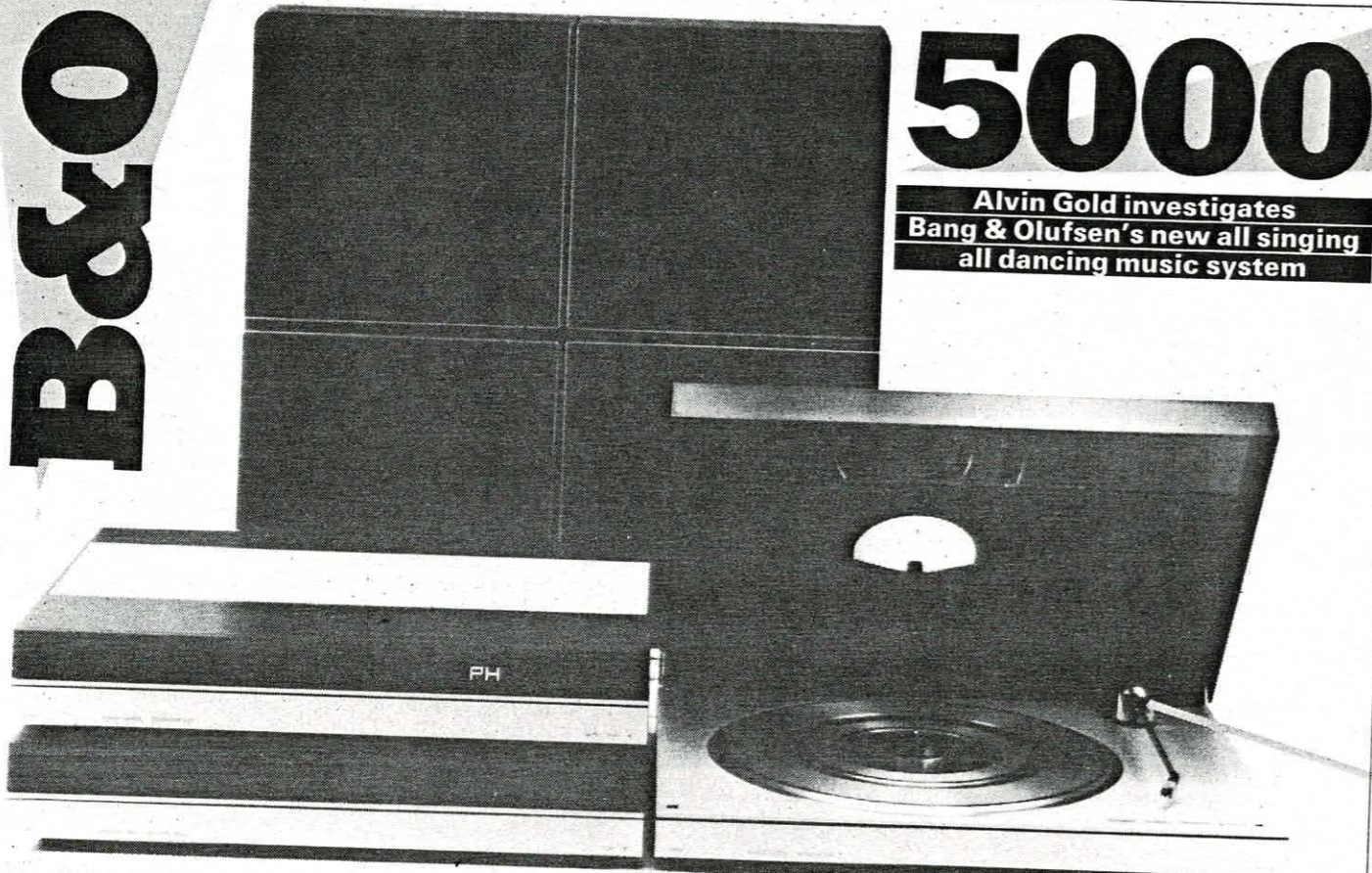


B&O

5000

Alvin Gold investigates
Bang & Olufsen's new all singing
all dancing music system



BANG & OLUFSEN, Europe's only manufacturer of complete high fidelity systems (all others buy bits in), are in the business of designing and making life-style products.

