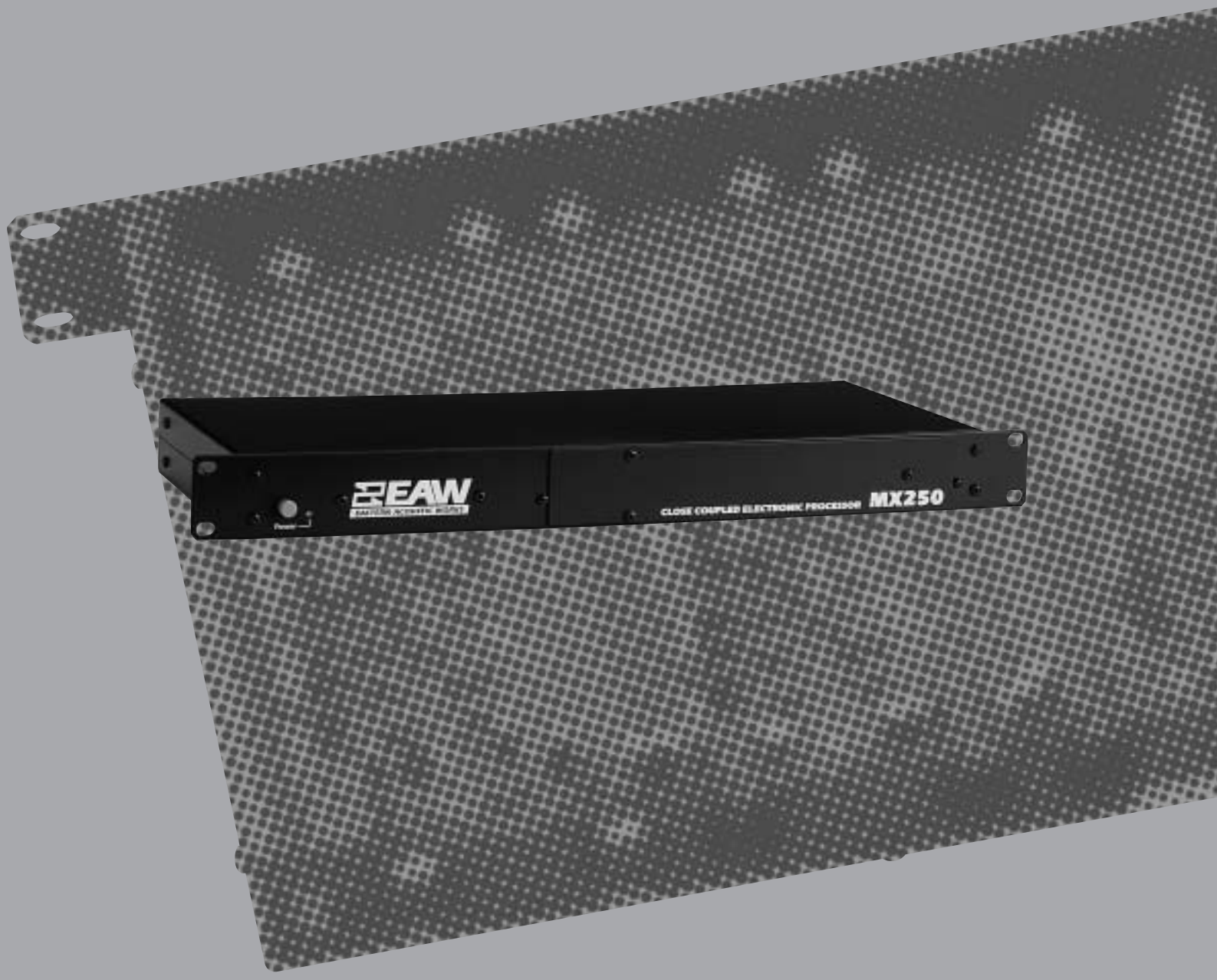
MX250 OWNER'S MANUAL



EAW

The MX250 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 EAW loudspeaker systems. This ensures optimum system performance and relieves the end user from the burden of configuration.

