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THE WORLD'S No.1 GUIDE TO BUYING HI-FI
HI-FI CHOICE
ISSUE NUMBER 79: FEBRUARY 1990

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MENU

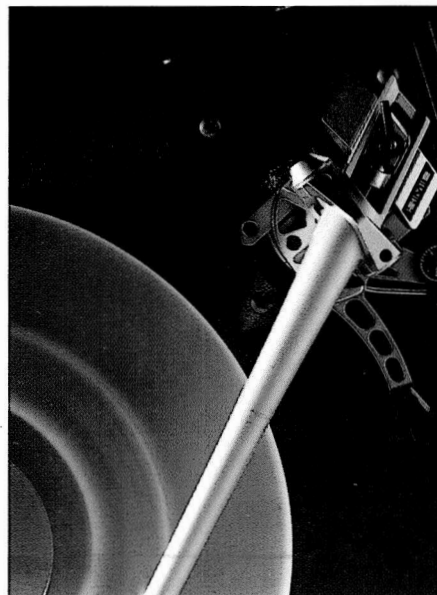
Assessing the performance of turntables and tonearms traditionally has been a rather subjective business. Sure, some aspects of performance such as speed accuracy and rumble can be measured on a test bench, but we learned many years ago that measurements do not tell us what a record player will sound like. Thus listening to the sound a turntable makes has been the main criterion in judging the performance for as long as many of us can remember.

But what exactly should a record player sound like? The answer to that, simply, is "nothing at all". Making a 'nice sound' is one thing, but to replay accurately the music signal hidden in the LP's groove a record player should neither lose information nor add its own 'sonic character'.

Most of us have a favourite record player, chosen because we enjoy the sound it produces in our chosen system. And that's fine, since a hi-fi system you don't enjoy listening to is not worth owning. But quantifying why we think turntable *A* is 'better' than turntable *B* is where subjectivity can lead magazine reviews astray. Having ascertained that at best hi-fi reviewers can only describe how and why they prefer the sound of individual products in their own systems, thereby leaving audio enthusiasts none the wiser as to whether *they* will like the sound the reviewer likes, what Richard Black is doing in this month's tests on record players is reporting on how true each record player is to the sound of the original master tape recording. The subjective business of which sound you'll prefer we're leaving for you to investigate for yourselves, as we're not in the business of telling hi-fi enthusiasts what they should or shouldn't enjoy listening to. Richard's review methodology is explained fully in *Tech Talk* on page 100.

Meanwhile the *Choice* review team is already working on future projects. Next month's issue includes tests on a wide variety of amplifiers, ranging from some of the latest 'budget' integrated models to pre-power combinations costing over £1,000, along with reports on high-end D-to-A conversion US style and an update on some of the latest 'tweaking' tactics for getting the best possible performance from all manner of hi-fi systems. We're also busy testing over 20 new cassette deck arrivals and a small handful of expensive floorstanding loudspeakers. These reports will be completed in time for April's edition of *Hi-Fi Choice*.

John Bamford



Cover photograph of a
Pink Triangle turntable
and SME tonearm by
Chris Richardson.

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This month Aspirations goes to Ireland (top); we have a session with in-car sounds (above) and visit Ortofon in Denmark.

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HI-FI CHOICE/ARCAM COMPETITION

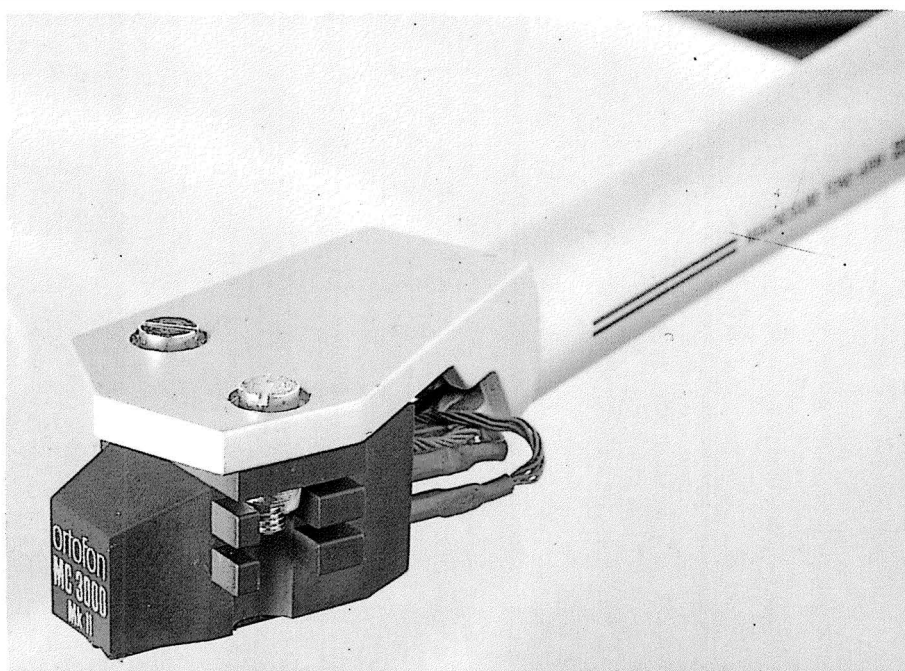
Over £2,000 worth of Arcam hi-fi to be won, including a first prize of a complete Delta system worth £1,460.

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FIRING ON ALL FIVE

Dolby Pro-Logic can give you the ultimate in cinema sound in your own living-room. Andy Benham explains.





The excellently-made Voyd (left) is one of many turntables reviewed, and enter our competition to win fantastic Arcam hi-fi (below), plus cinema-style surround sound – here by Marantz – no longer costs the earth (bottom)

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Get the best from your system with this superb *Choice*-discounted range of interconnect cables and accessories.

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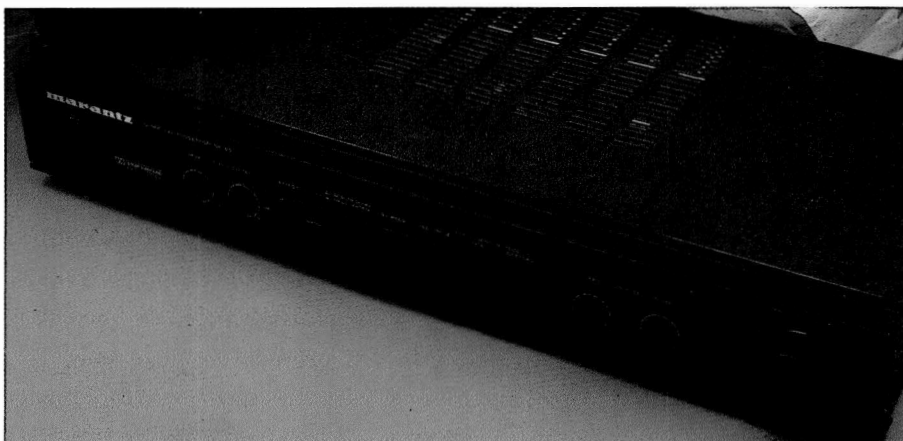
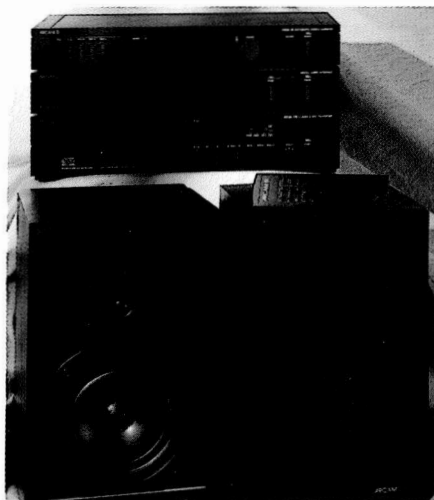
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PERSONAL MESSAGES


Paul Messenger reports on the progress of 'wide imaging stereo' as developed by Canon – yes, the photocopier company.



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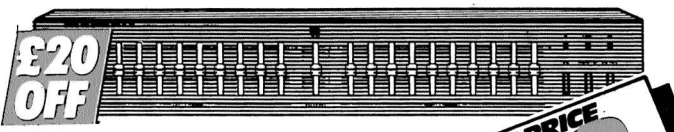


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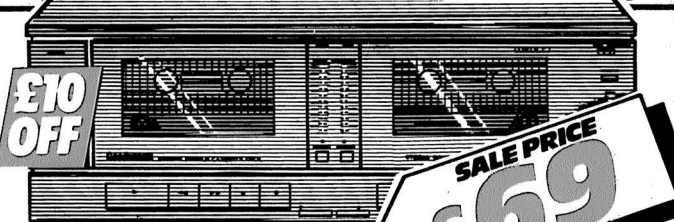


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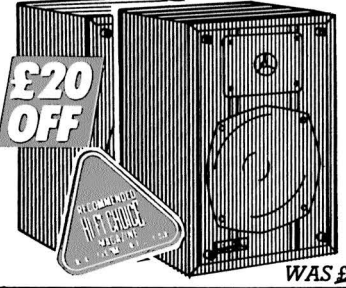
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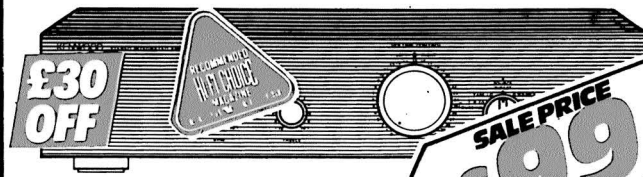
KENWOOD KK440HX Cassette Deck: Computer controlled logic is at the heart of this high spec cassette deck, featuring Dolby B&C NR, advanced HX pro technology and multi-segment peak meters.



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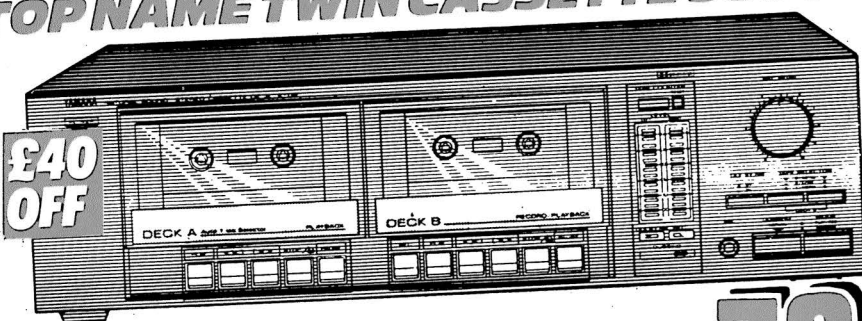
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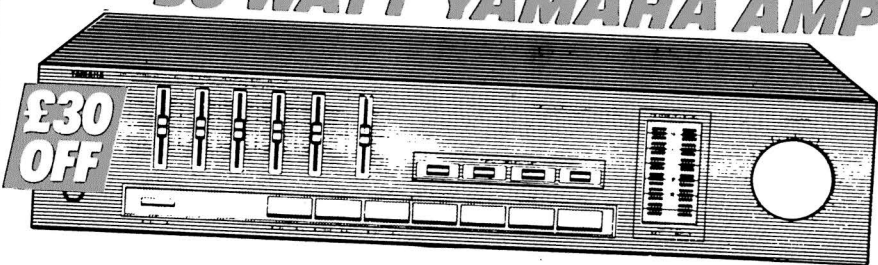
YAMAHA K09 A classy, crisp-sounding cassette deck if ever there's one. Featuring twin cassettes, high quality heads, soft-touch controls and Dolby* NR.

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UPDATE

BUSINESS

PREY EATS STALKER

Wharfedale has got itself a stock market listing by managing a reverse takeover of Audio Fidelity – the pro-sound and consumer electronics group. In a move that allowed Wharfedale shareholders a potential 80 per cent holding of the new company, Ashley Ward and Keith Mellors of the loudspeaker firm's board now become Chief Executive and Chairman of Wharfedale plc respectively.

Audio Fidelity had been in financial difficulty and the dynamic board of Wharfedale – itself the product of a management buyout two years ago – was seen as having the necessary skill to redress losses – running at £5.65m in the year before June 1989 (as opposed to £499,000 profit the year before that). The alternative to Audio Fidelity shareholders might have been receivership for the company. Commenting on the move Ashley Ward said: "Basically, Audio Fidelity bought Wharfedale but the Wharfedale board took over the whole company. Three members of the Audio Fidelity board are staying . . . There is actually a good business in there but unfortunately they suffered recent heavy losses and only had net assets of around £1m. The shareholders needed money to strengthen their solvency position and so the first thing we'll do is offer a further 25m shares to raise about £2.3m in a rights issue."

Wharfedale plc now consists of four companies: Wharfedale Loudspeakers, Fane Acoustics, McKenzie Acoustics and Fanfare Electronics.

PRODUCTS

ALL SINGING DANCING

Sony had developed a pre and power amplifier combination that could be advertised as 'My Last Sony'. The *TAE1000ES* and *TA N55ES* join the Sony ES range retailing as a combination at £1,100. The *TAE1000ES* is a

digital processing preamplifier which incorporates DSP (digital sound processing) to give different environment effects in the home. A variety of 'acoustics' are possible from a large concert hall to intimate jazz club while three Dolby Pro-Logic modes allow for extensive surround sound use.

Sony says the amplifier will recreate these effects when used in any size space, irrespective of loudspeaker positioning. You programme your own room parameters into the machine allowing it to equalise an 'ideal listening environment'.

Individual fine tuning is also possible and the whole lot is remotely controllable. Twelve inputs cater for most system building enthusiasts and include a high quality moving coil input.

NECESSITY THE MOTHER . . . ?

A year's beavering sees Brighton based Audio Innovations launching a new tonearm which does away with a counterweight. The *Delta-i* tonearm is heralded as 'the most significant advance in modern tonearm design for many years'. Audio Innovations has applied for patents on some parts of its design. The most significant aspect of the *Delta-i* is that there is no counterweight. Instead the arm is 'held up' by a spring.

AI's theory is that by getting rid of the weight you can also do away with energy that gets stored there and which gets 'transmitted back to the



In control: The Sony digital sound processing amplifier.

cartridge'. The concentration of mass at the stylus end 'enables the cartridge to track the groove modulations 'undisturbed' by reflected energy from beyond the bearings, and the purported result is better dynamic range and very little coloration.

Two models of *Delta-i* are available – the £149 'standard' which is wired with Audionote copper cable while the £339 'silver' uses Audionote 99.99 per cent pure silver cable.

The arm has been designed with Voyd record players in mind, but is also compatible with other makes. Audio by Design which markets both arm and Voyd decks recommends using a *Delta-i* unless you can afford the Heliuss *Cyalene*.

MODULAR MOTH

A new series of amplifiers has been designed for the Moth Group by Stan Curtis, previously of Cambridge Audio fame. The

Series 30 Amplification System consists, so far, of three modular 'mini' amplifiers which can be used together or separately with other makes of equipment. There is a four input passive control unit (£129) and a 30 watt power amplifier (£199), and a RIAA phono stage (£169) caters for moving magnet and moving coil cartridges. All are attractively housed in black painted aluminium oblong cases faced with inch-thick slabs of wood. The front of the cases measures two by four inches.

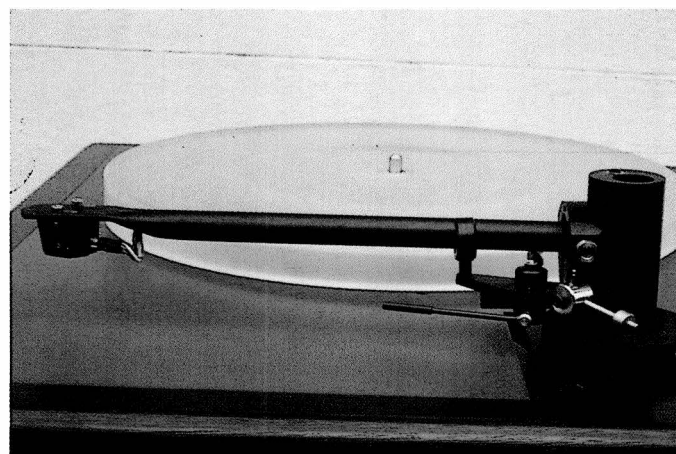
The *Series 30* moves away from the standard 'do everything in one box' amplifier and promises – according to the reputation of the designer – some fairly good sounds. Other modules such as a tape/headphone unit are planned.

SPLITTING THE AMP

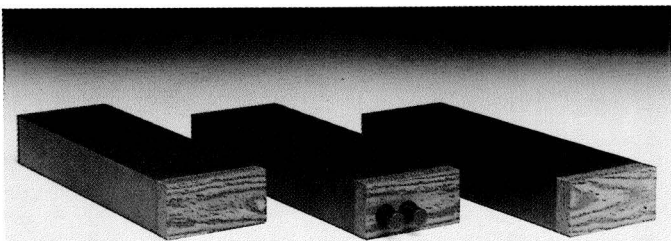
QED steps into the world of pre and power amplifier combos with its 'affordable' *C300* and *P300* amplifiers. They cost £300 each and build on the principles of the firm's popular integrated amplifiers, but promise to fully split the functions of both 'halves' of the amplification process with separate power supplies and full star earthing. The stereo power amp – the *P300* – can also be bridged for use as a monoblock which still keeps the entire system (ie *C300* plus two *P300*s) under £900.

MORE BUTTONS THAN A HABERDASHER

Carver will display five new amplifiers for the UK market at



No weighting: The new tonearm from Audio Innovations.



Moth minimalism (top), three instead of one amp from QED, and confuse a Carver: Ask it what it doesn't do.

the Bristol Show in February. Featuring enough buttons to make a pearly king jealous the *CT-17* remote control combined preamplifier and tuner offers 'Sonic Holography' with Dolby Pro-Logic five channel surround sound processing. Two other preamplifiers join it – the *C11* which also offers 'Sonic Holography' and the *C-19*, model which is described as a 'Vacuum Tube Reference Preamplifier'.

A couple of power amplifiers, *TFM-22* and *TFM-25*, promise the usual Carver dynamics together with enough power to serenade the deaf (225 watts RMS). Prices TBA.

MINIMAL PRICE

Just £79 buys you the new *Minim* loudspeaker from JPW. Although only 27.5cm high the *Minim* is 20cm deep and JPW promises "outstanding bass performance". It's finished in black ash vinyl and is suitable for amplifiers between 10 and 70 watts per channel.

The firm is also upgrading the extremely-good-for-£129 *Sonata*, incorporating a one-piece

aluminium dome tweeter and bi-wirable option.

TALISMANIC

A unique-looking floorstanding loudspeaker has arrived from the Ruark stable dubbed *The Talisman*. The £579 two-way loudspeaker uses a metal dome tweeter and doped paper mid and bass unit on a large cast alloy chassis. *The Talisman* looks striking with a raked back wooden veneered baffle which is larger than the enclosure behind. Ruark promises rigidity of construction and says the 'shallow-looking' cabinet is free from coloration.

KNOCK DOWN DENON

Thin prices are coming out of the budget end of the credit squeeze at the moment. Denon has four components in its 1990 budget range, all selling at under £200 and belying the eight per cent inflation figures. First is a £140 amplifier, the *PMA250III* which lists such audiophile credentials as by-passable tone and balance controls. The mega-selling *DRM07* cassette deck is replaced



Flowers . . . a bowl of fruit . . . and classical speakers from Jamo.



A close look at the Philips FC870.

by the *DRM400* which includes a fine bias control at £129. There's also the *DCD520* CD player at £170 and a 30 random preset tuner, the *TU 460L* at £129.

OOH THUR LUVLY

Jamo continues to lambast the competition with the introduction of the *Classic* range – two models with the emphasis on 'quality of sound and finish'. Designed for any amplifier the £149 *CL20* and £249 floorstanding *CL30* both claim a

sensitivity rating of 96dB and are made in Denmark.

AUDIOPHILIPS

Philips has completed the line-up of its 88-something audiophile range with a three head Dolby HX Pro cassette deck. The £250 *FC870* is described as 'feature packed' with quick music search, scanning, blank skip and Dolby B, C and HX-Pro. It joins the *CD880* CD player, *FA880* amplifier and *FT880* tuner among Philips' flagships.



The heart of the new Denon range – the £140 PMA250III.



VA40 AMPLIFIER: E89

THE VA40 AMPLIFIER FROM AURA

"...sound as good as I've heard from any sub-£200 amp.

It looks like it sounds: sleek and elegant. Certainly it demands to go on the budget amplifier shopping list. Very affordable. Very approachable."

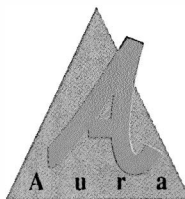
HI-FI REVIEW

"The Aura VA40's special qualities never get in the way of the music. This amp looks and sounds honest and attractive. Its price is an additional incentive."

CD REVIEW

"A very involving sound which I found hard really to fault. The VA40 could form the basis of a very nice 'purist' set-up... warrants a pretty confident recommendation."

GRAMOPHONE



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DOWN TOOLS

DIY-amplifier-kit supremo Graham Nalty and his partner Gainsford Holness have developed the first of a range of amplifiers the customer doesn't have to build himself. The *Sonic Link DM20* integrated amp promises the very best in design and components at a price of £299. Dual mono power supplies, star earthing, Holco precision resistors and low 'Temperature Generated Distortion' in the drive stage, using high power transistors back up the claims of 'accurate reproduction' and long-term reliability.

