34 Control Unit

Instruction Book

QUAD 34

Control Unit

INSTRUCTION BOOK

IMPORTANT
PLEASE READ THE INSTRUCTION BOOK CAREFULLY BEFORE ATTEMPTING TO MAKE ANY CONNECTIONS TO THE QUAD 34.

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Quad Electroacoustics Ltd.,
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PE18 7DB

Telephone No. Huntingdon (0480) 52561
Telex 32348 QUAD G

OI342EC

Accessory Pack Contents

1 x AC input connector (export models AC lead).	(Stock No. PSR0113)
1 x AC output connector.	(Stock No. PPR0413)
1 x 4 pin/4 pin DIN signal lead 1 metre long.	(Stock No. Q340817)
1 x 5 pin DIN to 4 Phono plugs 1 metre long.	(Stock No. Q340818)
4 x Shorting Links.	(Stock No. PP37712)
2 x Resistors.	(Stock No. R1K00J1)

Service

If servicing is required the control unit should be returned to the supplier, the distributor for the country of purchase or to Quad Electroacoustics Ltd. A brief note should be enclosed giving your name and address and the reason for returning it.

IMPORTANT

THE CARDBOARD CARTON AND EXPANDED POLYSTYRENE PACK SHOULD BE RETAINED IN CASE THE UNIT HAS TO BE RETURNED TO THE MANUFACTURER OR DISTRIBUTOR FOR SERVICE.

When repacking into the polystyrene, ensure that the rear of the unit is placed in the section marked with a figure **one** at the corner, otherwise the knob will be forced inwards, causing damage.

Guarantee

This control unit is guaranteed against any defect in material and workmanship for a period of twelve months from the date of purchase.

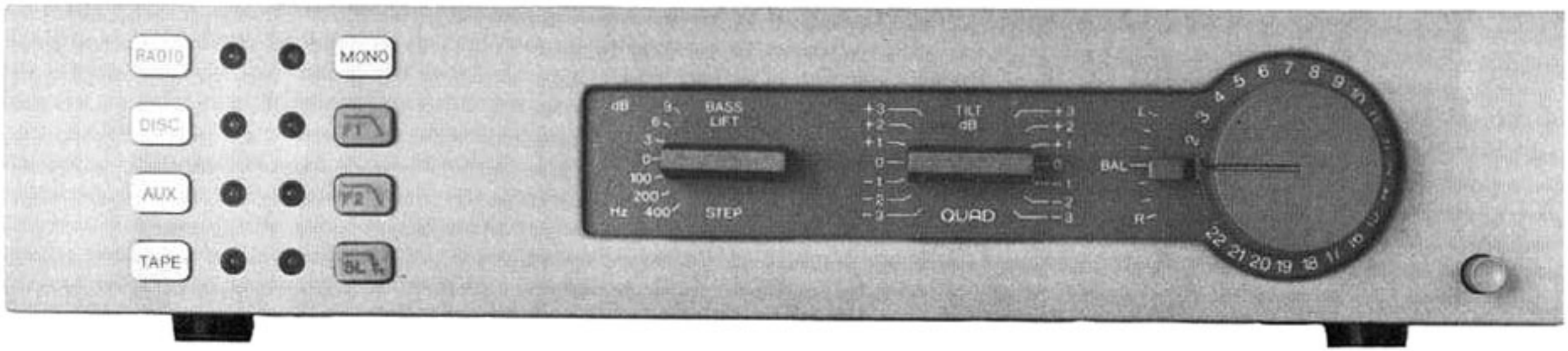
Within this period we undertake to supply replacement parts free of charge provided that failure was not occasioned by misuse, accident or negligence. Freight costs are not covered unless by local agreement.

Within the U.K. the guarantee offered with this equipment does not limit the consumer's existing statutory rights. A separate guarantee card is not supplied with your Quad unit. Your guarantee begins on the day on which you take delivery.

INTRODUCTION

The Quad 34 control unit has inputs for pickup, tape recorder, radio tuner and a fourth, termed auxiliary, which is intended primarily for a compact disc player, but may also be used for a second radio tuner or for record/replay with a two head cassette recorder. The chosen input is selected by pushbuttons and amplified to power amplifier input level. Filter, Tilt and Bass controls enable the listener to correct for certain room effects and programme balance.

QUAD 34



FRONT VIEW

INSTALLATION

The Quad 34 is designed to be used either free standing or installed in a cabinet. When it is correctly installed there should be no audible mains hum but the complete system should be assembled before a final installation is made, to ensure that there are no unforeseen difficulties of operation or wiring.

Hum is usually due to external connections, such as pickup wiring, double earthing, mains cable lying close to the pickup leads etc. in which case the hum level will increase as the Volume control is advanced.

If the hum level remains constant irrespective of the Volume control setting, then the source is probably internal, but it could, of course, be in either the control unit or the power amplifier or their interconnecting lead.

