

THE ADC SOUND SHAPERS

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ADC

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The ADC Sound Shapers are sophisticated stereo frequency equalisers which divide the musical spectrum into many frequency bands, allowing fine adjustments to be made precisely where required. They can be connected into the tape monitor circuitry of amplifiers or receivers, or alternatively between pre-amplifiers and main-amplifiers.

Each unit contains facilities more commonly found only in professional sound studios – and with four models to choose from, there's one for every system and every pocket.

Sound Shaper One

The SS1 divides the frequency spectrum into five ranges, with operating centres from 60Hz to 10,000Hz. Each range is controlled by a separate slider potentiometer for left and right channels – ten in all – giving a ± 12 dB adjustment marked in 2dB steps.

Separate controls for each channel are especially useful in rooms where speaker placement or room shape causes a difference in response between the two channels. For example, if the left-hand speaker is placed in or near a corner and the right-hand one against a flat wall, the bass response will be greater from the corner-placed speaker. The SS1's individual left and right channel controls will help you to compensate.

Power and tape monitor switches are direct-acting pushbuttons. And standard audio connections mean you can install the SS1 in a few minutes.

Seconds later, you'll know how much more you can do with your system, and how much better your music can sound.

Sound Shaper One Specifications

Channels

Two (with separate controls).

Frequency response (controls centred): 5Hz to 100kHz $+0.5$ dB-1dB.

Control frequencies

60, 240, 1000, 3500, 10,000Hz.

Control range

24dB (± 12 dB) nominal.

Harmonic distortion at 1 volt output (20Hz to 20kHz): 0.02%.

Intermodulation distortion at 2 volt output: 0.02%.

Hum and noise (input shorted): 80dB below 1 volt.

Output

Maximum (nominal) 10 volts into 10k Ohms load.

Gain (frequency controls centred): Unity ± 1 dB.

Recommended output load 10k Ohms or greater.

Output impedance 10 Ohms at 1kHz.

Input impedance 75k Ohms.

Inputs

2 main, 2 tape monitor.

Outputs

2 main, 2 tape out.

Pushbutton controls

Power, tape monitor.

Slide potentiometers

10 frequency (5 each channel).

Each slide control has a centre detent for easy location of the flat response position.

Semiconductors

8 transistors, 4 diodes, LED power-on indicator.

Dimensions (height \times width \times depth): 143mm (5 $\frac{5}{8}$ " \times 271mm (10 $\frac{5}{8}$ " \times 193mm (7 $\frac{1}{16}$ "). Overall max. including handles and feet.

Weight

3.37kg (7.44lbs)

Power consumption

Nominal 10 watts on 240v 50Hz supply.

Sound Shaper One Ten

The SS110's ten frequency ranges per channel are centred at 31, 62, 125, 250, 500, 1000, 2000, 4000, 8000 and 16,000Hz. Each is controlled by a linear (sliding) control for each stereo channel, with a total range of 24dB. A positive centre detent allows for easy location of the 0dB position.

A line record pushbutton is fitted, allowing you to make equalised tape recordings. This gives the tape enthusiast almost unlimited scope for experimentation and creativity. In addition, the tape monitor pushbutton allows instantaneous comparisons between the taped sound and the source material –

assuming you have a suitable 3-head tape machine, of course.

Another switch, marked eq-bypass, cancels the SS110's slider settings, so you can make an 'A-B' comparison of the sound before and after equalisation.

Sound Shaper One Ten Specifications

Channels

Two (with separate controls).

Frequency response (controls centred): 5Hz to 100kHz ($+0$ dB-1.0dB).

Control frequencies

31, 62, 125, 250, 500, 1000, 2000, 4000, 8000, 16000Hz.

Control range

± 12 dB min.

Harmonic distortion at 1 volt output (20Hz-20kHz): 0.02%.

Intermodulation distortion at 2 volts output: 0.02%.

Hum and noise (input shorted): 80dB below 1 volt.

Output

Maximum (nominal) 10 volts into 10k Ohms load.

Gain (frequency controls centred): Unity ± 1 dB.

Recommended output load

10k Ohms or greater.

Output impedance

10 Ohms at 1kHz.

Input impedance

75k Ohms.

Inputs

2 main, 2 tape monitor.

Outputs

2 main, 2 tape out.

Pushbutton controls

Power, line record, monitor, eq-bypass.

Slide potentiometers

20 frequency (10 per channel).

Each with centre detent for setting to flat response.

Semiconductors

10 transistors, 5 diodes, 1 LED, power-on indicator.

