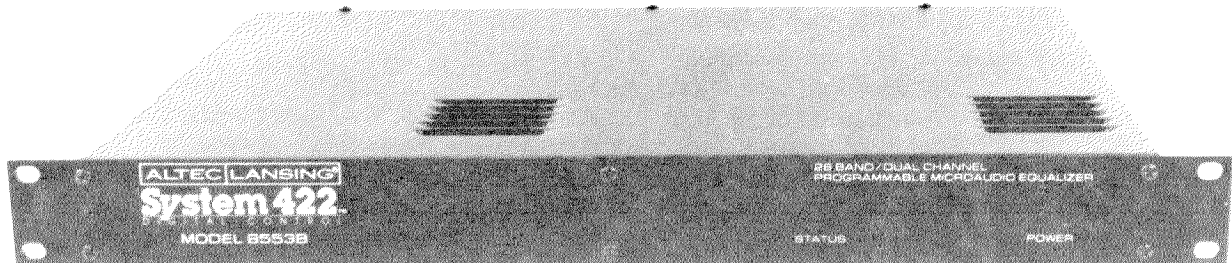


8553B DUAL ONE-THIRD OCTAVE PROGRAMMABLE MICROAUDIO EQUALIZER



DESCRIPTION

The ALTEC LANSING model **8553B** is a dual channel programmable one-third octave equalizer. Since the two channels are fully and independently programmable, there are no front panel controls to adjust. This makes the unit completely tamperproof and compact enough to fit into a single rack-space package.

Each channel has 28 programmable one-third octave frequency bands, programmable high and low pass filters, programmable master gain, and nine non-volatile memories providing one default and eight user preset memories. The gain of each frequency band and the master gain are programmable in precise 1 dB steps from -12 dB to +12 dB but can be easily modified by the user to provide ± 6 dB of boost and cut in 0.5 dB steps. High filter Q's provide improved selectivity resulting in less interaction between adjacent bands. The unit has electronically-balanced inputs and outputs with room inside to mount optional input and output isolation transformers.

The unit also features System422™ Digital Control via the PA-422 communications interface, a new serial interface definition for the control of professional audio products. This makes the **8553B** completely compatible with all other programmable products using the interface.

The PA-422 interface permits high speed communications between the programmer and each

8553B equalizer, and up to 250 equalizers can be series-connected to any single PA-422 output port.

The equalizer is fully programmable from most IBM PC-compatible desktop and laptop computers using Acosta-Graphics Release 2.0 System Management Software™ and the **8062A** PA-422 Dual Output Driver Card or the **8060A** RS-232-to-PA-422 converter. The **8062A** is an IBM PC XT/AT-compatible plug-in accessory card with two PA-422 outputs. The two ports permit independent control of up to 500 programmable devices. The **8060A** is an RS-232-to-PA-422 serial output converter. Although usable with any PC-type computer, it is especially useful with laptops which may not physically accommodate the **8062A** accessory card. With System422™, the equalizer can also be programmed using user-written custom software developed for specific installations. This permits increased flexibility in system designs where special needs are in order.

With its standard μ A-bus port, the **8553B** is also programmable from the **8061A** PC Control Adapter, **8051A** Autoprogrammer, or the **8055B** handheld programmer to the degree of the controller's capability.

The ALTEC LANSING **8553B** Dual Channel Programmable MicroAudio Equalizer provides unmatched power, performance, and flexibility to accommodate present and future system needs.