When the Quad 34 is to be mounted in a cabinet or a panel you will require an aperture 312 mm x 56 mm. The cover is removed from the Quad 34, the unit passed through the aperture from the front so that it locates in the aperture, and the cover replaced from the rear, thus gripping the cabinet panel between the Quad 34 front casting and its cover. The securing screws should be inserted finger tight and then given one further half turn to lock the unit firmly in position.

CONNECTIONS

AC Input and Output

IMPORTANT. The Quad 34 is suitable for either 50Hz or 60Hz AC supplies but before connecting it to the supply ensure that the voltage selector is correctly set. This selector is located on the rear panel, see page 6, and can be set to either 200–240 or 100–120V positions with a small screwdriver. Voltages of up to 10% above or below the indicated range will not adversely affect performance.

QUAD 34

BACK VIEW

The Quad 34 complies with all relevant international safety standards. The AC mains input is via a standard three pin Euro plug and socket, supplied with the unit which should be wired in accordance with the internationally agreed code, Green/Yellow earth, Brown live and Blue neutral. See Fig. 1.

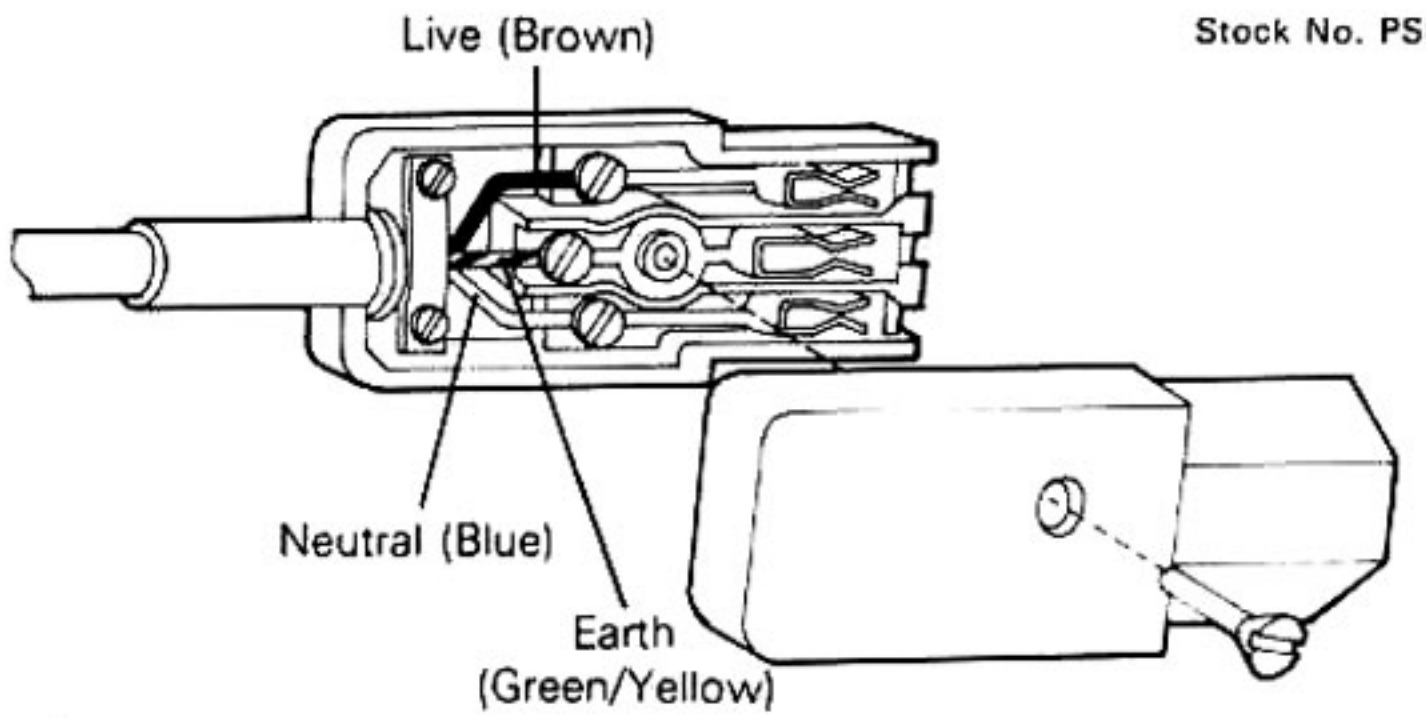


Fig. 1 A.C. Input Connector CEE22 cable ended socket.

