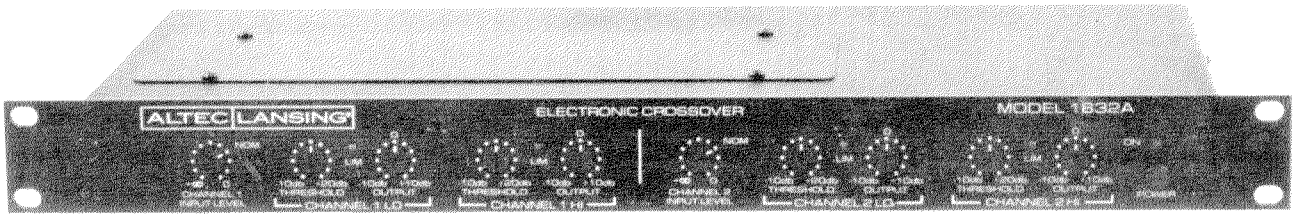
1632A ELECTRONIC CROSSOVER



DESCRIPTION

The ALTEC LANSING **1632A** Electronic Crossover is a dual channel two-way crossover switchable to a single channel three-way crossover. Combination woofer/enclosure equalization options are included on each low pass output along with combination horn/driver equalization options on each of the **1632A**'s high pass outputs. Also featured are selectable 30/60 Hz high pass input filters. Hard limiters on each output allow speaker protection in all but the most rugged of applications.

The crossover sections provide 24 switch selectable crossover frequencies ranging from 50 Hz to 10 kHz. Crossover frequencies are located on the ISO one-third octave centers. The Linkwitz-Riley fourth order filter response provides stop band attenuation of 24 dB/octave (80 dB/decade). Simple equations are provided to calculate other frequencies for custom applications.

Each low pass output is provided with a "flat" woofer/enclosure combination equalization submodule. This submodule provides a maximally flat frequency response. Other responses, including low frequency peaking and "step down", are available by custom building submodules whose components are easily calculated from simple equations provided to optimize a loudspeaker system.

Each of the high pass outputs is provided with a "flat" horn/driver combination equalization submodule. Optional submodules in the **9600A**-series are available to properly equalize almost any ALTEC LANSING horn and compression driver combination for a flat power response.

Speaker protection is provided by hard limiters on each output of the **1632A**. Each limiter features a front panel threshold control ranging from -10 dBu to +20 dBu with LED threshold indicators on each output. They also include switch selectable and user-optional response times to be used to aid in protecting low-frequency woofers as well as high-frequency compression drivers. The *feed-foward* design of each limiter eliminates the possibility of oscillation, and it allows exact response times to be program-dependent to preserve a more natural sound.

Other features include front panel input level controls for each input channel, ±10 dB gain controls for each output channel, barrier strip termination on each input and output, and electronically balanced input and output circuitry. The universal power transformer permits 100, 120, 200, 220, 240 Vac 50/60 Hz operation. An optional plug-in input and output line transformer, **15560A**, is available for isolation should it be deemed necessary.

SPECIFICATIONS

Type: Dual-channel two-way electronic crossover or single-channel three-way electronic crossover

Input Type: Electronically balanced

Input Impedance: >15 kΩ unbalanced
>30 kΩ balanced

Maximum Input Level: +18 dBu
(Ref. 0 dBu=0.775 Vrms)

CMRR: >60 dB

Output Type: Electronically balanced

Output Impedance: <50 Ω unbalanced
<100 Ω balanced

Maximum Output Level: +24 dBm

Minimum Load Impedance: 600 Ω

Frequency Response: (Ref. 1 kHz) 30 Hz - 20 kHz +0, -3 dB

Total Harmonic Distortion: <0.03% 0 dBu output at 1 kHz

Intermodulation Distortion (SMPTE): <0.1% at 0 dBu output

Noise Floor: <-80 dBm A-weighted

Channel Crosstalk: >60 dB

Input Filter: 30/60 Hz user-selectable high pass (24 dB/octave)