The *DM20* is finished in 'near black' and is the standard 430mm width.

Sonic Link is based in Borrowash, Derby. Tel: (0332) 674929.

BUSINESS

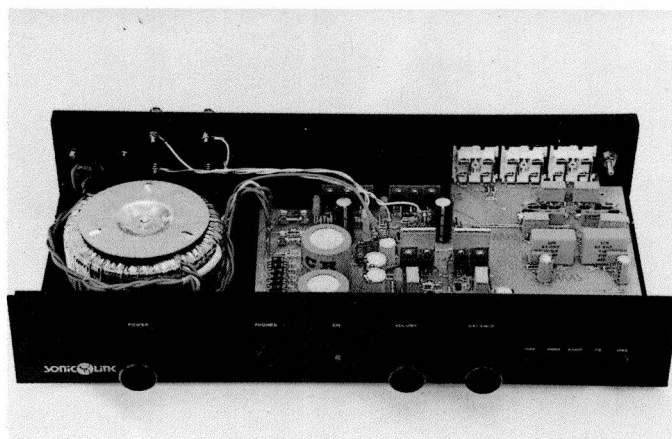
LOST IN LIMBO LAND

Acoustic Research has shut down its new Manchester factory with the loss of 18 jobs. Sales and service of the AR range of electronics and loudspeakers is now being handled by Hayden Laboratories, which imports and distributes Denon and Dual brands in the UK.

Dave Berriman, who loses his job as PR man for AR but keeps a freelance relationship with the firm as product development manager (!) told *Choice*: "It's true to say that the move (to the new factory in August '89) was hoped to change things, which hadn't been going too well. The present market situation with the pound being weak against the dollar means that although sales were holding up it just wasn't profitable."

Simon Spears who also stays on as Sales and Marketing Director agreed with him but added that the closure was a combination of several events, both managerial and economic. "Ninety per cent of the loudspeaker components come from overseas anyway," said Spears, "the drive units come from Japan and the cabinets are made in America - in fact the whole of the *Spirit* range is made in America although it was designed here.

"A couple of years ago Teledyne, the controlling company, had wanted to sell off AR but it couldn't do so - the General Manager had resigned then and wasn't replaced, so for some time there was no-one in overall charge. This year Teledyne decided to get behind the company again and started looking for a General Manager



Inside the new Sonic Link amplifier.



Seven tapes appearing...

but couldn't find the right person. It wanted to cut overheads and so relocated the factory to an existing Teledyne facility near Manchester, but since then the pound has become weaker and the company doesn't see a long-term upside turn to the economy. Teledyne wanted better efficiency and overall control so it was decided to move the manufacturing back to America. It's no longer as important to have 'Made in Britain' on a loudspeaker - it's more important that they're designed and engineered in the UK which we'll keep doing.

"We feel very strongly about the people involved and we will help them with relocation and redundancy settlements. Hopefully in a year's time we'll see it was the right decision but in the short term it will probably mean a decline in sales."

AR has manufactured loudspeakers in Britain for 17 years, before which they were imported. One of the staff who has been with the company most of that time told *Choice* that after so long he had no idea what he would do. "We're just lost in limbo land," he said.

As far as in-car equipment is concerned there is no change - Jet Sell, based in North London, will continue to distribute AR ICE.

PELICAN-BILLED KINGFISHER

As we went to press we received an announcement that Kingfisher was considering a takeover of Dixons, the (unwilling) giant consumer electronics retail specialist. Last month we reported Kingfisher's happy swallowing of the 58 Laskys shops, adding them to its chain of Comet stores. Laskys was obviously the hors-d'oeuvre in what is beginning to look like luncheon-with-a-view-to-pigging-out in the world of electronic chain store takeovers.

AGFA GOES FOR IT

Munich, W Germany: Agfa has just released details of its new range of audio compact cassettes aimed at re-establishing the brand as a market leader in this Japanese dominant field. Six tapes are available in both 60 and 90-minute lengths and they should be in UK shops by March. Priced between 90p (*HR C60*) and £2.34 (*SR-XS C90*) the new tapes consist of three ferric models - *HR*, *HR-S* and *HR-XS*, and three chrome class tapes - *SR*, *SR-S*, *SR-XS*. The company also has a DAT tape - *DA120* (£10.39).

Gone is the old 'synthesised fruit colour' casing of the old

range - the new tapes come in smart metallic/clear wraps and are aimed at the quality, rather than quantity end of the marketplace. Dr Ralf Bufe, Agfa's head of Marketing and Sales said the new tapes reflected a change of direction for Agfa which claims a 30 per cent share in supplying tapes for pre-recorded music cassettes. The new tapes use improved magnetic coating from Agfa's tape factory in Munich and have entirely new shells and running mechanisms. The company has invested heavily in new plant at Rothenburg (where the tapes are put together) with 40 per cent new machinery and three production lines with a claimed potential of 40 million cassettes a year.

GO TO A SHOW

Two public hi-fi shows will take place this month. The first is The London Hi-Fi Show, a new function organised by AT Labs at the Gloucester Hotel, Harrington Gdns, (Gloucester Road tube) SW7 over the weekend February 2nd-4th. The second is the established Bristol Show at the city's Holiday Inn over the weekend February 16th-18th. Admission is £2 with children under 14 free. Many products will be selling at a special show discount - ten per cent below retail price.

STEREO GLASNOST

After some tasty chocolate and peanuts apparently the first thing East Germans crossing the breached Berlin Wall like to buy is a personal stereo. Alba plc received an SOS (Send Our Stereos) message from Woolworth in West Berlin on Thursday November 16th asking for 25,000 of the firm's cheap, but obviously not that nasty, walk-things. The market demand saw capitalism responding in time for the Saturday morning rush at the various Woolworth branches in the city.

East Germans crossing the wall for the first time are given 100 Marks as 'greetings money' - 30 of which buys them a model in the Alba range. Dr Ulrich Schillert, for FW Woolworth (Germany) said: "The first thing East Germans are buying is chocolate or peanuts for Christmas. Then they buy a personal stereo or low price radio which might be up to 50 Marks. The third item is a watch which we sell for 10 Marks, and lastly we're doing well with plastic baroque style pendulum clocks - 20 Marks!"

Dr Schillert pointed out that while the value of the West



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Alba's man in Home Counties mock-up of Berlin drama.

German Mark was stabilising around ten times that of the East German Mark, several items were of comparable price. "In the East a video recorder costs around 7,300 Marks whereas our cheapest one is 800 Marks." However, Western goods seem to have an advantage with perceived better build and performance qualities. Time will tell on that one.

Alba was also active in other areas in Germany last month. Having bought Hinari UK in November, the firm has purchased Hinari Consumer Electronics (Deutschland) which apparently has strong trading links with Eastern Europe – an area in which Alba is obviously interested.

A GOOD DEAL

Some of the UK's favourite specialist hi-fi dealers were rewarded for their efforts during 1989 at the Sony and *Hi-Fi News* Dealer Awards in November. The most popular dealer was The Audiophile, Bishops Stortford – which also won its area category for East England. South West England and South Wales winner was Audio Excellence, of Cardiff; the North East's favourite was Gateshead's Lintone Audio. Grahams Hi-Fi took the Greater London prize, Reading Hi-Fi won for Thames Valley, The Music Room in Manchester won Midlands and North West. Chandlers Ford dealer Hampshire Audio was South England winner and Scotland and Northern Ireland went to Zeus Audio – of Belfast.

Winners were chosen by *Hi-Fi News* readers and also by visitors to the BADA booth at the Penta hi-fi show. Six out of the eight winners were BADA (British Audio Dealers Association) members, and BADA presented its own award – for Contribution

to Innovation in Hi-Fi Design – which went to Robin Marshall, designer of Epos and Mordaunt-Short loudspeakers.

STAY CLEAN WITH BIB

Dirty lasers fouling up that 'perfect sound forever' can now be cleaned with a new product from Bib. The *Bib Compact Disc Laser Lens Cleaner* looks like a CD and can be used on any conventional player. The laser is swept clean with a small brush situated near the centre of the disc. The entire process is automatic and the brush aligns itself as well as switching itself off at the end of cleaning. The £11.45 new gadget should stop CD users having to travel to their dealer for periodical laser cleaning.

TECHNOLOGY

NICAM UPDATE

This year will see much of the

country receiving Nicam (stereo) broadcasts on ITV and Channel 4, though BBC transmissions will remain of the 'test type' – principally from the Crystal Palace transmitter.

Both Thames, London Weekend Television and Yorkshire Television started stereo transmissions in September last year. Other IBA stations are planning to switch to Nicam as follows:
 HTV Wales – April
 Granada and HTV – May
 TSW and STV – June
 Grampian – July
 Ulster and Anglia – August
 Border – September
 Tyne Tees – October
 TVS and YTV – autumn
 Central – November
 Tyne Tees (other areas) – December

The IBA stressed that the above dates were provisional and also mentioned that parts of the country would not be able to receive Nicam broadcasts. For instance two of the TVS area transmitters, at Rowridge, Isle of Wight (West) and Dover (East), are due for change in the autumn but this will leave some of the TVS area uncovered by Nicam. "Overall between 70 and 75 per cent of the population will be receiving Nicam by the end of the year," said an IBA spokesman.

The BBC, which is still battling to provide full FM radio coverage throughout the UK, plans a fanfare type entrance to Nicam broadcasting, covering most areas at once in the autumn of 1991. BBC engineers work on both radio and television transmitters.

Mick Cleave, the BBC's assistant head of engineering information told *Choice*: "We obviously see it as a very important service but it has to be

viewed in context with the full range of things we are doing at the moment. And we want to start with a service that gives widespread coverage."

As with the IBA the Beeb only envisages a 70 per cent coverage at first, with remaining transmission 'pockets' being filled as routine refurbishment work on local transmitters is carried out: "We're looking a few years ahead to full coverage," Cleave said.

Viewers in the London region, with 'Near Instantaneously Companded Audio Multiplex' televisions or VCRs will still receive "significant amounts of stereo" as the testing programme gears up to full output on BBC channels.

Meanwhile, the days when horses *sounded* as if they were galloping from right to left while you could *see* them racing from left to right on your television screen are apparently over.

IN BRIEF

EC proposals to levy a Euro-tax on blank audio cassettes and a 'credit card pay as you record' system for DAT recorders have infuriated Home Taping Rights Campaigners who cite a US Congress report and the UK parliament view that levies would be unfair to consumers.

Richer Sounds has moved its Liverpool and York shops. The new addresses are 99 Renshaw Street, Liverpool and 66 Walmgate, York.

Audio T, of West End Lane, Hampstead, has changed its name to AT Labs, becoming a fully integrated member of the now four-strong AT Labs chain in London.

Aston Audio is holding a music evening featuring KEF's *105 Reference* loudspeakers and Meridian's latest compact disc player, the *CD 206*. The 90-minute demonstration kicks off at 8.30pm at The Stanneylands Hotel, Wilmslow, Cheshire. For tickets telephone (0625) 582704.

Leeds has a new dealer, Audio Reflections, which is the sole agent for Sumo Electronics and ATC loudspeakers in Yorkshire. The company promises a caring and personal service and can be found at: 12 Hawkhill, Leeds. Tel: (0532) 698037.



Robin Marshall receiving his award from Barry Cryer... plus support.

SHOW REPORT

TOKYO AUDIO FAIR 1989

The Tokyo Audio Fair is the signpost for the trends that will hit Europe during the following year. Many of the products we've mentioned will be in our shops by the spring, although a few will remain exclusive to the gadget-ridden Japanese market.

The show was held in Sunshine City – a gigantic shopping centre-cum-hotel complex, and the daily concert performance attracts thousands of listeners. To aid visibility from the higher floors, the proceedings are projected on to a giant Sony *Jumbotron* screen with impressive results. The main themes of the 1989 show, were DAT, slowly struggling to life in the wake of the recent copyright agreements and, once again, audio/visual systems and control centres. In 1988 the show was dominated by A/V, with little room for much else, but the 1989 show marked a return to hi-fi, as the big companies realise that there is still considerable mileage left in the separates market.

Audio-visual abounds

Almost without exception, the major companies were pushing gigantic A/V amps and receivers. Nearly all have Dolby Pro-Logic fitted plus a plethora of surround sound modes, with the front panels so cluttered that reading instruction manuals becomes mandatory. All the sets feature electronic displays of some sort and a number were even fitted or

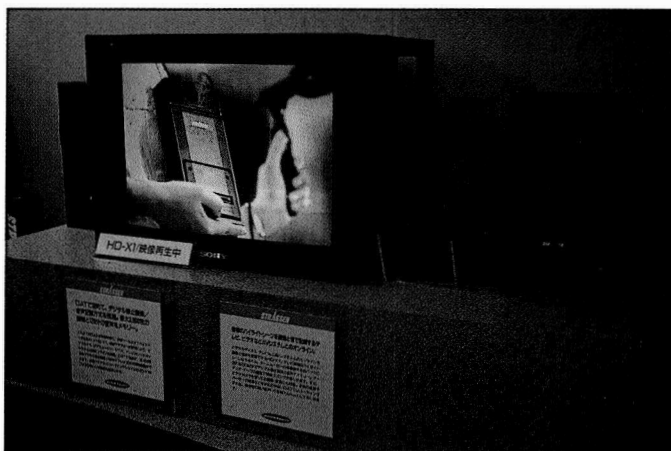
supplied with small TV screens to show the on-screen displays – perhaps just a touch of overkill?

The VHS camp continues to attack the Sony 8mm *VideoWalkman* but because of the size of VHS cassettes, they have had to develop A4 folder sized 'Laptop Video' players. Panasonic showed a hi-fi stereo version, with impressive picture quality from the LCD screen and a Tokyo price of £800. In the market for full sized home recorders, Super VHS has taken off like a rocket and most companies now list more S-VHS machines than they do plain old VHS ones.

CD – bitstream comes on stream

Sony, Yamaha, Harman Kardon and Sansui all showed PDM or PWM 'bitstream' CD players. Sony was publicising the fact that the new *ES X33/55/77* players used Sony technology rather than Philips, which was hard to confirm from the display models as all IC designations and names that were not Sony were blacked out. Technics, having been very coy about MASH for the last year or two was pushing the suddenly fashionable technology for all it was worth, with the Technics stand emblazoned with MASH logos and nearly all the CD players and new DAT machines carrying large gold MASH logos on their front panels.

Kenwood was eschewing bitstream and showed new models using 20-bit 8 times oversampling filters in conjunction with 20-bit (18+2) DACs. An interesting sideline on the 'Bit Wars' was that the two more expensive models had absolutely no mention of bits or



V-DAT from Aiwa? Music, and digital still pictures too . . .



A new generation of Sony Discman: shuffle on the move.



VHS 'laptop video' portables now have Hi-fi stereo sound.

sampling rates on the front panel, times change. Hitachi, also bypassing bitstream, was boasting another new twist, 24-bit, 4-DAC!

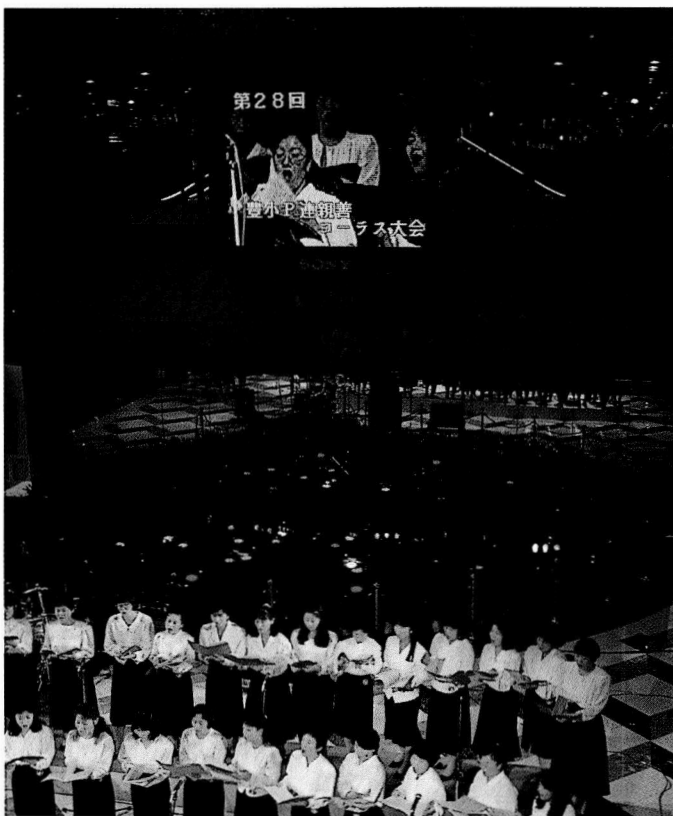
The Alpine/Luxman CD player *D107U* had one front panel control that is unlikely to be widely imitated – the pre-heating switch warms up the twin triode valves in the output stage.

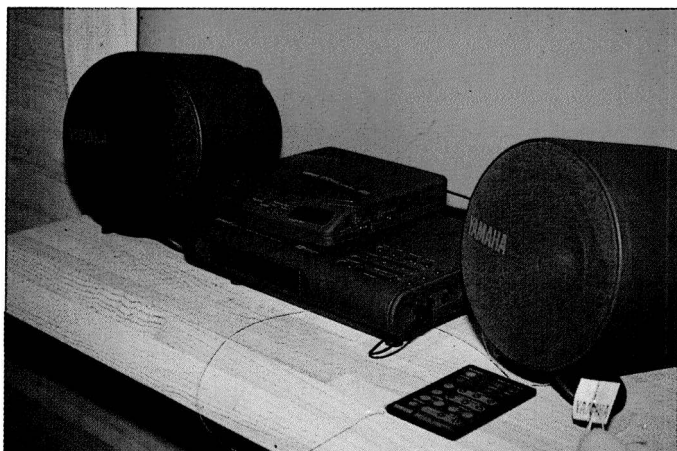
Continuing its capacity to amaze, Sony introduced another tiny *Discman* CD portable, this time with all the programming capability of a full size machine. If you've ever wanted to shuffle play on the move, this is the one . . .

DAT – Back from the dead?

Some 26 DAT machines were on

show, ranging from Aiwa's baby *HDX1* to the insanely expensive two box Nakamichi. JVC, Sony, Pioneer and Technics displayed models carrying the all important SCMS (serial copy management system) label, although there was a suspicion that the label was all that existed, as most of the necessary chips won't be ready for some months yet. In Japan no-one is buying DAT until the models with 44.1kHz digital recording hit the streets. All available evidence points to these arriving in early summer 1990 for the Japanese market and Christmas 1990 for the UK. Whether anybody other than impoverished professionals will buy this almost stillborn system





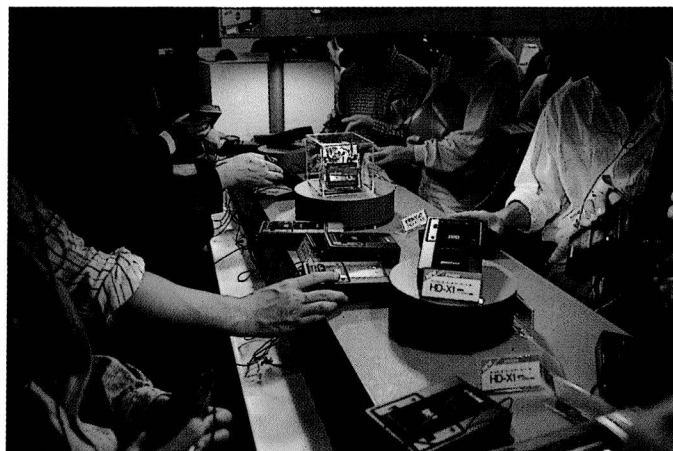
Yamaha scores a hit with its Tiffany (AST) Seven system.



Bose's designers take a bow for this sleek music centre.



Tannoy's 'listening table' - helping our balance of payments.



Hands-on DAT demonstrations for Tokyo show visitors.

is another matter, especially in the light of the accelerating development of recordable CD (see Sony *CDMO*).

Aiwa had its *HDX1* walkDAT strongly in evidence complete with a DAT bar where customers could get a hands-on demonstration. In an impressive display the *HDX1* was shown playing a recording of Bach's *Tocatta and Fugue* while at the same time rolling through a selection of digitally recorded still CTV pictures of the actual organ. The mind boggles at the possible acronyms - VDAT DATVISION etc.

Technics showed its *SVDA10* prototype DAT in the latest curvy silver styling with MASH logos right across the front panel. The machine looked stylish, simple and totally production ready.

The Sony DAT machine looked just like last year's model, with a paper SCMS sticker on the front. Sony promises real units by next summer.

Pioneer was one of the few companies showing a fully priced DAT, with the *D900* on sale at 180,000 yen (£800). A less complex machine, the *D700* with the same mechanics and SCMS, will be released in 1990 at a similar price.

Design - the decade's driving force

Bose showed a surprise new

product in the form of the sleek *II Sole* system, a serious case of 'eat your heart out B&O'. The 298,000 yen (£1,250) system features Bose *Acoustimass* satellite and subwoofer loudspeakers and a two and a half inch high console that fits a CD player, tuner and remote control amplifier into one slim, elegant case.