SPECIFICATIONS FOR THE 8553B DUAL CHANNEL

Channels:	Two, completely independent	Maximum Level:	+18 dBu
Filter Type:	Active analog 2nd-order bandpass filter set	Output Circuitry:	Electronically-balanced, transformer option
Number of Bands:	28 one-third octave bandpass filters on ISO center frequencies from 31.5 HZ to 16kHz	Type:	20 Ω balanced 10 Ω unbalanced
μA-bus Programmability:	28 one-third octave bandpass filters on ISO center frequencies from 31.5 HZ to 16kHz	Source Impedance:	600 Ω 's minimum
(using 8061A , 8051A , or 8055B programmers)		Nominal Level:	0 dBu (0.775 V rms)
B/C of each frequency band:	± 12 dB in 1 dB steps (standard configuration) ± 6 dB in $\frac{1}{2}$ dB steps (with user hardware modification)	Maximum Level:	18 dBm +24 dBu into 2 K Ω minimum load impedance
Master gain:	± 12 dB in 1 dB steps (standard configuration) ± 6 dB in $\frac{1}{2}$ dB steps (with user hardware modification)	High Pass Filter:	3-pole (18 dB/octave), programmable frequency
Channel selection:	rear panel toggle switch	Low Pass Filter:	3-pole (18 dB/octave), programmable frequency
μA-bus Interface Port:		Frequency Response:	20 Hz — 20 kHz, $\pm \frac{1}{2}$ dB (with high and low pass filters OFF)
Type:	Non-standard TTL	Total Harmonic Distortion:	<0.015% (at unity gain from 20 Hz — 20 kHz)
Max. Cable Length:	15 m (50 ft.)	IMD (SMPTE 4:1)	<0.015% (at unity gain)
System 422™ Programmability:		Noise Floor:	< -85 dBm (A-weighted, at unity gain, high and low pass filters OFF)
(using 8060A or 8062A PA-422 drivers and Acosta-Graphics Release 2.0 System Management Software™)		Dynamic Range:	>105 dB (peak signal to A-weighted background noise, 2 k Ω load)
B/C of each frequency band:	± 12 dB in 1 dB steps (standard configuration) ± 6 dB in $\frac{1}{2}$ dB steps (with user hardware modification)	Connectors:	
Master gain:	± 12 dB in 1 dB steps (standard configuration) ± 6 dB in $\frac{1}{2}$ dB steps (with user hardware modification)	Audio:	12-terminal barrier strip
Low pass filter corner frequency:	5 kHz, 6.3 kHz, 8 kHz, 10 kHz, 12.5 kHz, 16 kHz, & OFF (>50 kHz)	μ A-bus:	9-pin D-subminiature female connector
High pass filter corner frequency:	OFF (<10 Hz), 40 Hz, 50 Hz, 63 Hz, 80 Hz, 100 Hz, 125 Hz, & 160 Hz	System 422:	9-pin D-subminiature female (output), 9-pin D-subminiature male (input)
Memories:	Default (DEF), 1, 2, 3, 4, 5, 6, 7 & 8	Power:	IEC power connector
Memory pointer:	OFF, 1, 2, 3, 4, 5, 6, 7 & 8	RMS (Remote Memory Select):	9-pin D-subminiature male connector
Channel selection:	1, 2	Controls and Switches:	1 - 2-position toggle switch (for channel selection with μ A-bus programmers) 1 - 8-position DIP switch (for PA-422 device address selection)
Device Address:	via 8-position DIP switch	Non-volatile Memories:	9 (1 DEF & 8 User memories per channel)
PA-422 Interface Port:		Indicators:	1 - status LED (indicates that device is in the programming mode) 1 - power LED
Type:	Electronically-balanced, meets EIA-422-A	Power Requirements:	100, 120, 200, 220, 240 V ac, 50/60 Hz 50 watts
Baud rate:	19.2 kilobaud	Turn-on Protection:	\approx 3 second turn-on delay circuit, automatic ac failure bypass
Max. cable length:	1.2 kilometers (4,000 ft.)	Operating Temperature Range:	Up to 50°C (122°F)
Linking:	Serial	Dimensions:	
Character frame bits:	1 - start bit 8 - data bits 1 - even parity bit 2 - stop bits	(Depth measured from rear edge of front panel)	
Handshaking:	DSR/DTR	Height:	1.75 in. (4.4 cm)
Input Circuitry:		Width:	19.0 in. (48.2 cm)
Type:	Electronically-balanced, transformer option		
Impedance:	20 k Ω balanced 15 k Ω unbalanced		
Nominal Level:	0 dBu (0.775 V rms)		

CHANNEL PROGRAMMABLE MICROAUDIO EQUALIZER

Depth (unit only)	14.0 in. (35.6 cm)
Depth (with cables)	15.75 in. (40.0 cm)
Weight:	
Net:	15 lbs. (6.8 kg)
Shipping:	16.5 lbs. (7.5 kg)
Color:	Black
Enclosure:	Rack-mount chassis, 3/16 in. aluminum front panel

Included Accessories: Rack-mount hardware kit, 9-pin D-subminiature shorting jumper plug, 3 ft. linking cable, IEC power cord, Universal voltage stickers, operating instructions

Optional Accessories: **15560A** Input/Output isolation transformer

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Typical Performance Curves for One Channel of 8553B Dual Channel One-third Octave Equalizer