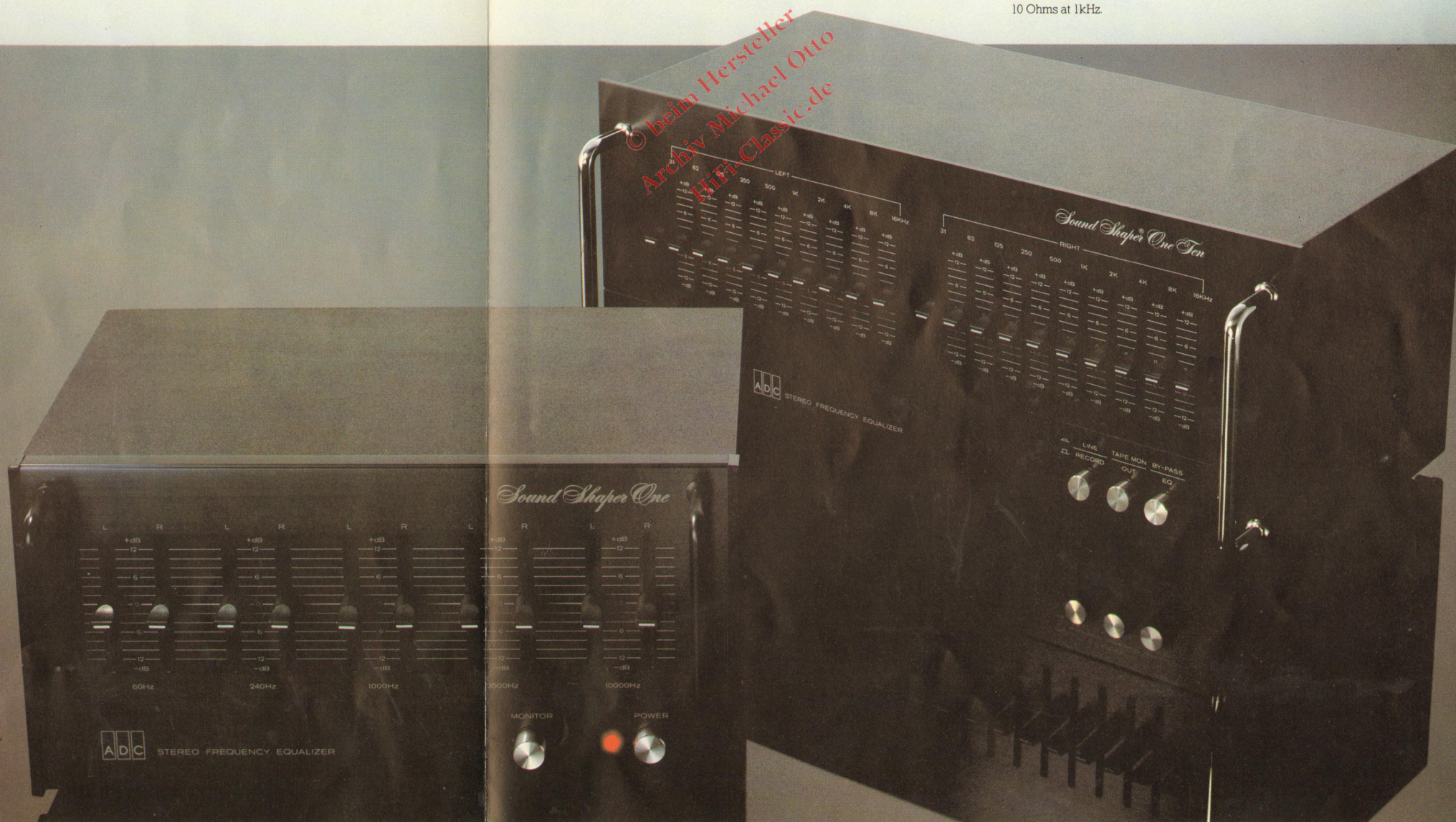
Dimensions (height \times width \times depth): 166mm (6 $\frac{1}{2}$ " \times 383mm (15 $\frac{1}{8}$ " \times 207mm (8 $\frac{1}{4}$ "). Overall max. including handles and feet.

Weight

5kg (11 lbs).

Power consumption

Nominal 13 watts on 240v 50Hz supply.



WHO NEEDS EQUALISERS ANYWAY?

Anyone with less than a perfect listening room.

Have you ever wondered why some hi-fi systems sound wonderful in the demonstration room, and awful in your living room? Unless you live in a concert hall or a recording studio, your home was built for living in – not listening in.