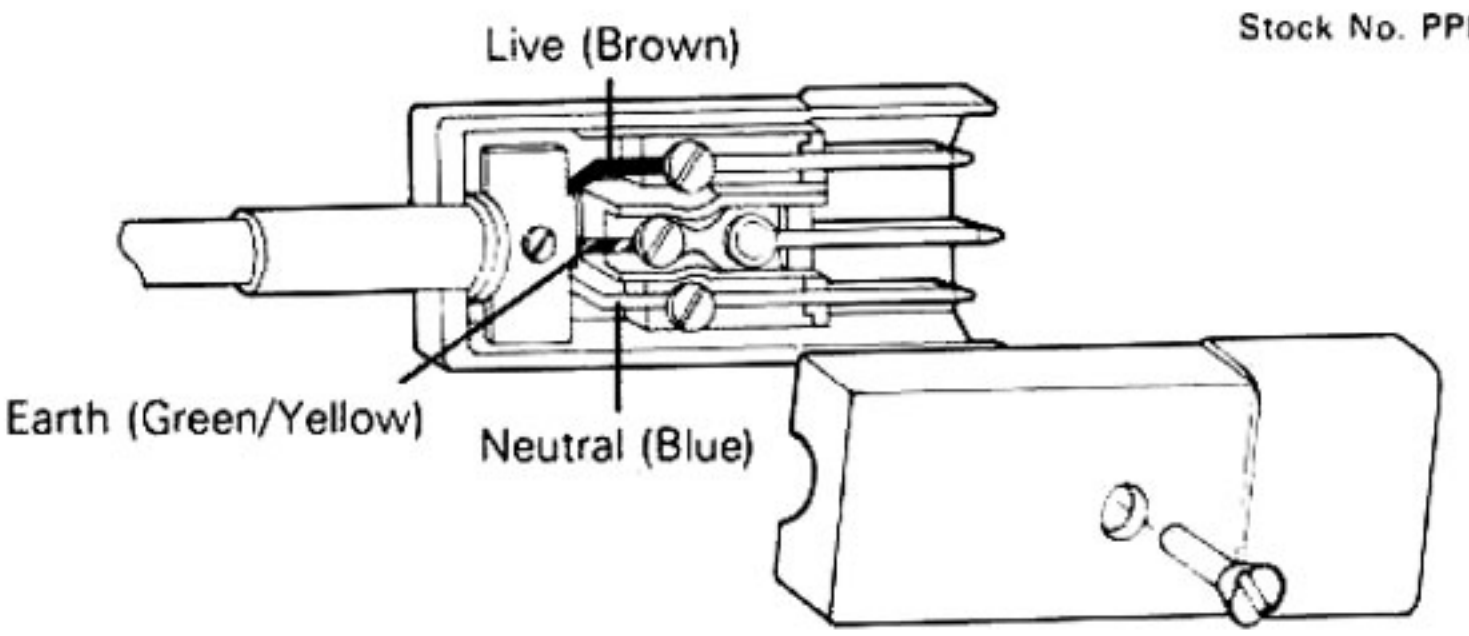


Fig. 2 A.C. Output Connector CEE22 cable ended plug.

One switched AC outlet is provided to power ancillary equipment. When used with the FM4, the FM4 AC input is connected to the switched AC outlet of the 34 and the power amplifier to the unswitched AC outlet on the FM4. The AC outlet is three pin, with the earth (ground) connected directly to the incoming mains earth. When connecting double insulated and other equipment using two conductor mains cable, the earth pin on the plug may be ignored.

The Quad 34 is switched on and off by pressing the button to the right of and below the volume control.

The maximum total steady current drawn from the AC outlet must not exceed 4 amps.

Fuse

The primary of the mains transformer is fitted with a 100mA fuse to protect the Quad 34 in the event of a component failure.

SIGNAL CONNECTIONS

Where practicable, DIN connectors are used for signal inputs and outputs. Experience over the past fifteen years has shown that they are more reliable and have better electrical performance than the standard phono type connector.

However the DIN interface standard for tape recorders is wholly unsatisfactory and the Quad 34 tape input/output does not conform to the DIN norm.

Output to Power Amplifier

The Quad 34 is equipped with one such output, via a 4 pin DIN socket at 0.5V rms, suitable for the Quad 303, Quad 405-2 and other similar amplifiers. A 4 pin DIN signal lead is supplied to interconnect the Quad 34 and Quad power amplifier.

Disc

The dynamic range of the Quad 34 Disc input, that is to say the height of the maximum input signal above the noise threshold, is 100dB.

The maximum dynamic range of the signal from analogue record players is between 50 and 60dB.