The hit of the show was a new Yamaha micro, the *Tiffany (AST) Seven*. This three part system comprises a miniature tuner/amplifier/timer, with the matching *CDXP7* portable CD player plus some very neat, drum shaped speakers. The sound quality is surprisingly high from something so small and undoubtedly Yamaha's AST Servo technology must take the credit for the bass response. The CD player is a true portable in its own right, with twin DACs and battery operation while the complete system is remote controllable from a fashionable credit card sized hand unit. Looking like another sales success, the *AST7* is rather more than the ultimate radio alarm it appears to be on first sight (UK price looks likely to be in the £375 region).

The Yamaha *Astarte* system that we know in the UK as the *AST10* is sold in Japan with intriguing speakers that look rather like the moon base in the

Quatermass experiment.

Unfortunately for those with more avant garde tastes, the export speakers are relatively boring. In recognition of the impact this system has had on the market, the *AST10* has recently been awarded the Japanese 'G mark' for good design, a very influential and prestigious award.

The Onkyo *Liverpool* CD player/receiver, is a slim lifestyle product with an oddball aspect. On switch on, a small bowler hat in the LCD display loops the loop along the 'Liverpool' logo. Sadly, the export version is called *Excel* and has no hat and no tricks. For 1989 the system was shown in AV configuration with a matching curvilinear colour TV.

Tannoy, not content with selling *Westminster Royals* at almost £7,000 a pair has come up with a companion 'listening table'. This beautifully finished piece of furniture sells at a mere £1,500(!) and is obviously designed to help our balance of payments deficit. The two together could pay for one Honda Civic or at least a hundred CD players.

Technology and Toys

Sony's showing of its Magnetic Optical (MO) CD recorder could be construed as the death knell for DAT. This digital recorder uses rewritable MO discs the

same size as CDs, to record for up to 74 minutes and Sony claims that the disc (which will cost less than a standard CD) can be re-recorded up to ten million times! Hands up anyone who wants to test that claim. The machine also plays ordinary CDs, but what was not clear was whether the CD MO discs would replay on an ordinary CD player. The prototype was available for hands on demos indicating great confidence on Sony's part.

Under its A&D label Mitsubishi showed the *P Cross* Communications centre. Nothing special, just another midi system at first glance, that is until you see the radio telephone transceiver built into the top. When the phone rings, the hi-fi turns itself down!

A perennial favourite re-appeared in a new guise, the Sasaki Crystal Company goldfish bowl loudspeakers were on show this year in a new yellow-orange finish. The resemblance to Halloween pumpkins must have been purely coincidental.

Finally, the Tapex micro micro system definitely deserves its place in the toy section. The tiny three part system includes a preamp, tuner and power amp and delivers about 500mw per channel. Appropriately it was displayed in a toy town setting complete with dolls house.

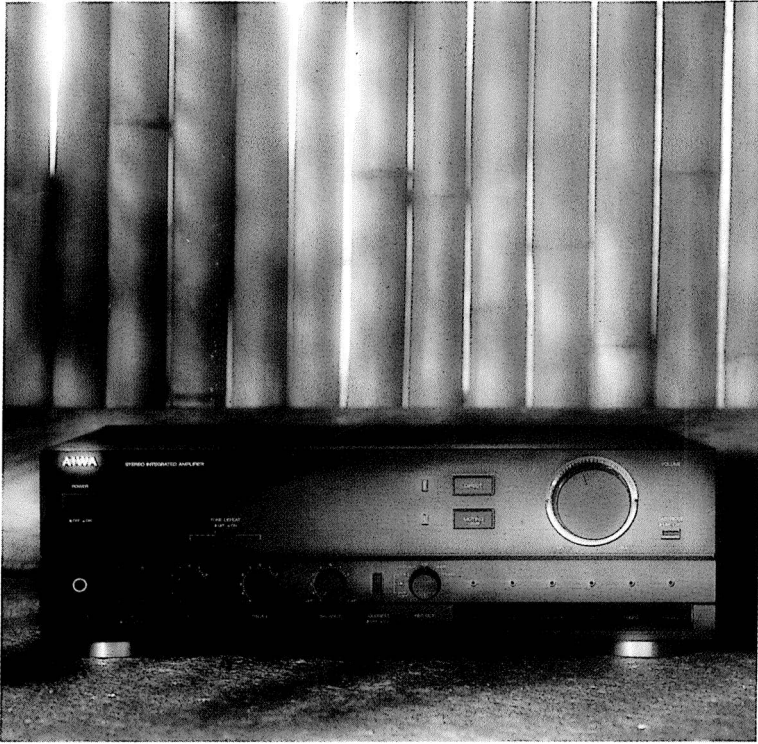
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Shibui. It is a maple leaf growing through a plain bamboo fence; some small rusty rivets on a simple wooden door; an unmelted patch of snow upon a dark, thatched roof.

It is a bare, elegant beauty that the Japanese appreciate; a long-held belief that less really is more.

This is one reason why you'll find no surplus dials or LEDs on the Aiwa XA-007 amplifier.

It makes for a pleasant, uncluttered appearance, but the purpose is more than aesthetic.

Here's the logic: the simpler you can make an amplifier's circuits, the purer the signal, the cleaner the sound.

Not only does the XA-007 have a minimum of buttons and dials, but Aiwa have gone one stage further. A 'Direct' switch allows you to eliminate the Balance, Bass and Treble controls, when appropriate.

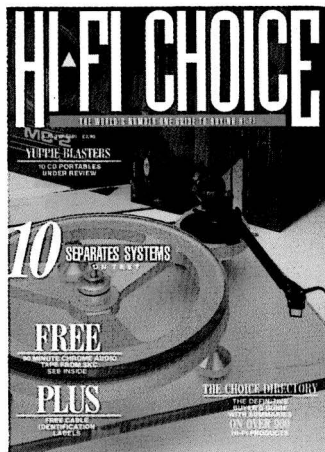
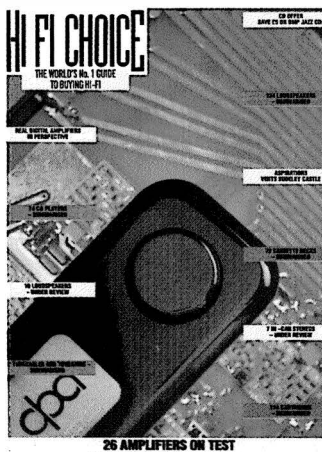
And the XA-007 features twin power supplies, which reduce interference between the pre- and power-amplifier stages and bring a greater sense of 'precision' to your music.

But, predictably, you won't find these mentioned on the outside of the unit.

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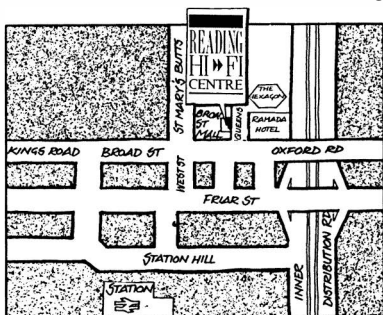
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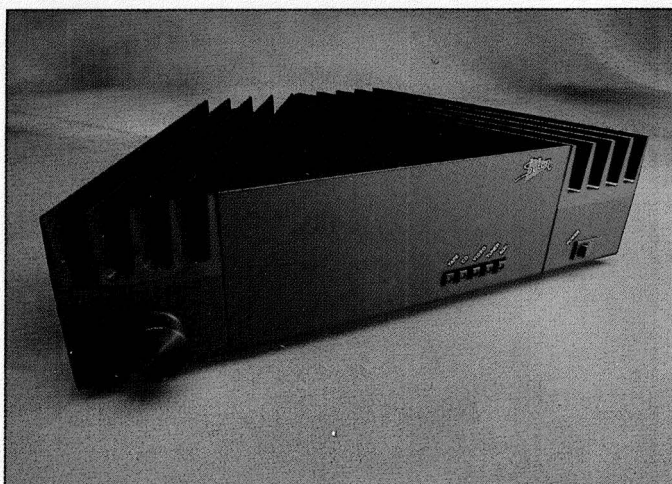
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MARCH ISSUE ON SALE FEBRUARY 9th

The summer sounds of village cricket. Auntie Beeb's measured tones. Both indisputably British. But Sony?

In actual fact, Sony's ES separates range sounds equally Anglo-Saxon. If only because it's produced with the help of the world's best audio specialists.

Us. That is, a team of distinctly British consultants, attuned to the precise demands of the British ear. (And, seemingly, to the preferences of the British hi-fi media.)

What of the pedigree of the equipment itself?

The range of CD players brings 45 bit eight times over-

sampling digital filtering to Britain for the first time. As the designer would have it, this transcends engineering. What's left is pure musicality.

In each model, interference has been all but eradicated. The CDPX7, for instance, sports ten times over-powered transformers, reducing magnetic leakage, fluctuations and hum to the unmeasurable.

(In fact, the obsession with obliterating spurious noise is carried over to every ES component. Thus all tape heads are laser welded, avoiding magnetization during manufacture.)

LEATHER ON WILLOW. THE BBC. SONY.



SONY ES

Among the amps, you'll discover another catchily named first: Pulse Density Modulation Digital Analogue Conversion. It's enough for some critics to swear by, but the choice, should you prefer 'conventional' DAC allied to a CD player, is yours.

Whichever, all ES amplifiers have a 'source direct' facility. Bypassing tone controls and filters, the net result is a 'piece of wire with gain' for the purists.

The range of speakers for the ES system is as impressive as it's broad. A listen to the twin drivers of

the APM 141s, for example, is an education in ice-like dynamic control.

And every one of the ES tuners features Sony's unique Direct Comparator circuit, specifically designed to combat FM station 'drift' and ensure crystal-clear reception.

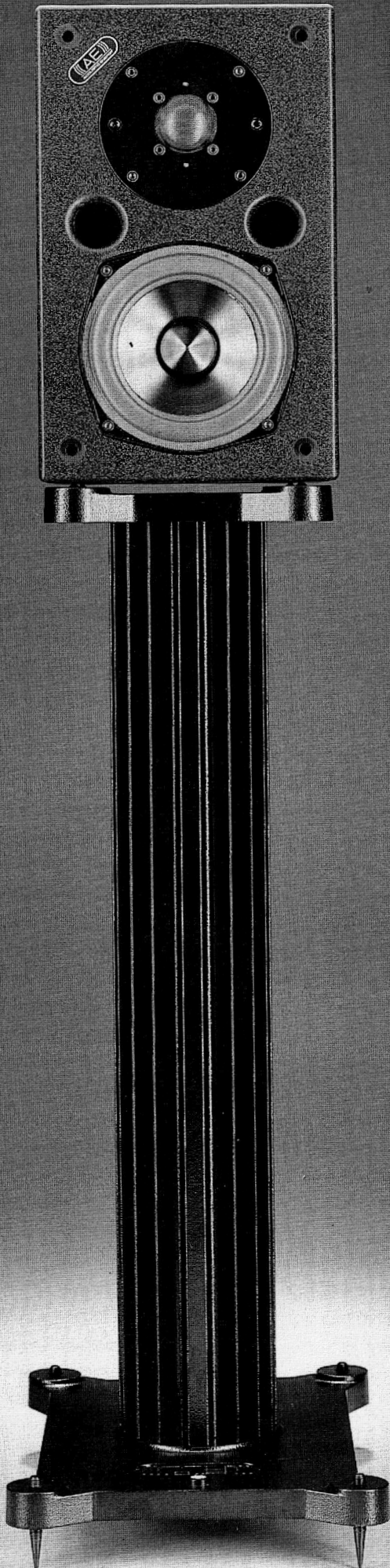
All said, the entire ES range sets punishing standards for hi-fi separates.

After visiting a dealer listed overleaf, perhaps you'll ask the same question Sony engineers ask each day.

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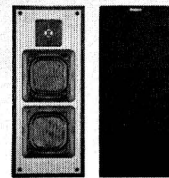
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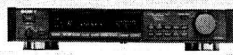
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SONYES



CHOICE SESSIONS

Things we hear . . . Sounds on the road, a spirited tool from Mana, the way ahead for noise reduction and Sennheiser's new headphones.



ON THE ROAD

JK fishes out his Van Halen tapes and takes to the highway in a Denon ICE equipped GTI. Watch out!

With the appearance of RDS on the in-car entertainment scene we have been looking for a radio/cassette head unit equipped with this facility to test. Having heard that audio veteran Denon had brought out a range of ICE components we asked if an RDS unit was available for trial. What we received was not only an RDS equipped head unit, but a fully kitted out *Golf GTI*. Not surprisingly, the usual three week review period had to be compressed down to a long weekend, which, while not adequate for a full audio test was long enough to experiment with RDS under diverse conditions, and to experience the *GTI's* rubber-burning capabilities.

By high-end ICE standards the car had been kitted out with some restraint – it's quite surprising how many loudspeakers and amplifiers you can get into even small sports cars if you really try, and some people do. By contrast the Denon *Golf* houses a mere six loudspeakers and only three power amps; OK, so it's not exactly run-of-the-mill but at roughly ten per cent of the cost of the car neither is it over the top. The set-up consists of the following Denon components: a *DCR 900R* head unit which plays cassettes and RDS radio for a reasonable £460, two *DCA 3180* 40W stereo power amps driving a pair of *DCS501* front speakers and a pair of *DCS461* rear speakers respectively. These are two-

way units, being intended to cover the mid and high frequencies; the front ones are door mounted and smaller than those in the rear situated either side of the parcel shelf.

Bass is provided by a pair of eight inch woofers driven in series by a bridged 120W *DCA 3280* power amp. These are bolted on to a Medite parcel shelf and use the boot for loading. The 'subwoofers', as they are called, are driven in mono because stereo imaging at these frequencies in a car just doesn't exist, and on a more practical level the avoidance of any phase cancellation, that might be caused by different left and right LF signals, means that you get a more powerful sound. Without installation, (estimated to cost

£150) or the Audioquest *Drivewire* interconnect and speaker cable used, this set-up will set you back in the region of £1,300.

The sound quality available from radio and tape is quite impressive. The auto azimuth correction on the head unit makes a significant improvement to high frequency extension and resolution with tapes, to the extent that it compares favourably with Nakamichi models in the same price range (and as yet they don't have RDS). The Dolby B and C noise reduction circuits also proved effective at removing noise rather than HF information as is often the case with ICE units.

Despite the *900R's* fairly high feature count, for ergonomic and safety reasons there are relatively few buttons (if 15 can be called a few) and the majority of these are of the dual function variety. Thus tuning and tape searching are covered by the same two buttons marked + and –, which takes some getting used to and much manual referral, such is the absence of graphics to indicate status. However, the less buttons and legends there are to interpret on in-car units, the less time one spends staring at the radio/cassette and ignoring the Volvo drivers out to test their crumple zones – far healthier in the long run.

In the end though, the sound is what counts and this is most definitely a notch or two above anything one usually hears in an automobile. Resolution of detail and information extraction is remarkable; it really marked out the fact that my usual in-Chevette system is hopeless at presenting even lyrics in a clear and distinguishable





Top: one of the 8inch woofers in the parcel shelf and the CAMI system control modules. Below: the DCR-900R RDS head unit in situ.



fashion. The subjective impression of tonal balance at normal in-town listening levels is of a slightly bass shy sound, but the degree to which one is aware of the rear mounted speakers alters quite dramatically with volume level. Thus if you set the front/rear fader (which due to the complexity of the system is controlled by a separate pot in the boot) to a rear dominant position this situation would be exaggerated, when for instance Guns and Roses' *Sweet Child of Mine* came on the wireless and you wanted to give it some welly. I guess that you set it up (by trial and error) for the volume level that you use most often, or alternatively mount the fader in or under the dash.

The RDS in the radio is quite basic, given the potential of the system (watch out for future *Choice Sessions*), but adequate for the information currently being broadcast. It includes station identification with which the name of the station is displayed on the LCD screen and used by the radio as a means of finding the same station on an alternative but stronger frequency. This ability to search for and automatically change over to a stronger signal is perhaps RDS' strongest facility, but obviously its degree of usefulness depends on the area in which you drive. For instance, around town it rarely comes into use but listening to Radio Four on a 15 mile drive east from Brighton the set changed frequency three times.

The other potentially handy feature is TA or traffic announcement, which searches out a radio station that broadcasts traffic information and raises the volume if you're listening to the wireless at low level, or even butts in to tape playback with an announcement.

All in all, the car and its audio system are a heck of a lot better than the two-speaker Vauxhall that this underpaid hack is used to, thus the general impression was very good – the motor really shifts and the hi-fi is extremely cruiseworthy. But is it worth £1,500? The head unit is undoubtedly one of the better ones available and under formal conditions it would probably warrant recommendation. The rest of the system seems expensive by domestic standards but it does work in a very clean and painless fashion up to serious volume levels, and obviously has hi-fi pretensions. One really needs to compare it with other expensive in-car systems before being able to critically assess a set-up like this, but what we can say is that it's so relatively free of distortion that more modest car installations sound coarse by comparison.

STOP



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DAT'S NEMESIS?

Dolby S noise reduction should dramatically improve cassette decks. Paul Messenger has the latest news . . .

Dolby's new S noise reduction system, previewed in some technical detail in *Choice* August '89, has now been demonstrated to hardware manufacturers in Tokyo and the music and recording businesses in London. Prototypes of the first commercial products could well be shown at January's Las Vegas CES, with Denon and Sony strongly tipped.

Dolby S is the 'domestic' simplified version of the SR professional noise reduction system for use with analogue reel-to-reel tape and optical (film) recorders. SR (Spectral Recording) has been a considerable commercial success, selling 30,000 channels in the three years since launch against an installed base of 100,000 Dolby A channels, accumulated over some 15 years. Perhaps surprisingly, sales of Dolby A have also grown, matching SR one for one and emphasising the enormous underlying strength of analogue technology in professional recording.

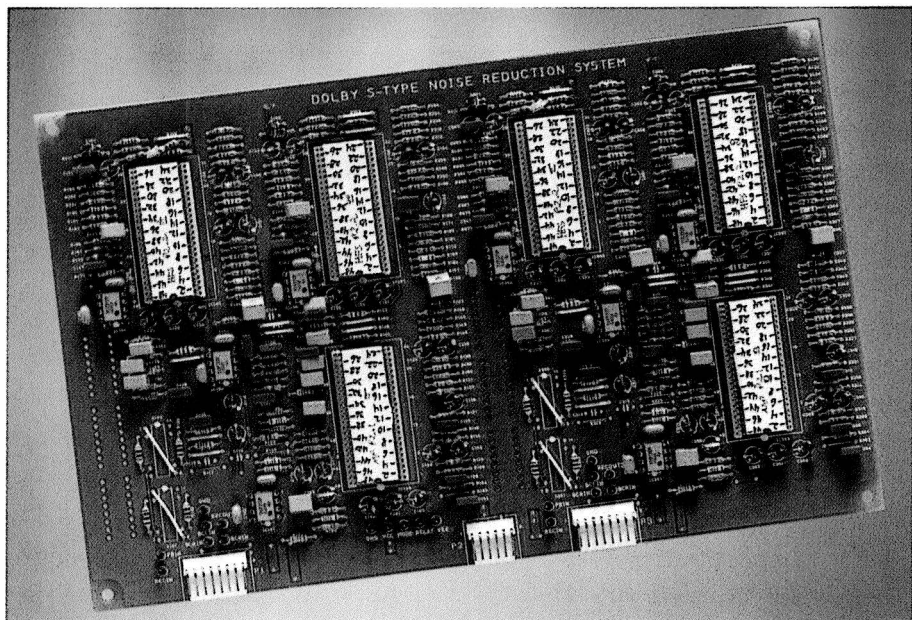
Where the original SR used over 1,000 components including 100 ICs, the S application is now down to a 3-chip set costing 3-5 times that of the Dolby C equivalent. These components are in very short supply and only represent the penultimate step towards the end of the chip reduction process, so the earliest S-equipped cassette decks will be both rare and expensive.

The real ball game will commence in the Autumn, since the single-chip S implementation is expected in Summer 1990, at a cost (to manufacturers) of about twice that of Dolby C. UK availability is then likely to begin, though again only on the more up-market separate hi-fi cassette decks.

Dolby S offers much greater noise reduction than previous domestic Dolby NR systems, providing a dynamic range enhancement of as much as 24dB midband/treble (1-10kHz), and at least 10dB elsewhere, which is some 15-20dB better than Dolby B and 5-10dB better than Dolby C. But perhaps more important, it does so with minimal interference to the music signal. The loud bits are left almost untouched, barring devices which are used to increase headroom a few dB at high or low frequencies, while the relatively mild processing takes place in side chains on lower level signals.

The demonstration not only confirmed that Dolby S works 'as advertised', but also that S-encoded material sounds reasonably tolerable when replayed either without any decoding at all, or with simple Dolby B decoding. Dolby hopes to persuade the music industry to use S for prerecorded cassettes, giving a potential dynamic range comparable with DAT when deprocessed correctly while at the same time giving acceptable results when replayed without deprocessing in in-car and personal/portable players - where the mild compression of low level signals could be a positive advantage.

The mass market is clearly still some years off, especially since the current (Sony) chips need $\pm 10V$ power, which is impractical for portable applications. But S produces stunning results when recording from CD, so its hi-fi future looks very bright - hardware



manufacturers are reportedly falling over themselves trying to get hold of the chips.

