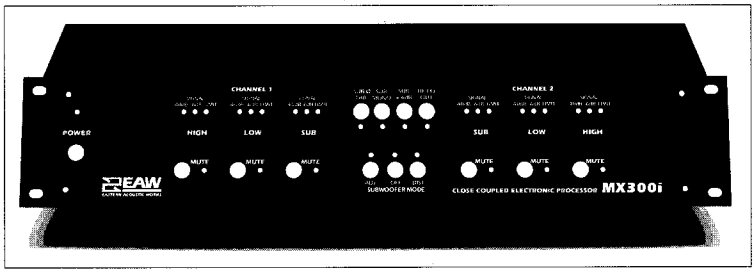
FORSYTHE SERIES

MX300i CCEP™

Electronic Signal Processing Unit

Preliminary New Product Data



The MX300i CCEP™ is a two channel, Three-way electronic crossover designed for use in both fixed installations and touring sound systems and is supplied configured for use with specific EAW system configurations. This removes the burden of "setting up" from the end user and ensures optimum system performance under all conditions. It is compact, robust and very reliable, yet simple to service should the need arise.

The MX300i initially will be offered configured for use with EAW's KF300i, KF600ix and DS223Hi/SB528 systems, for up to date information on additional configurations please contact the factory.

Overload Protection — Each frequency band has its own overload protection circuitry which utilizes a true-RMS above threshold infinite compressor to momentary reduce gain whenever the preset output limit is approached. This is normally set so as to prevent the power amplifiers from being driven into clipping at any time but may also be set lower to protect particularly vulnerable drivers.

Low Frequency Control — The MX300i lowest operating output incorporates a low frequency control circuit to provide both stepdown alignment equalization and high pass filtering to prevent operation below system cutoff. This equalized filter is controlled to provide maximally extended distortion free low frequency response at all power levels. The threshold for this circuit is pre-set at the factory.

Sub-Bass Mode — The front panel switchable sub-bass modes of "OFF", "ADJacent" and "DISTant", enable you to maintain the correct sound balance and source localization regardless of whether you do or don't use subwoofers and if used whether the subwoofer systems are mounted adjacent to the main speaker stacks or located remotely. This is particularly valuable when the sub-bass systems are mounted at ground level and the rest of the system is "flown".

Phase Compensation — At the crossover point of any multi-way system, the sum of the upper and lower output bands should always be flat so as not to cause any peaks or dips in the overall system response. This state of affairs, however, only occurs when the two signals being summed are in phase with each other.

The amplitude response of the filter and loudspeaker may each be correct but when combined, phase errors are almost certain to occur such that, the combined response will not be flat. Many manufacturers use equalization in an attempt to combat this shortcoming but equalization only attempts to hide the problem; it doesn't cure it. The result might look acceptable on paper, but listening tests confirm that this system does not yield the sound quality required and is not consistent.

The MX300i CCEP™ incorporates phase correction circuitry, again tailored to the specific system it is setup for, which compensates for the phase response of the drivers and their relative placement in the enclosure to present the listener with an accurate, phase coherent sound. Without phase correction, the high frequency drivers in a multi-way system tend to lag behind the low frequency drivers causing a significant loss of definition and intelligibility.

Asymmetrical Filters — The MX300i CCEP™ incorporates independent internal settings for each of the six filters on each channel. Within each filter's individual settings you can adjust independently both pairs of second order filters used to create the fourth order ultimate slope. This is a key element in the close coupling of the crossover to a particular speaker system to compensate for acoustical response of individual elements.

EASTERN ACOUSTIC WORKS, INC.

One Main Street, Whitinsville, MA 01588 ▪ (508) 234 - 6158 ▪FAX: (508) 234 - 8251

MX300i Preliminary Specifications

Audio Data

Dynamic Range:	115 dB (108 dB limited by internal limiter)
THD+N (0 dBu 20-20k Hz):	0.03% (0.08% limit)

Input Data

Connectors:	Female XLR (Locking)
Type:	Electronically Balanced Differential
Differential Input:	>10k Ohms
Common-Mode Input:	30k ohms
Input Overload 20-20k Hz:	+20 dBu (+18 dBu Limit)

