

Quad Electroacoustics Ltd.,
HUNTINGDON,
Cambs.,
PE18 7DB.

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

Quad is a registered trade mark

QUAD

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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Accessories Pack Contents

1 x AC input connector

1 x AC output connector

Module Pack Contents

Module Pack Contents

2 x 100mV Record Flags

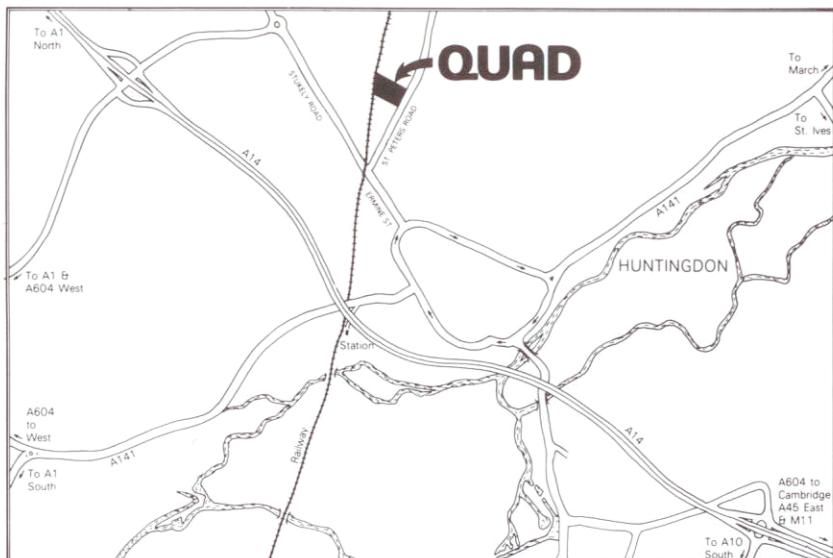
2 x 100mV Record Flags

2 x 100ml Reptile
2 x Y1Y2 Flags

28818

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.

Quad offers same-day service from Monday to Friday except for bank holidays. The map below shows where to find us. Please call 0480 52561 to make an appointment.



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.

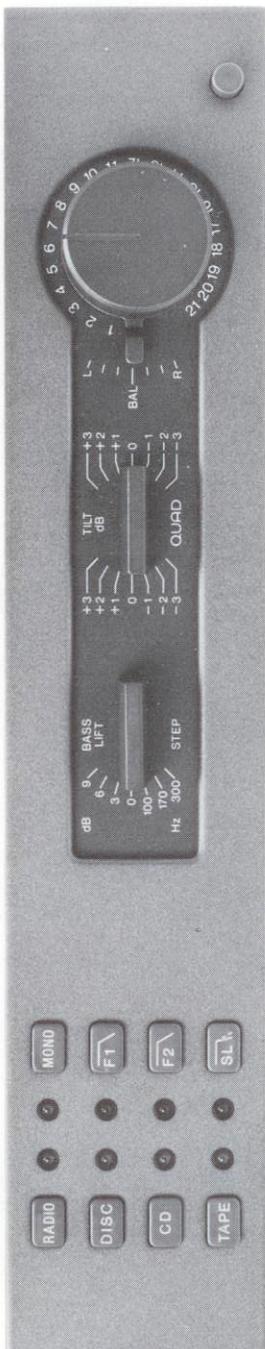
Guarantee

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.

QUAD 34



FRONT VIEW

INTRODUCTION

The Quad 34 control unit has inputs for pickup, tape recorder, radio tuner and a fourth, 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.

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 (using alternative longer screws available on request, if the thickness of the cabinet makes this necessary) 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.

Alternatively, as for the Quad Rack, it may be mounted by the cover securing screws at the rear.





BACK VIEW

CONNECTIONS

The Quad 34 is suitable for operation on either 200/240v or 100/120v supplies. The correct operating voltage is clearly marked on the back of the unit.