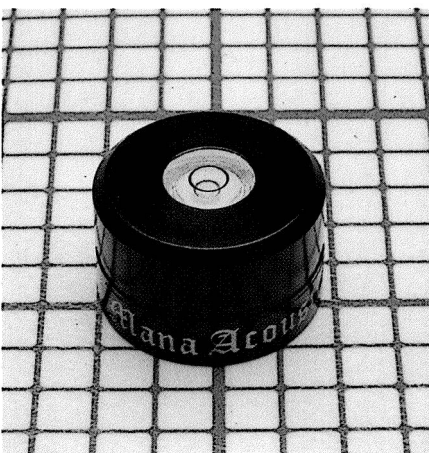
Although S is much less sensitive than C to cassette deck set-up errors, Dolby plans to use its muscle in an effort to upgrade the overall performance of the cassette medium. S-equipped machines will have to conform to minimum standards for mechanical performance, including (most contentiously) head azimuth alignment. All of which makes the prospects for DAT taking off in the consumer market look very slim indeed.

ON THE LEVEL WITH MANA

Vinyl junkie Jason Kennedy sorts out his Systemdek with a spirit level from Mana Acoustics.

In September's *Update* we ran a piece on an unusual spirit level from Mana Acoustics, which is designed to sit over the centre spindle on the record player platter and overcomes many of the problems of turntable set-up. Being a major fan of turntables and a closet tweaker I couldn't resist asking Mana's John Watson for a sample of the device, which duly arrived in the latest black anodised finish.

My initial enthusiasm was tempered when the level wouldn't fit over the spindle on my Systemdek, which is slightly larger than on most decks. However, it didn't take long to find some emery paper and enlarge the hole a few 'thou' so that it would fit. Other System-



Above - the electronics behind the future of noise reduction - Dolby S, and below an invaluable aid to turntable set-up - the Mana spirit level.

dek owners need only specify this fact when purchasing a level as Mana now makes one that fits.

Squeezing it on to the spindle, I wasn't entirely surprised to find that according to the little air bubble the platter wasn't level, a state of affairs that can be easily remedied on the Systemdek. You might be surprised to hear that correcting what was only a minor discrepancy in level had a distinct effect on stereo imaging and depth, which became more tactile and precise.

Previous to this minor adjustment, considerable time had been spent tweaking using a conventional level, and although the deck wasn't that far off, the effects of getting it that much closer to optimum were quite remarkable. Being a fanatic, however, the notion of checking the deck whilst it revolved sprang to mind and was duly tried. It revealed that due to a minute error in the mate of the bearing spindle and the sub platter it's impossible to achieve perfect level under dynamic conditions. However, it is possible to keep the air bubble inside the little black ring, which according to John Watson means that the platter is within a couple of thousandths of an inch of true. Further improvement would require better (more expensive) engineering.

Ideally, a turntable needs to be set up with an average weight LP on the platter as this is all, apart from stylus pressure, that it supports when in use, and it would be logical to have a spirit level that weighed a similar amount. The Mana level actually weighs 40 grams less than an LP, although its compactness gives the opposite impression, so the fanatic might consider finding something like a washer to achieve a mass closer to the 110-120g of most LPs.

Either way the Mana level is one of the most useful turntable tweaker tools we've

THE POWERHOUSE EFFECT

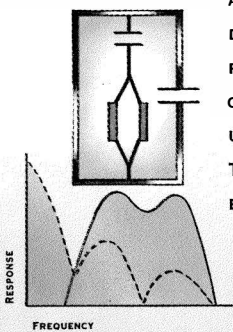
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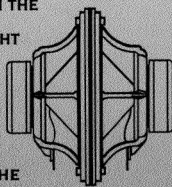
ADVANCED COMPUTER AIDED DESIGN TO EXPLORE AND PREDICT VIRTUALLY EVERY COMBINATION OF ENCLOSURE AND DRIVE UNIT. THE RESULT: A BAND-PASS ENCLOSURE PRODUCED BY PLACING A HELMHOLTZ RESONATOR OVER THE FRONT OF A BASS REFLEX SYSTEM. THE

ADVANTAGE: GREATER SENSITIVITY AND FLEXIBILITY OVER A SIMPLE BAND-PASS SYSTEM WITH REDUCED CONE AMPLITUDE AT THE LOWER END OF THE BAND.

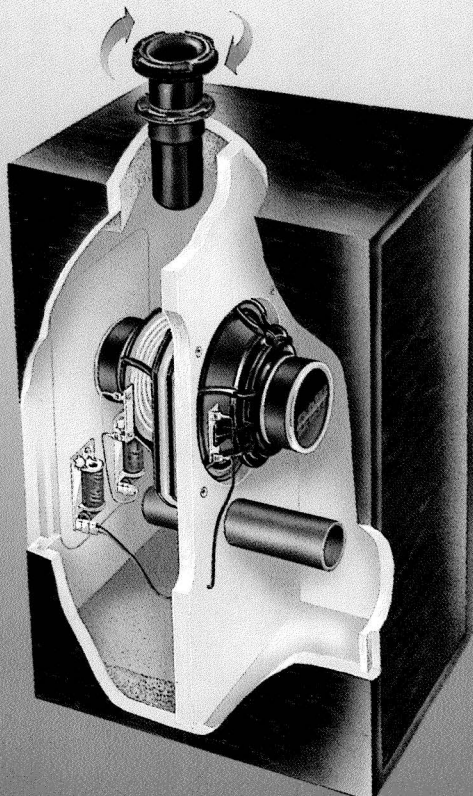
ENTER THE SUPERDRIVER

TO KEEP THE ENCLOSURE AS SMALL AS POSSIBLE CALLS FOR A DRIVER WITH BOTH HIGH MASS AND HIGH MAGNETIC STRENGTH. THIS MEANT LITERALLY SPLITTING THE REQUIREMENTS OF THE DRIVER IN TWO SO CREATING WHAT IS IN EFFECT A 'SUPERDRIVER' — TWO BASS DRIVERS ASSEMBLED FACE-TO-FACE AND DRIVEN OUT OF PHASE.

THE TINY VOLUME OF AIR BETWEEN THE DUAL DRIVER UNIT PRODUCES TIGHT ACOUSTIC COUPLING WHICH, AT LOW FREQUENCIES, MAKES THEM BEHAVE AS IF THEY WERE GLUED TOGETHER. FEEDING THE LEFT CHANNEL TO ONE DRIVER AND RIGHT CHANNEL TO THE OTHER ACOUSTICALLY SUMS THE TWO STEREO CHANNELS OVER THE LOW FREQUENCY RANGE.



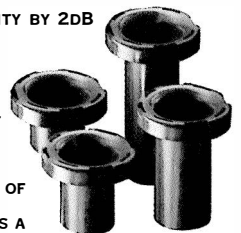
SINCE THE DRIVERS CREATE A 'PUSH-PULL' EFFECT, SECOND HARMONIC DISTORTION IS MUCH LESS THAN IN MORE NORMAL DRIVER CONFIGURATIONS WITH THE DRIVING FORCE RENDERED TOTALLY SYMMETRICAL. DISTORTION IS FURTHER REDUCED OVER A SIMPLE BAND-PASS SYSTEM, BECAUSE THE RESONANCE OF THE INTERNAL PORT REDUCES CONE AMPLITUDE AT LOW FREQUENCIES, PLACING LESS STRAIN ON THE SUSPENSION.



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come across and the sonic benefits of using it easily outweigh the £25 asking price.

AN OVATION FROM SENNHEISER

Alvin Gold runs in a pair of HD560s and finds phones worth listening through.

After the elegant simplicity of Sennheiser's early models starting with the *HD414* and including most of the models identified by the shy and retiring yellow and black colour scheme the company came up with the *450*, *480* and the *500*-series – clever, high tech headphones which seemed to offer gains all round. They gained in bass extension, they gained in treble clarity. They gained in cubic centimetres and they certainly gained weight. The only area in which they didn't show obvious gains was in musical quality. To be fair, most of them were still pretty good but I for one felt vaguely uneasy with certain of the newer models, and the expensive variants like the *HD5430 Reference Gold* most of all.

I don't dispute that the last named had fine qualities too, and it's not easy to say what was wrong except in generalities: they tended to sound crystal clear but dry as dust and rather cluttered and flat into the bargain. There was also a certain lack of proportion in the sound, as though it had been subtly manipulated for effect.

With the launch of Sennheiser's latest *560* series headphone, it looks very much as though Sennheiser's powers-that-be have put the engineers in their place and put the refinement through listening approach back on top. Maybe I'm wrong and the *Ovation* is merely the product of Sennheiser's latest and most powerful CAD programme. I know which makes the better story, but I confess I don't know which (if either) is the truth.

What I can say is this. The *HD560 Ovation* (which incidentally has some astonishingly glossy metalwork) appears to use the same bodywork as the previous *500* series. This means a two-piece headband (an outer spring hop; and a pliant inner strip which moulds to the shape of the head – but it's inferior in design to the double headbands Sennheiser was making a decade or more ago) and that characteristic large shell shaped earpiece structure. The *560* is open back, or rather semi-open back, and the ear cushion is a circumaural design which leaves the ears all but unobstructed.

The differences start with those earpads. I still think the 'phones are a little too heavy, but they are extremely comfortable, even in long term use. The earpad ring is covered in a velvet type material which has good grip and a cool, soft feel. Best of all – and this I think is the real secret – it breathes extremely effectively, so there is very little build up of heat around the ear, which is a common objection to cans.

The other difference is much less tangible, but even more important. Without any appreciable loss of clarity, the synthetic edge I've complained of in other recent models has been banished. Not that you'll necessarily tell at first. Like most good loudspeakers, the *560s* tend to sound bright and edgy until they have been thoroughly run in. But once this has been done, they sound extremely civilised.

The improvements are obvious through-



out. The sound is more naturally distanced, and the bass, whilst deep, has a lighter, less obvious touch that is welcome at all times and is particularly beneficial with radio speech which so often tends to drone in a quite unnatural way. The treble is also less intrusive, smoother and sweeter which is a rare quality indeed with headphones where even the most minor problem tends to be magnified by the proximity to the ear. Best of all, the sound is a great deal more subtle and varied which implies it's imposing less of itself on the music.

At £100 the Sennheiser *HD560 Ovation* is the best reasonably priced full size headphone I've heard for a long while, if not ever, and one of the very few I can listen to for hours rather than minutes without fatigue. The only other design I'm equally excited about is a miniature in-ear headphone from Aiwa called the *HP-V99* – and even they cost £50 a pair.

Incidentally, Sennheiser has truly mastered the art of technological doublespeak – the knack of coining convincing but utterly meaningless pseudo technological talk as a means of instilling confidence (spurious or otherwise) in a product – which until now was perfected only by certain Japanese manufacturers. We are informed in the *560's* instructions for example that 'the new multi-stage attenuation method and the new attenuation elements provide an absolutely linear presence characteristic in the important upper midrange'. And what about the 'sound guidance in the system which permits the fundamental frequency to be reduced to 16Hz'?

The HD560 Ovation, designed by ear or computer?



ASPIRATIONS

Perched on a hilltop with views to the mountains of Mourne a retired couple spend much of their time listening to their hi-fi. Words: Dan Houston, photographs: Chris Richardson.

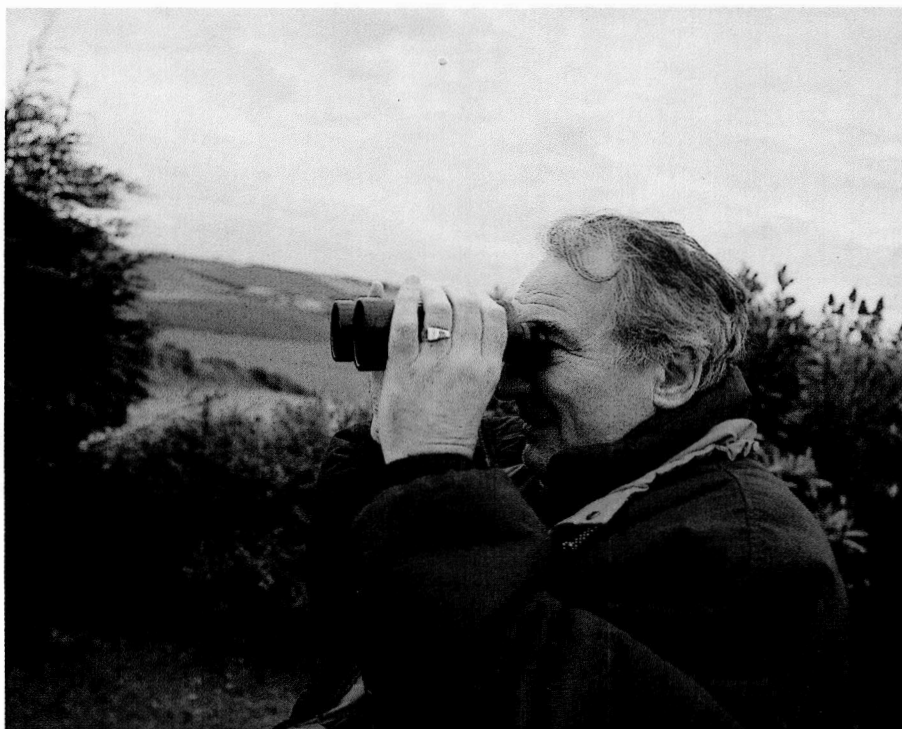
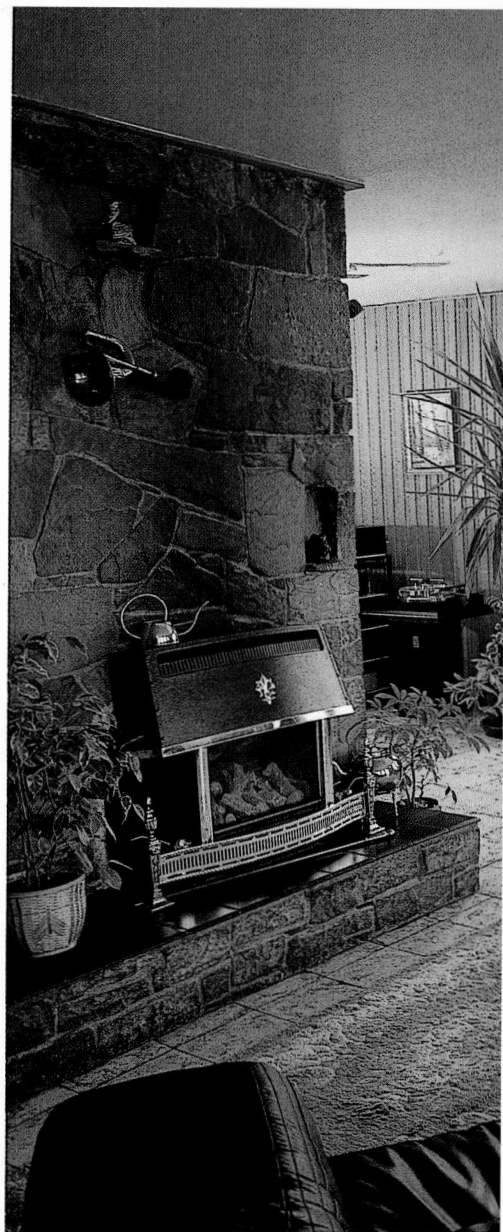
Sounds Of The Emerald Isle

The shifting light under scudding clouds reflected on the distant purplish Mountains of Mourne as we neared our destination. "They say that if you can see the Mountains it's about to rain – and if you can't see them it's already raining," explained our host, a Geordie who came to live in County Down in the '60s when he joined the Harland and Wolff shipyard as a production manager.

Now semi-retired, he lives with his wife in a wooden hilltop house from where, on a good day, he relaxes by taking his large BMW motorcycle down twisting lanes to the Eire border. It seems a perfect peaceful existence, especially if you could put a lid on it but sadly our audiophile cannot be named for reasons of security. The views

from the house are stunning and after the activity of Zeus Audio's Northern Ireland Hi-Fi Show (in November) it was like the slow motion bit in the Horlicks advert. This part of the world revolves quietly to the sound of sheep and the wind across a rolling landscape . . . That is until we fire up the Carver-based system with its massive ribbon loudspeakers.

Dave (we can call him that) has been an audiophile since the term was invented, graduating through Thorens' based systems to a Linn deck in the early '70s, which he bought for the princely sum of £139! "I have an historical, or should I say hysterical interest in Linn," he says, "and I kept the deck, with an *Ittok* arm and *Asaka* cartridge up until January this year (1989).





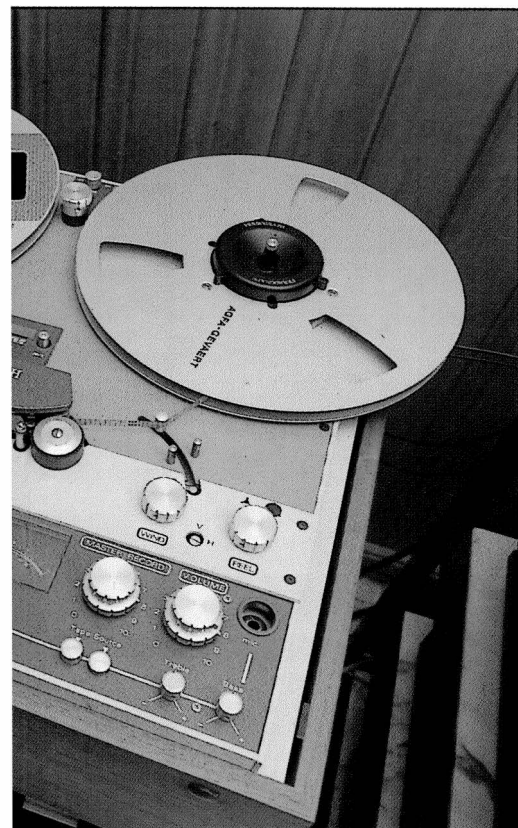
Gateway to the sound: Carver loudspeakers dominate both the ears and eyes relaxing classics from an old classic like the reel-to-reel Ferrograph (mid-bottom).

“At that time I had a Sugden and a pair of Cambridge power amplifiers (*R50s*) with a pair of Meridian *M1* loudspeakers. I was happy with the *M1s* but my wife found the tweeter a bit harsh. And this room gives very hard acoustics; we could never get much bass out of the *M1s*.”

The listening room is indeed acoustically hard, with a tiled under-heated floor and wooden panelling with plate glass on two sides of the walls – slightly softened by vertical blinds. The only stone in the house (locally hewn) makes up the chimney breast. The house is even roofed with wooden shingles and consequently creaks in the wind. The living-room is L-shaped, with the hi-fi system arranged along a wall in the ‘L’ bit so to speak. But it is the ebony lacquer loudspeakers which dominate. They stand at five feet six inches tall and seem to take up most of the area at the back of the living-room. A token Sharp television sits out of sight like a 40 horse power engine in a sailing barge, confirming the importance of hi-fi and the aural, as opposed to visual medium.

Although they look like an all-ribbon design the Carvers are in fact a hybrid – using a ribbon for the high, mid and bass frequencies and four subwoofer cone drivers arranged vertically in the centre of their mass. The ribbons take the signal from 25Hz to 40kHz, while the subwoofers apparently give a response down to 18Hz! They are very heavy, weighing some 110lbs each, and sit at a slight angle. This angle between the perpendicular and bottom of the loudspeaker is used to tailor the soundstaging according to the room’s parameters. In this case the angle was decreased slightly when Dave bought his latest amplifier – an Aragon *4004* – which recently replaced a brace of Carver amps (it used to be an all Carver system).

“The higher soundstaging of the new amplifier was adjusted by making the



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Reconciling user friendliness with superb sound quality: The heavily gorgeous Oxford Crystal Reference (left). Below: The rolling landscape of County Down.

speakers more vertical," Dave explained. "You get a plumbline and hang it beside the baffle which can tilt back or forward to get the right balance. You have a problem to position them to get the best sound. I take it that that is supposed to be half the fun – the gadgetry and all that, but I knew I must come into it some time or another." Unfortunately the 'speakers were not at their best – the right-hand ribbon having come slightly loose before our visit. Dave had temporarily repaired the ringing ribbon by stuffing some sponge wadding down its length; half the fun indeed!

The hi-fi system is kept on for most of the day and the demands on the system are

twofold. First, it was chosen as a superb hi-fi for the equivalent of a private orchestra, but it is also very much a background source of entertainment with the radio on for long periods. Most of the system was bought from Zeus Audio, the Belfast specialist which has just won the Sony dealer of the Year award for the Scottish and Northern Ireland area. Zeus introduced the Carver domestic hi-fi to the UK but now HW International, which handles Carver professional (studio) equipment has taken over the distribution of domestic equipment. We quote the current prices but some of the equipment was cheaper while Zeus was distributor.

"Everything was tried out at home before we bought it," said Dave, illustrating what has become a common selling point among 'high-end' dealers. Indeed the listening room environment can drastically affect the sound of any system and several less than high-end dealers now offer home demonstrations or let serious customers borrow trial equipment.

The system fronts with the innovative Carver 'digital time lens' CD player and the gorgeous Oxford Acoustics *Reference* turntable using a Rega *RB300* tonearm and Audio Technica *OC7* cartridge. "I suppose it is a bit daft putting a £100 arm on a £2,000 deck," conceded Dave, "and the arm is the weak point in the system. Zeus keep telling me I need a better one but first I need to be convinced about the right one."

