



## Model 610 "Complimiter"™



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**GENERAL DESCRIPTION**

A proven concept in a rack-mounting compressor/limiter system with performance both measurably and audibly discernable as "beyond the state of the art". The unit performs the functions of peak-limiting and volume-compression, either independently or simultaneously, as a direct function of the type of program input, with performance that is unequalled by most linear amplifiers. The extremely low noise characteristics of this unique, self-contained system provides a very low threshold of -40 dBu, thus allowing the greatest input sensitivity and compatibility with audio equipment and accessories used in the professional recording, broadcasting, and motion picture, sound-reinforcement and high-end home cinema markets.

As the fastest of all peak-limiting devices (100 nanoseconds to 2 microseconds), peak-limiting can be employed with no audible distortion, thus allowing undistorted recordings, transmission, etc. at average levels significantly higher than conventional "O" VU (+4 dBu or +8 dBu) while simultaneously providing maximum amplitude protection. A white threshold attack indicating LED provides the user a representation of peak-limiting taking place without the task of monitoring with an oscilloscope. A separate red overload LED indicates in advance of overload. The continuously variable compression/limiting ratio assure the widest range of slope control available from 1.1:1 (approximately linear amplification) to approximately 100:1 (flat slope, maximum amplitude protection line). Coupled with a constant threshold attack level of -40 dBu, the need to continually reset input levels during operation for each new compression/limiting ratio is eliminated. Variable release time control allows selection of the smoothest dynamic action commensurate with minimum distortion (typically less than 5/100ths of 1%). The uniform frequency response of this unit negates the need for "de-ess"/roll-off of high frequencies.

During actual listening, the absence of noise, distortion and frequency discrimination is readily apparent. The Model 610 "COMPLIMITER"™ is particularly effective in controlling sibilant sounds, restricting extreme dynamic ranges and providing uniform dynamic action.

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**ARCHITECTS' AND ENGINEER' SPECIFICATION**

The amplifier shall be self-contained solid-states device in standard 3 ½ "x 19 "rack-mount format. The amplifier shall be capable of independent limiting and compression functions up to 30 dB, while not exceeding total harmonic distortion of 1/10<sup>th</sup> of 1%, 30 Hz to 20 kHz, at +16 dBu (release time set as not to allow attack and release on each successive cycle of the lowest frequency). The signal-to-noise ratio shall be not less than 80 dB below +4 dBu output with -40 dBu input (threshold), 20 Hz to 20 kHz, at +16 dBu, and the release time of the amplifier shall be variable. The compressor/limiter shall contain threshold attack indicating LED and overload indicating LED system to additionally monitor the signal. The amplifier shall be the SPECTRA SONICS Model 610 "COMPLIMITER"™.

## SPECIFICATIONS

Output Impedance	Approximately 120 ohms (1kHz), floating
Output Loading	600 ohms to Infinity, balanced or unbalanced
Maximum Gain	56 dB
Input Level	Typically -50 dBu to +10 dBu
Threshold Attack Level	-40 dBu
Output Level	Typically +4 dBu or +8 dBu
Signal-to-Noise Ratio	Not less than 80 dB below +4 dBu output with -40 dBu Input (threshold), 20 Hz to 20 kHz, unweighted.
Frequency Response	$\pm .1$ dB, 20 Hz to 40 kHz, at +16 dB (High Z load)
Harmonic Distortion	$\pm .5$ dB, 20 Hz to 20 kHz, at +16 dBm (600 ohm load)
	Less than 1/10 <sup>th</sup> of 1%, 30 Hz to 20 kHz, at +16 dBu, up to 30 dB compression, with release time such that attack and release does not occur on successive peaks of the lowest frequency utilized. (Typically less than 5/100ths of 1%)
Compression/Limiting Ratio	Continuously Variable from approx. 1.1:1 to 100:1
Attack Time	Automatically Variable
Limiter	100 nanoseconds to 2.0 microseconds
Compressor	100 nanoseconds to 1.2 milliseconds
Release Time	For 90% Recovery
Limiter	Less than 90 nanoseconds
Compressor	Continuously variable from 50 milliseconds to more than 10 seconds
Maximum Temperature	140 degrees Fahrenheit
Power Requirement	105-125 VAC, 60 Hz, 6 watts
Physical Dimensions	3 1/2" high x 19" x 8 1/2" deep for standard rack mounting
Weight	Net, 9 1/2 pounds, Shipping, 14 pounds
Stereophonic Interconnection	Two units are coupled easily. Requires Model 610 SI Accessory.

## OPERATING APPLICATIONS

The separate and distinct limiting and compression functions, available only with the Model 610 "COMPLIMITER"<sup>TM</sup>, makes possible an inaudible "limiting only" mode of operation. Peak monitoring for this mode is provided by threshold attack and overload indicating lamps. A maximum amplitude protection line and sustained maximum average level may be established with this mode, thus providing an invaluable advancement "beyond" conventional limiters which quickly reduce and slowly restore average level for peak inputs exceeding a predetermined level. In recording alone, this "limiter only" mode eliminates the need for the 10 dB (or more) margin conventionally set aside for overload protection (of peaks). The significant increase in S/N and signal output, resulting from this one application of the Model 610 "COMPLIMITER"<sup>TM</sup> is self evident. The following additional modes of operation are automatically available for control: limiting and compression, compression only, limiting and compression with additional fixed amplitude protection, and normal linear amplification.

## VARIABLE COMPRESSION/LIMITING CURVES

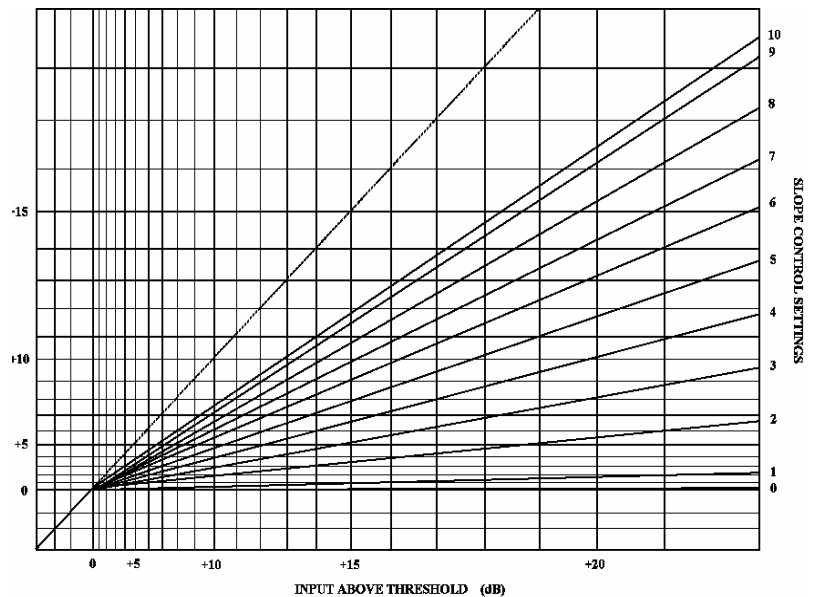


FIGURE 1  
COMPRESSION CURVE SLOPE  
VS. SLOPE CONTROL SETTINGS

# SPECTRA SONICS

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