These are built to accord with B&O's vision of what a modern life-style means, and by implication the equipment imposes this style on the user. By the end of this review, you should have an idea of whether you qualify as a customer. Because of the kind of beast it is, I've concentrated mainly on the way the equipment functions – though I've not attempted a complete button-by-button description. You can get a prettily coloured brochure to elaborate on this, and any B&O dealer is even better equipped for the task.

Further on you can read about how good the system is to listen to. For now, I'll attempt to put it into a general context. The 5000 system as reviewed comprises a turntable, a cassette deck and a tuner-amplifier plus a remote control – the Master Control Panel – which together bring new meaning to the term 'uniform styling'.

Styled immaculately in brushed aluminium and dark brown (and I mean immaculately!) B&O do not intend you to touch the equipment itself unless it's to put on or remove a record or cassette tape. You're supposed to place the equipment somewhere out of the way, sit down with the Master Control Panel by your side, and enjoy.

You're not meant to be confined to the same room as the equipment, though. Using a single wire link to the receiver, an extra pair of speakers plus a remote two-way sensor/transmitter can be placed in a second room, and further pairs of loudspeakers (up to 5 pairs in all) daisy-chained from there on. Using the remote control to switch on, say, a radio preset, will get that station on the loudspeakers in the room concerned, and in that room only. In all respects, the system continues to behave in the second (or subsequent) room exactly as though you were using it in the room the system proper is installed in. It's just that you'll have to get up and go back to change records or tapes.

There are other ways of getting sound into different rooms. One is to use a slave amplifier based on the 5000 amplifier, which can be operated from the main receiver's preamplifier output sockets. The slave amp is 'invisible' as far as the user is concerned. The slave is not available yet; but in the meantime B&O have come up with a relay attachment for other makes of power amplifier to do the same job. So if you want the advantages of the B&O approach but cannot live without valve amplification, they still have you very much in mind. On the other hand, if you cannot live without the Thorens D124 and an Ortofon SPU, you've got a tougher job on your hands...

As reviewed, the 5000 system includes the items already mentioned, with the option of a number of accessories – some of which I've noted earlier. One item not so far available, although the

operating controls are already fitted to the Master Control Panel, is a Compact Disc player. The intention was to have had this item on sale by now, but a few months back, whilst on the phone to their Danish HQ, I was warned that their plans had come unstuck. The position was (and remains) that B&O were unhappy with various aspects of both CD hardware and software, and that their unhappiness related directly to the sound quality obtainable from current discs and players. There were further reservations brought about by certain problems found on first and second generation equipment, and because of the lack of a firm price structure to the market. The effect, though, is that B&O will not release a Compact Disc player until they're satisfied with the performance, and in any case not before April 1985.

This puts B&O in the unusual position of being both involved in CD hardware and publicly critical of the performance of the medium.

Each item in the system is available separately, though the specialised internal communication between components, which uses a form of digital data links passed through extra pins on the interconnecting DIN leads, limits their usefulness as stand-alone items. In any case, if you try and use, say, the cassette deck on its own, you'll soon come across problems like the lack of a headphone socket (which is on the receiver only) or even a monitoring signal from the record amps. As reviewed, the system costs £1150 complete with everything bar loudspeakers. Individual prices run as follows: record deck, £149; receiver, £425; cassette deck £325 Master Control Link (the main remote control) £98. A simpler remote control without a display of operating status, clock or timer costs '£48-ish'. Link terminal and cable to wire up a second pair of loudspeakers costs £85, and special cable lengths are available at about £1 per meter. Other prices – for example for the slave power amplifier and, of course, the CD player – are not yet available.

I've not yet covered properly one of the most unusual features of the system. The receiver contains quite a lot of computer-like processing power and memory (more than many home computers, according to B&O), part of which is devoted to a clock (quartz driven, of course). The display for this is on the master Control Panel only, which also includes controls to start and stop up to 12 recordings or play operations in a 7-day period, much as on a video recorder.

You can thus be sitting in your favourite armchair, sipping port in the conservatory with the B&O system in a different room altogether. You pick up the Master Panel, tell the system to make a recording from the radio while you're out, give it another instruction to switch on for the news that evening, and then play a record. You'll have a silly grin on your face by then, of course!