Crossover Frequency Range: 50 Hz to 10 kHz, switch selectable on the ISO one-third octave centers

Crossover Filter Type: Fourth-order Linkwitz-Riley
Slope: 24 dB/octave (80 dB/decade)

Limiter Threshold Range: -10 dBu to +20 dBu

Response Times: Switch selectable from
Ch.1 LF output: Slow (<500 Hz) to Medium (full range)
All other outputs: Medium to Fast (>500 hz)

Controls: Ten recessed screwdriver-slotted controls include:
Two input level controls
Four limiter threshold controls
Four output gain controls
AC power switch

Connections
Input: Barrier strip
Output: Barrier strip
AC Power: IEC power cord receptacle

Power Requirements: 100, 120, 200, 220, 240 Vac 50/60 Hz user selectable. Supplied wired and fused for 120 Vac with a power concumption of 14 watts. A detachable line cord with 120 volt grounding plug is supplied.

Operating Temperature: Up to 60°C (140°F)

Dimensions: 1.75" (4.45cm) H x 19.0" (48.3cm) W x 9.75" (24.8cm) D

Shipping Weight: 11 lbs. (5 kg)

Net Weight: 8 lbs. (3.7 kg)

Enclosure: Rack mount chassis
18 GA steel main chassis
18 GA steel top/back cover
3/16 inch aluminum front panel

Color: Black

Support Documentation: Equations to calculate new crossover frequency
Equations to modify LF EQ curve
Guidelines to modify HF EQ curve

Included Accessories: Three "flat" horn/driver EQ submodules'
Two "flat" low frequency submodule assemblies

Optional Accessories: **10401** perforated steel security cover
15560A plug-in line transformer

Optional Horn/Driver Equalization Submodule Accessories (16-pin DIP plug)

9600A: Blank submodule assembly for custom equalization

9601A
9602A
9603A
9604A
9605A
9606A
9607A
9608A
9609A
9610A

See chart to select 9600-series submodule for a particular horn/driver combination.

LARGE FORMAT HORNS AND DRIVERS

HORN \ DRIVER	288-L	290-L	291-L	299-L	906-A
MR42B	**9603A**	**9602A**	**9603A**	**9603A**	**9603A**
MR64B	**9601A**	**9602A**	**9601A**	**9601A**	**9601A**
MR94B	**9601A**	**9602A**	**9601A**	**9601A**	**9601A**
MRII-542	**9605A**	**9602A**	**9606A**	**9606A**	**9607A**
MRII-564	**9607A**	**9602A**	**9608A**	**9607A**	**9607A**
MRII-594A	**9605A**	**9604A**	**9604A**	**9605A**	**9605A**
MRII-5124	**9610A**	**9602A**	**9604A**	**9609A**	**9609A**

SMALL FORMAT HORNS AND DRIVERS

MR994A/909-A: **9609A**

ALTEC LANSING continually strives to improve products and performance. Therefore, specifications are subject to change without notice.

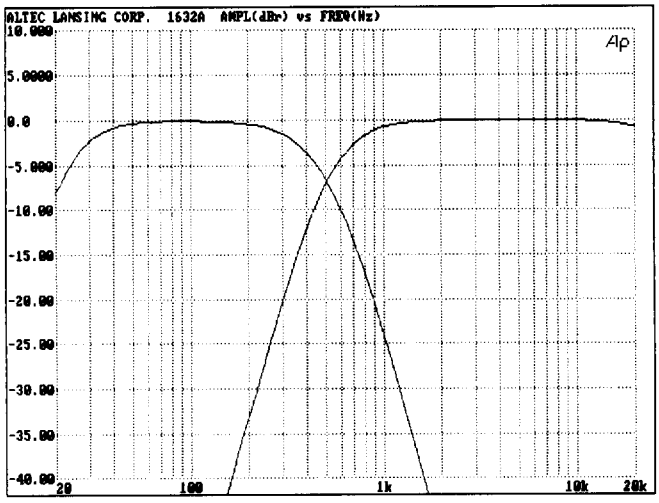


Figure 1. Typical two-way crossover curve.

