

# AUDIO 4

turned down on most systems. I found the bass/treble balance somewhat tilted in favour of the top end. This emphasized sibilance and made some music sound peaky—though many people may like the degree of presence imparted to vocals and pop music in general. The open-air operation gives very little isolation from one's surroundings but, in compensation, there is a real sensation of hearing music up close with practically no feeling of the headphones actually being on one's ears at all.

## Yamaha HP-2

Manufacturer: Nippon Gakki Co. Ltd., Hamamatsu, Japan. UK distributor: Natural Sound Systems, Unit 7, Greycaine Road, Watford, Herts WD2 4SB. Price: £27.

INSTEAD of the usual moving-coil construction, these headphones are based on the orthodynamic principle—as used in a famous Leak/Wharfedale design. A spiral coil is wound into the thin-film diaphragm so that drive is applied over the whole diaphragm area. The claimed advantages include a more piston-like action without break-up resonances and certainly the sound quality was much liked. Leather-type covers on foam embrace the ears, giving some isolation from one's surroundings—but not much. The earpieces swivel on single-point suspensions and there is easy adjustment of headband size, with a

soft inner band contacting the wearer's head. A 2.4m straight connecting cord has the usual 6.3mm jackplug and divided ear wiring.

At 190 grams (6.7 ounces) the HP-2 headphones are heavier than most of the others in this review, but still reasonably light-weight and comfortable in use. They are styled in an attractive brown finish and very robust.

The most obvious benefit of the larger drive units and supra-aural earpads is the excellent bass, which extends lower than in any of the mini systems discussed above. Presence too is very marked, giving a sense of liveness to music of all kinds. Treble is in good balance, while just tending to emphasize sibilance. Sensitivity is a little on the low side, and indeed the instructions on the box state "there is a possibility that the volume will be insufficient" from a cassette deck or tuner—making the amplifier jack a better bet. In practice, I foresee no problems with any modern equipment. Volume levels were at all times enough for my needs, and indeed I could reach near-damaging levels, for example, on my Nakamichi 582 cassette deck. Distortion was unusually low, and overall performance very commendable. I also tried the less expensive Yamaha HP-3 headphones (£17.95). These produced similar quality and are worth investigation despite the less stylish and comfortable headband.

JOHN BORWICK.

## Quad 34 control unit

Manufactured by: Quad Electroacoustics Ltd., Huntingdon, Cambs PE18 7DB. Price £219.

IF you read my report on the Quad FM4 tuner in our June 1982 issue you may recall a heavy hint that a control unit sharing its neat format was in the pipeline. Well now it is here, and I think they have produced an absolute winner; which should come as no surprise when one is reminded that it is over 30 years since they made their first one.

Recent design thought in control units seems to have become polarized into two schools. The one sets out to embrace every facility, offering great flexibility in both its connection to other equipment and in the range of control provided. Indeed, a refined example is Quad's own Model 44 which has been with us for a couple of years now. The second school predictably goes to the other extreme so that controls are minimal and facilities decidedly limited. It is sometimes diffi-

cult to understand why both the price and performance claims for the latter often exceed those for the former by a factor of two—sometimes more—particularly when such obvious things as, for example, matching channel balance at varying volume settings seem to have been ignored. Someone at Quad has thought hard about all this and moved in with the Model 34 which elegantly treads a middle road and does it at a most moderate cost. As we shall see, little versatility has been lost and all aspects of performance have been fairly dealt with.

The Quad 34 has four inputs, Radio, Disc, Auxiliary and Tape and they are selected by a vertical row of push-switches at the extreme left of the diecast metal panel; each has an associated green LED which remains alight after the input has been selected. Silent solid-state switches are used and, as there is complete isolation between all inputs, no breakthrough is audible. The second row of LED-indicated switches select monophonic operation and engage the four treble

filter characteristics. To their right are the two lever knobs of the tone control switches, not the usual Bass and Treble but Bass and Tilt. The large knob is the stepped volume control and the small lever to its left swings the balance from left to right with an obvious notch at the central position. The sole remaining control is the mains switch knob at the extreme bottom right.