In case I forget to mention it later (an occupational hazard when reviewing B&O equipment!) the controls have all been made so

simple and foolproof to operate that even I was beginning to understand the rudiments by the time I had to write up this report. My wife fell in love with it; mostly because it has the effective portability and handiness of a transistor radio, with much better sound. And everyone 'flipped' over the remote control. I saw grown men – reps/designers/directors from hi-fi companies – walk into a room full of Linns, Krells, Koetsus and the like, and within minutes become totally absorbed in the intricacies of the Master Control Panel – even when the rest of the system was out of the room.

Description

Traditionally, remote controls have been designed to simulate or duplicate the main functions found on the equipment itself. B&O have adopted this approach in the past, but the 5000 system is different in principle, not just a variation on a theme.

All the important controls are available on the Master Control Panel, the main ones arranged in the middle section and minor ones under a fold-down flap at the bottom. The top section of the panel gives operational status information. Entered commands are displayed for about one second, the display then switching to show a message flashed back from the equipment itself. In general, the messages displayed are identical and you'd never know the two-way communication has taken place. If there is something wrong, though – for example if you've forgotten to put a blank tape in the recorder and you've asked it to tape a radio programme – an appropriate error message will be passed back as a warning that your instructions cannot be obeyed.

A number of the controls fitted to the equipment do not appear on the remote control and vice versa, but as a general rule everything you could possibly need is available on the remote panel. Such functions as balance and tone controls are only adjustable remotely (logically enough if you think about it) and this applies to the programme timer and clock too.

A feature of the Control Panel is the twin transmitter/receiver units built in, one at each end of the unit. This makes it unnecessary to orient the Panel towards the equipment, and it should work properly regardless of its position in the room. The display itself is of the LED type, which may be why B&O allow the display to stay on for only a few seconds at a time, though pressing the 'status' button will always retrieve the display for another look. A liquid crystal display would presumably have made it possible to keep the readout going continuously, shutting down perhaps only when the system is switched to 'stand-by'.

The system operates an automatic source selection system. Pressing a radio preset button switches the amplifier to its tuner and cassette deck. Most operations, therefore, require just one button push, and even complex operations like setting the timer have been drastically simplified, following a logical 'flow chart' principle. The standards of construction are extremely high; everything works smoothly, quickly and with decorum, and the controls themselves are a delight.

Beogram 5000 turntable

Pressing the front panel on its left-hand side opens the lid (the catch broke on the review sample) to reveal the innards. The deck is built to established B&O principles, with a light platter resting on a fully floating subchassis which in turn supports a very thin pivoted arm, the latter having a stainless steel armtube and being fitted with a B&O MMC4 cartridge. The latter is interchangeable within the B&O cartridge family only. The deck is fully automatic, of course, incorporating record speed/size sensing, auto repeat if required, and has an automatic arm control system that is faster on the draw than the legendary flying bullet... but gentle with it.

Although you normally operate the deck from a remote position, simply pushing the fascia on its right-hand side initiates 'play' – a trick that works with the cassette deck too. On the receiver, a similar action switches between 'mute' and 'play'.

Beocord 5000 cassette deck

Visually identical to the other components when not under power, a push on the left-hand side of the fascia causes a full-width drawer to pop out, this carrying all the controls and the cassette loading tray. The deck has few of the sophistications of the well known 9000, for example – it is a 2-head deck, with auto tape type selection and Dolby-B and -C noise reduction systems. An electronic counter is supplemented by a counter zero memory, and a track location device which looks for gaps between recorded items. The recording meters are neat and easy to read, but are only calibrated at 0VU. A socket is fitted to accept a signal from a second tape deck or from microphones.

Predictably, the deck is fitted with B&O's *pièce de résistance*:

Dolby HX Pro. HX Pro is a simple system for manipulating record bias so that the effective bias reaching the tape (including the contribution of the high frequency content of the signal being recorded itself) is constant. The result is a more linear recording system that removes, at a stroke, one of the main causes (if not the main cause) of compression at HF, with lower bias tapes especially. HX Pro works only during recording, of course, and the deck is fully compatible with any other, whether equipped with HX Pro or not.