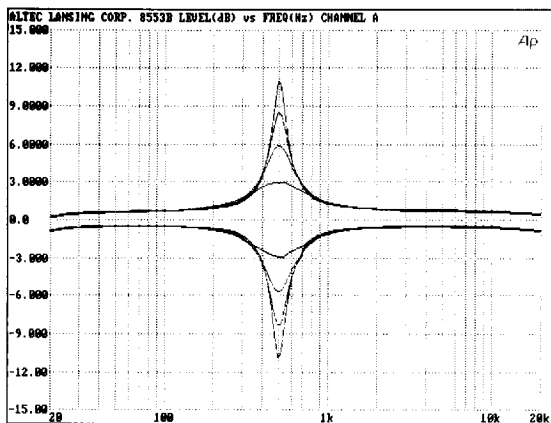


Figure 1. Plot of Amplitude (dB) of 500 Hz band at ± 3 dB, ± 6 dB, ± 9 dB, and ± 12 dB

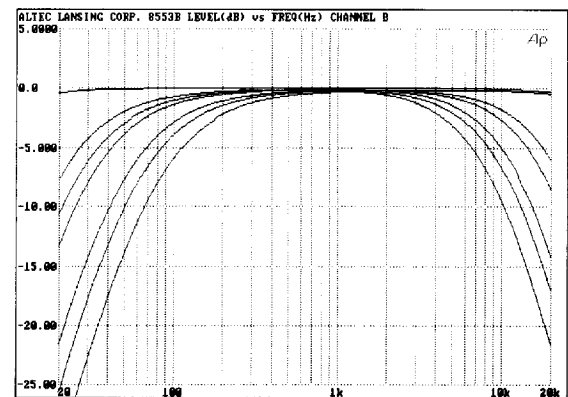


Figure 2. Plot of high and low pass filter responses

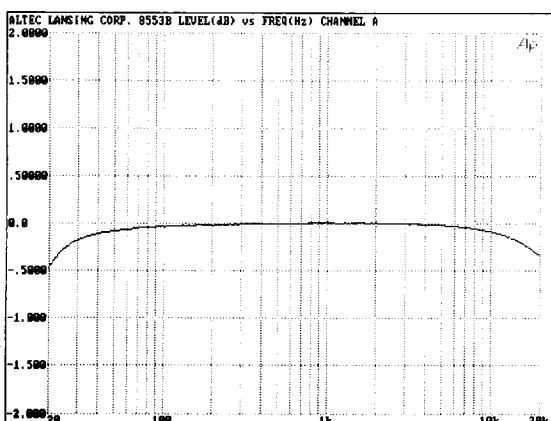


Figure 3. Plot of Frequency Response (all bands set to 0 dB, high and low pass filters set to off)

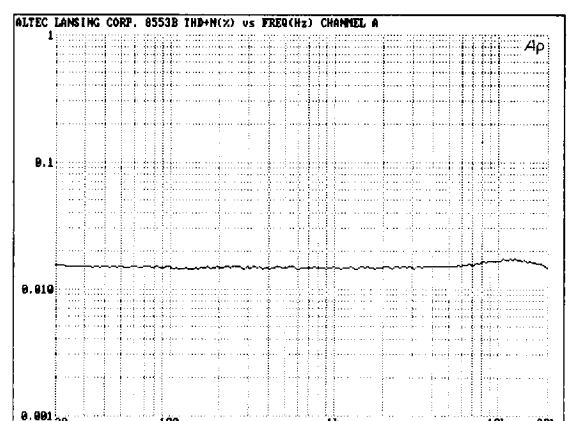


Figure 4. Plot of (THD + Noise) (%) versus Frequency (Hz) (all bands at 0 dB, high and low pass filters set to off)

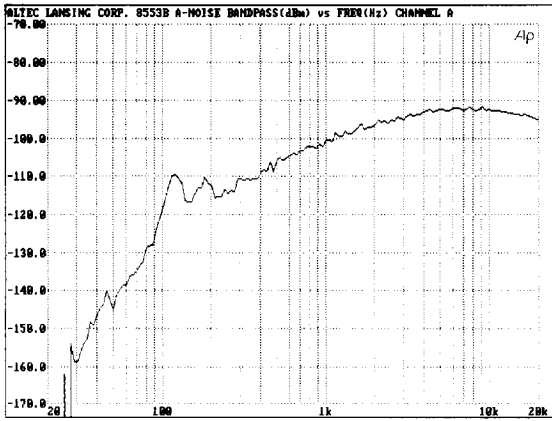


Figure 5. A-weighted Noise (dBm) versus Frequency (Hz) (all bands at 0 dB, high and low pass filters set to off)