If we look in a little more detail at the arrangement and circuit layout it will help us to realize how much this new model has to offer. The Radio input is straightforward, requiring 100mV of signal for full output and loading it with 100k. The auxiliary input is the same, being intended for Compact Disc players. However, like Radio and Tape, connection is via a 5-pin DIN socket (which Quad consider to have superior mechanical and electrical properties) and so the tape recording feed can also be brought to this socket, enabling a second tape machine to be wired in if desired. Tape monitoring (using a three-head machine) can be performed only on the real Tape input and it is interesting to note that, although a DIN socket is used, the signal levels are chosen to match the standard Line Input and Line Output more common on modern tape machinery; it is acknowledged that the true DIN standard levels, which are rather odd, have proved unsatisfactory with high-quality equipment. As a further measure of flexibility the Quad 34 can provide tape input and output levels of either 100mV or 300mV by plugging a couple of resistors into spring-loaded contacts provided on the printed circuit board. Source impedances are 2.2k and loads 120k and the record outlets are buffered so that the signal path cannot be interfered with.

The Disc input is even more flexible, for here a plug-in module is fitted which the user can easily change without in any way dismantling the equipment. Two are normally provided, one to suit most moving-magnet cartridges has 3mV sensitivity and a 47k/220pF load. The other for low impedance (usually moving-coil) cartridges offers 0.1mV sensitivity and 100 $\Omega$ /22nF load. Others are becoming available. The disc input board incorporates the only discrete transistors to be found in the direct signal paths, all the rest of the amplification being provided by quantities of Bifet ICs. A form of single-ended push-pull arrangement has been chosen with the supplies carefully stabilized and with a part of the feedback loop on the module used to set the gain. RIAA compensation is active at all audio frequencies changing to passive at ultrasonic frequencies.

The tone and volume controls are true stepped attenuators made for Quad by ALPS in Japan; they incorporate contacts and resistive material deposited on a common base material and matched between channels by an etching process which enables Quad to claim balance errors of less than 0.5dB over a 60dB range—and the one I checked was rather better than that. The unique tone control arrangements brought in with the Model 44 are developed in the 34. The major control is descriptively labelled 'Tilt' and it does just that, see-sawing the bass and treble about a hinge at 950Hz as shown in our curves (Fig. 2). It is quite gradual and thus adds no coloration or loss of naturalness in the resultant sound, whilst quite accurately compensating for the differing behaviour of rooms and their furnishings. The Bass control on the other hand is concerned with loudspeakers and their position in the room. Small, bass light, loudspeakers benefit from the Lift positions, which deliberately fall away at the lowest frequencies to avoid pushing them beyond a sensible limit, whilst the Step mode reduces bass output by a fixed amount at three frequencies as a palliative for unfortunate, but domestically necessary, loudspeaker placement, e.g. too near a corner. The balance control is straightforward, swinging the signal completely from left to right and thus acting as a mixing control between channel inputs if the Mono mode is engaged. It is in the filtering arrangements that a major departure from Quad practice can be seen. This is the first control unit of theirs not to incorporate a continuously variable slope filter—perhaps an acknowledgement that distortion in the source is less

The Quad 34 control unit has four inputs, with a spare module for moving-coil cartridges



SPECIFICATION AND TEST RESULTS  
QUAD 34 STEREO CONTROL UNIT

	Maker's Specification	Test Result	Reviewer's Comments
1. Rated output (mV)	500	Agreed	May not fully drive certain less sensitive power amplifiers
2. Harmonic distortion (worst case 30-10,000Hz)	0.05%	0.002% at 1kHz	Excellent
3. Frequency response (Hz)	30-20,000 $\pm$ 0.3dB	See Fig. 1	Dead flat
4. Phono overload (mV)	MM 150 MC 15	165 16	Should cope with highest recorded levels
5. Input sensitivities (mV)	Phono MM 3 Phono MC 0.1 Radio 100 Tape 300	2.9 0.1 94 295	Alternatives are available
6. Tone controls	Tilt and bass	See Figs. 1 and 2	Give flexible control
7. Hum and noise (dB)	105	106 DIN A 89 unweighted	Excellent
8. Filters	Treble	See Fig. 1	—
9. Dimensions (mm)	321 $\times$ 64 $\times$ 207	12.6 $\times$ 2.5 $\times$ 8.2 inches	Exact match for F4 tuner

of a problem these days. However, I am already given cause to wonder if some of the peaky sounds being put on to the Compact Disc and being accurately reproduced by it might not require its return. Time and experience will tell. In the present case, Quad have elected to provide two fixed slopes of about 6 and 12dB per octave occurring at roughly 6 and 10kHz as our curves show (Fig. 2).