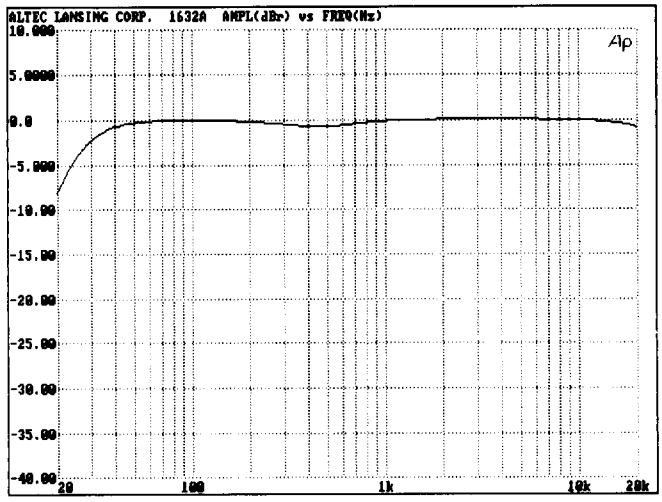


Figure 2. Summed high pass and low pass amplitude response

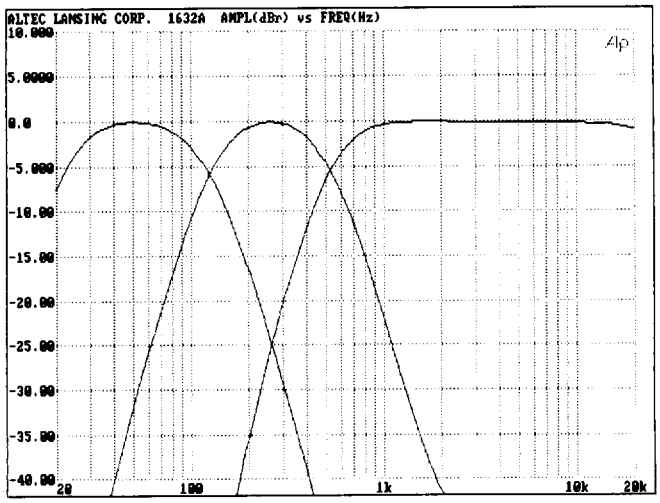


Figure 3. Typical three-way crossover curve.

