

SPECTRUM SHIFTER



AN ENTIRELY NEW SOUND EFFECT
VERSATILE HOWL REDUCTION APPLICATIONS



The Spectrum Shifter shifts the audio frequency spectrum upwards or downwards by any amount between 0.1 and 1000 Hertz. The larger shifts allow weird special effects on music or speech which are unlike any other form of signal processing, the shift of all audio frequencies by the same number of Hertz destroying the normal harmonic relationships. This is distinct from the fractional change in pitch obtained by variable speed tape systems, though a combination of Spectrum Shifter and a variable speed device gives yet another range of unusual effects. Using very small shifts with the 'EQUAL MIX' facility, where the input and shifted versions are combined in a one to one ratio, provides phasing effects. As the shift is made larger this becomes a 'beating' effect. If a mono source is fed directly to one speaker in a stereo system and, via the shifter, to the other speaker, then strange spatial and 'double sound' effects can be produced. Like any other special effects device it is impossible to describe all the possibilities when used in conjunction with other equipment. However, this is a unit with obvious applications in electronic music, commercials and drama.

FREQUENCY SHIFTING TO REDUCE HOWL ROUND

If the sound emerging from the loudspeakers in a public address system is shifted slightly in frequency, it is generally possible to utilise a further 4-8 decibels of gain before the system becomes unstable (howl round). The 1-10 Hertz range on the Spectrum Shifter allows choice of the optimum shifting frequency for each occasion and has particular applications in instances where an increase in system gain may not be sought but a reduction in the 'ringing' colourations found in conventional systems is desired. Musical and theatrical events are cases where a very low shift (2 or 3 Hertz) may be selected, while speech only public address may require use of the 2-8 Hertz region, to give the system the greatest stability margin on types of sound where the larger shifts will not be noticed.

The frequency shifting technique is equally effective outdoors, or over two way 'open microphone' intercom systems, such as telephone conference arrangements, and, indeed, in any situation where the microphone is in the reverberant sound field from its own amplified signal.

The case is attractively finished in red epoxy paint, with a white control panel bearing legends in green and blue.

The University of Manchester Institute of Science and Technology, where the original development work on this technique of shifting audio was done by Dr. M. Hartley Jones, receive a royalty from Surrey Electronics.

SPECIFICATION

Frequency Shift Ranges	0.1-1 Hz; 1-10 Hz; 10-100 Hz; 100-1000 Hz
Input impedance	Balanced type 10 Kohm or 600 ohms; Unbalanced type 10 Kohm
Output impedance	Balanced type 50 or 600 ohms; Unbalanced type 50 ohms

USING 5 Hz SHIFT

Frequency response	-1dB 50 Hz-20 Hz; -3dB 20 Hz-40 KHz
Gain	Unity within 0.5dB
Noise	-50dB (V.7) (20 Hz-20 KHz, mean reading meter)
Residual 5 Hz in output	-40dB (V.7)
Total Harmonic distortion at 1 KHz	} Less than 0.1% @ +12dB (V.7) } Less than 0.01% @ -4dB (V.7)
Residual amplitude modulation at any output level	} Less than 1dB pk-pk 220 Hz-12 KHz } Less than 0.5dB pk-pk 250 Hz-3 KHz
Mains power input	47-65 Hz, 110 or 200-250V @ 5VA
Connectors	Unbalanced, jack; Balanced, XLR 3-pole
Box dimensions and weight	310 x 240 x 170mm: 3.8Kg

Supplied with 3 metres mains lead, instruction pamphlet and servicing information.