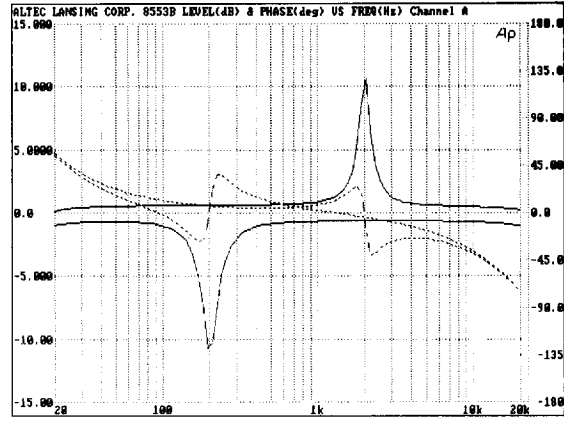


Figure 6. Plot of Amplitude (dB) versus Phase (degrees) with 200 Hz filter set to -12 dB and 2 kHz filter set to $+12$ dB

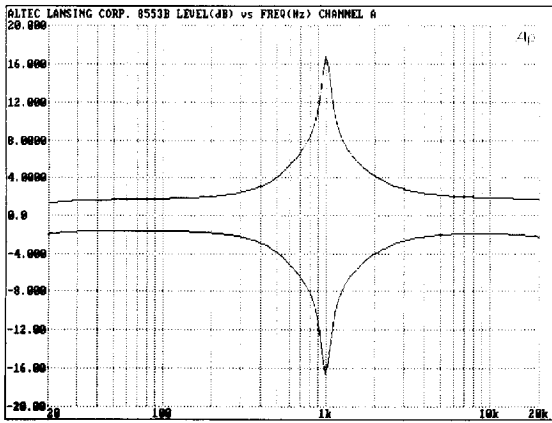


Figure 7. Plot of Amplitude (dB) with 1 kHz band set to ± 12 dB and adjacent bands (800 Hz and 1.25 kHz) set to ± 4 dB

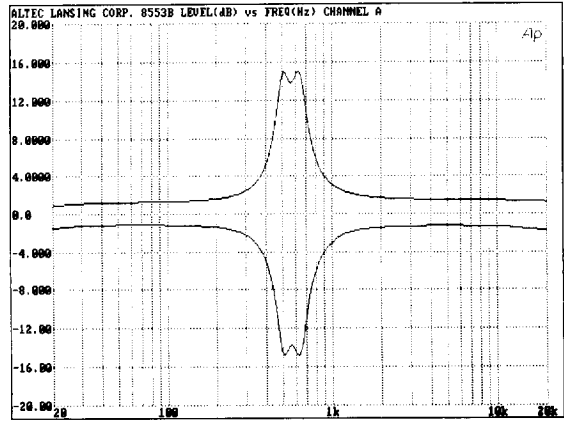


Figure 8. Plot of Amplitude (dB) of 500 Hz and 630 Hz bands set to ± 12 dB

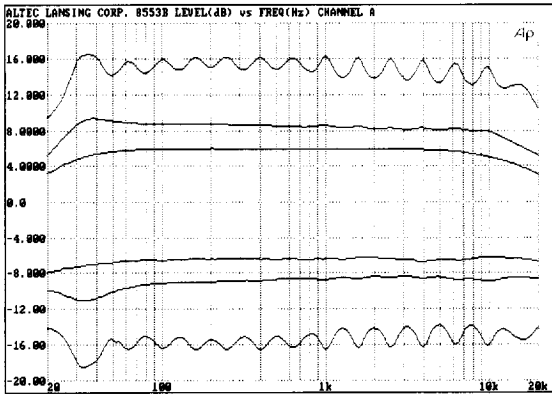


Figure 9. Plot to Amplitude with all filters set to ± 1 dB, ± 3 dB, and ± 7 dB

SYSTEM 422™ TECHNOLOGY

System 422™ Digital Control, via the new industry standard PA-422 serial communications interface, is the means through which a computer system communicates with programmable audio devices. The PA-422 serial communication interface definition was initiated by Altec Lansing in a paper presented at the 87th Audio Engineering Society Convention in New York City.