This design continues EAW's commitment to the primary importance of total system design in controlling a loudspeaker's ability to maximize its outputs within your application.

Features Overview

The MX250 CCEP™ incorporates a unique combination of features and design innovations that set it apart from conventional crossover networks and permit its precise adjustment for a particular EAW speaker system. EAW Engineering completed all the guesswork that you would normally perform with a conventional crossover in an attempt to attain the optimum parameters for each speaker system.

NON-COINCIDENT FILTERS

When necessary, the MX250 CCEP incorporates a non-coincident filter system. This means that the high-frequency and low-frequency filters aren't restricted to the same corner frequency—contributing to the system's overall superior acoustic performance. The filter types for both high frequencies and low frequencies are 24 dB-per-octave Linkwitz-Riley. Careful analysis of the MX250's electrical performance and the loudspeaker's acoustical performance remain key elements in the close coupling of the crossover to a particular speaker system. The end result of the close coupling process corrects acoustic response at the crossover frequency rather than depending on an "idealized" electrical response.

Optimum crossover frequencies and filter shapes for each speaker system configuration have been determined, and incorporated at the factory as the MX250 CCEP's presets. The label on the rear of the unit confirms the configuration.

Technical Description

OPERATIONAL SUMMARY

The MX250 CCEP functions as a stereo two-way crossover or as a stereo two-way crossover with additional summed monaural low and high outputs. EAW presets the MX250 as part of the configuration process. Unlike most outboard crossover devices, we optimize this device for a particular combination of EAW subwoofers and full-range speakers or for bi-amping specific EAW full-range systems. The configuration of your unit is labeled on the back of the MX250 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 MX250 CCEP has been preset at the factory using separate high-pass and low-pass filter modules. The summed output configuration is also preset at the factory.

If you wish to reconfigure your MX250 CCEP for a different speaker system contact the EAW Service Department at 800-992-5013 (508-234-6158), fax 508-234-3376. The MX250 CCEP is not intended to be modified in the field.

ENCLOSURE

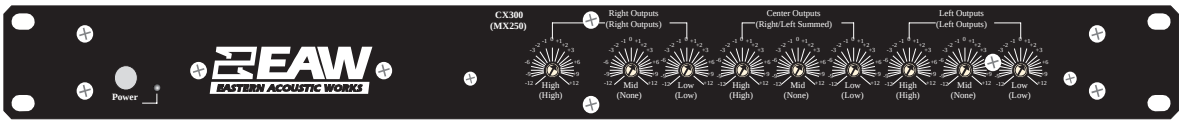
The steel chassis of the MX250 CCEP is designed and built to withstand the abuse and jostling of portable and mobile applications while ensuring reliable operation. The chassis is one rack-space tall (1.75 in.; 44.5 mm) and has a depth of 8.16 in. (207.3 mm).

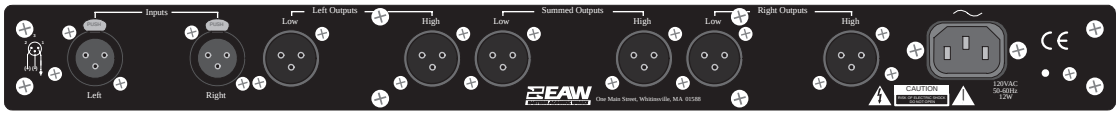
The inputs and outputs are 3-pin XLR connectors on the rear panel of the chassis; two females for the inputs, and six males for the outputs.

AC POWER

The MX250 CCEP has a universal power supply compatible with virtually any AC power source throughout the world today. An internal switch sets the power supply for either 95-130 VAC (50-60 Hz) or 190-260 VAC (50-60 Hz) operation. A label on the rear of the MX250 indicates the factory voltage setting.