The listening room's size, shape and furnishings all have a profound effect on the sound of the system in it. For example: thick carpets, curtains, wall hangings and padded furniture absorb high frequencies. They can make even an expensive system sound lifeless. On the other hand, polished floors, wooden furniture and lots of glass reflect high frequencies, and can make the sound unbearably harsh and bright.

Conventional amplifier tone controls operate over a very broad area of the total frequency spectrum and cannot compensate for these anomalies without adding new ones of their own.

With a multi-bank frequency equaliser, boost or cut can be applied precisely where it's needed, and nowhere else.

It's more practical than moving into the Royal Festival Hall – and a lot cheaper!

Anyone with less than perfect records, tapes and radio reception.

Too many records, old and new, contain surface noise and rumble. Too many tapes hiss along with the music. Too many FM broadcasts

over-or under-modulate the extreme high or low frequencies, producing an unbalanced frequency response.

With a frequency equaliser you can reduce rumble, hiss and some surface noise without getting rid of the music. And you can boost extreme highs or lows to replace what the broadcast engineers take away.

Anyone with less than perfect speakers.

Try as they might, loudspeaker engineers can't get round the laws of physics – one of which dictates that very low bass notes cannot be properly reproduced by the sort of speakers most people have house-room for.

To create an illusion of deep bass, therefore, designers often boost the mid bass; unfortunately, this can produce 'boom', but no real, ground-shaking bass.

A frequency equaliser can remove the 'boom' and replace it with more genuine bass response.

At the high end of the audible spectrum, the engineering problems of speaker design are less restricting. However, their place is taken by the intensely subjective nature of 'correct' treble and mid-range reproduction.

A speaker with a bright, forward treble response might be described by the same listener as 'exciting' on some types of music, but 'unbearable' on others. Equally, you might find a more subdued treble

'natural' or 'dull', depending on the source material – maybe even on the mood you happened to be in at the time.

The precise adjustability of a graphic equaliser allows you to turn a good speaker into a great one, whatever the music, whatever your mood.

Anyone with less than a perfectly balanced system.

Many hi-fi enthusiasts are forced to listen to unbalanced hi-fi systems by restrictions they can't control.

For example, you may want a pair of huge studio monitor speakers with bass down to 10Hz; you may even be able to afford them, but if your listening room is too small to fit them in, you are doomed to listen on something smaller.

Maybe you use a cartridge/speaker combination which sounds superb except for an annoying dip or peak at a particular point in their frequency range.

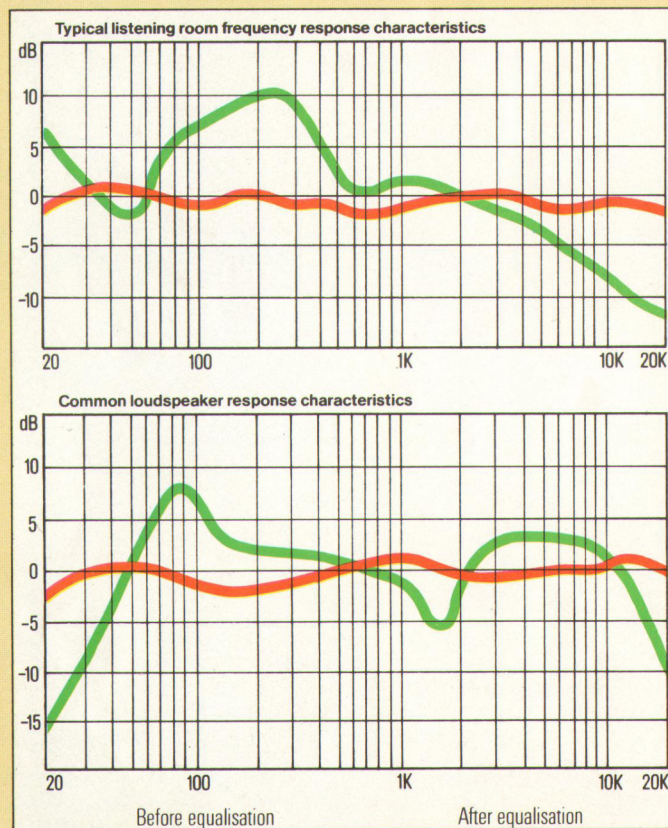
Conventional amplifier tone controls can't help. Equalisation can.

Anyone with a tape recorder, but without a studio.