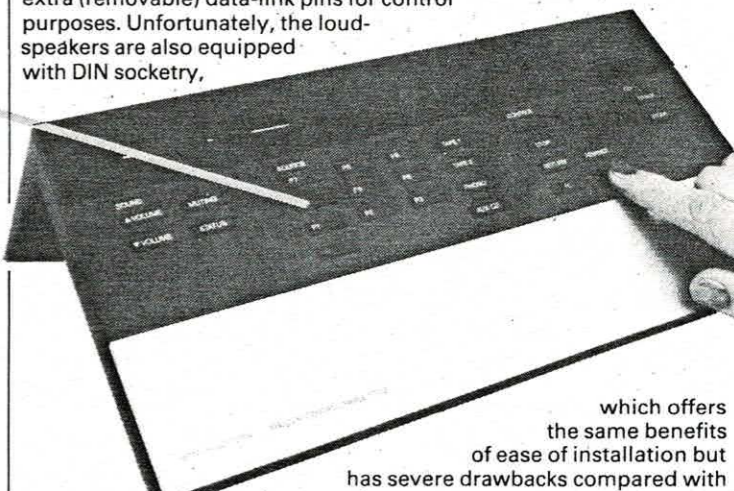
Beomaster 5000 receiver

A synthesizer tuner using exclusive B&O microprocessor devices, the tuner has nine presets, each of which carries frequency plus stereo/mono information for one station on any one band. FM, MW and LW are all provided, and the presets can be allocated at random to whichever selection of wavebands is required. Tuning takes place in 12.5kHz steps (instead of the usual 50kHz ones) on FM, but fine tuning on all bands works uniquely. The tuner unlatches from its synthesizer controlled steps and tunes exactly to the centre of the received transmission. The process is analogous to AFC, but it isn't the same. There is zero nominal tuning error for one thing, and no favouring of nearby stronger transmissions – an AFC shortcoming.

To use a word used earlier in another connection, the amplifier section is effectively 'invisible' to the user. Source switching is usually accomplished from the source being used, and what's left is an essentially simple set of controls – volume, balance, bass, treble, etc. The amplifier is rated at 50 watts per channel into 8 ohms with both channels working together, and a novel form of output protection circuit brings in a form of automatic compression at high levels, or when overdriven into too low a load impedance, etc. This appeared to work rather too enthusiastically, as is shown in the measurements section. The unit is cooled by a thermostatically controlled fan which was hardly switched on during the entire test period. I never once heard it running anyway.

The system

The units are interconnected using captive DIN terminated leads, the choice of DIN being because such plugs are available with the two extra (removable) data-link pins for control purposes. Unfortunately, the loudspeakers are also equipped with DIN socketry,



which offers the same benefits of ease of installation but has severe drawbacks compared with the normal, more current-capable loudspeaker connectors. Signal level socketry is duplicated in phono sockets, and an extra tape deck plus an auxiliary item (CD player perhaps) can also be connected. Connecting-up requires nimble fingers!

On audition

I chose to assess this system using criteria normally reserved for equivalently priced rack systems: up-market rack systems in general, that is, since there aren't many at this price level. Clearly it was only appropriate to compare like with like, and whilst there are those who say that an audio system can only be judged by what it sounds like, that argument holds little water when the buying decision includes convenience, styling, availability of remote control, and so on. These things do cost money, especially in the context of a fairly specialist brand like B&O. The company may be big enough to swallow all of the British hi-fi industry several times over, but it is small beer by Matsushita standards and cannot operate on the mass production type costings commonly employed by Japan Inc.

In any case, the B&O 5000 is a rack in everything but the provision of a housing unit itself. It can be stacked vertically (though for best results the turntable should be used on its own) and offers the same kind of packaging, aesthetic matching – call it what you will – of the archetypal rack or integrated system, even though its looks are plainly quite different. For the record, then, the system performed extremely well by those standards – indeed it has no obvious peer in

sound quality grounds in this field. By the standards of the best equivalently priced 'hairshirt' high fidelity, though, the B&O will be found wanting.

But not in the cassette or tuner departments. The cassette deck measures slightly bright, it is true (though an on-the-ball dealer will be able to realign the deck for your choice of tape quite readily), but a combination of an extremely fine transport, good tape/head contact and Dolby HX Pro gave cassette sound quality more than a degree or two above many of its rivals. Sound quality here was remarkably firm and stable; and stereo imagery was unusually incisive. Cassette decks generally sound rather vague at frequency extremes and

provide rather ill-defined stereo, but the usual shabbiness of the medium was vastly improved with the B&O, which worked in a surprisingly lucid and explicit way. Within their inherent limitations, prerecorded cassettes worked very well too; again with that very solid, firm stereo soundstage and the good musical resolution heard on home-made recordings.