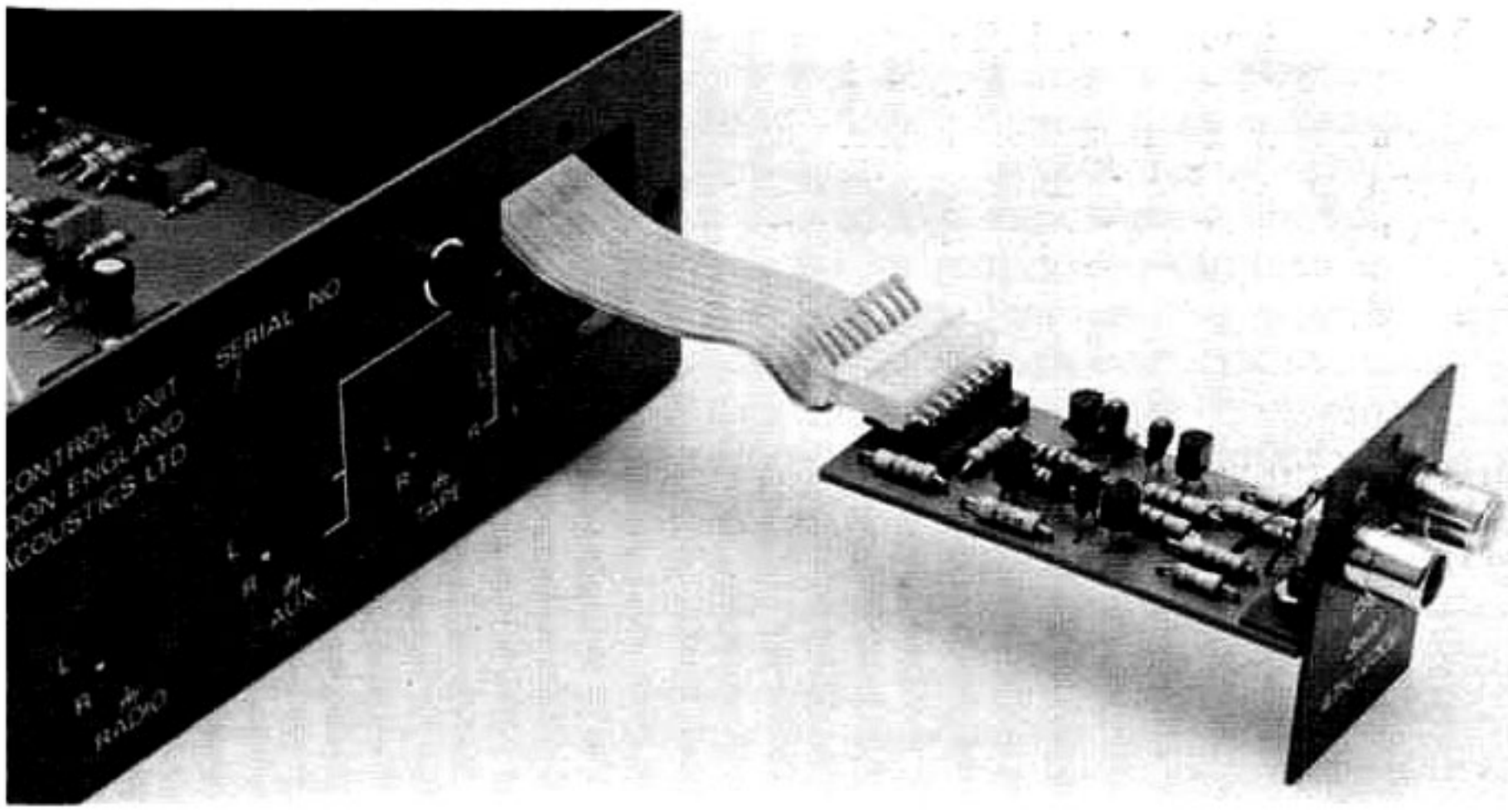
Since pickup cartridges vary enormously in output level, from microvolts to millivolts, a range of 40dB, and have different loading requirements it is impossible to design a universal pickup input. There is a range of disc input modules for the Quad 34 which provide correct matching for any cartridge. Choosing the correct one ensures that the 60dB range of the signal passes neatly through the 100dB window of the disc input with plenty of room on either side.

Choosing the correct input module also results in a sensible volume control setting. Too much gain and the volume control setting is too low giving coarse adjustment of level, too little gain and full volume is not loud enough. As a rule-of-thumb guide, the correct disc input module will give a volume control setting of between 12 and 17 for normal listening. (See the section on volume control).

The Quad 34 is supplied with two disc input modules one suitable for most high quality moving magnet pickup cartridges, the other with 26dB more gain for moving coil pickup cartridges. A range of input modules to suit pickup cartridges with non standard load requirements is available. Full details can be obtained from Quad Electroacoustics, the distributor or your Quad retailer.

The Disc input fitted as standard has a sensitivity of 3mV and presents a load of 47K//220p to the pickup. The moving coil input is packed separately and has a sensitivity of 200μV and presents a load of 100Ω//22nF.

Changing input modules is very simple. Undo the two screws securing the module to the rear chassis and carefully withdraw the module. Connection to the input module is via an 8 way plug and socket attached to a flexible strip cable. Detach the socket from the disc input module, and connect to the replacement module being careful to ensure that all the pins on the board are correctly inserted (see illustration on page 9). Then insert the new disc module into the rear panel and secure with the two screws.



Radio

The Radio input is designed for use with the Quad FM tuner or others with similar output level. The 100K load impedance makes this input suitable for use with a microphone pre-amplifier, or digitally encoded disc player.