## How it performed

Internally the construction is a pleasure to behold, as was the case with the FM4 tuner. A single printed-circuit board covers the entire area with all the major components on it. Once again all those parts of the power supply which could constitute a shock hazard are safely isolated in a screened-off corner and there is a corresponding insulated area on the underside of the board.

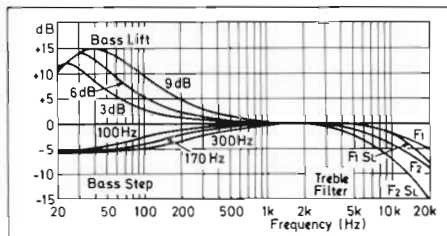


Fig. 1. Quad 34 effect of bass lift, bass step and treble filter controls

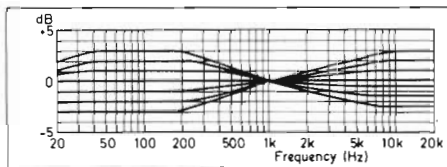


Fig. 2. The tilt control see-saws the response on either side of 950Hz

Satellite boards are connected via ribbon cables and every component is identified. I think it is safe to say that no audio equipment produced elsewhere is better made, and none of a comparable price gets anywhere near it. After which high praise one is justified in asking "How does it perform?"—and once again the answer can only be expressed in high marks. On measurements alone it is exemplary, although it should be pointed out that unlike the Model 44 it will only drive Quad or other 0.5V-input power amplifiers; its quite gentle overload, if asked to provide higher levels, having been deliberately engineered, perhaps with some foresight. Subjectively too it is a very gentle-sounding control unit with a smooth creamy character which, on first acquaintance, has fooled many people into suspecting a falling frequency response. Direct comparisons with a couple of formidably expensive designs showed that everything seemed to be there, although one appeared to hear slight differences, noticeable perhaps in the appreciation of the surroundings in which the players were performing. Of course slight differences in choice of pickup loading can produce such subtle effects or maybe—I say maybe—there are differences in amplifiers which cannot be explained by the most scrupulous scientific tests.

The tone controls are meant to be used and do exactly what is intended without any loss of information. I proved to my own satisfaction that use of small loudspeakers was most definitely enhanced by the bass lift, and a deliberately-induced room honk was somewhat ameliorated with the step function. In the past I have tended to ignore the usual bass and treble controls for they often disturb the naturalness of reproduced music. I own one control unit which has none and on another they have remained switched to Cancel for many moons; not, may I add, that I am one of those poseurs who recoil in horror at the very thought of tone controlling whilst listening to records that have been through every form of electronic cook-

ing known to man. What I am saying is that I pleasantly listened for long periods with some degree of tilt either way, when I happened to disagree with the programme producer's choice of environment.

Quad's new 34 control unit can be thoroughly recommended and, in view of what it offers at such a truly modest price, there is every likelihood of it remaining a popular choice for many years to come.

GEOFFREY HORN.

## Thorens TD147 turntable

Manufacturer: Thorens-Franz AG, Wettingen, Switzerland. UK distributor: Cambrasound Ltd., Britannia Road, Waltham Cross, Herts EN8 7NX. Price: £260.



THE Thorens pedigree can be traced back nearly 100 years. The company was founded in 1883, making music-boxes at first, then a cylinder phonograph in 1898 followed by a succession of acoustical and electrical gramophones. In recent years, the Thorens laboratories have refined the design of their low-voltage belt-drive motors and Isotrack arms to provide an exceptional level of technical performance in the medium-price bracket. If the £260 price tag on this latest TD147 model looks rather high, it should be realized that the unit has a state-of-the-art 'improved' suspension system and comes complete with the Isotrack TP16 Mark III arm and an end-of-side switch-off sensor.