The tuner was even better. Again, the sound was extremely firm and solid, if a touch warm in balance, with a very natural overall character and a believable, explicit sense of stereo. Radio reception quality was extremely good and more importantly still, it was predictable in the sense that the sound didn't change between loud and soft passages, or according to the strength of the incoming signal. AM sound quality was less good – interference levels were moderate – but the frequency response was rather limited by the best AM standards, and the sound was a little dull and unvarying as a result.

The turntable and the amplifier can be similarly lumped together, despite their totally different roles. Both suffered from a touch of vagueness at low frequencies, a finding implied too in some of the measurements. The amplifier shows this effect mainly via its phono input – a finding arrived at by separating all the components of the system and using them individually with good quality, known components from other manufacturers. Used with easy-to-drive loudspeakers like KEF Coda IIIs (a suitable match) the amplifier held together well, and gave a strongly characterised and dynamic performance. There was a seamlessness about the reproduced sound which came from good control and an essential degree of resolution: tonal colours were explicit and easily identifiable, whilst individual instruments remained well separated even during complex passages. The amplifier also sounded very smooth and sweet and did not change in sound quality with level. But the bass was always a little soft and bloated, lacking definition and control. Known awkward loads led to a rather uncomfortable sound, with the solidity of stereo imagery suffering and the sound losing much of that seamlessness and integrity. Medium-to-high efficiency loudspeakers with a neutral or slightly dry overall balance will suit

AMPLIFIER

B&O SYSTEM	
Power output 1kHz for 0.5% THD	8+8 ohms 83.6W 8 ohms 97.3W 4 ohms trips at about 35W
THD (%)	20Hz 1kHz 20kHz
80W, 8 ohms	1.2 0.026 0.036
40W, 8 ohms	0.042 0.015 0.029
Frequency response Aux input – 1dB at 11.5Hz & 48.8kHz	
Aux sensitivity	20mV for 1W output
Aux noise (S/N)	80dB CCIR/ARM ref 1W
Noise ref 1W with vol at min	– 84dB unweighted – 90dB CCIR/ARM
Crosstalk (dB)	20Hz 1kHz 20kHz
Aux	72 67 43
Disc	66 63 41
Disc overload (mV)	12 75 600
Disc sensitivity	1.13mV for 1W
Disc S/N ratio	77dB CCIR/ARM

TUNER

Mono S/N ratio	71dB
Stereo S/N ratio	68dB
Stereo threshold	14V
THD full deviation 1kHz	0.09% mono 0.1% stereo
Pilot rejection	72dB
Capture ratio	1.1dB
AM rejection	77dB
Stereo crosstalk	1kHz 43dB 5kHz 39dB 10kHz 31dB
Spurious rejection	83dB