IMPORTANT – BEFORE CONNECTING THE UNIT TO THE AC SUPPLY CHECK TO ENSURE THAT THE VOLTAGE MARKED ON THE BACK OF THE UNIT CORRESPONDS WITH THE AC SUPPLY VOLTAGE.

The Quad 34 can be changed from 220v to 110v operation and vice versa by a suitably qualified technician. Voltages of up to 10% above or below the indicated range will not adversely affect performance.

AC Input

The Quad 34 is supplied with an A.C. input connector (A.C. input lead in some countries). This should be wired as shown in Fig. 1. When the wall plug is fused, fit a 13A rated fuse.

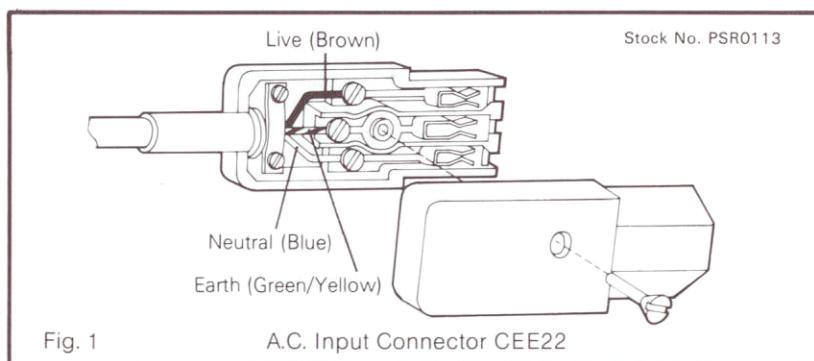


Fig. 1

AC Output

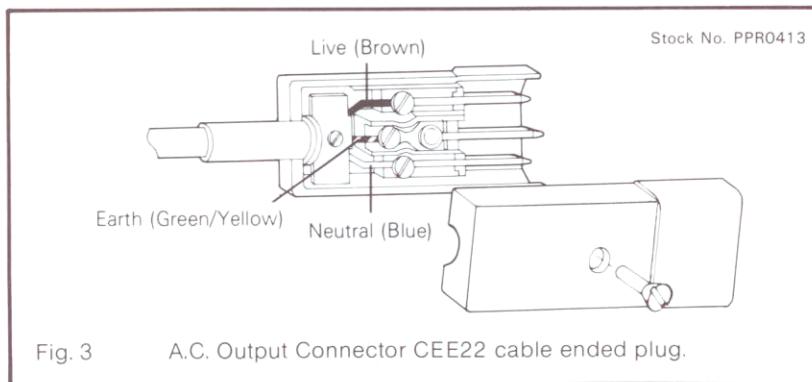
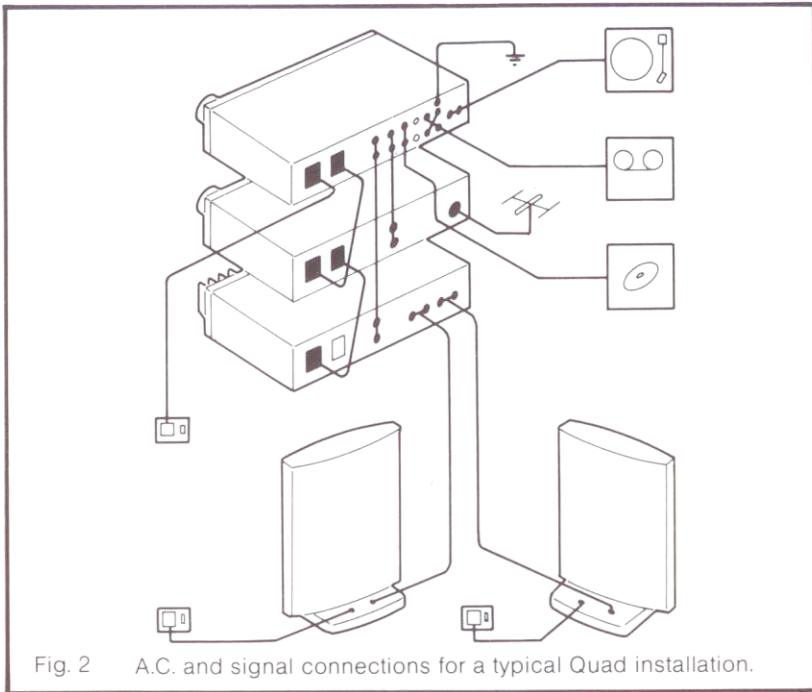
The Quad 34 is fitted with a switched A.C. outlet which feeds other units in the system. The Quad power amplifier and Quad tuner are provided with appropriate interconnecting leads. Fig. 2 shows how the units are linked together.