The AC power line cord attaches to the MX250 CCEP chassis via an IEC-230 connector on the rear panel. Check and insure the AC line cord mains cable and voltage setting are correct for the power source. An incorrect voltage switch setting could cause severe damage to the unit.

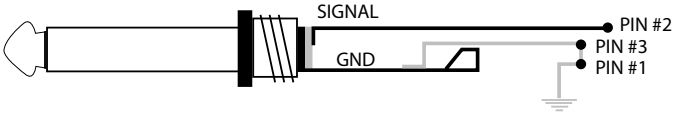




The power switch on the front panel switches the AC on and off. No current flows when this switch is in the "off" position. A power LED on the front panel confirms that the unit is correctly powered up.

CONNECTING THE MX250 CCEP

Care should be taken to ensure that pin #3 of the MX250 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 MX250'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 (canceling 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 input impedance of the MX250 CCEP is 20 kΩ balanced, 10 kΩ or greater unbalanced.

OUTPUT SIGNAL CONNECTION

Output signal connections are through the male XLRs. The MX250 has actively-balanced differential output amplifiers.

The outputs are wired as follows:

2	signal +
3	signal -
1	ground

INTERNAL SERVICING

There are no user-serviceable parts inside the MX250 CCEP. The filter modules, presets, trims, etc., should not be changed, adjusted, or modified by anyone other than an EAW 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. POTENTIALLY LETHAL VOLTAGES ARE PRESENT INSIDE THE MX250, THEREFORE SERVICING SHOULD BE LEFT TO QUALIFIED TECHNICIANS.

Practical Considerations

P H Y S I C A L

The case of the MX250 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 MX250 CCEP at least two inches from any power amplifier. Computer monitors, motorized devices, and some other gear may emit strong hum or electromagnetic fields also, so exhibit care when mounting the MX250 CCEP near them.

Convection currents from power amplifiers and other such heat-producing equipment could cause the MX250 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 there is any concern.

E N V I R O N M E N T A L

As with all electronic equipment, avoid using the MX250 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.

C L E A N I N G

You can clean the exterior of the MX250 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.

S P E C I F I C A T I O N S :

Inputs	Two; active balanced
Input Impedance	> 20k Ohms
Max. Input Level	+22dBu
Outputs	Six; active balanced
Output Source Impedance	200 Ohms
Output Min. Load	600 Ohms
Output Max. Level	+26dBu into 600 Ohm load
Frequency Resp.	+/- 0.5dB 20Hz - 20kHz
Noise	< -90dBu, 20Hz - 20kHz unwtd
Dynamic Range	110dB
Total Harmonic Distortion	< 0.003% 20Hz - 20kHz, 0dBu
Gain	+/- 12dB from unity setting
Gain at Unity Setting	0dB unbalanced out, 6dB balanced out within passband
Input Connectors	3-pin female XLR
Output Connectors	3-pin male XLR
Power Connector	3 pin IEC
Power	95-130 VAC, 190-260 VAC; 50-60Hz
Power Consumption	< 15 watts
Net Weight	8.5 pounds (3.9kg)
Shipping Weight	10 pounds (4.5kg)
Dimensions	1.75 (1U) X 19.00 X 8.16 inches (44 X 483 X 207mm)