The turntable itself is essentially the 'S' (for 'Super') version of the popular Thorens TD160, which is marketed without an arm and aimed very specifically at the 'audiophile' purchaser. The drive motor is a 16-pole two-phase synchronous type. It runs at the comparatively low rotational speed of 375rpm (for 50Hz mains) with the advantages of reduced rumble and wear. Motor construction aims at minimizing stray magnetic fields, and hum induction at the cartridge is further avoided by locating the step-down transformer (from the AC mains voltage to around 16 volts) in the mains lead itself.

The use of a rubber belt to convey the drive torque from the spinning motor-capstan to the platter provides a valuable degree of isolation from motor rumble. Thorens improve on this by employing a double-suspension technique. The platter and the tonearm are mounted on a separate chassis which is suspended by a system of damped springs clear of the main chassis carrying the motor. An acceleration clutch prevents slipping of the belt to give a smoother start motion and avoid belt wear.

The Isotrack TP16 Mark III pickup arm achieves a very low effective mass of only around 7.5g by eliminating as many weight-introducing components from the cartridge end of the arm as possible. A low-mass skeletal headshell is employed, on the end of a straight tube (which Thorens call a 'wand'). This has been treated to reduce resonances and plugs into the main bearing assembly where it is secured by a knurled collar. Tracking force (playing weight) is applied by means of a calibrated spring, balance first being set in the usual way by positioning of the counterweight. Sidethrust compensation uses magnetic torque, which is adjusted by a rotary knob and scale calibrated for spherical and elliptical styli (playing dry or wet—as with a LencoClean).

Deck controls have been reduced to only two: a three-position switch for 33 $\frac{1}{3}$ rpm, 45rpm and off, and a raise/lower cueing switch. To play a record, the first switch is pushed to the appropriate side for the speed required, which starts up the motor. The pickup is then moved by hand so that the stylus is over the run-in groove or other selected point on the record, and the cueing switch pushed to the 'lower' position, whereupon the pickup moves gently down on to the record. Though most Thorens turntables are simple manual units, the TD147 acknowledges the need for at least partially automatic operation by providing an auto-stop function. This uses an electronic sensor to detect the accelerated inward motion of the arm as it reaches the run-out spiral, rather than any type of mechanical trip-switch which could introduce distortion, and simultaneously switches off the motor and moves the arm to its raised position.

The main platter is a moderately heavy (3.2kg) zinc alloy unit, dynamically balanced and with most of its mass concentrated at the deep outer edge for maximum flywheel effect. The rubber mat is also fairly heavy, with raised concentric rings to support standard-diameter discs. The all-black styling is functional rather than eye-catching, but the solidly-built plinth cabinet has an attractive mahogany finish and the plastic lid has sensible friction hinges to hold it open at any desired angle.

The TD147 package includes a beautiful three-language instruction booklet and quite elaborate aids to cartridge mounting and alignment. An assortment of spacers enables the cartridge effective height to be set precisely, as checked on a

### SPECIFICATION AND TEST RESULTS THORENS TD147 TURNTABLE

	Maker's Specification	Test Result	Reviewer's Comments
1. Speeds (rpm)	33 $\frac{1}{3}$ and 45	Less than 1% fast	Within international standards tolerances
2. Motor type	Low-voltage 16-pole synchronous	—	Transformer is part of mains cable
3. Wow and flutter (% at 33 $\frac{1}{3}$ rpm)	0.04%	0.04%	Excellent
4. Turntable diameter (mm)	300	(11.8 inches)	—
5. Turntable weight, (kg)	3.2	(7.05 lb)	—
6. Turntable material	Zinc alloy	—	—
7. Rumble (dB)	-52 unweighted -72 DIN	-54 -74	-82dB weighted using non-disc test method
8. Pickup arm	TP16 MkIII	—	Tracking force calibration accurate
9. Auto operation	Auto-stop only	—	—
10. Dimensions (mm)	440 x 350 x 170 (cover closed)	(17.3 x 13.8 x 6.7 inches)	445 mm high with cover open