Any would-be recording engineer knows how difficult it is to make live performances sound professional on tape. Even in a professional sound studio, instrumental balance, microphone placement and room acoustics are difficult problems to overcome.

With the added anomalies of a non-studio environment, successful recording becomes practically impossible.

Unless you use a frequency equaliser...

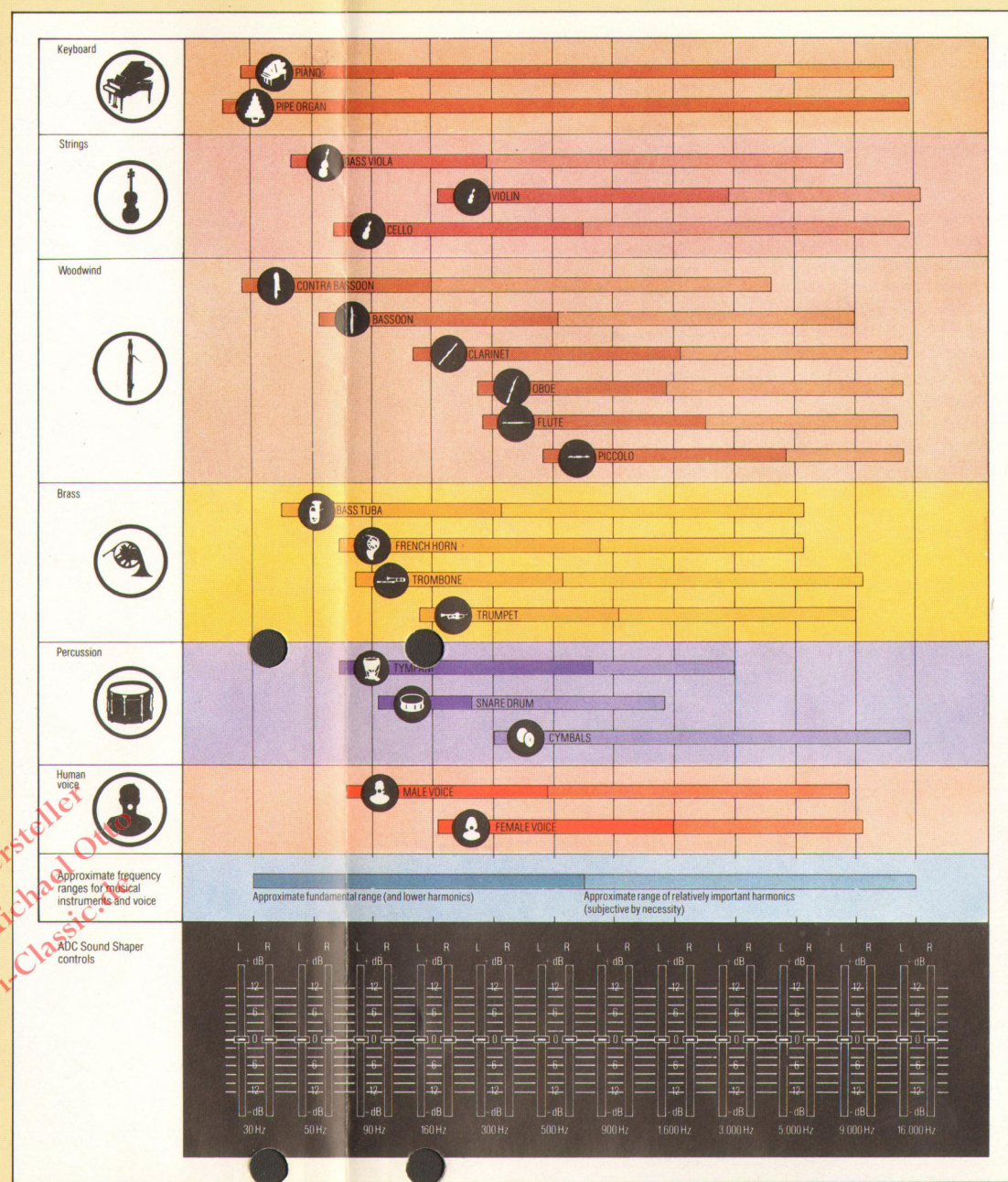


THE MUSICAL SPECTRUM

This chart relates familiar musical instruments to the actual frequencies they produce.

Everyone knows that the audible frequency range is 20-20,000Hz; but like so many things that 'everyone knows', it's not that simple.