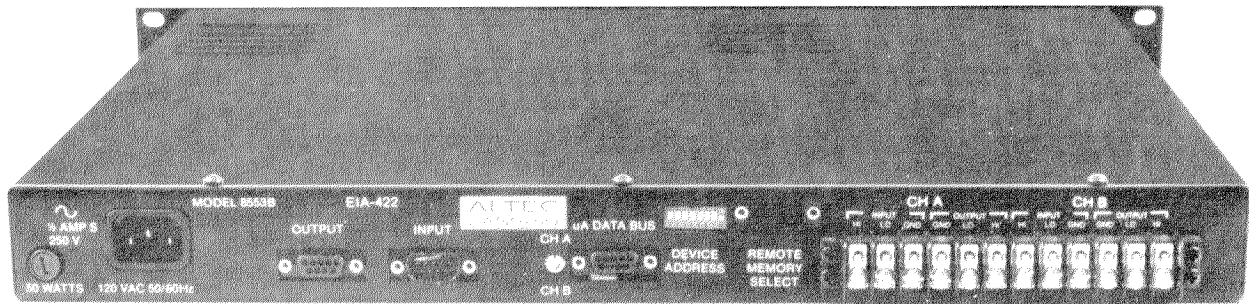
The PA-422 interface is easily adaptable to different types of computers and microprocessors. Based on the definition for the control of professional audio products, System 422 digital control via the PA-422 interface makes the Altec Lansing **8553B** dual channel one-third octave programmable micro-audio equalizer completely compatible with all other programmable products using the interface. The PA-422 interface permits high speed bi-directional communications between the programmer and each **8553B** equalizer, and up to 250 equalizers can be serially-connected to any single PA-422 output port.

Acousta-Graphics Release 2.0 System Management Software™

The Acousta-Graphics System Software will run on IBM PC, XT/AT, or 100% compatible computer systems which use PC-DOS/MS-DOS version 2.1 or greater, and which have at least 512 kbytes of random access memory (RAM). The graphics screens will work with most graphic display adapters with the appropriate video monitors attached. This includes most laptop systems which can display a pixel resolution of 640 horizontal by 200 vertical.

From the main graphics screen you can select the particular device, device channel and user memory you want to program. You can also program each frequency band, the high and low pass filters, the master gain, and the memory pointer value. And you can recall data from any memory in the device. The software can print text and graphics on most dot matrix printers and laser printers that can emulate the HP LaserJet Series II.

The **8060A** provides one PA-422 output port from any standard RS-232 serial port. Although usable with desktop computers, it is especially useful with laptops which may not physically accommodate the **8062A** internal plug-in accessory card. With **System 422™**, the equalizer can also be programmed using custom software developed for specific applications. With its standard μ A-bus port, the **8553B** is also programmable from the **8061A** PC control adapter, **8051A** autoprogrammer, or the **3055B** handheld programmer, or to the degree of the controller's capability.



ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The equalizer shall be the Altec Lansing model **8553B** dual channel one-third octave programmable microaudio equalizer. It shall have two channels. Each channel shall have 28 one-third octave frequency bands at the preferred ISO center frequencies between 31.5 Hz and 16 kHz inclusively, and a master gain control. The gain of each frequency band and the master shall be programmable in 1 dB steps from -12 dB to $+12$ dB. There shall be no internal or external user gain controls, or other front panel controls. The equalizer shall be microprocessor-controlled and programmable only from an external means.

Each channel shall have a 3-pole (18 dB/octave) high pass filter with software-selectable corner frequencies. The corner frequencies of said filter shall be <10 Hz (OFF state), 40 Hz, 50 Hz, 63 Hz, 80 Hz, 100 Hz, 125 Hz, and 160 Hz. There shall also be a 3-pole (18 dB/octave) low pass filter for each channel with software-selectable corner frequencies. These frequencies shall be 5 kHz, 6.3 kHz, 8 kHz, 10 kHz, 12.5 kHz, 16 kHz, and 50 kHz (OFF state). The inputs and outputs of the equalizer shall be electronically-balanced with provisions for the inclusion of optional input and

output signal isolation transformers.

Each channel shall have nine non-volatile memories, one power-up or default memory containing the actual "live" settings and eight user memories for storing additional preset equalization settings. One programmable non-volatile memory pointer for each channel shall be provided to permit quick changes on cue. Said memory pointer shall have the capability to be disabled or to "point" to one of the eight user memories. The equalizer shall have a PA-422-compatible device interface port as well as a standard μ A-bus programming port for backwards compatibility.

The equalizer shall meet the following performance criteria. Maximum input level: at least 6.16 V rms. Input impedance: at least 15 k Ω . Maximum output power level: at least +18 dBm. Output noise: <-85 dBm A-wtd. (all gains at unity). Dynamic range: at least 105 dB. THD: $<0.015\%$ (all gains at unity). IMD (SMPTE 4:1): $<0.015\%$ (all gains at unity). The equalizer shall be operable from a 120V ac, 60 Hz supply.



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