unbalanced.

Output Signal Connection

Output signal connections are through the male XLRs.

The single-ended output is wired as follows:



- 2 signal
- 3 ground -
- 1 ground (As shipped with internal jumpers in place. Otherwise, pin 1 is "floating")

Grounding Considerations

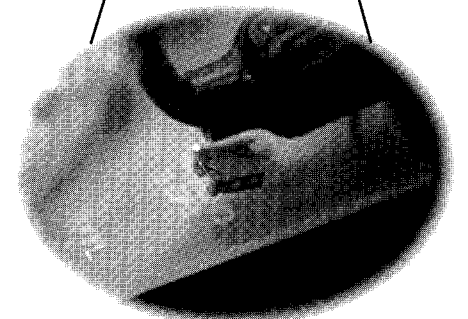
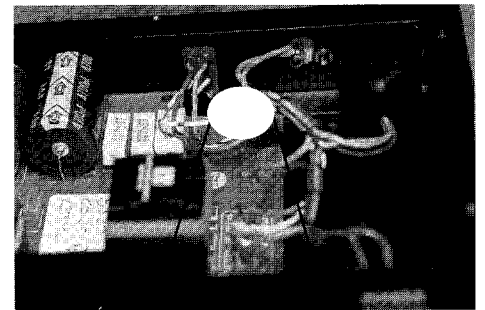
Chassis ground is connected to the earth/safety ground via the AC line cord, and it is also connected to all XLR cases.

Floating Pin 1

To eliminate ground loops that might occur when cable shields are tied to pin 1, the output XLR pin 1's on the MX100 CCEP can be disconnected by removing an internal jumper. Each output XLR has an internal jumper which, when removed, breaks the electrical connection between its pin 1 and all ground points. Lifting this jumper effectively "floats" pin 1. These jumpers are accessible when the chassis top cover is removed. The MX100 is shipped with these jumpers in place.

Disconnecting Earth and Signal Ground

An additional jumper has been provided which can be used to disconnect signal ground from earth ground. This may also be helpful in eliminating ground loops. The MX100 is shipped with this jumper in place.



Closeup of removeable ground lift pin

WARNING: DISCONNECT THE MX100 CCEP FROM THE AC MAINS BEFORE YOU REMOVE THE CHASSIS COVER.

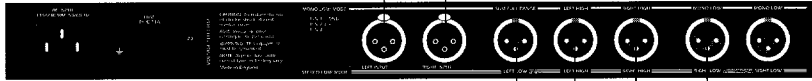
WARNING: NEVER OPERATE ANY EQUIPMENT WHICH REQUIRES AN EARTH A MAINS GROUND, WHILE THE GROUND WIRE IS DISCONNECTED.

Connection Diagram

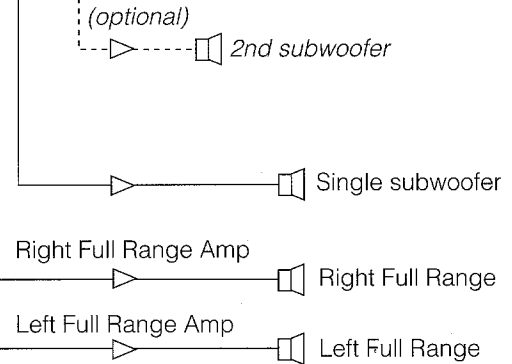
The diagrams that follow show typical signal cabling for connecting the MX100 CCEP with power amplifiers and speaker systems. Other setups may be necessary to derive optimum performance under certain situations, but the connection scheme shown here is appropriate for the most common applications of the MX100.

Mono Low Mode

2 ch "stereo" input from console or other line level source (comp/limiter, EQ, etc.)

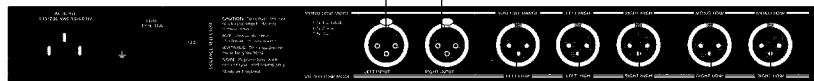


NOTE:
Generally the subwoofer output frequency range is 20 to 80 Hz and the full range output is 80 Hz to 20 kHz