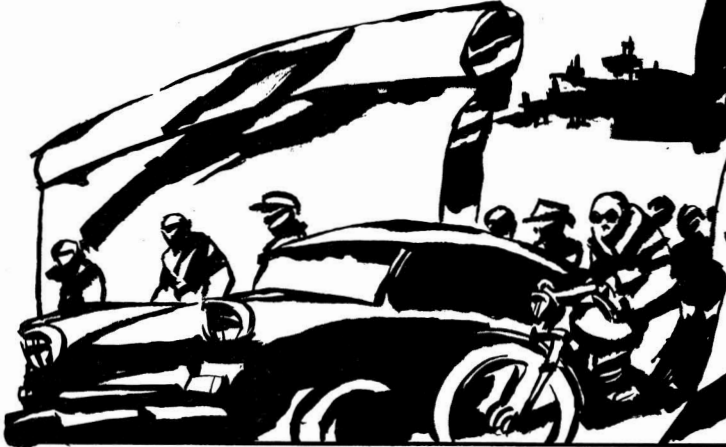
Like many audiophiles he prefers analogue sound and chose the CD player on its 'analogue merits'. "The digital time lens is supposed to widen the soundstaging. It



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works very well with bright recordings and you may also get more ambience with a Rachmaninov piece but it tends to dull the piano sound somewhat." This was confirmed when listening to the system both with and without the switchable time lens facility. It seemed to put a veil across the music which although see-through nevertheless 'misted' the clarity of some pieces.

The other sources are a Carver tuner, a 12-year-old Ferrograph reel-to-reel tape deck and an Aiwa cassette deck which was introduced with the standard: "that's OK for making tapes for the car!" These are run into an Audio Research *SP9* preamplifier and the signal is then powered to the speakers by the new Aragon stereo power amp. All the equipment stands isolated on Target furniture with bespoke marble isolation slabs commissioned at £12.50 from a local monumental mason (why does that always give the image of a giant sculptor?).

One of the merits of this system is that it can be driven at very low volumes. "The Carver amps gave tremendous power but they weren't so good if you wanted to listen at low volumes – they just stopped driving the loudspeakers. With the Aragon you can turn it right down and still get good resolution," Dave told me. Not everything is rosy however: "I now have a problem with the cartridge situation," he continued, "the *SP9* has no moving coil section, although you're supposed to have enough gain to take you through. It worked well with the Carvers (power amps) but with the Aragon I feel that the preamp doesn't have quite enough gain." Dave says he's not keen on rectifying the situation with step-up devices, but plans instead to upgrade to a higher output moving coil cartridge.

If all this suggests that the system is meek, or weak, then that is not the case. While most of our host's collection is classical or jazz material he's keen to show just how much air he can move with *Ask Me How I Feel* on a Tina Turner CD. "Normally I'm not into this," I lip-read across the clashing gale of sound, "but if you play it with the volume at the 12-o'clock position you just about end up out of the room!" We swap it for a Telarc recording of Elgar's *Pomp and Circumstance* and come back to normality, though the volume stops on

the preamp weren't changed. "It surprises me that the record industry doesn't have a standard recording level," he muses, referring to the different loudness levels between CDs. "I think Opus 3 recordings are a sensible balance of the original, but sometimes I wish I had never changed from a simple system because it's like a computer – if you put rubbish in you get rubbish out."

Neither has time and the digital (nor even stereo) revolution improved the audiophile's lot. "The other day I played a mono jazz record which was cut in 1968 and I couldn't believe how good it was. There was not a hiss, nor a scratch on it, yet I have some classical records from the late 70s and 80s and the quality is terrible with awful surface noises. Quality control in the record industry has a lot to answer for."

In spite of being in an acoustically live room – 'a killer for loudspeakers' – the new system, and particularly the loudspeakers, has found favour with Dave's wife who originally hated the idea of their presence compared to the more classical Meridians. "Since we listen to it all the time we have to have something which we *can* listen to all the time. And now I use the record player, whereas I never liked operating the Linn," she said flying the flag for the Oxford Acoustics turntable which reconciles user-friendliness with superb sound quality.

The local wildlife also seems to enjoy

the system, a couple of hares (and maybe some leprachauns) regularly coming to sit on Dave's porch apparently enjoying the free concert (though I think he could scatter them with Ms Turner at twelve o'clock!).

However, the true measure of satisfaction must be subjective as our host points out: "I know many people who are very happy with their midi systems and good luck to them. The question must be: 'Do you like it?' And if the answer is yes then it's good".

THE SYSTEM

Oxford Acoustics <i>Crystal Reference</i> turntable	£2,395
Rega <i>RB300</i> tonearm	£100
Audio Technica <i>OC7</i>	£399
Carver <i>DTL-200</i> CD player	£695
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Audio Spec <i>Latitude 6</i> loudspeaker cable	£5/m
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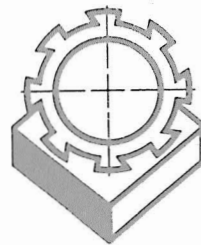


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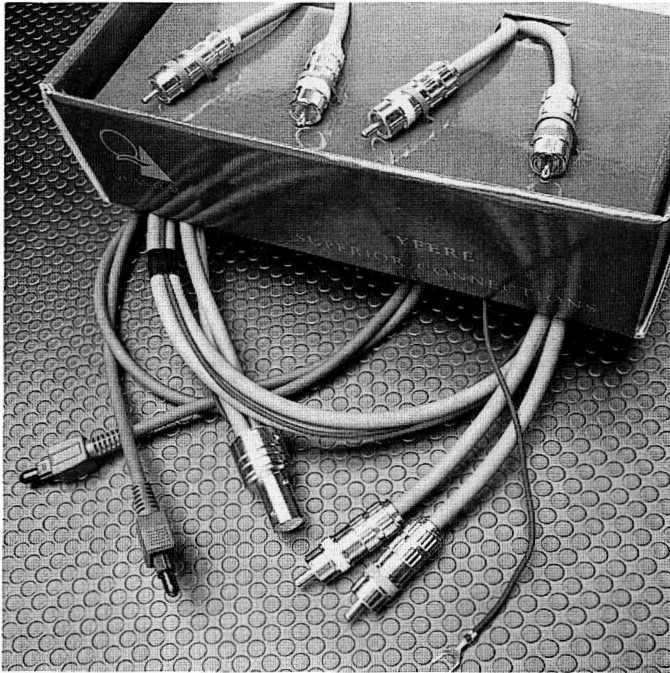
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For digital aficionados there is also a high quality fibre optic cable (yes, cables really do make a difference even in the digital domain). And the analogueophiles looking to get the best from their record collection might care to upgrade their arm cable with the *Superior* tonearm cable which uses YFERE's Quad wiring.

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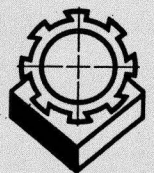
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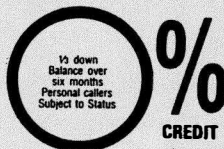
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FOCUS ON . . .

Although the success of compact disc has reduced demand for cartridges worldwide, Ortofon is still dedicated to the art of producing the finest modern pick-ups. John Bamford visits the Danish factory to learn about Ortofon's brand new top-of-the-range moving coil, the MC3000 MkII.

It's a two hour drive from Ortofon's administrative and research headquarters in Copenhagen to the company's factory in the town of Naskov, situated at the southern-most tip of Denmark. I'd come to see how Ortofon makes cartridges, of course, while the principal reason for my making the journey from London was to learn what was behind the company's latest go-for-broke moving coil design, a *MkII* version of the near-legendary *MC3000* flagship model.

When introduced to audiophiles three years ago, the *MC3000* cost a breathtaking £800 – £1,550 if you included the accompanying *T3000* step-up transformer. The new *MkII* model is priced £850; the silver wired transformer remains available at £740. Heady stuff for sure, but here we're discussing the finest hand-built pick-ups Ortofon can produce.

The differences between the original *MC3000* and the latest *MkII* cartridge are subtle, but Ortofon nevertheless regards them as significant in the subjective sound quality of its flagship transducer. The improvement programme began after Ortofon had produced its limited edition 'Anniversary' moving coil called the *MC70*, launched (you guessed) to celebrate the company's 70th anniversary. Priced at £630, the *MC70* was a runaway success with analogue connoisseurs around the world, and subsequently caused some embarrassment at Ortofon headquarters when some reviewers – along with members of Ortofon's 'Golden Ears' Owners Club – began reporting back that in some ways they actually preferred its sound to the more expensive *MC3000*. What they were referring to was a sense of musicality – an almost indefinable feeling of warmth, involvement, naturalness . . . call it what you will – that gave it the edge for sheer listenability and enjoyment.

Ortofon had promised the hi-fi world that the *MC70* would be strictly a limited edition moving coil, and true to its word only 800 pieces were made. But the folks at Ortofon HQ must have been quietly kicking themselves, because worldwide demand for the *MC70* was such that they could easily have sold ten times that number!

What Ortofon had done with the distinctively white-bodied *MC70* was to base it on the *MC3000* but slightly modify the design



Danish Diamonds

of the stylus profile and alter the suspension wire of the cantilever. These changes are now being incorporated in the *MkII MC3000*, along with the use of a new rubber material for the critical damping of the armature.

Everything is done 'in-house' at Ortofon – the company even has its own rubber department! – and the designers claim that the new rubber bearing, which is machined to the highest possible precision, is much improved in terms of consistency as well as temperature stability. The spring-steel suspension wire is now thicker and stiffer; they use an electroplating nickel process, and even though we're dealing here with impossibly small

dimensions, it has been possible while increasing the diameter of the wire to keep a tiny portion of it free from nickel to form the pivot point.

The *MC3000* employed what Ortofon calls its Replicant 100 stylus which is the one component not produced in the Danish factory (although Ortofon is now growing its own diamonds for its cheaper ranges of fixed coil cartridges). The Replicant 100 comes from Fritz Gyger of Switzerland, and for the *MkII* cartridge the profile has been modified slightly with a flat front facet. Ortofon claims this low mass tip makes even better contact with the record groove, while in the magnetic circuit itself the profile of the front pole



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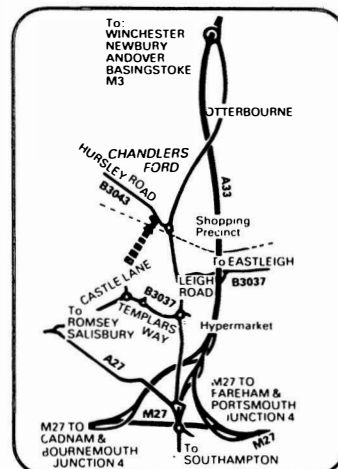
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shoe has been changed and the air gap reduced to increase magnetic induction. What this means is higher output from the cartridge, which might come as music to the ears of some audiophiles who simply cannot cope with the very low output of Ortofon's top-flight moving coils. But don't get too excited: the increase in output is marginal – from 110 μ V in the old model to 125 μ or so in the *MkII*. This is still uncommonly low compared to the majority of low output moving coils on the market which typically produce around 500 μ V, and whereas with many high-end preamplifiers you can often get away with running a MC cartridge straight in to phono input (I'm thinking here of valve designs such as Audio Research and Conrad-Johnson models, which don't have dedicated MC inputs), you will never be able to use an *MC3000* – even a *MkII* – without employing some form of step-up device.

HEAVENLY SOUNDS . . .

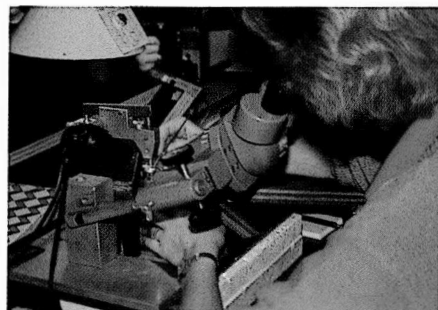
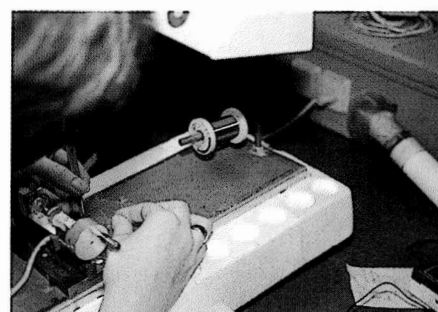
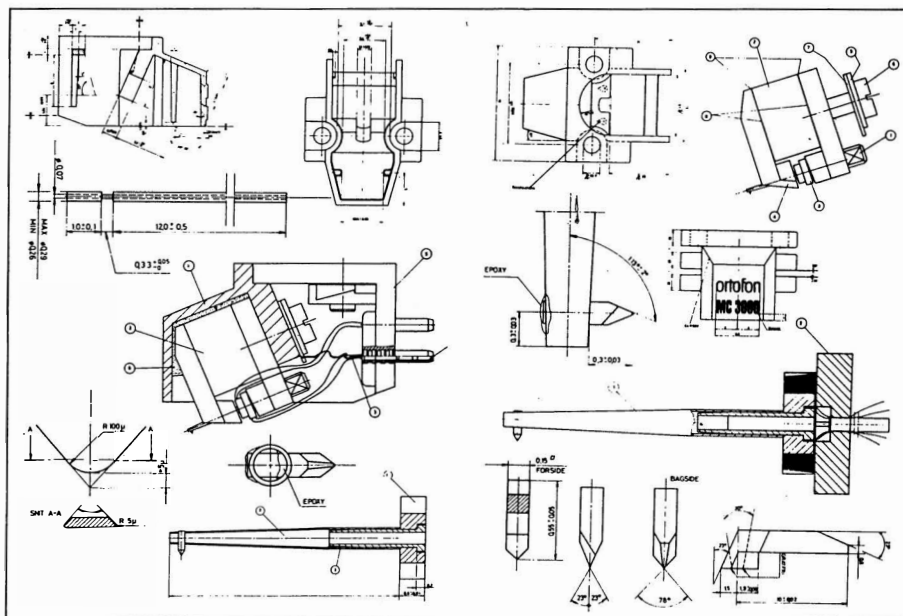
It was with much excitement that I returned to London clutching an early sample of the *MC3000/II*. With the cartridge (minus its packaging, which had yet to be made when I visited the factory) tucked firmly in the depths of my flight bag, I couldn't help thinking that if Ortofon really had managed to combine the detail resolution and precision of the sound of the original *'3000* with the beguiling sweetness and 'warmth' of the rare *MC70* then I was in possession of something special.

A couple of weeks passed by before I had the opportunity to get it up and running, but I can now report that the *'3000/II* clearly is an audiophile's dream. Like its predecessor it has clarity in abundance coupled with breathtaking stereo imagery and 'scale', but detail information is now presented in a less matter-of-fact, take-it-or-leave-it fashion. Not that the *'3000* was over-sterile mind you, but there's no doubt that the *MkII* does have a warmer sound which is more endearing, and an improved sense of naturalness.

Yet clearly I've not even heard this cartridge at its best. After enjoying heavenly sounds for a couple of weeks, I removed the cartridge from my tonearm and had our technical reviewer, Paul Miller, run off a few measurements to see how it compared with the old model. We've published the test results side by side.

As you can see, the *MC3000's* impressively low distortion performance has been further improved in the *MkII*, yet inexplicably our sample displayed wildly asymmetric compliance figures which we have to conclude may be due to the cartridge having taken a knock whilst on its travels. This anomaly will no doubt have upset the resonance characteristics of the cartridge, but this is something which I failed to hear when listening due to the fact that I use the Townshend *Rock* turntable with its front-end damping trough.

We've put in a request for a replacement



sample of the *'3000/II*, and no doubt *Choice* will be running a full review of the cartridge later in the year. But we'll have to be patient. As we went to press we learned that Ortofon UK was just taking delivery of the first batch of *MkII's* – and they were all pre-sold! Seems like UK audiophiles don't know what it means to have too much of a good thing.

In the meantime, I shall continue to enjoy wallowing in the three dimensional soundstage produced by our early sample, the output of which is currently being 'stepped up' by a rare and wonderful (but sadly no longer made) Conrad-Johnson *Premier Six* mains-powered valve head amplifier.

Yup, I'll just have to be patient . . .

MC3000

Type, body mass	very low output mc, 9.5g
Cantilever	aluminium/carbon fibre pipe
Stylus type	Ortofon replicant 100, 5 x 100 μ m
Compliance, vert/lat	12.1cu/14.9cu
Tracking force range	2.0-2.5g
Test tracking weight	2.3g
Tracking ability, L/R	>80 μ m/>80 μ m
LF resonance, vert/lat	10Hz @ 12dB/9Hz @ 16dB
Output at 1kHz, 5cm/sec, L/R	110 μ V/111 μ V
Channel separation, L/R, 100Hz	28.5dB/27.9dB
1kHz	29.6dB/30.8dB
10kHz	25.9dB/26.2dB
Channel balance	0.10dB
Coil resistance	6.12 ohm
THD (300Hz)	-46.9dB (0.45%)
THD (1kHz)	-38.7dB (1.16%)
HF (10.8kHz) Distortion	-41.7dB (0.82%)
Squarewave linearity	-35.7dB
SMPT E IMD, 2nd Order	10.7%
3rd Order	1.7%
Vertical tracking angle	25°
Loading requirements	10-100ohm

MC3000 MkII

Type, body mass	very low o/p mc, 10g
Cantilever	aluminium/carbon-fibre pipe
Stylus type	Ortofon replicant 100, 5 x 80 μ m
Compliance, vert/lat	33.5cu/6.2cu
Tracking force range	2.0g-2.5g
Test tracking weight	2.3g
Tracking ability, L/R	>80 μ m/>79 μ m
LF resonance, vert/lat	6Hz @ 20dB/14Hz @ 23dB
Output at 1kHz, 5cm/sec, L/R	132 μ V/126 μ V
Channel separation, L/R, 100Hz	29.8dB/30.1dB
1kHz	31.5dB/32.8dB
10kHz	27.9dB/28.0dB
Channel balance	0.41dB
Coil resistance	6.34 ohm
THD (300Hz)	-54.7dB (0.18%)
THD (1kHz)	-42.1dB (0.79%)
HF (10.8kHz) Distortion	-45.9dB (0.51%)
Squarewave linearity	-37.5dB
SMPT E IMD, 2nd Order	4.6%
3rd Order	1.7%
Vertical tracking angle	21°
Loading requirements	10-100ohm

Top: engineering drawings of MC3000 MkII. And it takes steady hands to build a top-flight moving coil: stylus alignment is checked on monitor screen (above, left); winding the delicate coils (right); mounting the tip on the cantilever (below).

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THE BIG A/V QUESTION

I intend to update my entire hi-fi and video set-up, both because of its age and in order to take advantage of the latest technology. Up until now I have been interested in hi-fi but not to the extent of critically comparing technical performance etc. I'm also interested in video and would like to incorporate this into any system that I buy so as to achieve full A/V integration. Additionally, I have a great enthusiasm for computer art and graphics and would like to be able to hook up my Commodore Amiga system to the TV so as to be able to 'frame grab' images in real time and mix video and computer generated images (within the computer for colour printing rather than for video editing purposes).

I have in mind an outline specification of what I would like, but the more I read magazine articles, (no doubt genuinely meant to help), or speak to seemingly knowledgeable hi-fi shop personnel, the more confused I become. I also have an aversion to mismatched jumbles of different sized and branded boxes and would certainly prefer to slightly compromise on ultimate performance by having a one-make system or as near to that as possible.

I am prepared to spend some £5,000 on a system comprising: A/V integrated amplifier to give Dolby Surround Sound, tuner, CD player, cassette deck, loudspeakers, S-VHS NICAM stereo VCR and a NICAM TV. I'm not particularly concerned about a record deck since 95 per cent of my collection is on CD or cassette. Later I may wish to add a multi-satellite TV receiver, so any equipment I buy now will need to be able to accommodate this. Can you help?

IAN SAWYER,
BIRMINGHAM.

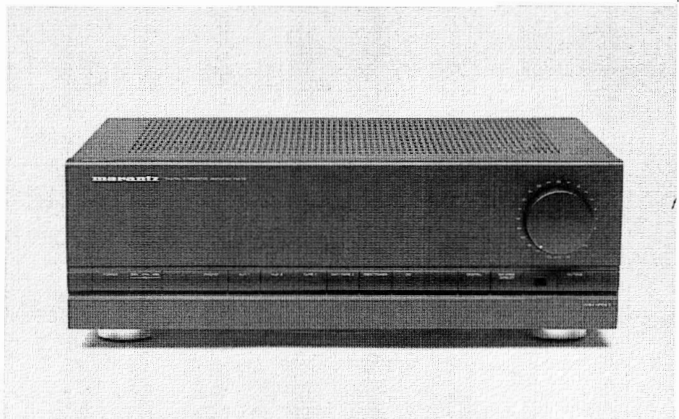
You've dug up a real can of worms here, as serious A/V and computer integration is a nightmare from which we have yet to fully wake. The hi-fi side isn't too bad, although our limited familiarity with A/V amps has led to some head scratching as does your all-one-brand prerequisite – an element which cannot be easily satisfied and represents too much of a

compromise when crossing over from A to V. We would advise you to go for audio from one manufacturer and video from another and suggested manufacturers would be Marantz, Denon and Sony which produce good examples of the components you require – although it's debatable whether any of them make a specific and affordable A/V amp of a suitable audio calibre. It's probably more rational to do all A/V switching at the TV and use an amp that's got enough inputs to accept the audio output from the TV. At present only Marantz makes a reasonably priced Dolby Pro-Logic surround decoder which offers significant advantages over conventional Dolby 'surround sound', but it would seem that the other Japanese majors have models on the way.