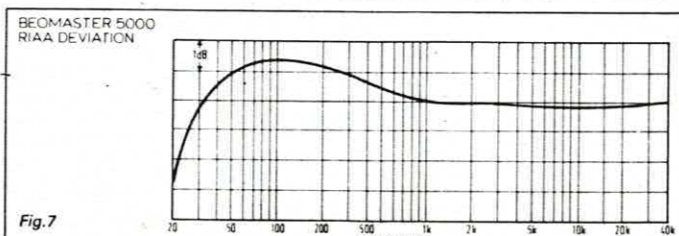
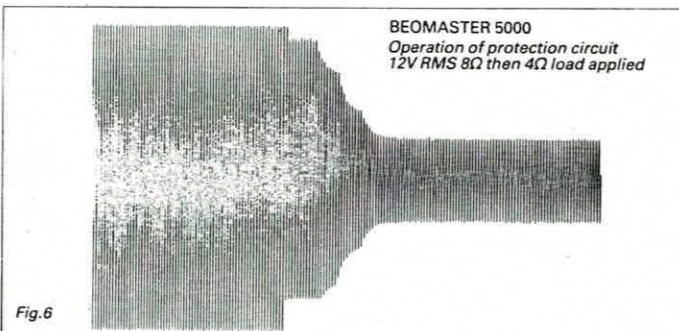
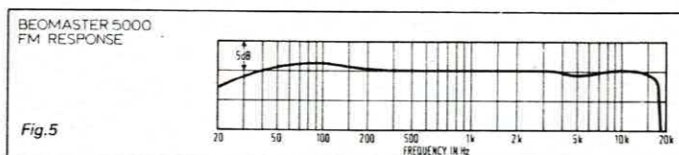
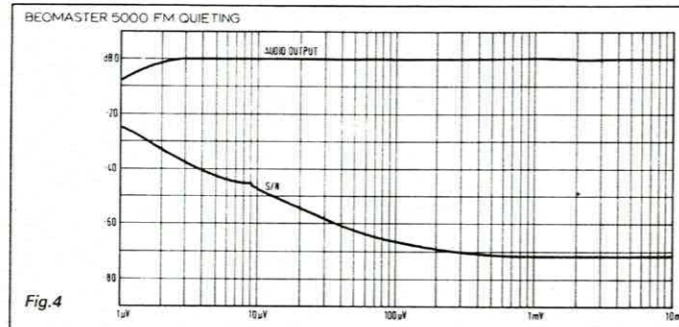
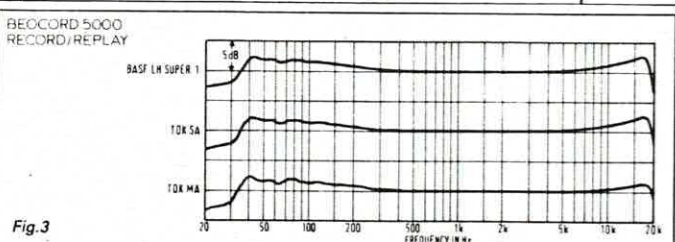
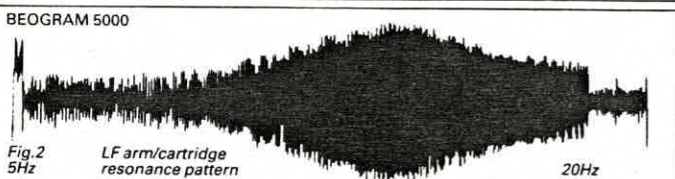
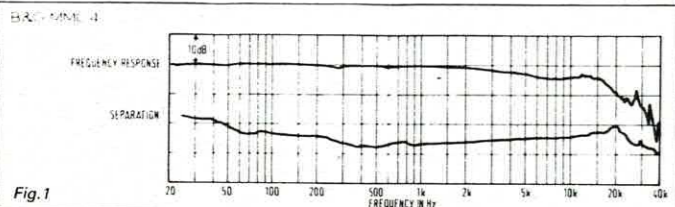
TURNTABLE

Rumble DIN B weighted	– 76dB
Wow & flutter DIN peak wtd	0.05%
Absolute speed accuracy	– 0.07%

CASSETTE DECK

Wow & flutter DIN peak	0.04%		
Speed error	+0.1%		
Signal/noise* Type I (BASF LH Super I)	48.5dB	CCIR/ARM	0.8% THD
II (TDK SA)	52dB	CCIR/ARM	1.8%
IV (TDK Metal)	50.5dB	CCIR/ARM	1.7%
ALL C90s N/R out	Ref 0VU on meters		

Measurements by Jelgate Ltd (except *)



EQUIPMENT REVIEW

EQUIPMENT REVIEW

best; the only B&O speaker I tried (the current version of the S80) is not good enough in my opinion.

Records suffered from this low frequency loss of control via the Beogram 5000 – there was little sense of power or weight despite the obvious presence of bass, even when used with non-B&O amplification. But the effects were not strong, and the turntable had plenty going in its favour. The cartridge was smooth and undoubtedly easy on the ear, resolving the midrange and treble well without exaggerating record surface noise. The sound was very cultured and smooth in fact, but was again let down by a loss of focus of the stereo soundstage and a rather rich and slow bass/upper bass region. The suspension fitted by B&O appears extremely well designed. The deck is almost impervious to shocks and – as far as I could tell – feedback. There were obvious improvements to be had from placing the deck on a solid surface well away from the other electronics.

Other equipment used during the listening tests included an AR turntable with Rega RB300 arm and Ortofon OM20 cartridge; NAD and Rotel amplification (including the Rotel RA-820B) and a variety of loudspeakers including models from KEF (the Coda III) and SD Acoustics.