Auxiliary

Intended primarily for use with a compact disc player the auxiliary input can also be used for a second radio tuner or, by fitting shorting links into spring terminals on the main circuit board marked X1 and X2, as a second record/replay socket suitable for use with two head cassette recorders only. Do not attempt to use a three head machine as this may generate feedback which could damage your loudspeakers.

Recordings can be made from the Auxiliary and Tape sockets simultaneously, with monitoring available on Tape only. Tapes can be dubbed from Aux to Tape but not vice versa.

Tape

The buffered tape record/replay socket does not conform to the DIN norm. Record level and replay sensitivity and impedances have been chosen to match the vast majority of cassette recorders currently available. The standard record out level is 100mV rms at rated input level with a peak output capability of 5 volts rms. The nominal output level can be increased by 10dB to 300mV rms simply by inserting the pair of 1K resistors supplied into sockets on the printed circuit board marked R27 and R28. Similarly replay sensitivity which is normally 300mV can be increased to 100mV by replacing resistors R16 and R18 with the shorting links supplied.

The tape record output carries whatever signal is being fed through the pre-amplifier so that to make a recording it is simply necessary to set the tape machine to record.

Off tape monitoring and tape replay are achieved by pressing the [TAPE] button.

Operation

When switched on the Quad 34 automatically selects [RADIO] . Any of the other inputs can be selected simply by pressing the appropriate pushbutton and an LED indicates the selected input. [RADIO] [DISC] and [AUX] are all interlatched so that pressing one automatically cancels the others. Switching is entirely electronic and totally silent. It is not necessary to turn down the volume control when changing from one input to another. The inputs are electrically isolated so that it is not necessary to turn off the radio tuner when listening to disc for example.

[TAPE] is not latched. Pressing it once gives either Tape replay, or, if recording is in progress it will give off-tape monitoring without interrupting the recording. In this case both the Tape LED and that of the source being recorded will be lit. Pressing [TAPE] again switches back to whichever of the other three inputs was originally selected.

Volume Control

There is a popular misconception that the volume control limits the power output of the amplifier so that a half-way setting implies half power rather akin to the acceleration of a motor car.

In reality the volume control adjusts the gain of the system, which is to say that it adjusts the output level for any given signal level. If the input level is zero then of course the output will also be zero irrespective of the volume control setting and conversely if the input signal is sufficiently large full output will occur at very low volume control settings. In practice the sensitivity of an input is designed to be appropriate to the source, so that normal listening levels are obtained at sensible volume control settings, on the Quad 34 somewhere between 12 and 17.

The perspective of a recording or broadcast is fixed in the studio by the relative placement of microphones and performers and the use of the volume control should be thought of as a focusing device.

A close miked performance will sound rather forward and the volume control is turned up to bring the image of the performers into the plane of the loudspeakers.

More distant placement of the microphones produces a more open perspective and the volume control is adjusted to bring the performers and recording environment into focus at a distance behind the plane of the loudspeakers. For any given recording or broadcast there is only one correct volume control setting.

The volume control on the Quad 34 is of the detent type, accurately balanced between channels with a law carefully designed to give the listener maximum control at normal listening levels, when input sensitivity and programme source are correctly matched. The volume control positions are numbered to provide a convenient reference.

Balance/Mono

Interchannel balance is adjusted by a lever which is concentric to the volume control. At the limits of its excursion it provides left or right channel only.

When [MONO] is selected, left and right inputs are combined and the balance control operates as a mono mixer. In the centre position the sum of both inputs is fed to both loudspeakers. As the balance control is moved progressively towards either end, the input mix changes and at the limits, the signal fed to both loudspeakers consists exclusively of left or right channel input.

When listening to weak FM transmissions which are too noisy in stereo, select [MONO] and adjust the balance control for minimum noise.

Filter Controls (see page 13)

It is not widely appreciated that even with modern stylus shapes the tracing distortion from a gramophone record doubles for every half octave, and at high frequencies and high modulation levels the distortion can rise to 50%.

A well designed filter system intelligently used can remove most of this distortion without removing the musical information, enabling the listener to have more of the music and less of the hi-fi.

The Quad 34 filters are operated by three pushbuttons and give four filter characteristics as shown on the accompanying curves.

[F1] and [F2] are single pole filters operating from 11kHz and 7Kz respectively. Adding the [SL] button converts them to 2nd order aperiodic filters (Q $\approx$ 0.5) at the same two frequencies.

With accurate loudspeakers and pickup most older orchestral recordings will sound best with [F2] + [SL] pressed. Good recordings with not too high a dynamic range will benefit with [F1] + [SL] and in exceptional cases with [F1] alone or nothing at all.

Without the [SL] button pressed both filters will be milder and are suitable as antidotes for microphone directivity problems and the like.

Pressing [SL] a second time reverts to [F1] or [F2] as the case may be.

To switch out the filters just press whichever of [F1] or [F2] has been selected, irrespective of whether or not [SL] is also engaged. This provides a ready reference with the original to check that use of the filter is correct.

Inevitably, defects in loudspeakers and pickups will bias these recommendations so that optimum use can only be learnt by experience.