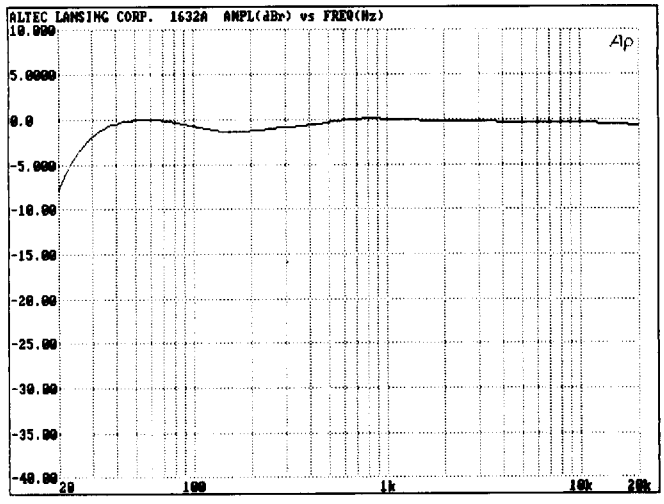
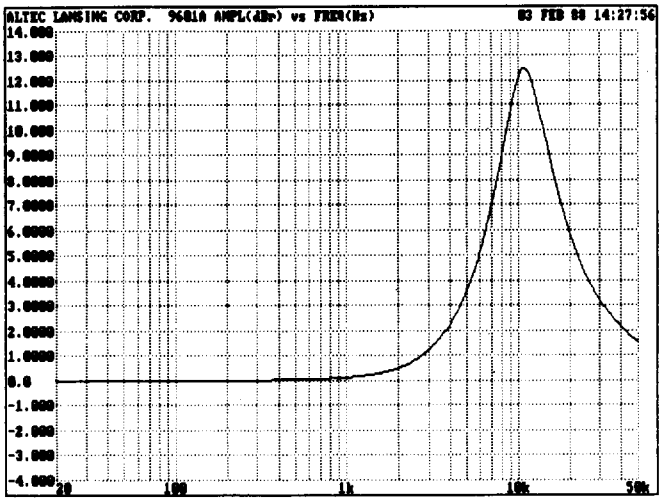
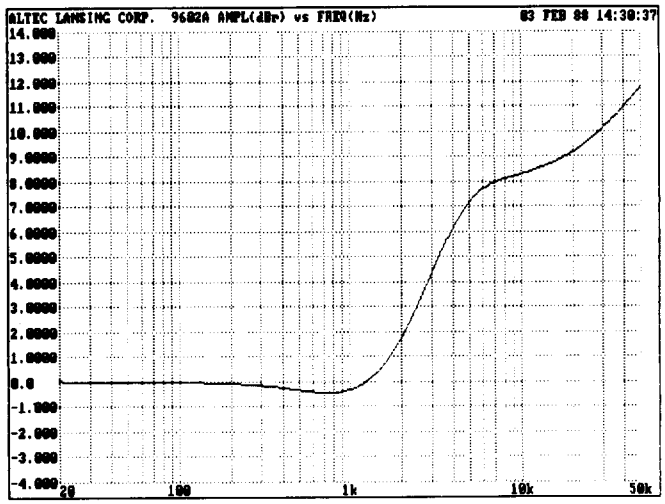
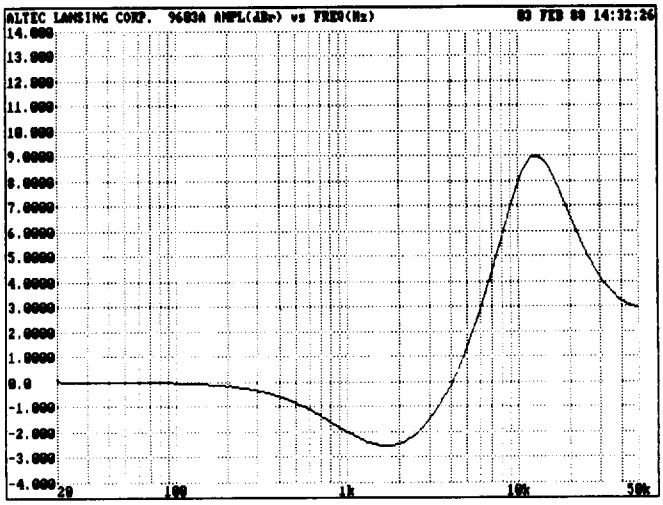


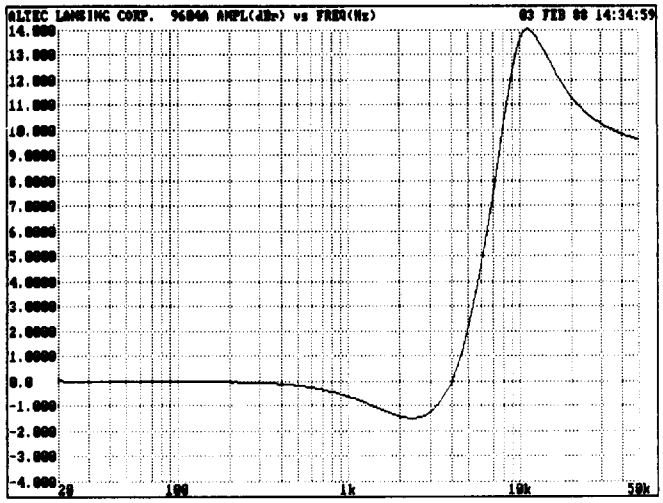
Figure 4. Summed high pass, low pass, and mid band amplitude response.