The Marantz separates that you could use to make up the system that you're after are: CD80 compact disc player, SD60 cassette deck, ST50L tuner, PM75 amplifier and the SP50 surround processor. Because of seasonal range changes we haven't tested the majority of these components, but the models they replace did well, sometimes very well, in past reviews.

For effective surround sound you will need two pairs of loudspeakers, one full range pair for the front and a pair of satellites for the rear channels. A combo which might work well is the KEF C95 and C15. But of course there are a lot of other good speakers around so have a look in the Directory for our recommendations. The Marantz SP50 processor (£199) includes a small two-channel amplifier for driving the rear speakers, but for full Pro-Logic sound you will need another amp (mono) and speaker for the centre front channel.

On the video front the Mitsubishi HS-B70 would seem a logical choice as it's very flexible and even achieved Recommendation in our tests. The TV on the other hand is a somewhat greyer area, as our experience of the genre is really not adequate to the task of a definite recommendation. For instance, in our last review group only two of the models, the Sony and the JVC, featured adequate socketry for your



NICAM stereo TV: finding a model which combines good picture, good sound, the requisite number of inputs and outputs and S-VHS isn't easy. And Marantz PM75 amplifier: inputs a-plenty for stereo video etc, and two tape loops for external processors.

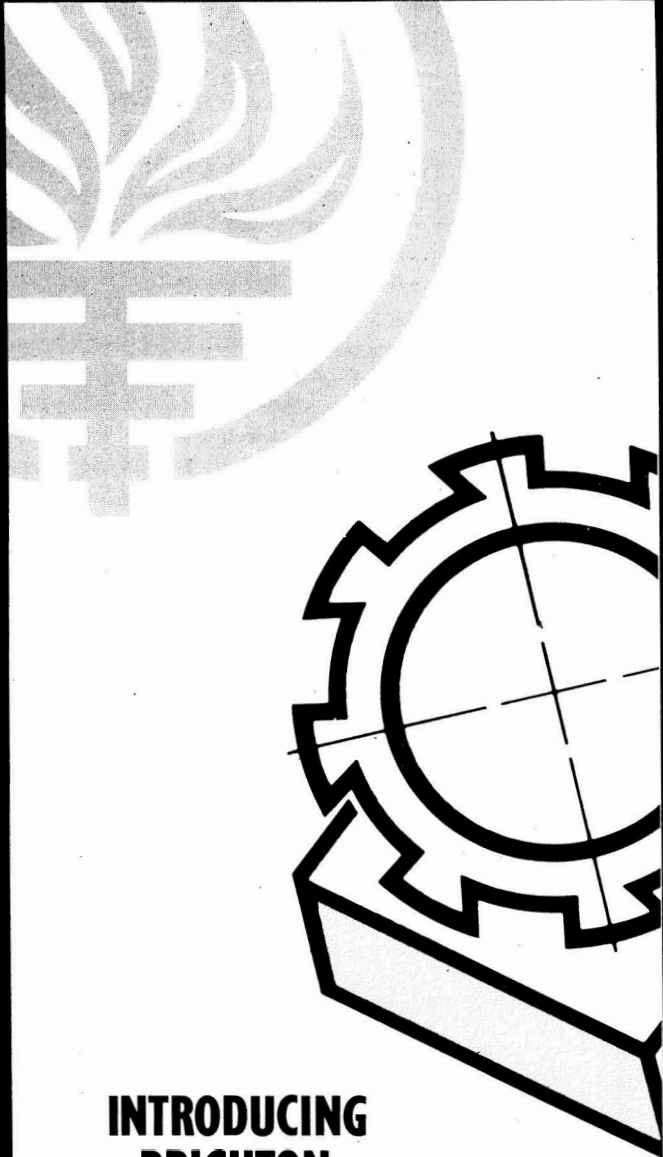
requirements. You need at least two SCART inputs and a pair of phono audio outputs, or a third SCART. Neither of the models just mentioned have onboard NICAM circuitry, but if your VCR has a decoder this isn't really a problem – unless you want to listen to one NICAM program and record another simultaneously. Then there's the screen size to consider; we tested 25-inch models but you may need a larger or smaller one, though the smaller ones are unlikely to have adequate socketry.

We'd suggest that you find a competent hi-fi dealer and have

him sort out your audio requirements, bearing in mind the video aspect, and then go to an equally competent TV dealer and let him work out a suitable video system. As you only need to connect an audio output from video to audio, integrating the two systems should be straightforward. Good luck.

RUNNING BLIND AT 33 $\frac{1}{3}$ RPM

If turntables have a greater effect on sound quality than loudspeakers, why does *Hi-fi Choice* test the speakers 'blind' but not the turntables?



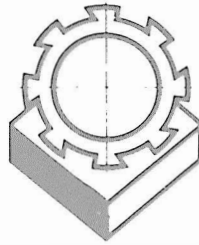
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R. P. SMITT,
WOKINGHAM, BERKS.

We don't blind test turntables because of their sensitivity to set-up. It takes too long to make sure that each player is correctly set up and installed for blind listening to be practical. Ideally, it would be a good idea to blind test everything, but time and manpower often make it difficult. And that said, blind listening isn't the final arbiter that some consider it to be – merely presenting the same product at different times of day can alter the listening panel's reaction to it. Long term listening therefore is the best way of assessing a product's performance, and, combining this with a blind panel's opinion makes for a less subjective evaluation. As for suspended subchassis autostop turntables of the British variety, there is at least one – the Ariston Icon (£200), a review of which appears in this very issue.

LUCKY MAN

As the first prize winner of your Marantz competition may I thank you once again for the magnificent prize. The equipment is fully installed in my listening room and is performing beautifully.

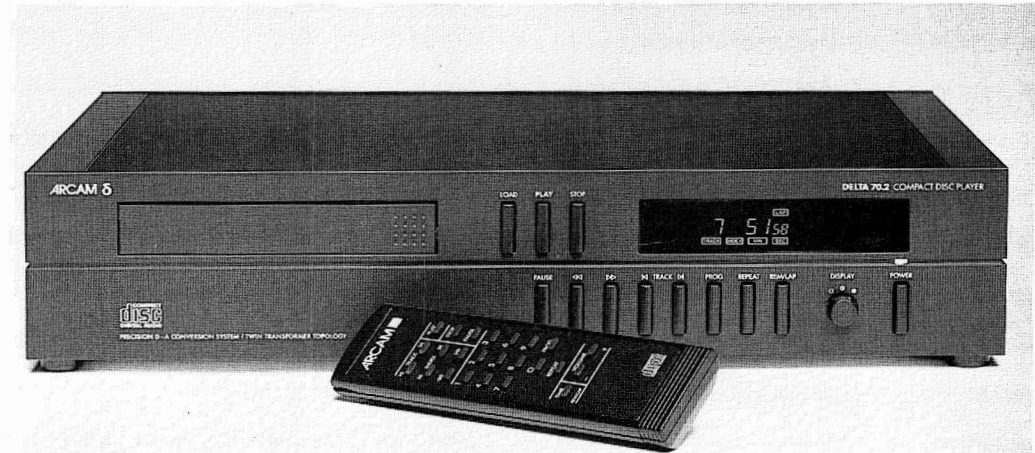
I might mention that a look through my previous issues of *Choice* in which most of the equipment has been reviewed gave me a few valuable tips on the best connections when setting up.

J. JONES,
WOKINGHAM, BERKS.

THE RELUCTANT DISC PLAYER PURCHASE

We have an extensive collection of classical and jazz records which we play on a Rega Planar 3 turntable (Linn K9 cartridge) through an Arcam Delta 60 amplifier and Arcam Two + speakers, all of which we bought about a year ago. However, as it seems to be increasingly difficult to obtain the new releases we want on LP we are somewhat reluctantly thinking of buying a CD player.

Can you recommend one which is well built and reliable that will produce at least as good sound quality as the Rega (so we don't begrudge the extra cost of



CDs) with our system? We don't require remote control, nor wish to pay for hi-tech features which don't contribute to sound quality. It should be simple and clear to use (and all other factors being equal we would like to buy British). Our maximum budget is £500, but if we can get the sound quality we seek for less so much the better.

JASON KING,
EXETER, DEVON

A CD player with sound quality to match a Rega, huh? Could be tricky, might even be nigh-on impossible. At the time of writing, the bitstream versus 16-bit digital to analogue conversion debate is still going strong, with reviewers split over which system is likely to come out best. Therefore we'd advise you to compare the likes of Rotel's RCD-855 and RCD-865, which are 16-bit and 1-bit respectively, to see what you think. If, after that, you find that 1-bit is no great shakes then compare the RCD-855 with the

Arcam Alpha and Delta CD players which are not only a good visual match for your existing equipment but also get more than a few favourable comments in reviews. And they're British.

A PLEA FOR TRANSPARENT TRANSDUCERS

I'm at the end of my tether. Two years ago, while on holiday in Switzerland, I came across a pair of loudspeakers made out of Perspex. Since then I have searched high and low looking for a pair to buy. I heard that the Ideal Home Exhibition had one on sale but missed the opportunity.

So please, please, if you could supply me with any info I would be eternally grateful.
SHIRLEY ELLIS,
LONDON.

To be honest we are not aware of anyone that manufactures Perspex or acrylic (which looks

Ariston Icon: good performance for the price (£200). And below, an Arcam CD player seems like a sensible choice.

the same) loudspeakers but would suggest that you get someone like a signmaker to make up some Perspex cabinets and use the innards from a pair of conventional speakers. A sealed box design of modest proportions would probably be most suitable, and economical – Perspex is not cheap stuff. Your best bet would be to get a speaker kit from a company such as Wilmslow Audio, (0565) 50605, which will supply specifications for the cabinet design that's required.

Before choosing your hi-fi,
we recommend you get a few quotes.

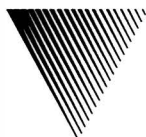
Critics have been singing the praises of the latest additions to the Kenwood Hi-Fi Concept Series.

As a glance at the reviews we've received will show.

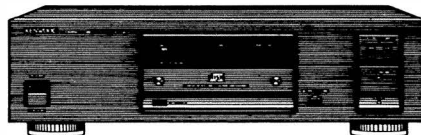
So pay us a visit. And let's just say the experience will speak volumes.

KAMLA
ELECTRONICS

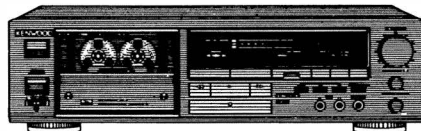
251, TOTTENHAM COURT ROAD, LONDON W1P 9AD
Telephone: 01-323 2747 (4 lines)



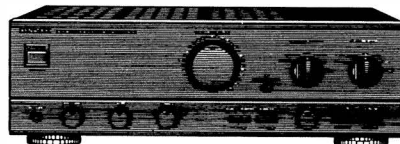
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(Hi-Fi Answers)



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Due to a special deal with Presence Audio, Opus 3's UK distributor, *Hi-Fi Choice* is offering its readers these CDs at a special price of £12.95 plus postage and packing. The two sampler discs *Test Record 1 – Depth of Image* and *Test Record 3 – Dynamics* are especially recommended as excellent introductions.

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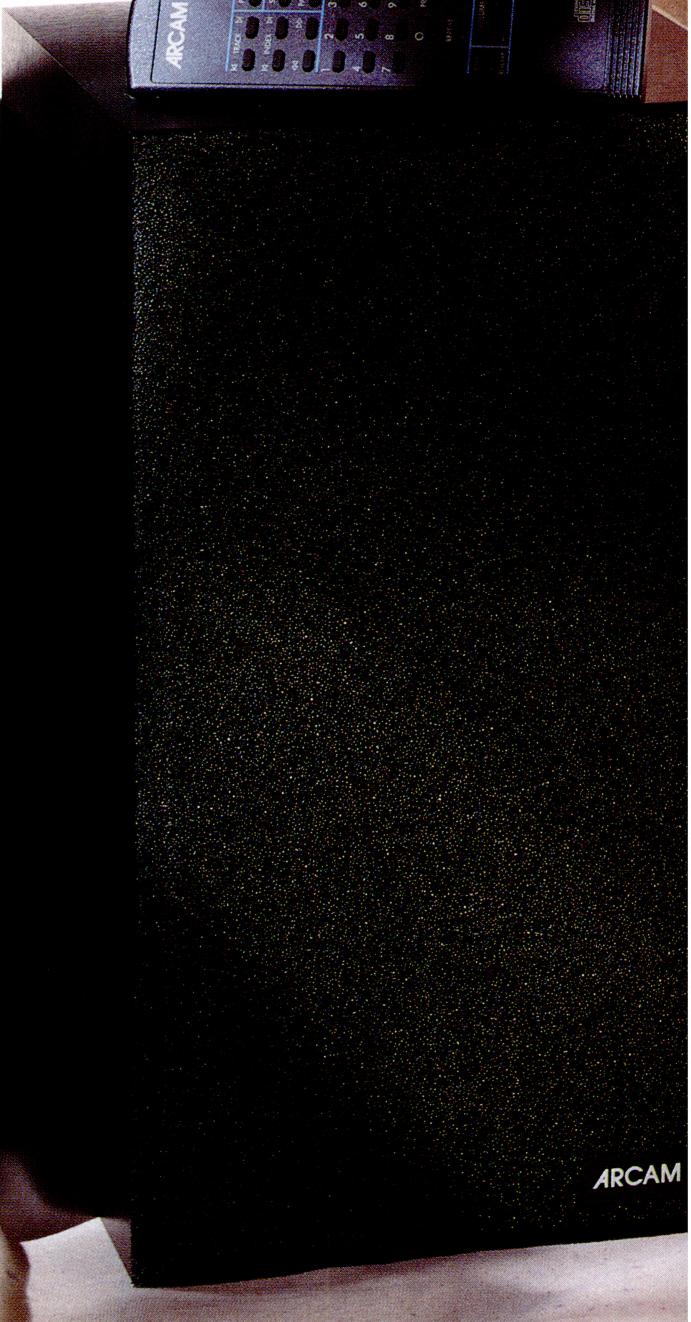
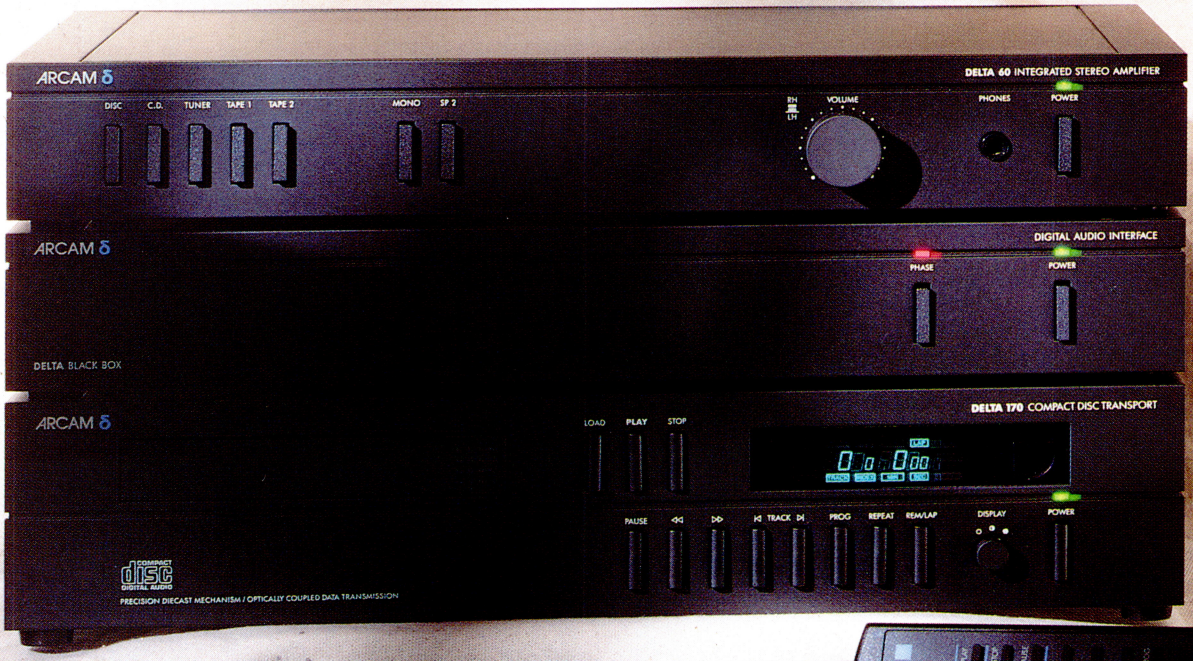
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HFC Opus 79

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COMPETITION

Hi-Fi Choice and British manufacturer A&R Cambridge are offering readers the chance to win a fabulous selection of Arcam hi-fi components worth over £2,000. We are giving away a complete Arcam Delta system, plus two runners-up prizes of the remote control Arcam Alpha CD player and Alpha II amplifier.

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A&R Cambridge is an innovative Cambridge-based British company which has become known for the reliability and sound quality of its products. Since A&R introduced the Arcam Black Box outboard digital to analogue converter to the UK, the principle – splitting the job of mechanics and electronics – has spawned a host of similar devices on the market. Originally an amplifier specialist, A&R's Arcam Alpha and Delta ranges now also consist of tuners, loudspeakers, CD players and cartridges – many of which have found their way into our best sellers and recommended lists.

HOW TO ENTER

Our simple hi-fi crossword requires ten one-word answers which must be written on the entry form provided. Fill in the form, remembering to include your name and address and send it to the address shown at the bottom of this page. Mark your envelope **Arcam Competition**.

The first correct entry drawn from our envelope after the closing date will win the complete Arcam Delta system, worth \$1,460. The second correct entrant will receive the remote control CD player with remote control, and the third will win the Alpha II amplifier.

THE CROSSWORD

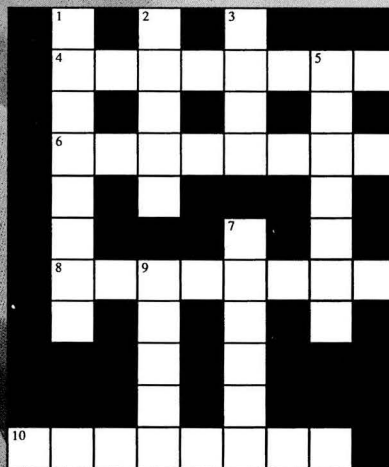
Please write your answers in the space provided.

Down:

1. Manticores arm plays music.
2. With a dash, the *Choice* is yours.
3. Glaswegian products rewrote the hi-fi rule book.
5. Diamonds from Denmark? Surely not.
9. British loudspeakers named with a professional accent.
7. Is it a chair, a knife, or hi-fi designed by Bob?

Across:

4. The *Aro* principle?
6. Loudspeakers last for ever and ever, Amen.



8. Pre-Beta's boy plays records.
10. Unreal recording – replacing Dolby A in professional studios.

NAME:

ADDRESS:

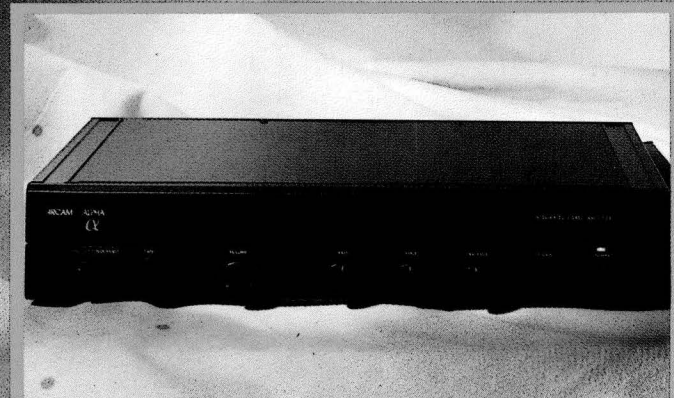
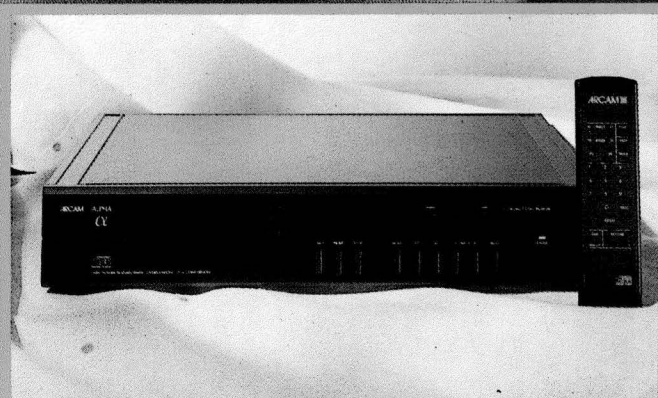
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- 2) There is no cash or other alternative to the prize.
- 3) Employees of Dennis Publishing Ltd and associated companies, the manufacturers and suppliers of the prizes, their agents and relatives, are not eligible to enter the competition.
- 4) The competition is not open to readers living outside the United Kingdom.
- 5) The prizes will be awarded to the first sets of correct answers opened after the closing date. The Editor's decision shall be final and binding. No correspondence whatsoever will be entered into regarding the competition.
- 6) The winners will be notified by post and the results will be published in *Hi-Fi Choice*.