Tone Controls

The results obtained from any programme depend upon the aggregate effect of the listening room, the recording environment together with corrections applied by the recording engineer, and the characteristics of the equipment of the reproducing chain. It is not difficult to understand that it is extremely unlikely that the arbitrary combination of these variables which occurs when listening at home will yield the closest approach to the original sound, and indeed it is only necessary to play a good recording on first class equipment in a number of different rooms to realise just how much variation there can be.

Room effects are delayed in time with respect to the original sound so that only certain types of error are correctable by frequency response shaping.

Traditional Bass and Treble controls have very limited use and are more suitable for correcting transducer failings than acoustic problems. The graphic equaliser is exceedingly versatile but with high built-in redundancy because problems amenable to correction are confined to clearly defined parts of the musical spectrum.

The Tone controls on the Quad 34 are designed to enable the listener to obtain the closest approach to the original sound in his environment with the assumption that only first class pickups and loudspeakers will be used. The operation of each of the controls is described below.

Tilt Control (see page 14)

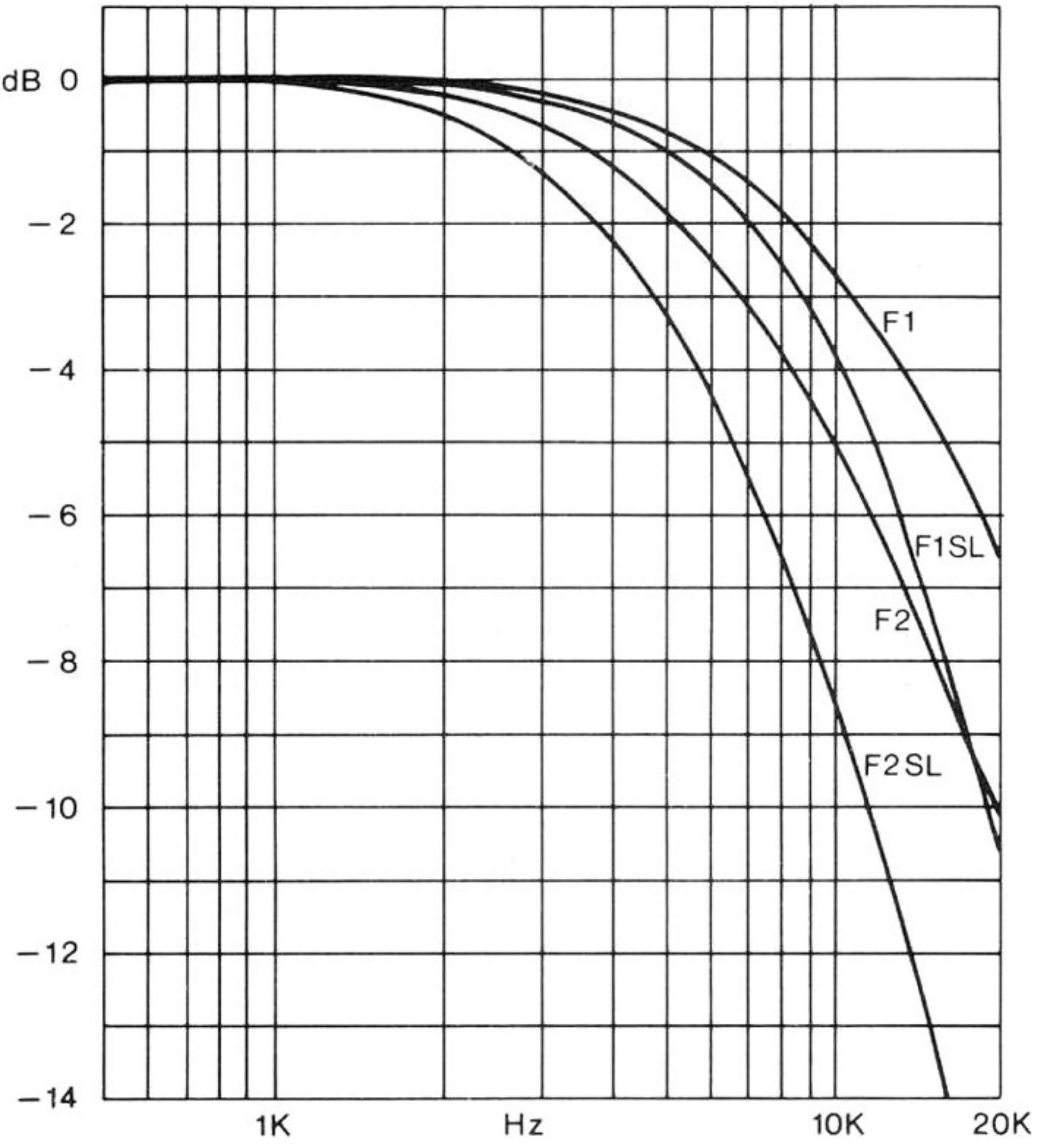
The TILT control operates exactly as its name implies and produces a very gradual change in balance across the musical spectrum without changing the overall subjective level. When set for +1 −1 there will be gradual fall of 2dB from bass to treble with a maximum rate of change in the centre of not more than ½dB per octave. This absence of sudden change means that there will be no 'colouration' added to the sound. The sound will remain entirely natural but with a slight added warmth. Such a setting will be used if the recording and/or the listening room are slightly analytical or overbright.