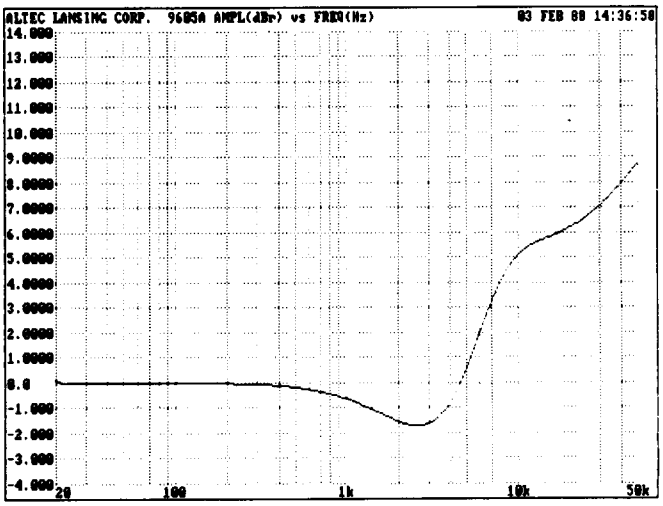
EQUALIZATION CURVES FOR THE 9600A SERIES SUBMODULES

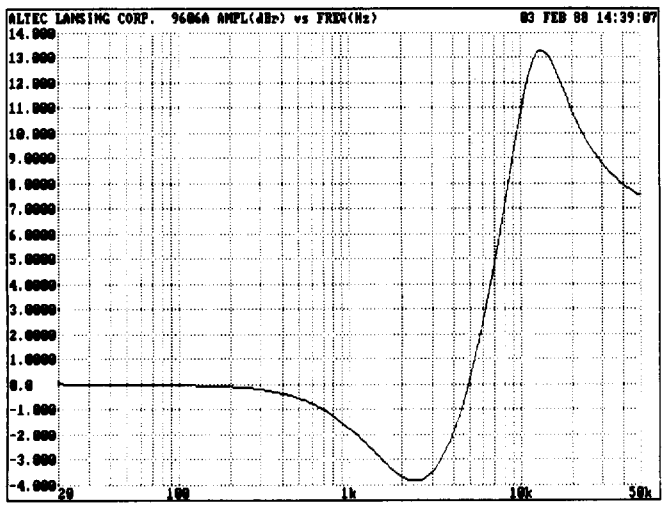


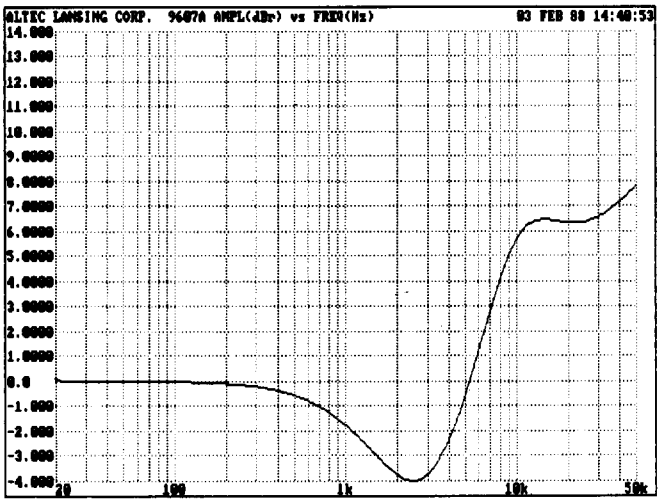








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14.000
13.000
12.000
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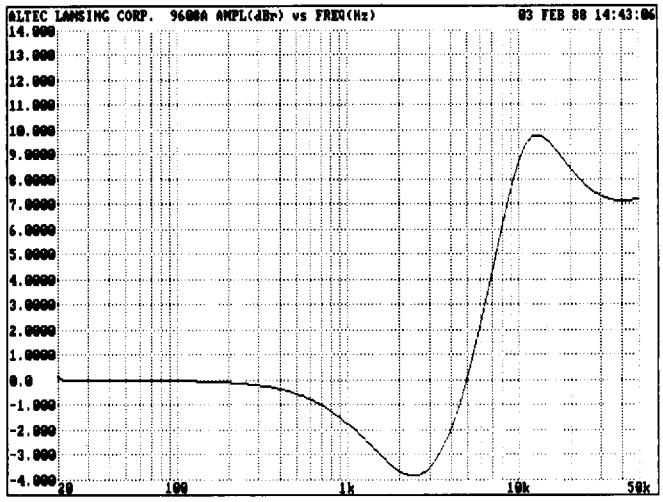
10.000
9.0000
8.0000
7.0000
6.0000
5.0000
4.0000
3.0000
2.0000
1.0000
0.0
-1.000
-2.000
-3.000
-4.000