Note that the musical fundamentals (dark bands) are almost all under 3,500Hz. However, if instruments were heard only as fundamental notes, they would all sound very much alike. The harmonics or overtones (light bands) give each instrument its characteristic timbre, or quality, and help the listener to distinguish them from one another.



The Bass (approx 20-140Hz)

There is little musical material with fundamental frequencies below about 60Hz, and what is normally described as 'low bass' is actually in the 60-140Hz range. The very lowest frequency controls can be used to reduce rumble, acoustic feedback and other low frequency aberrations.

The greatest perceptible changes in 'bass response' are normally made by controls in the 60-90Hz area.

The Mid-Bass (approx 140-400Hz)

An over-accentuated mid-bass produces a very muddy, boomy sound; a lack of mid-bass, on the other hand, sounds hollow and thin.

Controls in this region are important for overall balance.

The Mid-Range (approx 400-2600Hz)

This is the area where the ear is most sensitive to tonal balance.

Midrange boost or cut can totally alter the subjective sound quality, and no two engineers or listeners will agree on the 'correct' balance in this range.

You will also find that while one setting is right for some types of music, other styles may need a different setting.

The Upper Mid-Range (approx 2600-5200Hz)

Speaker designers often boost this range to add 'presence' to the music; but too much energy here sounds unbearably harsh and strident.

A good balance may be easily achieved with the appropriate equaliser controls.

The High End (approx 5200-20,000Hz)

To affect the brilliance of music – which, in excess, produces an unpleasantly piercing quality – adjustments should be made in the 5,200-12,000Hz area. Above this there is very little musical material – and in any case, most adults' hearing rolls off rapidly above 15kHz.

Controls in the 14-20kHz region have a subtle effect – they can add a little more dimension to the music, or act as a very high frequency noise filter.

Sound Shaper Two Mk II

The SS2 Mk II adds still further sophistication, with 12 frequency sliders for each channel for extra-fine control. Its unique LED (light emitting diode) metering system monitors signal levels instantly and with unerring accuracy. The 14 LEDs – seven for each channel – are easier to read than conventional VU meters, too!

As well as power, line record, tape monitor and eq-bypass switching, the SS2 Mk II has meter gain controls which allow the equalised signal to be re-centred at 0dB on the LED display.

A further pair of controls allows you to adjust the subjective volume of the equalised signal, and match it to the original. This feature is unusual on an equaliser of so modest a price.

Sound Shaper Two Mk II Specifications

Channels

Two (with separate controls)

Frequency response (controls centred): 5Hz to 100kHz ± 1 dB

Control frequencies

30, 50, 90, 160, 300, 500, 900, 1600, 3000, 5000, 9000, 16,000Hz

Control range

24dB (± 12 dB) nominal

Harmonic distortion at 1 volt output (20Hz to 20kHz): 0.02%

Intermodulation distortion at 2 volt output: 0.02%

Hum and noise

(input shorted):

Nominal 85dB below 1 volt.

Output

Maximum (nominal) 10 volts into 10k Ohms load.

Gain (frequency controls centred, level controls maximum):

Unity ± 1 dB

Recommended output load

10k Ohms or greater.

Output impedance

10 Ohms at 1kHz

Input impedance

75k Ohms

Inputs

2 main, 2 tape monitor, sound level meter.

Outputs

2 main, 2 tape out.

Pushbutton controls

Power, line-record, monitor, eq-bypass, meter on/off.

Slide potentiometers

24 frequency (12 per channel).

Rotary potentiometers

2 LED meter adjust, 2 equalised signal adjust.

Semiconductors

12 transistors, 22 diodes, 2 integrated circuits.

Dimensions

(height \times width \times depth): 166mm ($6\frac{1}{2}$ " \times 429mm ($16\frac{7}{8}$ " \times 207mm

($8\frac{1}{4}$ ".) Overall max. including handles and feet.

Weight

7 Kgs. (15.4 lbs).

Sound Shaper Three

The SS3 is the most sophisticated equaliser available outside a professional recording studio. It's the first Paragraphic equaliser, so-called because it combines the virtues of both Graphic and Parametric equalisers.

Like the SS2 Mk II, the SS3 divides the spectrum into twelve sections per stereo channel, and controls each with a slider potentiometer – 24 in all – to give up to 12dB lift or cut.

The big difference is that the operating centre of each frequency band can itself be raised or lowered by nearly 20%, thus giving the fine tuning normally found on Parametric equalisers. For example, the second slider from the left on each channel normally centres on 56Hz. But flip the switch below that slider, and you can change its frequency centre instantly to either 47Hz or 68Hz.