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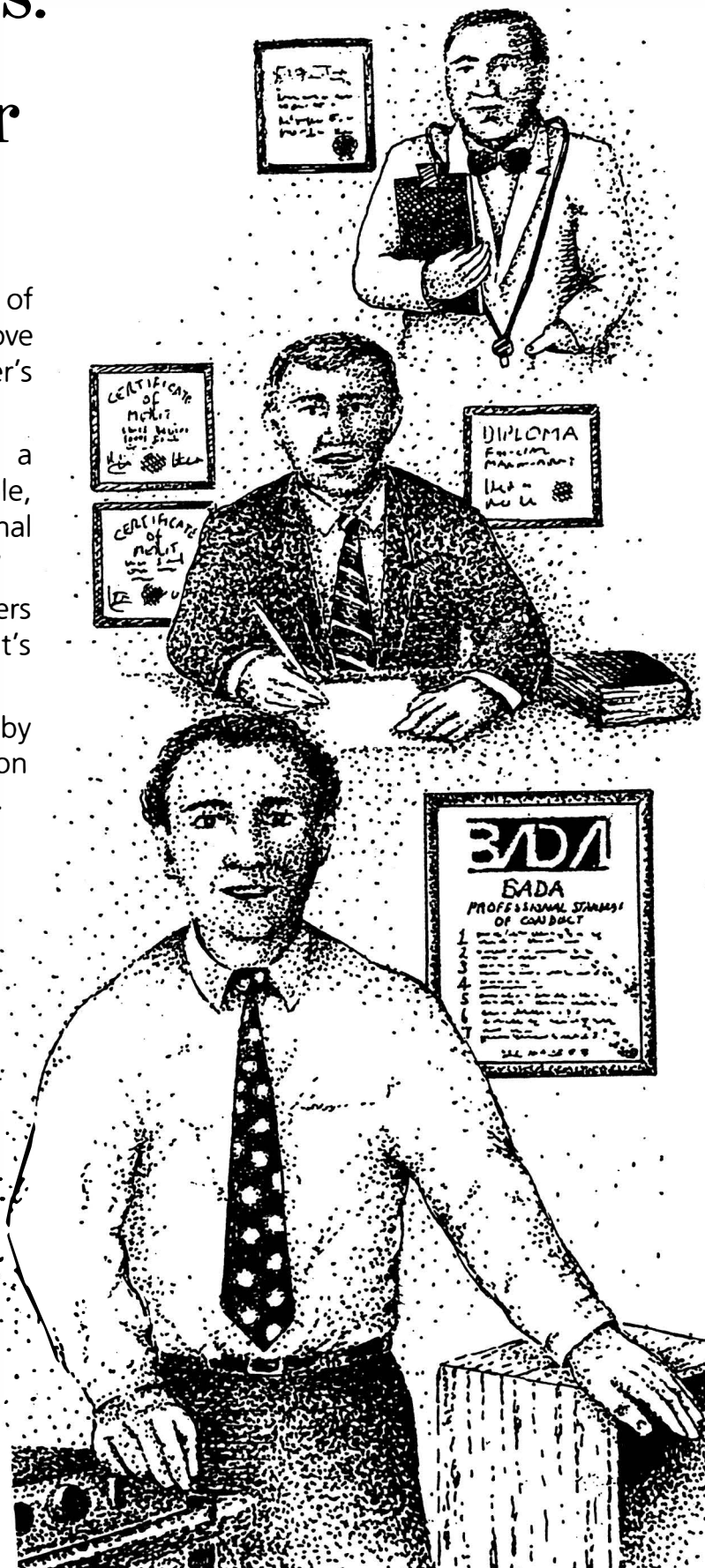
That is BADA, the British Audio Dealers Association. We're not ashamed to say it's a rather exclusive group.

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MARKET RESPONSE

Dan Houston ends our present series of market surveys with dealers' comments on the turntable marketplace.

Do you get the feeling that whenever you buy a record these days the salesman is thinking you're behind the times? As he puts your LP in one of the larger carrier bags, he's thinking that you don't own a CD player yet; that you haven't upgraded and – let's get really paranoid – you're an impoverished dinosaur!

You'd love to tell him that your record player sounds better than any CD player he'd care to mention; that you're maintaining the integrity and attractiveness of your music collection . . . But who'd believe you?

Last month we reported sales of compact discs overtaking records for the first time, and this is best seen in the record shops where vinyl stocks are being pushed farther and farther into the corner. On the hardware side CD players have been selling at about four times the rate of record players for a couple of years now. But sales of separate turntables rallied during 1989 after dropping by about 10,000 between 1987 and 1988. The Audits of Great Britain Group puts individual unit sales at 126,700 (worth nearly £25m) for the 12 month period before October 1989. This represents a rise of about four per cent, both in terms of volume and price from the same period in 1988. And AGB puts the average amount of money spent on a turntable at £195. Over the last few years this figure has been rising with sales of sub-£100 turntables falling dramatically.

Ironically the advent of CD is one of the reasons dealers often give for this; the perceived better quality of digital music has supposedly raised public expectation of what a 'hi-fi' should deliver, and what they're prepared to pay for it. Many British turntable manufacturers have cashed in on this perception which was coupled with a consumer boom before the summer of '89. Rega for instance claims a 30 per cent growth rate for both 1987 and 1988, which has also been the boom period for CD players. "The market is still going strong," said Rega's MD Roy Gandy, "but since Christmas '88 things have levelled out for everyone, though we're still

selling about 2,000 decks a month."

In the United States the market appears to have gone completely digital and many have thought the pattern would translate to the UK soon. However, with the billions of (often unreplaceable) records still sitting in collections turntable manufacturers don't see themselves shutting down production in the foreseeable future. "It's not like the situation with 78s," John Watson, Roksan's International Sales manager told us, "then there were far fewer records around and although we still get asked to make 78rpm players it is a severely limited market."

"The other thing to remember about the States is that LPs and CDs cost the same; the UK has been resisting a CD revolution with records still costing much less than CDs."

However, no-one is expecting a boom period for record decks, and for many reasons – not least user friendliness and the increasing lack of records – CD players and the digital media offer the way forward. Indeed several manufacturers are now making midi-systems without a record player; the Yamaha *Astarte* system doesn't even have a phono input.

Most of the dealers we spoke to for this survey told us they now sell more CD players than record decks. Last year half were telling us they were still selling more analogue systems. Roger Dawson, of Doug Brady Hi-Fi commented: "Two years ago we had a dozen turntables in the budget category but now we only stock two. Many people are now spending most of their money on a CD player and just buying an OK deck from a specialist manufacturer. People are getting pushed into buying a CD player, and they will find it more and more difficult to buy records." Martin Polak of Goodrights backed him up, explaining: "Customers used to buy a turntable-based system with an optional CD player but now they buy a CD-based system with an optional record player – the emphasis has reversed." If you need a third opinion consider this from Paul Tam of the



Michell Synchro: the best of British design and performance. And below, a Sound Organisation wall bracket isolates a Rega Planar 2.

Listening Rooms: "People are looking to digital because they believe it will sound better – if we expose them to one of our better turntables they often realise that they can get good use from vinyl – but can you imagine what a scratched record of *1001 Strings* by Mantovani sounds like on a Garrard *SP25 MK IV*? I'd get rid of my record collection if it sounded like that!"

All the dealers we contacted by telephone opined that record playing systems sounded 'pound for pound' better than CD-based equivalents. And we're still hearing the story about the man who walks in looking for a £500 CD player and walks out with a Linn *Sondek* or a Roksan *Xerxes*. The usual criticisms of CD are that it sounds brash, two-dimensional and fatiguing – and if you read *Aspirations* on visits to audiophiles they never appear to give CD players much shrift.

Several dealers told us that as far as high-end system sales were concerned – where customers buy principally on sound quality – it was still a turntable-governed market. Many recognised that CD players were now 'coming along', but lamented the fact that digital was still behind analogue in terms of sound quality. Basically Sound commented: "There's a lot of potential for CD players to get better. What we need is for a firm like Linn or Naim to produce one."

RELIABILITY

Apart from sound quality record decks also tend to be very reliable – there's a lot less to go wrong than with a CD player or cassette deck. And a good bearing should give years of service. Roger Dawson, for instance, claimed that a Linn *Axis* bearing would last for 20 years. Quality control at the

factory also seems reasonably good, though we did hear some horror stories (see below). Our QC average shows just over two per cent of decks arriving from the manufacturer as faulty and compares well with past surveys.

We asked dealers to name their most and least reliable turntables by brand and calculated the results on a points system. Of course the more product you sell the more you are likely to find faulty samples, but we have found dealers to be aware of this. Many quote percentage failure rates and two said that between 25 and 30 per cent of their Ariston *Q Deck* sales developed faults.

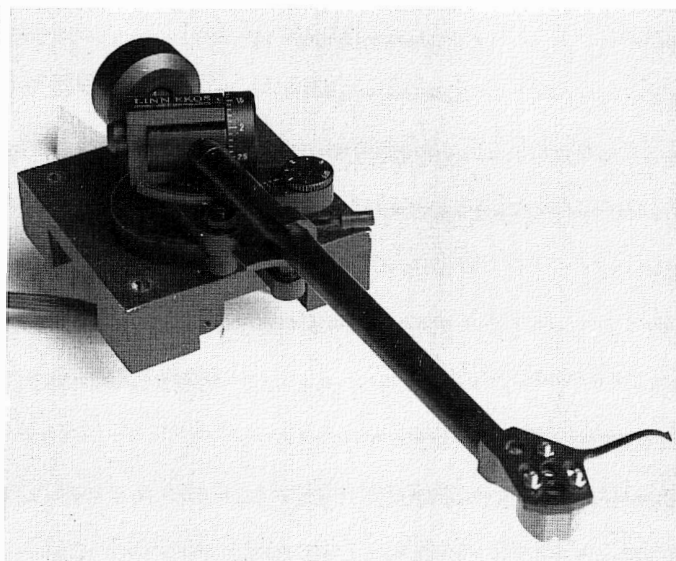
Linn Products came top with 70 points followed by Rega (55), Dual (47), Thorens (29), Roksan (27) and Systemdek (20). Here Rega, Roksan and Thorens do particularly well with nigh-on all their dealers voting for them and none giving adverse comments, and Systemdek appears to have sorted out its electric power supply problems of last year on the *IIIXE* deck.

As far as unreliability goes, we received 12 comments against Ariston (scoring minus 27) and four comments against Manticore which scored minus 15. There were four comments for Ariston's reliability. Peter McCormack, Ariston's managing director, admitted that his products had had problems in the past – over a year ago. "We have changed the procedures with the *Q Deck* and to my knowledge the reliability is second to none, the number of returns is negligible," he asserted. Our dealers, however would not agree with this and cite continual faulty power supplies, switches and even worn out bearings on their *Q Decks*. Doug Hewett, for Manticore said that his firm's problems has been with the electronic power supply. "We contacted another hi-fi firm to build the power supply and nearly all of them have blown up," he said, "however, we now build our own power supply which is reliable and we're not getting any problems with it. Of about 200 decks sold with the old supply about 120 have gone wrong but we give a lifetime guarantee on our products so we're happy to replace them."

Keeping a record deck running sweetly is fairly simple though some, such as *LP12s*, need yearly re-setting for optimum performance, and most suspended sub-chassis decks need re-setting every time they are moved. It's also a good idea to change the drive belt every few years (washing it in warm, soapy

water is a good interim measure), and you can prevent oxidation of input plugs by pulling them in and out of the sockets a few times.

If the player does break down most dealers would repair it themselves and the average time seems to be about two weeks. We asked dealers, who was on the ball in terms of service and heard



The popular Linn Ekos tonearm – an obvious upgrade for Ittok owners.

positive yelps for Linn, Michell, Roksan and Rega. Dual and Systemdek each excited a few comments as slow.

STANDS AND DIAMONDS

Next to loudspeakers a turntable is the most important element of the hi-fi system to benefit from isolation. Proprietary three and four legged tables or wall-brackets will do the job or you could use an isolation platform on a sturdy shelf in a wall alcove say. Dealers particularly recommend the latter approach with the solid plinth (Rega) type of turntable. Popular makes of isolation furniture are by the Sound Organisation, Target, Apollo and Origin Live.

While the more expensive moving coil type cartridge generally lasts longer than a cheap moving magnet neither will last for ever. Diamonds, James Bond might be surprised to hear, don't last forever especially when they are asked to brave the walls of a record groove for several hours a day. Looking after the diamond, especially in these days of depleted and deleted vinyl, is imperative because a badly worn stylus can damage your record collection. Moving magnets can last up to 1,000 hours or 14 months at a couple of records a night, with moving coils lasting about 20 months. If in doubt your best bet is to follow Brian Peaston of Holborn Hi-Fi's advice. "A good

dealer should have a microscope and he will be able to check the diamond for signs of wear. But you can generally hear a stylus becoming worn, you get more crackles, pops and distortion."

THE BEST SELLERS

We ask dealers for their three top-selling turntables (plus arm) in each of three price brackets.

Budget Category (Up to £199)	
Dual 505 III	105
Rega 2	55
Dual 503 I	54
Ariston Q Deck	47
Dual CS 430	29
Mid Priced £200-£450	
Linn Axis (Akito Arm)	75
Rega 3 (RB300)	55
Systemdek IIX	52
SEE Corporation Revolver	37
Acoustic Research EB101	27
Michell Synchro	25
Top Priced Best Sellers (£451+)	
Linn LP12/Ekos	82
Roksan Xerxes/RB300	43
Michell Gyrodeck	31
Alphason Sonata/HR100s	27

CARTRIDGES	
To get a picture of popular cartridges we asked dealers to name best sellers in three 'compatible' price categories.	
Budget – Up to £35	
Audio Technica AT95E	88
Linn K5	69
Audio Technica AT110E	51
Arcam, ARC77	28
Goldring Epic II	24
Mid Price £35 – £99	
Linn K9	83
Audio Technica AT-F3	43
Rega Ellys	30
Goldring G1012	26
Arcam P77	23

Cartridges £100+

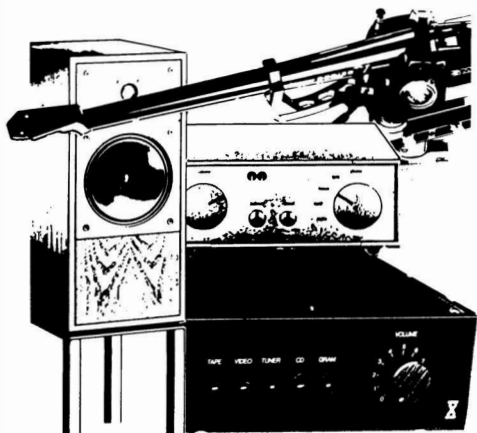
Audio Technica AT-F5	86
Goldring Eroica	53
Audio Technica OC7	52
Linn Troika	51
Linn K18	49

Market Response is compiled with the help of a random selection of specialist dealers up and down the country. The topic complements the main reviews but concentrates on different criteria such as reliability. The aim is to give readers a distillation of many dealers' views and experience with turntables and we have replies from 40 dealers covering 35 brands of turntables. We don't pretend the picture is totally accurate but specialist dealers don't always represent the mass market. On average the dealers we have spoken to offer just five brands of turntable – and rather than representing restricted choice this would hopefully mean that they know more about the character of the record deck they are selling.

PARTICIPATING DEALERS

Our thanks to the following dealers.

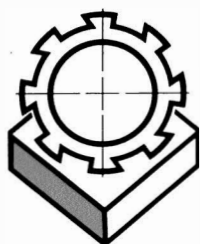
Aerco Audio, Woking, Surrey.
 AT Labs, Enfield, Middlesex.
 Aston Audio, Alderley Edge, Cheshire.
 Audio Insight, Milton Keynes, Bucks.
 Audio South, Farnham, Surrey.
 Avon Hi-Fi Ltd, Shrewsbury, Shropshire.
 Basically Sound, Bracon Ash, Norwich, Norfolk.
 Beaver Hi-Fi, Liverpool.
 Better Hi-Fi, Liverpool.
 Brentwood Music Centre, Essex.
 Chew and Osborne, Saffron Walden, Essex.
 Cloney Audio, Blackrock, Co Dublin, Eire.
 Doug Brady Hi-Fi, London WC2.
 Elite Hi-Fi, Harrogate, N. Yorks.
 Francis of Streatham, London SW16.
 Gilson Audio, Middlesbrough, Cleveland.
 Goodrights, Preston, Lancs.
 Grahams Hi-Fi, London N1.
 Holborn Hi-Fi, Aberdeen, Scotland.
 Horns Ltd, Oxford, Oxon.
 Listen Inn, Northampton.
 Lyon Audio, Stanway, Colchester.
 M. O'Brien Hi-Fi, Wimbledon, London.
 Newbury Audio, Newbury, Berks.
 Nottingham Hi-Fi Centre, Nottingham.
 Now That's Hi-Fi, Portsmouth, Hants.
 Paul Green Hi-Fi, Bath, Avon.
 Peter Russell's Hi-Fi Attic, Plymouth, Devon.
 Pro Musica Ltd, Colchester, Essex.
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 The Audio File, Bishops Stortford, Herts.
 The Cornflake Shop, Windmill Street, London W1.
 The Listening Rooms, London SW5.
 The Music Room, Glasgow, Strathclyde.
 University Audio, Cambridge.
 West Midlands Audio, Worcester.
 Westwood and Mason, Oxford.
 Zeus Audio, Dungannon and Belfast, N. Ireland.



XERXES

This remarkable player is being constantly refined so that it is now better (and better value) than ever; but for the first time in over a year, Roksan have announced a major improvement.

The new power supply offers advantages in pitch accuracy and detail resolution that have to be heard to be believed and the overall effect is that the music is simply more solid and believable than ever before. The new unit is supplied as standard with current players and is an essential upgrade for all Roksan owners. Bring in your existing power unit and we will fit the new circuitry, fully test the unit and return it to you in a matter of hours. Please ring to confirm availability as we are sure that demand is going to be huge. Provisional cost is a very reasonable £150 including fitting.



ROKSAN

DARIUS

This unique loudspeaker is being constantly improved and the latest models, with separate mono cross-overs are spectacular. A more conventional type of floor stand will allow this loudspeaker to fit into more homes than ever.

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 Ⓞ DENON Ⓞ CREEK
 Ⓞ AUDIO TECHNICA



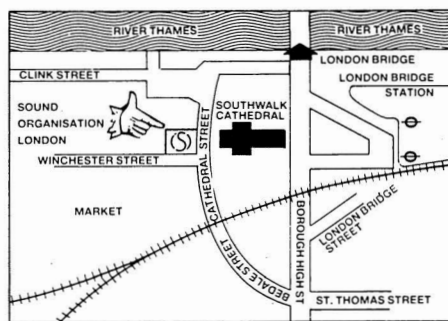
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The equipment we sell is chosen on its ability to play music, rather than on specifications, or its ability to get good reviews. If you want to buy "flavour of the month" products we suggest you look elsewhere.

Dogma plays no part in our choice of stock and we are not politically tied to any one brand. We do however limit choice a little, by carrying out thorough preselection. If it doesn't sound good, we won't sell it! If another dealer recommends something we won't stock, get him to make it sound good, before you ask us for comment.

To ensure that equipment is properly set up and thoroughly warmed up, we feel it is essential that full demonstrations are carried out by appointment. However, if you just wish to look around and get a feel for us and the type of equipment we recommend, please feel free to visit at any time.



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TABRIZ

Not one, but two new arms from Roksan. If everything goes to plan, these arms should be available about now, but initial supplies are bound to be limited.

Using techniques originally developed for the superb Artemiz, The Tabriz is expected to appear in two different versions although both arms share common points such as an Artemiz style one piece arm tube.

The simpler model has a conventional counter weight and provides an excellent 'entry level' combination with the Xerxes. The more advanced model includes an Artemiz type 'Intelligent Counter Weight' and special arm wiring and interconnect lead. Prices are not yet fixed but it is expected the cheaper model will be under £200.

ARTA-XERXES

Rarity value alone should make this new unit worth investigating. It is a dedicated phono pre-amp, specially configured for the Shiraz cartridge and fitting inside the Xerxes.

The Shiraz produces a very high output for a cartridge of its type and many input stages simply cannot handle the level, but the Arta-Xerxes handles it with ease and produces a flat, line level signal that feeds straight into a high level input, totally overcoming the distortion problem. Not a new idea of course but surely the first designed to improve upon a dedicated m/c input.

A release date has not yet been confirmed but we shall have this unusual unit on demonstration as soon as it is available.

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CHOOSING AND USING . . . RECORD PLAYERS

Richard Black states the case for vinyl records, outlines the problems inherent in replaying them, and pinpoints what to listen for when choosing a turntable.