20
100
1k
10k
50k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10.000
9.0000
8.0000
7.0000
6.0000
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4.0000
3.0000
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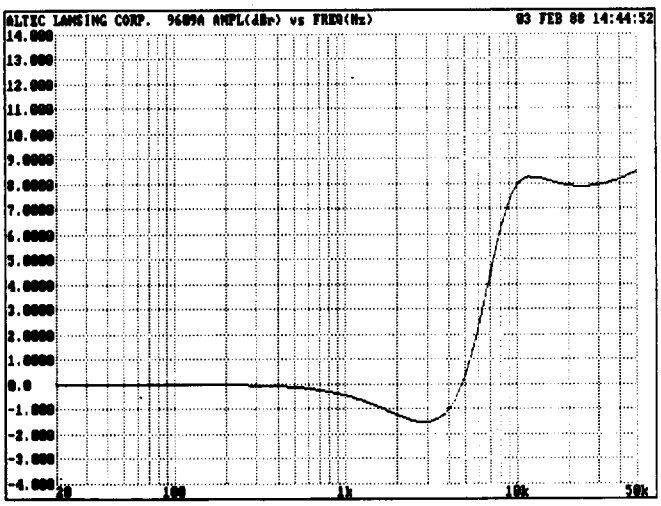
0.0
-1.000
-2.000
-3.000
-4.000
20
100
1k
10k
50k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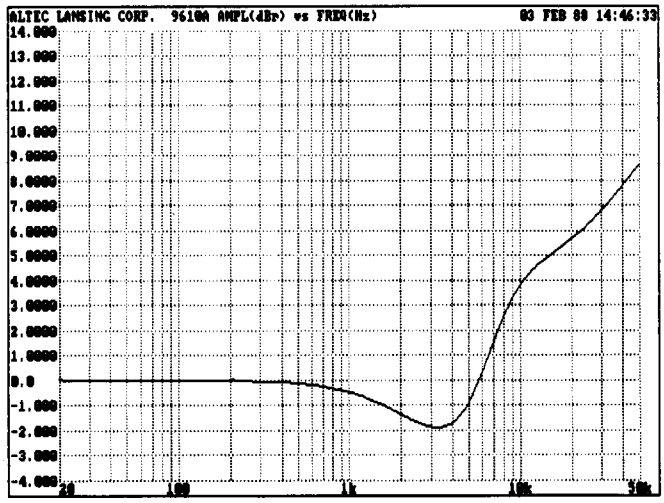
-1.000
-2.000
-3.000
-4.000
20
100
1k
10k
50k