The Measurements

(The majority of these measurements were conducted by Jelgate Ltd, the exceptions being the cassette deck frequency responses, signal/noise and distortion measurements which were done by the author.)

Turntable

The measurements tell the story of a thoroughly modern, well designed and engineered turntable. Thus the rumble figures are extremely low whilst both speed stability and wow & flutter are of a high standard. Having said this, the review sample turntable proved to be rather erratic in a number of respects, giving different wow & flutter measurements on different occasions and displaying a number of intermittent logic faults. However, these problems can be assumed not to be of a general nature. The main bearing quality was partly revealed by a wow & flutter spectrogram. This indicated a very 'tight' bearing that works as it should.

The cartridge frequency response too suggests a very clean design (fig.1). The response itself is even through the midband, the notches at 280Hz and 580Hz probably being attributable to arm resonances whilst the treble output exhibits a gentle declining curve. Channel separation is a satisfactory 28dB at 1kHz, but more important is the way it is maintained to the frequency extremes – especially in the treble. Clearly the tip mass/vinyl resonance has been very effectively tamed. LF arm/cartridge resonant behaviour is plotted on a linear frequency scale (fig.2). The amplitude peak is near 16Hz and measures around 10dB high – a good result – which keeps it well away from the subchassis resonance.

Cassette Deck

The recommended ferric tape type is BASF LH1. None was available at the time of the test so the newer LH Super 1 was substituted. The record/replay responses of the three tape types (note vertical scale) are all slightly bright, an effect exaggerated a little with Dolby in circuit (fig.3). The effects

are not severe though. Signal/Noise levels are satisfactory, but note the distortion levels for Type II and IV tapes at 0VU on the record level meters (table) – this level should not be exceeded on these tapes, though an extra 1dB or so can be squeezed from ferric tapes. Recent Japanese high coercivity ferric tapes give a flatter response than BASF, and replay-only responses from TEAC test tapes (not charted) showed the Beocord to be very well set up.

Other matters: Absolute speed accuracy is almost exactly correct, and the excellence of the transport can be seen from the superb wow & flutter figure, which was backed up by a very clean spectrogram. The 1kHz squarewave response was also unusually fine by cassette standards. The lack of head contour effects at LF (see frequency response curves) rounds off a set of measurements that are indicative of an extremely well engineered deck.

Tuner

There were no problems here. Full limiting takes place by 2mV and the quieting curve (fig.4) suggests a tuner of high sensitivity, capable of working successfully with low input voltages. Crosstalk and pilot tone rejection met equally high standards, whilst the frequency response is well tailored (fig.5), being especially well extended at HF, but showing a minor 1dB increase in output between about 50 – 200Hz, which accounts for the slight warmth noted on audition.

The measurements charting RF performance are equally sound. Capture ratio is an excellent 1.1dB, whilst both spurious and AM rejection measure well. Measurements don't tell everything, of course – the background noise character is basically clean but there are occasional traces of (presumably) synthesizer induced 'hash', but it was only shown up via a generator and was never obvious when listening off-air.

Amplifier

Power output is high when driven into an 8 ohm resistor, but considerably less impressive into 4 ohms. This effect has been charted in two ways: a power output measurement into 4 ohms, and the plot (fig.6) which shows the power output (vertical scale) collapsing somewhat raggedly when a 4 ohm load is applied. This may be of minor significance when used with a single pair of well behaved 8 ohm loudspeakers, but has obvious penalties for both maximum output levels and sound quality when two pairs of such speakers are driven in parallel, or where a single pair with an awkward load characteristic is used. Given that the manufacturer makes such a strong feature of the multiple loudspeaker capability of the system, the protection circuit should be relaxed accordingly if – as I suspect – this is the item most culpable.

The RIAA response (fig.7) is extremely accurate above 1kHz, but below this applies up to 1.5dB boost, centered on 100Hz, rolling the cartridge off sharply below 30Hz, presumably so that the limited LF power bandwidth is not stretched too far in practice. Note the high distortion level measured from a 20Hz signal at 80 watts output, a further sign that the amplifier dislikes delivering a lot of current.

There were no other shortcomings. The other distortion figures are fine, all sensitivities and noise levels more than acceptable and crosstalk good. ↯

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