The flexibility this gives has to be experienced to be believed. Anomalies in source material, listening rooms or ancillary equipment can be corrected

accurately – and with minimum effect on adjacent areas of the musical spectrum.

A 13-segment-per-channel LED display allows easy monitoring and channel balancing. The slider signal gain controls allow you to match the equalised volume level to the unequalised level. This is a useful feature, because boosting or reducing parts of the frequency spectrum usually changes its total volume – thus making comparisons with the original practically impossible. With its other facilities (line record, tape monitor, eq-bypass and level control) the SS3 adds up to the world's most advanced domestic stereo equaliser.

Sound Shaper Three Specifications

Channels

Two (with separate controls and 13-LED signal level display for each).

Frequency response (controls centred): 5Hz to 100kHz $+0.5$ dB -1.0 dB

Harmonic distortion at 1 volt output (20Hz to 20kHz):

0.018%

Intermodulation distortion at 2 volt output:

0.02%

Control frequencies

(centre frequency shifted by switch below each slide control):

LOW	CENTRE	HIGH
26Hz	32Hz	39Hz
47Hz	56Hz	68Hz
84Hz	100Hz	120Hz
150Hz	180Hz	215Hz
260Hz	320Hz	390Hz
470Hz	560Hz	680Hz
840Hz	1kHz	1.2kHz
1.5kHz	1.8kHz	2.15kHz
2.6kHz	3.2kHz	3.9kHz
4.7kHz	5.6kHz	6.8kHz
8.4kHz	10kHz	12kHz
15kHz	18kHz	21.5kHz

Control range

± 12 dB minimum.

Hum and noise

(input shorted):

Nominal 82dB below 1 volt.

Output

Maximum (nominal) 10v into 10k Ohms load.

Gain (all controls centred):

0dB ± 1 dB.

Input impedance

75k Ohms

Output impedance

10 Ohms at 1 kHz.

LED 'meter'

Dual (13 segment per channel) solid state display in 2dB increments.

LED metering tolerance

$+12$ dB ± 0.5 dB

0dB ± 0.5 dB

-12 dB ± 0.5 dB

other -1.0 dB

Inputs

2 main, 2 tape monitor, sound level meter.

Outputs

2 main, 2 tape out.

Signal gain controls

For setting unity gain.

Meter level controls

Metering sensitivity adjust.

Pushbutton controls

Power, line-record, monitor, eq-bypass, meter on/off.

Slide potentiometers

24 frequency (12 per channel), 2 signal gain.

Rotary potentiometers

2 signal level display adjust.

Switches

24 frequency selectors (12 per channel).

Semiconductors

25 transistors, 49 diodes, 31 LEDs.

Dimensions (height \times width \times depth): 172mm ($6\frac{3}{4}$ " \times 484mm ($19\frac{1}{8}$ " \times 341mm ($13\frac{1}{2}$ ".) Overall max. including handles and feet.

Weight

8.16 kg (18 lbs).

Power consumption

Nominal 25 watts on 240v 50Hz supply.

Accessories available

ADC Sound Level Meter SLM-3 including test record and 20 foot interconnecting cable.

Sound Level Meter

The ADC SLM-3 Sound Level Meter is a useful accessory for any hi-fi system or studio, particularly so when used in conjunction with an ADC Sound Shaper.

It measures sound pressure accurately over a wide range of levels in a choice of ways. It can be set to flat response ('C' weighting), or response similar to the human ear ('A' weighting), and also is able to adjust for peak sounds by use of its slow and fast response switch.

Battery powered, the SLM-3 is portable and comes complete with a 20-foot connecting cord for use with the SS2 Mk II or SS3. This enables signal levels to be read either from the Sound Shaper's LED display.

Using the ADC Test Record you can measure your system response obtained in each frequency band, and then adjust the Sound Shaper controls to produce a flat response in your listening room.

SLM3 Specifications

Range of measurement

60dB-126dB by 6 switch settings.

Accuracy

± 2 dB at 114dB sound level

Standard

0dB ± 0.002 bar.

Weighting

A and C

Response

Fast and slow.

Signal output

1 volt (peak) Meter FSD at 1kHz

10k Ohms minimum load.

Distortion

Less than 2% at 1kHz 5 volts.

Microphone

Electret condenser (omni-directional)

Battery

9 volt PP3.

Dimensions

(Height \times width \times depth): 160mm ($6\frac{1}{4}$ " \times 62mm ($2\frac{7}{16}$ " \times 44mm ($1\frac{3}{4}$ ".)



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