The power amplifier and tuner are left switched on and the system is switched on using the on/off switch on the Quad 34.

A spare A.C. output connector is provided with the Quad 34. This should be wired as shown in Fig. 3.

The maximum steady state current drawn from the switched A.C. outlet of the Quad 34, should not exceed 4 amps. It should not be used with installations involving multiple power amplifiers or very large power amplifiers. These should always be powered directly from the wall A.C. supply.

If, when the control unit is used with a Quad power amplifier having a 4-pin Din input, hum occurs with the volume control at minimum and all other equipment disconnected from the control unit, it is permissible to break the earth connection at one end of the interconnecting mains lead. The amplifier will still be earthed via the screening of the signal lead.



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

All input and output connections are clearly marked on the back of the unit with the exception of the pair of sockets between CD and Tape replay.

These are normally not connected but may be used as an additional tape recording outlet as described under CD on page 11.

Output to Power Amplifier

The output level of the Quad 34 is 0.5V rms suitable for all Quad power amplifiers except the Quad II. This can be increased (up to 1.5 V rms max) by decreasing the value of resistors R118 and R121 and increasing R119 and R122, or reduced by decreasing R119 and R122. Actual values and output levels are given below.

To Reduce the Output

Connect additional resistors in parallel with resistors R119 and R122 as follows:

470Ω for 9dB attenuation (.18V)
180Ω for 15dB attenuation (.09V)
100Ω for 20dB attenuation (.05V)

To Increase the Output

Change resistors as follows:

	Output (rms)		
	1.6V	1.1V	0.775V
R118/R121	Shorted	1k	1.5k
R119/R122	3.3k	2.2k	1.5k

Note: Increasing the output level will also tend to increase the momentary switch-on noise.

Disc

The signal lead from the turntable is plugged into the R and L sockets on the Disc module. The signal lead will normally incorporate a separate earth/ground lead which must be connected to the earth/ground terminal marked $\frac{1}{4}$.

When the turntable is correctly installed, it is possible to select and without placing the pickup on the record, turn the volume control to normal listening level without hearing hum.

Audible hum indicates error in the installation such as incorrect earthing, signal lead too close to a lead carrying AC, too sensitive an input module for the cartridge concerned, etc.

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.

180Ω Resistors
inserted in
parallel to
R119 and R122.

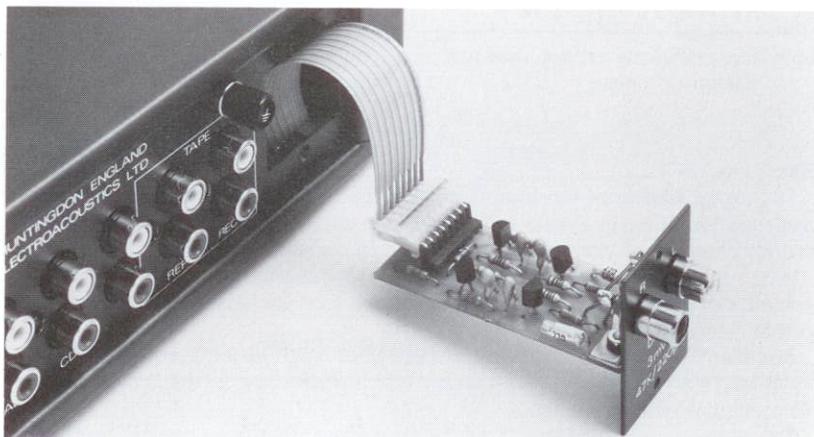
Since pickup cartridges vary enormously in output level, from microvolts to millivolts, a range of 40dB, and have different loading requirements it is impossible to design a universal pickup input. There is a range of disc input modules for the Quad 34 which provide correct matching for any cartridge. 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 23dB 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 200 μ V and presents a load of 100 Ω //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 below). 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.