Conversely if both the recording environment and the listening room are rather lush sounding then −1 +1 (or even −2 +2) would be used to restore detail. In using this control the extreme bass and extreme treble should not unduly influence judgement because these are separately adjustable.

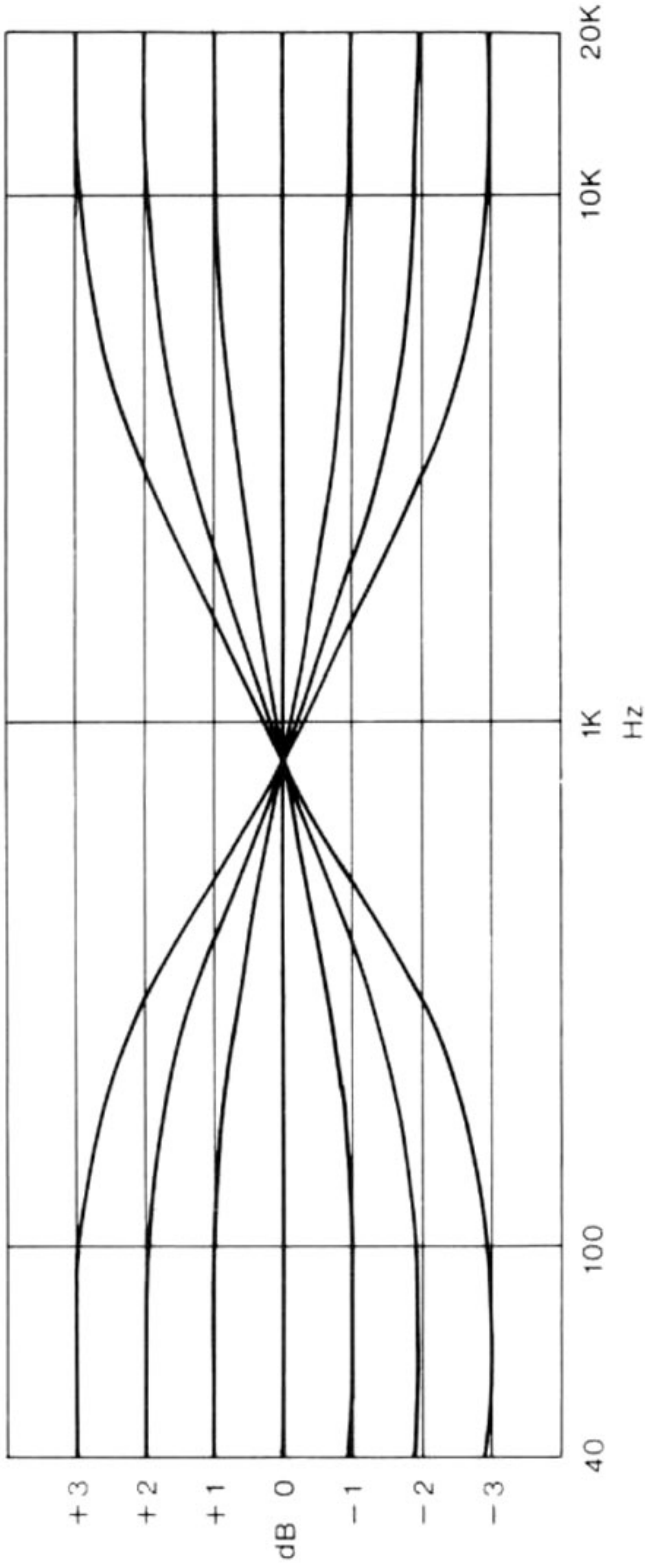
Bass Lift and Step (see page 15)

In the LIFT position the BASS control acts as a smooth progressive boost for use with small loudspeakers of necessarily limited bass response, and the profile of the Bass lift response provides optimum equalisation.