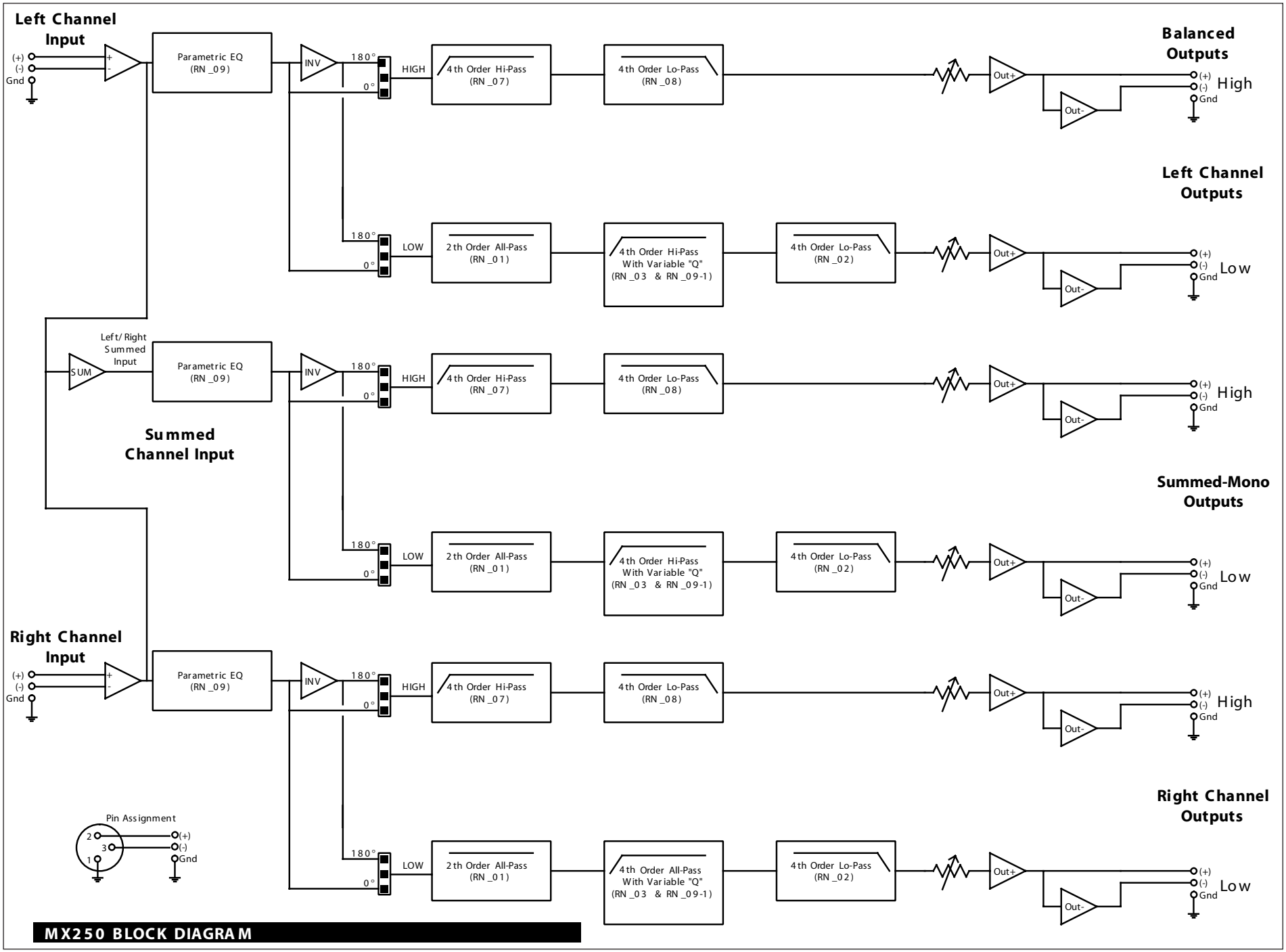
System Sensitivities

For the Direct Radiating Sub configuration a default gain adjustment of +5dB on the sub output is factory preset. For the Horn Loaded Sub configuration a default gain adjustment of 0 dB is factory preset. Amplifier gains, environment, and personal taste may require the further level adjustment. The following list of sensitivities is for EAW products commonly used with the MX250. Use this reference to fine tune your particular combination of sub and full range products. This is easily done by removing the front panel of the MX250 and adjusting the gains to meet your needs.