CD

The CD input is intended primarily for compact disc, but can be used as an auxiliary input or second tape/replay input suitable for two head cassette recorders only. Do not attempt to use a three head machine on this input as this can generate feedback which will damage your loudspeakers.

The input sensitivity is determined by the value of resistance built into plug-in "flags" inserted into sockets R135/R136 on the main circuit board. As supplied the input sensitivity is 300mV, suitable for all compact disc players. Flags for input sensitivities of 100mV (to suit Quad tuner) and 500mV if required, are available from your dealer or Quad Electroacoustics.

To record on a second tape recorder, the spare sockets between the CD and Tape Replay sockets may be brought into circuit by inserting the two flags X1 X2 into the X1 and X2 sockets on the main printed circuit board. The signal level will be the same as from the Tape Record sockets and recordings may be made on both machines simultaneously, but monitoring facilities will not be available for the second machine.

Tapes may be copied from CD to a recorder in Tape Record but not from Tape Replay to one in the spare sockets.

Inserting resistors instead of the X1 X2 flags will reduce the signal level at the spare sockets, for example, when recording via a Din input to a tape recorder, when 470k would be a suitable value.

Tape

Record level and replay sensitivity have been chosen at 300mV, to match the needs of the vast majority of cassette recorders currently available. Either can be changed simply by removing the cover of the unit and replacing the appropriate 300mV flags by those of another value. Alternative 100mV flags are supplied in the moving coil module pack.

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.

To use a second tape recorder see under CD above.

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 **CD** 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 by the curves on page 13.

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.

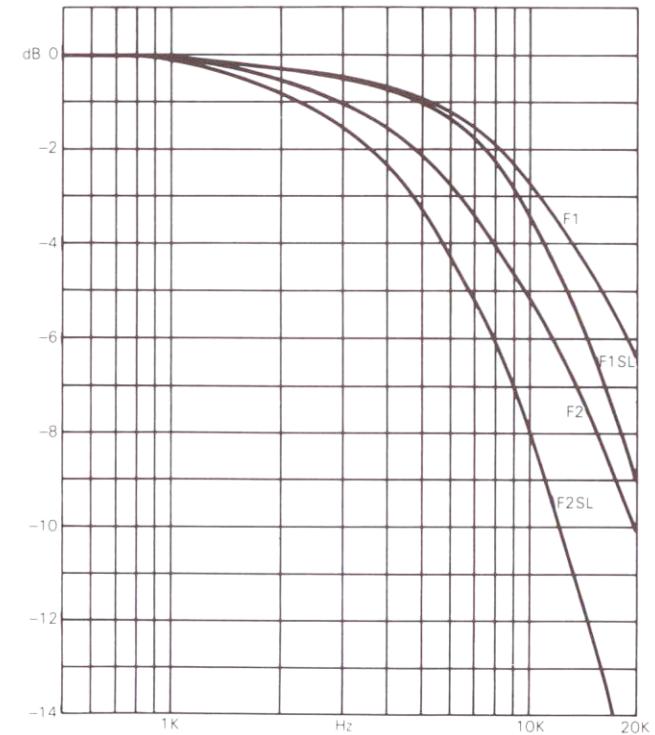
With accurate loudspeakers and pickup most older orchestral recordings will sound best with **F1** + **SL** pressed. Good recordings with not too high a dynamic range will benefit with **F1** + **SL** and in exceptional cases with **F1** alone or nothing at all.