Output Data

Connectors:	Male XLR (Locking)
Type:	Single-Ended
Output Impedance:	10 Ohms
Max Output Voltage:	+18 dBu +14 dBu rms limited by internal limiter
Minimum Resistive Load:	300 ohms during limiting
Maximum Capacitive Load:	22 nF during limiting Outputs are stable with any capacitive load.
Output Noise(20 - 20k Hz @ 600 Ω)	
Sub & LF Bands:	-100 dBu (-97 dBu limit)
HF Band:	-97 dBu (-94 dBu limit)
Output Offset Voltage:	±1.5 mV (±10 mV limit)

General Data

Dimensions:	19" W x 3.5" H x 10" D
Line Input Power:	30 W
Line Voltage Requirements	
110 VAC Setting:	90 - 135 VAC, 50 - 60 Hz
220 VAC Setting:	195 - 270 VAC, 50 - 60 Hz
Line Input/ Fuse Holder:	IEC 320 socket with 5 x 20 mm fuseholder
Operating Temperature:	0 - 50° Celsius
Accessories Included:	UL/CSA Line Cord Spare Line Fuse (in fuseholder)

High Section Data

Highpass Filter Type:	Cascaded Second-Order Sections
HF/LF Crossover Frequency:	400 Hz Nominal (KF300i) (85 - 1.4k Hz via internal SIP)
Lowpass Filter Type:	Third-Order Butterworth
Lowpass Frequency:	48k Hz -3 dB
Limiter Type:	True-RMS Above-Threshold Infinite Compressor
Limiter Time Constant:	39 msec
Limiter Threshold:	1 Vrms Default (0.25 - 4 Vrms via internal Master Threshold Control & HF Threshold resistor)
Pass Band Gain:	0 dB (10 dB range via internal HF Gain resistors)

Low Section Data

Highpass Filter Type	
SUB ADJacent Mode:	Cascaded Second-Order Sections
SUB DISTant & OFF Modes:	Q=.54 2nd-Order Section, fn=40Hz
LF/SW Crossover Frequency	
SUB ADJacent Mode:	75 Hz Nominal (KF300i) (31 - 640 Hz via internal SIP)
SUB DISTant & OFF Modes:	35 Hz Nominal (KF300i) (31 - 1.6k Hz via internal plug-in PCB)
Lowpass Filter Type:	Cascaded Second-Order Sections
Limiter Type:	True-RMS Above-Threshold Infinite Compressor
Limiter Time Constant:	85 msec
Limiter Threshold:	1 Vrms Default (0.25 - 4 Vrms via internal Master Threshold Control & LF Threshold resistor)
Pass Band Gain:	0 dB (10 dB range via internal LF Gain resistors)
LF/HF Phase Network Type:	1st-Order Allpass
LF/HF Phase Adjustment:	0 - 180 degrees(via internal plug-in PCB)

Sub Section Data

Highpass Filter Type:	Cascaded Second-Order Sections
Limiter Type:	True-RMS Above-Threshold Infinite Compressor
Limiter Time Constant:	182 msec
Limiter Threshold:	1 Vrms Default (0.25-4 Vrms via internal Master Threshold Control & SW Threshold resistor)
Pass Band Gain:	0 dB (10 dB range via internal SW Gain resistors)
SW/LF Phase Network Type:	1st-Order Allpass
SW/LF Phase Adjustment:	0 - 180 degrees(via internal plug-in PCB)
Sub Mono Switch:	Sums both SW bands each attenuated -3 dB

System Highpass Data

Highpass Filter Alignment	
ADJacent & DISTant Modes:	2nd-Order, Q=2, fn=37 Hz
SUB OFF Mode:	2nd-Order, Q=1.3, fn=40 Hz
Highpass Response	
ADJacent & DISTant Modes:	+6 dB @ 40 Hz(Default KF300i)
SUB OFF Mode:	+3 dB @ 48 Hz (Default KF300i) Both modes independently adjustable 12 - 300 Hz (via internal plug-in PCB)

Low Frequency Protection

Protection Circuit Type:	Sliding 2nd-Order Highpass Filter Controlled by True-RMS detector to yield 2:1 compression of energy below 80 Hz above threshold set via internal Master Limit Control)

EASTERN ACOUSTIC WORKS, INC.
One Main Street, Whitinsville, MA 01588
(508) 234 - 6158 ▪ FAX: (508) 234 - 8251

Pub # MX300 V1.0.2/91
Printed In USA