ALTEC LANSING CORP. 9610A AMPL(dBr) vs FREQ(Hz) 03 FEB 88 14:46:33
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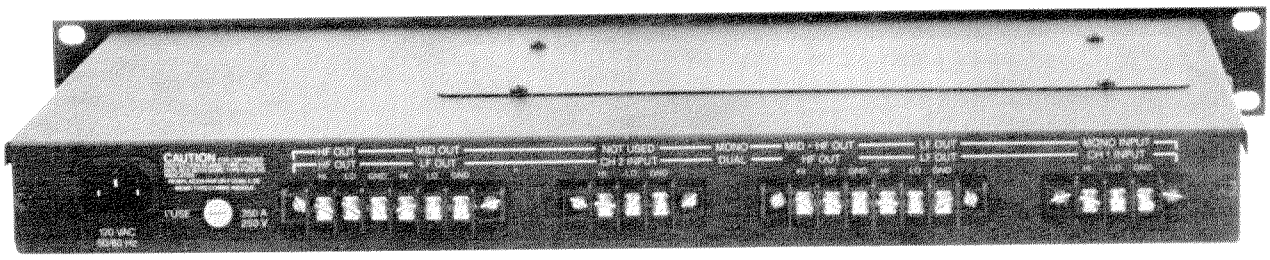
13.000
12.000
11.000
10.000
9.0000
8.0000
7.0000
6.0000
5.0000
4.0000
3.0000
2.0000
1.0000
0.0
-1.000
-2.000
-3.000
-4.000
20
100
1k
10k
50k



ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The electronic crossover shall be a dual-channel two-way crossover switchable to a one-channel three-way crossover. The crossover sections shall provide 24 switch selectable frequencies within the range of 50 Hz to 10 kHz. Crossover frequencies shall be chosen to conform to ISO one-third octave centers. The crossover shall include additional circuitry and female DIP sockets for the acceptance of optional plug-in equalizer submodule assemblies in all outputs. In the low frequency outputs, this circuitry, in combination with the submodule assemblies shall equalize specific woofer/enclosure combinations for low frequency peaking or "step down" operation. For the high frequency outputs, this circuitry, in combination with the submodule assemblies, shall equalize specific horn/driver combinations for a flat power response. This circuitry shall be compatible with ALTEC LANSING's **9600A**-series of horn/driver equalization submodules. Three "flat" horn/driver submodules and two "flat" low frequency submodules shall be included accessories. A limiter shall be included on each output. Each limiter shall have a threshold control ranging from -10 dBu to +20 dBu and switch selectable response times. An LED threshold indicator shall be included on each output. The limiters shall exhibit the feedforward design concept to eliminate the possibility of oscillation. Each input shall include a user-selectable 30/60 Hz high pass filter with the slope of 24 dB/octave. An input level control shall be included on each input along with a gain control on each output.

The electronic crossover shall meet or exceed the following criteria: electronically balanced inputs and outputs; input impedance: 15 kohms unbalanced and 30 kohms balanced; maximum input level: +18 dBu; CMRR: >60dB; output impedance: 50 ohms unbalanced and 100 ohms balanced; maximum output level: +24 dBm; minimum load impedance: 600 ohms; frequency response: 30 Hz to 20 kHz +0, -3 dB; THD: <0.03% 0 dBu output at 1 kHz; IMD (SMPTE): <0.1% 0 dBu output; noise floor: < -80 dBm A-weighted; and channel crosstalk: >60dB. Input and output connections shall be made via barrier strips and the ac power via IEC power cord receptacle. A universal power transformer shall permit use with 100, 120, 200, 220, 240 Vac 50/60 Hz lines. Power consumption shall be 14 watts at 120 Vac. A standard IEC power cord shall be included. The electronic crossover shall be enclosed in a black 18 GA steel rack mount chassis with a 3/16 inch aluminum front panel. The unit shall conform to the following dimensions: 1.75" H x 19.0" W x 9.75" D, with a weight of 8 lbs.

The electronic crossover shall be the ALTEC LANSING **1632A**.

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OPERATING INSTRUCTIONS

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