

# STEREO VARIABLE EMPHASIS LIMITER 3

- AS A PROTECTIVE LIMITER FOR LIVE RECORDING AND BROADCASTING
- FOR DYNAMIC RANGE REDUCTION IN PROFESSIONAL TO SEMI-PRO FORMAT TRANSFERS
- INCORPORATES INDEPENDENT FLAT LIMITERS AND VARIABLE EMPHASIS LIMITERS
- MANUFACTURED USING BBC DESIGN INFORMATION (B.P. 1,172,310)

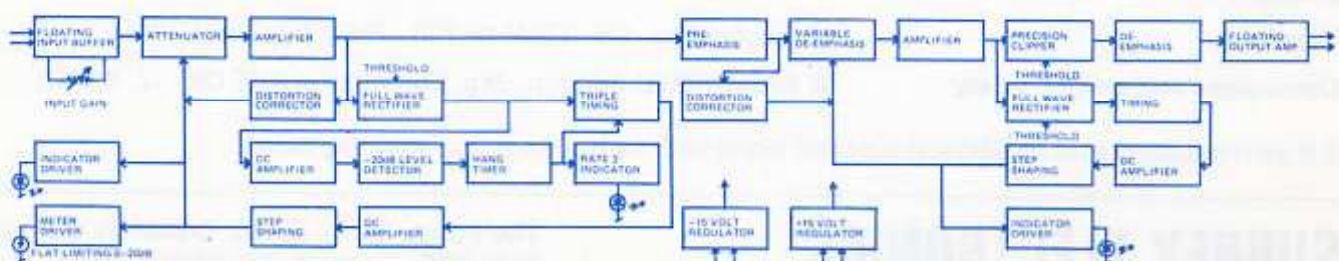


The Stereo Variable Emphasis Limiter is designed to control the peak amplitude and spectral content of mixed programme material in ways which cause the least possible subjective alteration to the short term dynamic range. Combined with this, the unit has excellent figures for distortion and signal to noise ratio.

The limiter can be used in several quite distinct ways. Firstly, as a protective device where the programme is normally below the limiting threshold all the time and the limiter is only in circuit to avoid distortion arising when there is a sudden high level which has been missed by the human operator. This approach would typically be used when making master recordings onto formats offering a very wide dynamic range and for serious music and speech broadcasting.

Secondly, where the recording or transmission medium has a limited dynamic range, the signal level can be set so that short transients of syllabic duration are controlled. Such transients consume several decibels of dynamic range yet contribute negligibly to the loudness of the programme, so this limiter is designed to adapt the period for which the gain is reduced to avoid gain pumping or fluttering yet still provide low distortion on longer lasting transients. The unit would often be used in this way when recording onto analogue tape, disc or cassette and for fm or television sound broadcasting.

Beyond this, the input level can be increased further so that limiting action is taking place almost continuously. Such operation with this limiter gives the maximum subjective loudness that is possible without apparent alteration to the programme balance. Finally, the third recovery rate can be switched out, when the unit becomes more like a conventional studio limiter where, for example, the relative balance of vocals and backing will alter as more limiting is applied. The unit retains its adaptive recovery from shorter transients and produces very high energy densities in the top few decibels of the transmission channel. Apart from uses with music, these characteristics are ideal for public address in noisy environments and general communications applications.

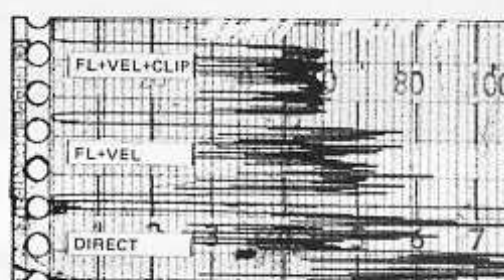


Following the linear frequency response Flat Limiter, already described, is the Variable Emphasis Limiter which can be used whenever the transmission channel has a falling overload characteristic at higher frequencies. This includes digital systems with pre-emphasis, slower speed analogue tape, vinyl disc and, of course, fm recording and broadcasting systems. When the Variable Emphasis Limiter is switched on the emphasis curve is momentarily ducked by just the amount necessary to keep the hf energy within the permitted bounds. The audibility of this process is very low provided the attack and decay characteristics are carefully selected and false triggering is avoided, which is why the Flat Limiter must be switched on first to ensure a defined peak amplitude for the programme before the Variable Emphasis Limiter can be used.

Very fast attack times are, in themselves, audible, so both of the limiters described above allow through some overshoot and when the transmission channel has an abrupt overload point the clipper can be used. Clip 3dB gives a 3dB headroom above the limiter thresholds with the alternative of Clip 1dB. The 1dB setting will occasionally modify the sound of a transient slightly but will be used for fm or tv sound broadcasting where every decibel of level is sought.

The limiter has true floating audio inputs and outputs and a front panel input gain control which has the gain of the stereo channels matched within 0.2dB. The unit is mains powered and housed in an attractive black anodised 2U rack cabinet.

The chart recordings on a Surrey Peak Deviation Meter show the effect when the same master tape is played through the limiter with various settings. The signal passed through a Surrey Stereo Coder (with low overshoot, group delay compensated filters) and an fm modulator adjusted for 60kHz deviation.



## SPECIFICATION

Inputs, electronic floating	Input impedance 20k Ohms, XLR 3 pole female				
Outputs, electronic floating	Output impedance 50 Ohms, XLR 3 pole male, same polarity as input				
Limiting levels at output	Flat Limiter	+8.5dBu 22dB range			
	Variable Emphasis Limiter	+9.0dBu 50µs curve			
	Clip 3dB/1dB	+12/10dBu			
Frequency response	20Hz – 20kHz ±0.2dB (below VEL threshold)				
Noise	–78dBu 20Hz – 20kHz mean reading				
	–69dBu CCIR468–2 weighting and peak meter				
Total harmonic distortion	<b>Below limiting</b>	<b>Worst point FL</b>	<b>10dB of limiting FL</b>	<b>Worst point VEL</b>	
	20Hz	–85	–45	–50	
	50Hz	–85	–48	–55	
	100Hz	–85	–52	–58	
	400Hz	–85	–58	–67	
	1kHz	–80	–60	–69	
	5kHz	–70	–60	–67	
	10kHz	–66	–58	–62	–67
	20kHz	–66	–55	–56	–78
Static IMD 50Hz + 7kHz, 4:1	–86	–46	–58		
Gain tracking between channels, steady tone or during recovery	Flat Limiter	± 1dB			
	Variable Emphasis Limiter	± 1dB			
Supply	IEC connector, 90–120V or 200–250V 50–60Hz 10VA				
Dimensions and weight, safety	W 483xH 88xD 180mm, 3kg. Complies with IEC65–2, BS415				

2.5 metres supply lead to BS6500 supplied along with instructions and servicing details.