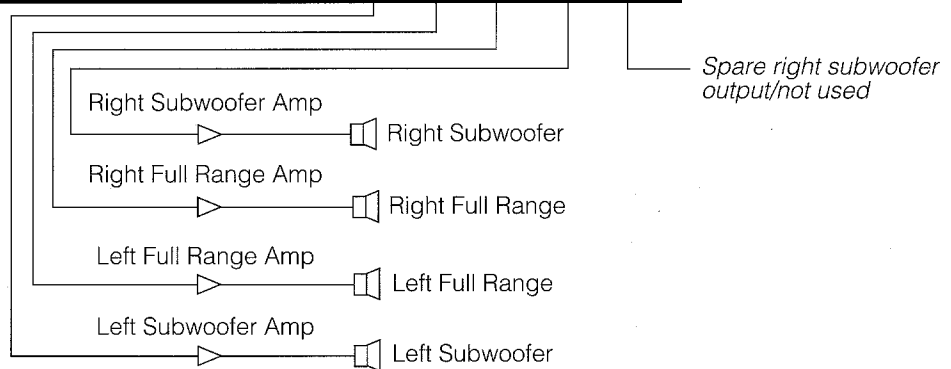


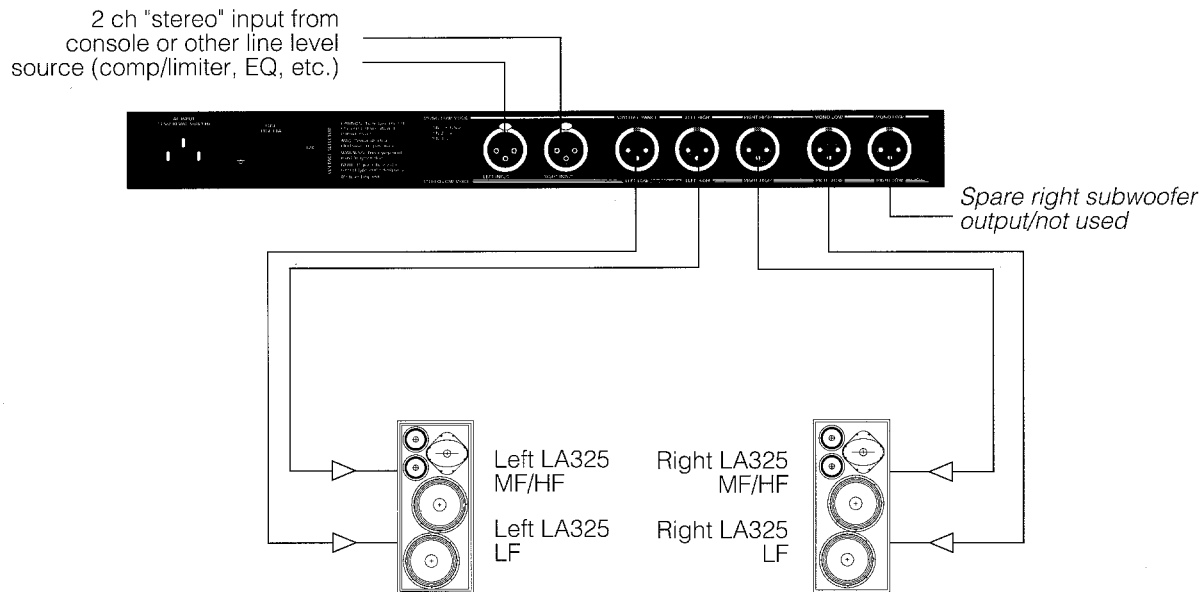
Stereo Mode

2 ch "stereo" input from console or other line level source (comp/limiter, EQ, etc.)



NOTE:
Generally the subwoofer output frequency range is 20 to 80 Hz and the full range output is 80 Hz to 20 kHz





Internal Servicing

There are no user-serviceable parts inside the MX100 CCEP. The filter modules, presets, trims, etc., should not be changed, adjusted, or modified by anyone other than an authorized service engineer. The settings within the unit are the results of careful testing and are not designed to be modified in the field. Tampering with them will probably result in audibly inferior performance. It will also void your warranty.

The only internal user-definable settings are the output ground lift jumpers mentioned above. Accessing them requires removing the top cover of the chassis.

To remove the top cover:

1. Disconnect the MX100 CCEP™ from the AC mains.
2. Using a Pozidriv® or a #1 Phillips screwdriver, remove the six screws that hold the top cover.

If the rear panel fuse blows, replace it only with the same type fuse (type T1A). If the rear panel fuse blows repeatedly, have the unit checked by an authorized service agency.

PRACTICAL CONSIDERATIONS

Physical

The case of the MX100 CCEP is fully enclosed to prevent the entry of foreign material and to shield the internal circuitry from most outside electromagnetic fields. To prevent the circuitry's picking up hum from inadequately shielded transformers, mount the MX100 CCEP at least 2 inches from any power amplifier. Computer monitors, motorized devices,

and some other gear may emit strong hum or electromagnetic fields also, so be careful about mounting the MX100 CCEP near them.

Convection currents from power amplifiers and other such heat-producing equipment could cause the MX100 CCEP to run hotter than it should, perhaps eventually causing premature failure of the electronic components and/or power supply. Make sure there is adequate ventilation in the equipment rack – use fans if necessary.

Environmental

As with all electronic equipment, avoid using the MX100 CCEP in damp or excessively humid conditions. In outdoor applications, protect the unit from rain and precipitation or any other dampness. If some mishap causes the unit to get wet or damp, dry it out thoroughly before using it again.

Cleaning

You can clean the exterior of the MX100 CCEP with a slightly damp cloth. Use a small amount of mild detergent or cleaning fluid if necessary. Do not use petroleum spirits, thinners, or other solvent cleaners – they might seriously damage the finish.

**If you have any questions regarding
the operation of your MX100,
please call EAW at (800) 992-5013**



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