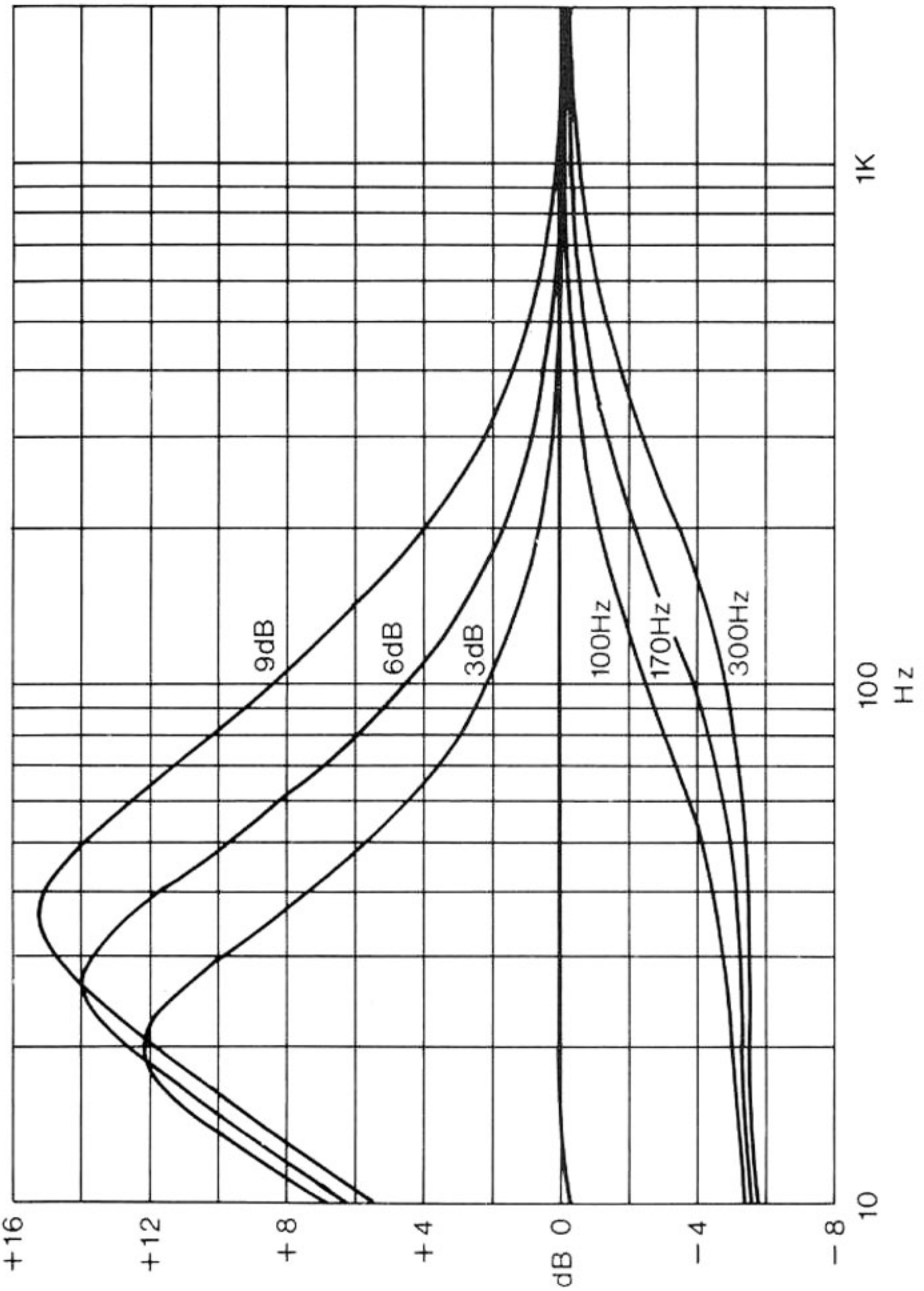
In the STEP mode the control acts as a step filter, producing a 5dB drop in output centred on either 100Hz, 170Hz or 300Hz. This will be found to be extremely useful in removing the characteristic 'honk' caused by the excitation of the room's eigentones by the loudspeakers, particularly when they have to be placed in or near a corner.



FILTER



TILT CONTROL



BASS CONTROL LIFT & STEP

SPECIFICATION

All voltages quoted are rms.

Distortion	Worst case, any input	.05% 30–10,000Hz
Residual Noise	'A' weighting. Volume control at minimum	105dB
Frequency Response	Any input except Disc, any output	±.3dB
	Disc RIAA	±.5dB both at 30–20,000Hz
Tilt, Bass & Filter	see curves	
Interchannel Balance	±.5dB with Volume control varied from maximum to –60dB.	
AC Input	100–130V or 200–250V 50–60Hz maximum continuous consumption 4.5VA	
Weight	3.2Kg.	
Dimensions	Width 321 mm; Height 64 mm; Depth 207 mm.	

OUTPUTS

To	Output Level	Source Impedance
Power Amplifier **Tape Recorder**	0.5V 100mV*	830Ω 2.2kΩ

INPUTS

Source	Input Sensitivity for full Output (at 1kHz)	Maximum Input (at 1kHz)	Load Impedance	Signal to Noise 'A' weighted Input loaded
Disc	3mV* 200μV*	150mV 10mV	47k//220pF* 100Ω//22nF	–75dB –72dB
Radio & Aux	100mV	5V	100kΩ	–88dB
Tape Replay	300mV*	15V	120kΩ	–87dB

**others available*

Circuit diagrams and service data for this Quad product are available from the manufacturer or distributor on request.

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