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.



FILTER

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 15)

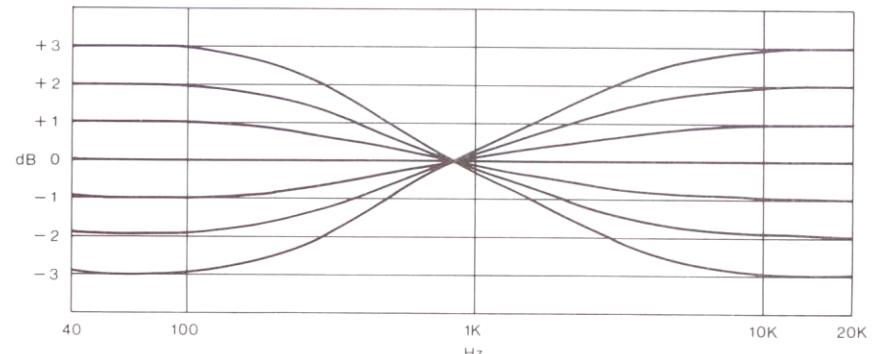
The TILT control operates exactly as its name implies and produces a very gradual change in balance across the musical spectrum without changing the overall subjective level. When set for +1 -1 there will be gradual fall of 2dB from bass to treble with a maximum rate of change in the centre of not more than $\frac{1}{2}$ dB 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.

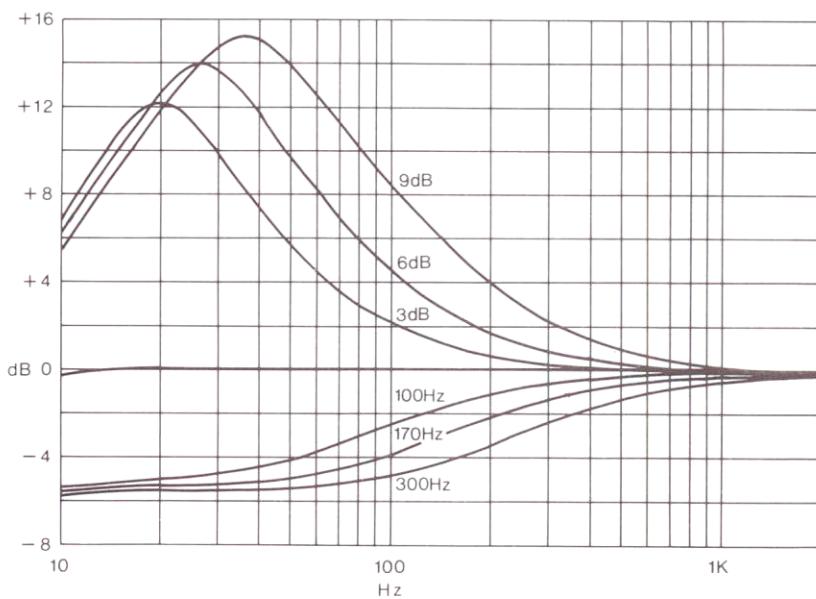
Bass Lift and Step (see page 15)

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 eigenmodes by the loudspeakers, particularly when they have to be placed in or near a corner.



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	0.5V	830Ω
Tape Recorder	300mV*	2.2kΩ

INPUTS

Source	Input Sensitivity (for full output at 1kHz)	Maximum Input (at 1kHz)	Input Impedance	'A' weighted Noise (dB below 500mV full output)	
				Volume control at max	Volume control at 15
Mag Disc	3mV*	135mV	47k//220pF*	75	87
	200μV*	9mV	100Ω//22nF	72	84
Radio	100mV	4.5V	100k	88	99
CD	300mV*	20V	49k	87	98
Tape Replay	300mV*	13.5V	57k	87	98

*Others available

Circuit diagrams and service data for this Quad product are available from the manufacturer or distributor at a small charge.