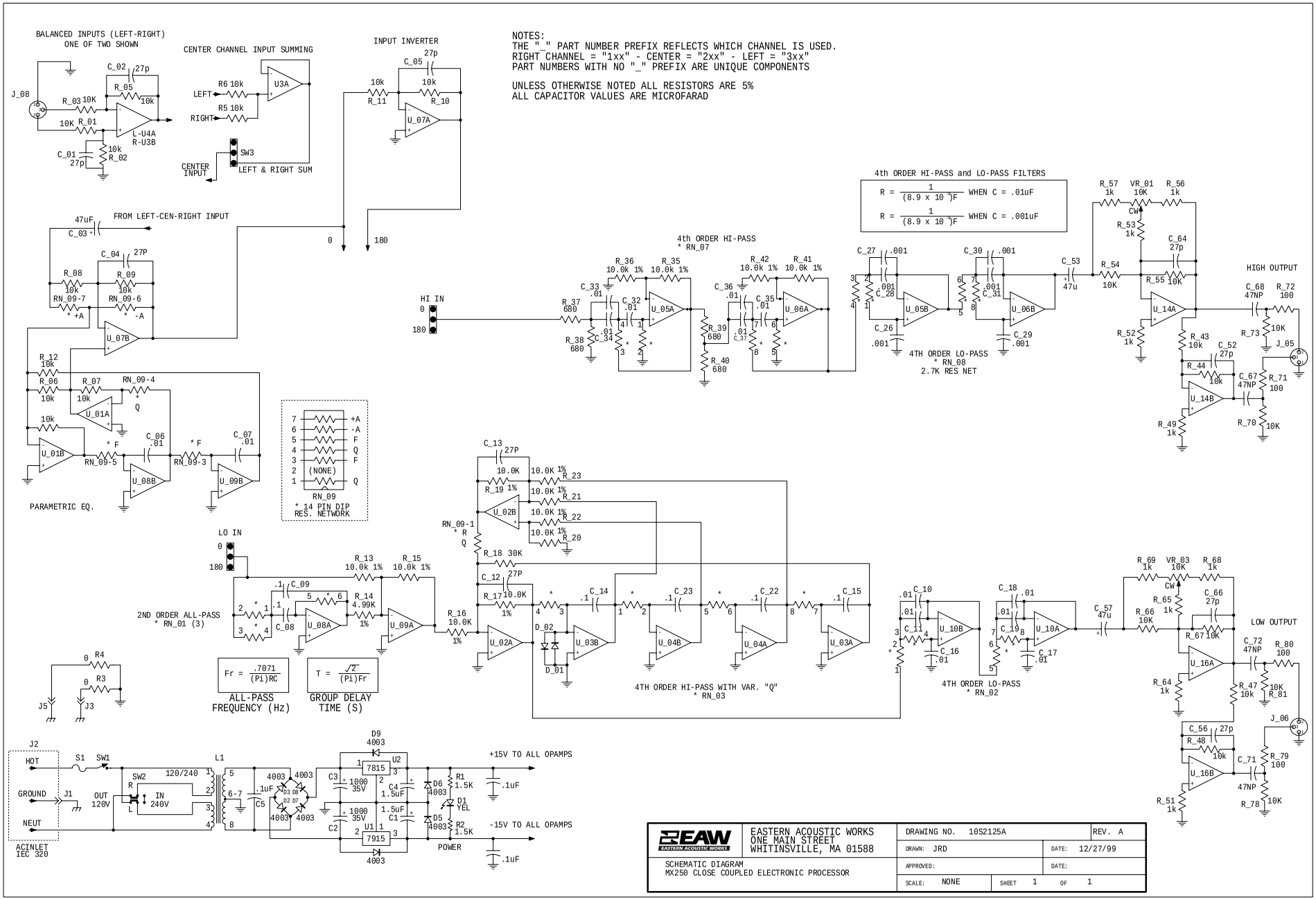
Full Range	
AS300e	98
CP621	101
DC5	97
DC6	95
DS122e	98
DS123e	97
DS153e	98
DS223e	99
FL103	95
FR129z	97
FR153z	97
FR159z	100
FR122e	98
FR152e	98
FR153e	98
FR253e	101
JF50S	91
JF60	90
JF80	93
JF100e	97
JF200e	98
JF260z	97
JF290z	97
JF560z	97
JF590z	97
KF300e	99
L8CX2XO	90

Full Range	
LA212	97
LA215	97
LA325	100
LA460	97
LS432	95
LS832	97
MK2164	97
MK2194	97
MK5164	96
MK5194	97
MK8196	95
MS20	88
MS30Ci	90
MS63	95
MS103	95
SM122e	99
SM155e	98
SM200iH	98
SM260iV	98
SM400iH	101
SM500iV	98
UB12Se	89
UB22i	94
UB42	94
UB72	94
UB80	92
UB82	95

Subsytems	
BH822e	109
DCS2	107
FR250z	101
KF940	109
LA118	95
LA128	98
LA400	107
SB48e	92
SB120	96
SB150	95
SB180	96
SB250	98
SB330e	96
SB528	99
SB600e	98
SB625P	98
SB750	99
SB850F	99
SB850P	99
SB850R	99
SB1000e	99
SB184C	96
SB185C	96
SB284C	99
SB284CP	99



MX250 BLOCK DIAGRAM


BALANCED INPUTS (LEFT-RIGHT)
ONE OF TWO SHOWN
CENTER CHANNEL INPUT SUMMING
INPUT INVERTER
NOTES:
THE "_" PART NUMBER PREFIX REFLECTS WHICH CHANNEL IS USED.
RIGHT CHANNEL = "1xx" - CENTER = "2xx" - LEFT = "3xx"
PART NUMBERS WITH NO "_" PREFIX ARE UNIQUE COMPONENTS
UNLESS OTHERWISE NOTED ALL RESISTORS ARE 5%
ALL CAPACITOR VALUES ARE MICROFARAD
4th ORDER HI-PASS and LO-PASS FILTERS
FROM LEFT-CEN-RIGHT INPUT
4th ORDER HI-PASS
* RN_07
HI IN
4TH ORDER LO-PASS
* RN_08
2.7K RES NET
HIGH OUTPUT
PARAMETRIC EQ.
LO IN
2ND ORDER ALL-PASS
* RN_01 (3)
4TH ORDER HI-PASS WITH VAR. "Q"
* RN_03
4TH ORDER LO-PASS
* RN_02
LOW OUTPUT
ALL-PASS
FREQUENCY (Hz)
GROUP DELAY
TIME (S)
+15V TO ALL OPAMPS
-15V TO ALL OPAMPS
POWER
ACINLET
IEC 320
EASTERN ACOUSTIC WORKS
ONE MAIN STREET
WHITINSVILLE, MA 01588
DRAWING NO. 10S2125A
REV. A
DRAWN: JRD
DATE: 12/27/99
APPROVED:
DATE:
SCALE: NONE
SHEET 1 OF 1
SCHEMATIC DIAGRAM
MX250 CLOSE COUPLED ELECTRONIC PROCESSOR

All data, drawings and specifications published in this manual are subject to change without notice. EAW assumes no liability for typographical errors. All the information contained herein has been carefully checked for accuracy. Nevertheless, no warranty whatsoever of product performance is implied or assumed.

Terms of the EAW Warranty

EAW Professional Active Electronics devices are guaranteed for a period of two years from the date of original purchase against malfunction due to defects in workmanship and materials. During the warranty period, EAW will remedy all such defects without charge for parts or labor upon the return of the unit together with its original sales receipt or other proof of purchase to EAW or to an authorized EAW service facility.

This warranty does not extend to damage resulting from improper installation, misuse, neglect or abuse. Defects in or damage to the exterior appearance of EAW products are specifically excluded from this warranty. In no event shall EAW be liable for incidental or consequential damages. Repairs and/or modifications by other than EAW or its authorized service facilities automatically void this warranty. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. For more information concerning EAW service and warranty policies, contact EAW.