I could hardly write an introduction to this month's batch of turntable reviews without first raising the question, "Why bother with LPs at all in these days of Compact Discs' technological perfection?" Allow me to dispute this 'perfection' business. First point (trivial): perfection is impossible, period. Second point (arguable, strongly): when the LP and CD systems are judged on the merits of their respective sound quality potential, at present LP has distinct advantages for a significant number of listeners. This fact alone (and it is a fact, not an opinion) makes LP an important music carrier in the context of real high fidelity.

Another fact, that the number of LPs and LP players in existence in the world is little short of astronomical, lends further weight to the argument for preserving LP alongside CD. Wishing to uninvent CD is naive and wishing to abolish LP is likewise. Can we have a little reason around here please? The argument does seem to have deteriorated a little recently.

Having established that LPs remain worthy of attention, one may reasonably ask just how far it is worth going in developing playback systems for them. The answer seems to be a remarkably long way. After all, although people have been working at it for several decades, the rate of improvement in quality of disc replay has arguably never been greater. What's more, the 1980s have seen considerable activity in 'audiophile' record production, with many specialist companies taking recording quality as seriously as hi-fi enthusiasts do their replay equipment.

Being an avid collector of recordings from the dawn (almost) of recording to present day releases, and also having been closely involved with some 'audiophile' recordings, I strongly recommend putting considerable effort into the accurate replay of all records – be they 1980s 'supercuts', 1930s electrical 78s, or 1900s acoustics.



WHY SPEND?

What, then, is the crucial difference between the typical mass-produced 'autochanger' and the rather more refined works of engineering art reviewed in this month's issue of *Hi-Fi Choice*? What essential design features make £2,000 worth of exotica extract more information from a record than did the 12 ounce wonder on the top of your first stacking system?

Cartridges not being the subject of this month's reviews, let us assume for now that a given cartridge tracks the groove cut in a record pretty much perfectly (not necessarily a valid assumption!). The signal produced by the cartridge is proportional to the velocity of the stylus, relative to the cartridge generator assembly. As the stylus is tracking the record groove, and if the cartridge is reasonably well made, the signal is proportional to the relative velocity of the groove modulation and the cartridge body. The £2,000 'superdeck' simply introduces less spurious movement between

the record and the cartridge than the cheap moulded plastic gadget. Spurious movement causes some sort of distortion in the signal, corrupting it and masking subtle details.

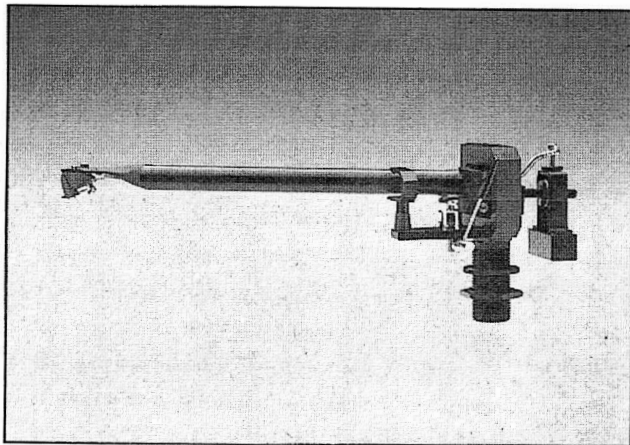
How might such spurious movement arise? One important way is that the act of pushing the stylus to and fro imposes a force on the record, and if the record is not completely restrained this force moves it a little way from where it should be – hey presto, spurious movement. Then again, the stylus is attached to the cartridge via a springy mount, and moving the stylus imparts a small force to the cartridge making it move slightly – more spurious movement. The other main sources of movement are mechanical rumble in the turntable drive system imperfections, and externally-induced vibration. The extent and nature of the movement due to each cause determine the sound characteristics of a record player.

Turntable design (and I include arms under turntables,

for present purposes) is basically a matter of eliminating spurious movement, or, since that is not strictly possible, reducing its manifestations to what one might deem an acceptable level.

Because of considerations of record equalisation, hearing sensitivity and ancillary equipment behaviour, not all types of movement are equally destructive. For example, one micron of oscillation at 2Hz is probably negligible, while one micron of oscillation at 2kHz certainly is not. In fact in the most sensitive frequency band – around 2kHz to 10kHz – spurious movement should be kept to the order of one atomic diameter, less than one thousand-millionth of a metre! Ideally, anyway . . .

Two factors get in the way of realising the 'perfect' turntable design. One can be broadly categorised as 'real world considerations', the other is the speed of sound. The first includes annoying little things like cost, feasibility of manufacture and use etc. while the second puts a basic limitation on the



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usefulness of strong members intended to restrain two or more points relative to each other. If a cartridge is supported by an arm 23cm long, considered restrained at its bearing, the maximum frequency at which the cartridge can be said to be restrained by the arm bearing is determined by the speed of sound in the arm. When the wavelength of sound vibrations in the arm approaches the length of the arm, the arm becomes floppy.

Even worse than being floppy, the arm tends to become resonant – that is, standing waves with a wavelength equal to sub-multiples of twice the length of the arm can be set up. This means that at certain frequencies the arm behaves quite differently towards the cartridge than at other frequencies, and this is what gives the arm its particular 'sonic character'. Instead of holding the cartridge still, once it is excited (by vibration originating from the cartridge, due to record groove modulation at an appropriate frequency), the arm tries to wave the cartridge around. Clearly this is not what we want.

A similar argument applies to any other part of a turntable be it platter, subchassis, or whatever. Each component has not one but many 'resonant modes', any of which may cause spurious movement under certain circumstances between cartridge and record. There are two options in combatting this: put up with a certain amount of resonance and try to place it in areas of the acoustic spectrum where it's not so audible, or apply damping of some sort. In practice, both measures are usually used to some extent.

All manner of apparently different approaches can be used to damp out vibration before it becomes a problem, and all kinds of materials used in the construction of record players – everything from light but rigid Aerolam (a costly aluminium honeycomb sandwich material) to lead sheet. No design solution is perfect; some are more successful than others. Of course, some products (intentionally or otherwise) actually use resonances to derive a particular sonic character or mask some flaw.

So what does all this resonance mean for you, the purchaser? Resonances and

rattles manifest themselves in different ways, and different people are more or less sensitive to them. What is more, preventing them is difficult and costly, hence the high price of the best record decks. When you audition a record player, it's worth listening for any particular resonant sounds; notes or frequency bands which, whatever the recording, seem to be unduly prominent, perhaps giving a characteristic 'thud', 'honk' or 'screech' to the player depending on frequency. If you notice any, you may well find the deck fatiguing to listen to over long periods. If you don't notice any, there are probably still some there but they happen to be less obvious to your pair of ears.

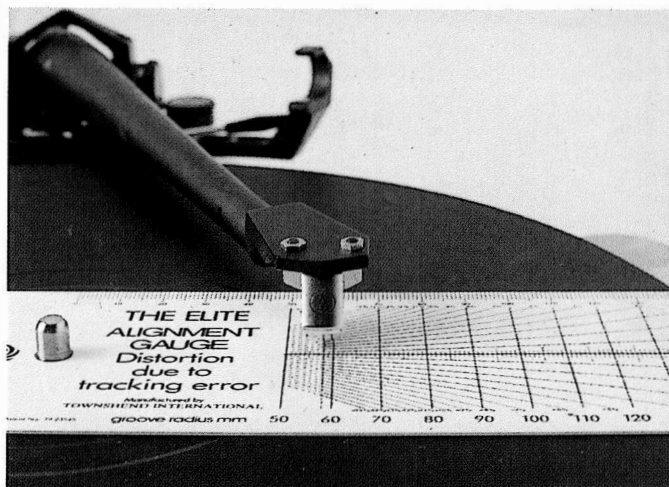
The other things to listen for are clarity of fine detail, 'attack' on transient notes (pianos, drums and the like), and stability of sound and image. Resonance is not the only evil of record decks, of course, and problems with drive systems (wow and flutter, or rumble) and feedback (resonance-related) may also irritate.

Space – by which I mean the whole of this issue of *Hi-Fi Choice* – does not permit a full discussion of how and why record players work. I have only tried to outline some areas of particular importance. Imperfections are often subtle, and can show up in peculiar ways, and I've tried to mention some of these in the appropriate reviews.

DON'T WASTE YOUR DECK!

Clearly it is worth making a few points about how to get the best from a record player. One of the most important things to do is to set up the cartridge correctly. End-of-side distortion is a real bugbear if you haven't done this, and almost negligible if you have. Use a decent alignment gauge or protractor (such as the *Elite Alignment Gauge* free with *Choice*, issue No. 67) and take a lot of care. You only have to do it when you change the cartridge, after all.

It is also most important to keep the stylus, and your records, scrupulously clean, and always handle records with great care. The majority of stylus and record cleaners work just fine. Finally, but of no less importance, you need to put the turntable somewhere suitable. Coffee tables and the like may be OK, or they may send masses of



structure-borne feedback right into the system – it all depends on the deck. Wall-mounted shelves are often an ideal solution, while various isolation bases also exist and are readily available from specialist retailers. I use a home-made platform constructed from concrete paving slabs and lead sheeting, supported on a car tyre, but it's a bit ugly and most people probably wouldn't give it house room! Whatever you use, keep the deck absolutely dead level.

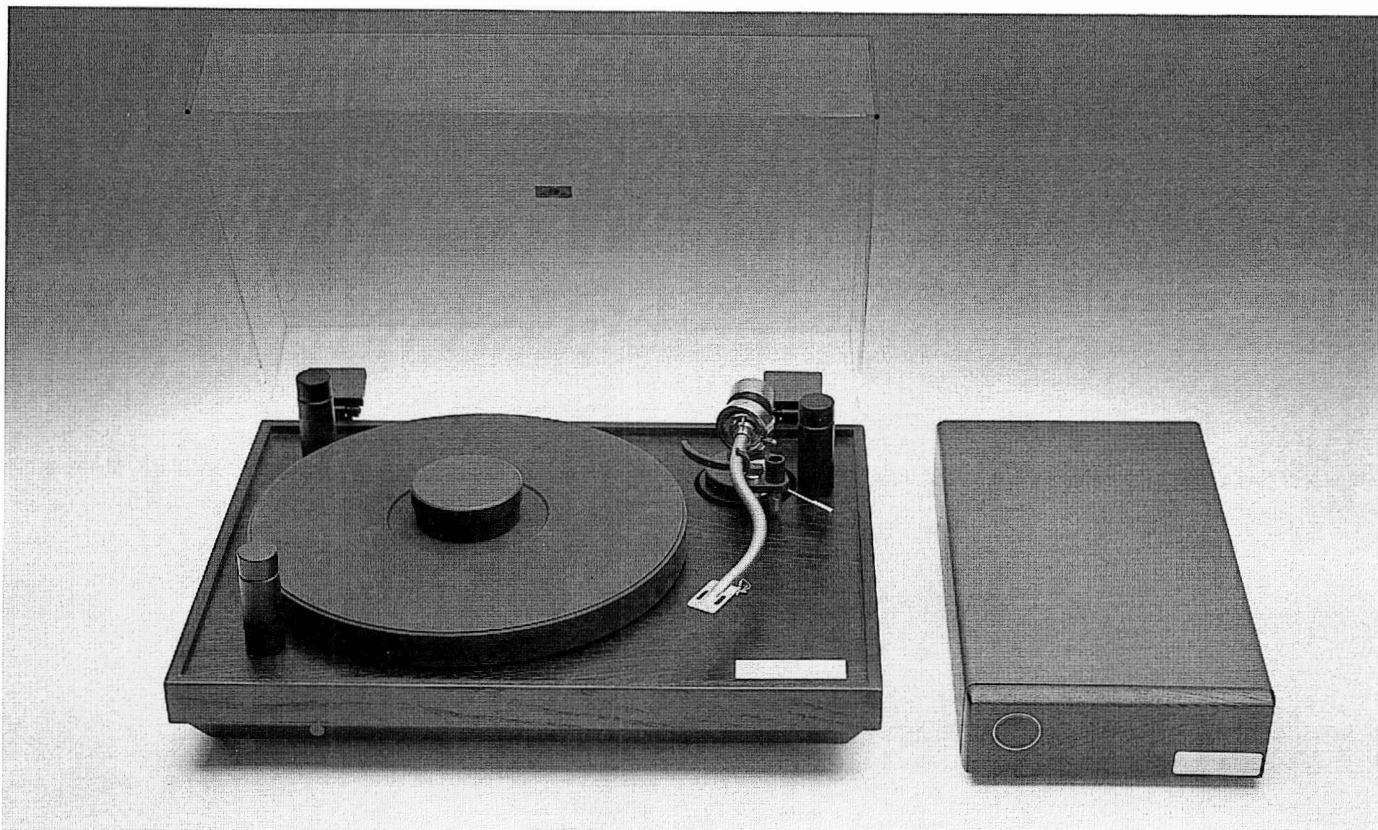
Using a good cartridge is always worthwhile. Some of the really cheap models are a bit gruesome, but for under £20 there is plenty of choice in decent transducers, and some really gorgeous models above £100. All of the decks reviewed here will benefit from at least £50-worth of cartridge, suitably chosen.

I would love to be able to tell you what to buy, it would make life so easy! But there are just too many variables. Find a good dealer, take along a good pair of ears and a couple of well-loved LPs, and enjoy listening.

Correct cartridge alignment is critical for optimum performance (top), while all decks will benefit from a stable platform (below). Shown here is the Appolo AT1 (£55) which has adjustable spikes top and bottom for accurate levelling.

ALPHASON SONATA/HR-100S MCS/ATLAS

ALPHASON DESIGNS LTD., UNIT 2, LINSTOCK WAY, WIGAN RD., ATHERTON, LANCS M29 0RL. TEL: (0942) 897308.



Since its review in *Choice* the Alphason *Sonata/HR-100S* combination has been upgraded by the addition of the (optional) *Atlas* outboard power supply unit, so a re-try seemed appropriate.

From experience with similar power supplies, I vaguely knew what to expect in the way of improvements to the basic deck, but was eager to try the *Sonata* which was new to me. Imagine my frustration then, when the deck took something like twice as long (about an hour) to get up and running as most of the other decks in this month's test group.

In fact my only serious reservation regarding the *Sonata* is to do with setting up. The instructions looked promising with photographs to illustrate the process, but turned out to be not much better than average. Packaging is very good – at least the first time round; repacking for transport is not quite so easy. The main problem is fitting the belt which is a real hassle, involving bent bits of wire (supplied), preferably an extra pair of hands, and a certain amount of luck to get the belt over two motor pulleys and the underneath of the platter. It's also very difficult to check whether the belt is in fact going where it should, and if one has to lift off the platter to reposition the belt, the latter is liable to jump into areas around the bearing where, almost inevitably, there will be drops of oil. That apart, the job is not too arduous and suspension adjustment from above is a good deal more user-friendly than with many other decks. Setting up the *HR-100S* arm is a

perfectly straightforward operation.

It would seem that Alphason rates rigidity as an important parameter of record deck design. The basic member of the subchassis is a large lump of cast iron, to which are attached the main bearing well and the arm mount. This hefty component is suspended – literally – from springs in three towers which stand well proud of the deck, and which can be a nuisance when you're trying to put a record on the platter. This arrangement gives better stability than is possible with compression springs, and it's a pity it isn't matched by a more stable bearing than the geometrically conventional one fitted (ie, bearing point well below the platter).

The *Sonata's* platter is a large, solid, black item with a slightly rough top. It's made of a composite material that's designed to be as acoustically dead as possible. It is driven by the aforementioned belt from two opposed synchronous motors, the one nearer the cartridge being electromagnetically shielded to cut hum levels.

The motors are powered either by direct mains (connected via a five-pin locking bayonet connector) or by the *Atlas* power supply, using the same connector and requiring no wiring changes to swop over. This power supply is evidently a bit more sophisticated than the (almost industry-standard) 'flutterbuster' design used with many decks. Rather than using conventional capacitor-split phasing, two phases of the 50Hz signal are supplied, and accurately maintained at 90 degrees apart. This should reduce vibra-

tion in the motors to an absolute minimum. Unusually for a quartz-referenced supply, speed control is available, which is obviously a significant benefit for most users (speed accuracy of better than 0.2 per cent is desirable, this being about the limit of accuracy of a practised musical ear). It is possible to adjust the speed at which the deck runs, but on the review sample the adjusting screws had slipped away from the holes in the case intended to provide access.

The *Atlas* is neatly housed in a large grey case with rounded corners and a chunky on/off switch – it's surprising how many good products are let down by cheap-and-nasty-feeling controls. This one actually looks and feels like a high-end product.

Alphason supplied this deck with the *HR100S-MCS* arm, and we thought it would be worthwhile to re-evaluate this component as well. This top of the range arm is an S-shaped device that's nicely finished in matt silver, and uses double gimbal bearings. The armtube and headshell are fabricated out of the same piece of titanium, a material that has a good strength – and stiffness-to-weight ratio. The counterweight locks on to a thimble on the back of the arm which is screwed in and out to adjust tracking in very fine increments of 0.25g per revolution. Bias is applied by a thread and weight arrangement which seems a rather weak feature as the weight slides up and down in a tube and any friction could upset bias force, and also because it's possible to accidentally catch the thread with your finger when raising the

arm and thus upset the bias setting without noticing it. However, all that is really required is care in setting up and use in order to avoid these pitfalls.

ON TEST

It was well worth the trouble of setting up the *Sonata*. Initial listening was done without the *Atlas* PSU and it rapidly became clear that the *Sonata* was going to do well. Clarity, detail and dynamics all seemed good and the frequency range gave no feeling of limitation. The 'master tape test' showed the *Sonata* to be pretty much on a par with or better than other decks in this price range.

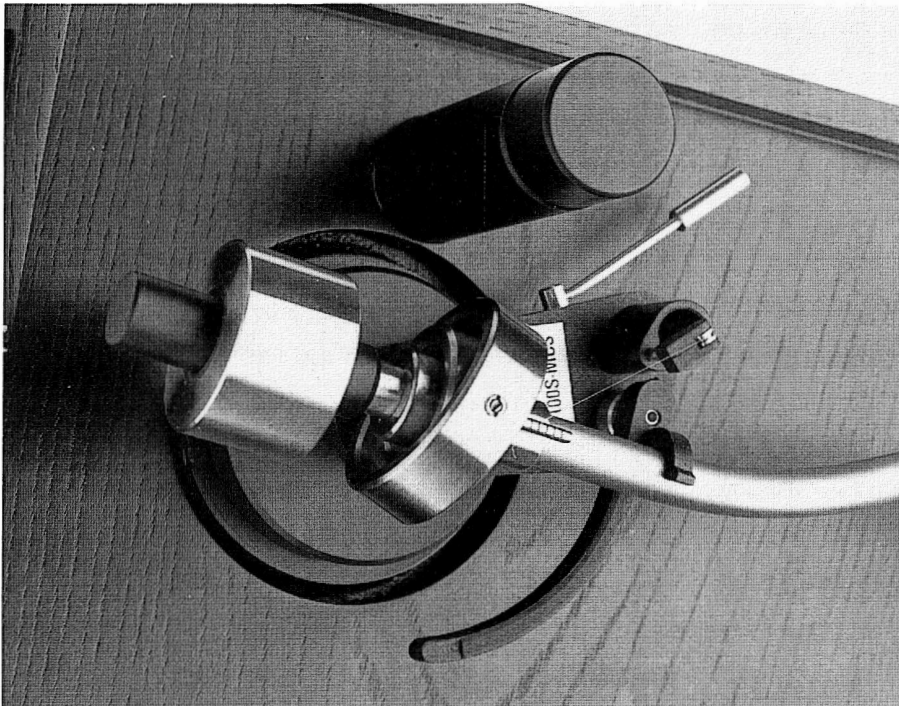
The *Atlas* changed all that. The benefits of conventional power supplies on similarly-driven decks are quite familiar, but this one is worth the extra expense, make no mistake. The sound is brought into focus more clearly and there's a better sense of what the Americans call 'intertransient silence'. True bass

weight and power, only marginally lacking without the *Atlas*, are brought out better than ever, and detail over the entire bandwidth is improved.

The measurement results on the *Sonata* are all exemplary, with or without the *Atlas* (those printed include the *Atlas*). Note the excellent acoustic breakthrough plot, which is partnered by very low shock and vibration breakthrough. The *HR100S*, with its sharply coloured spectrum, is puzzling; tapping it gives a very obvious tuned note, but it doesn't seem to be objectionable in use. Maybe more internal damping would improve it even further.

CONCLUSIONS

With a good partnering arm this is a very fine deck indeed. Its performance is lifted into the top flight by the *Atlas* outboard power supply, and the whole package is confidently Recommended.



TEST RESULTS

MOTOR SECTION

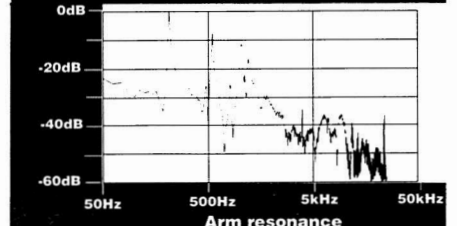
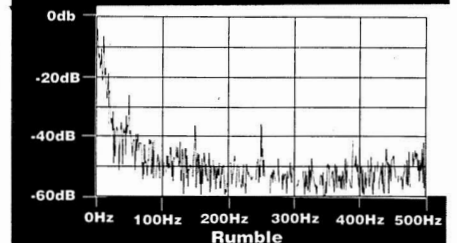
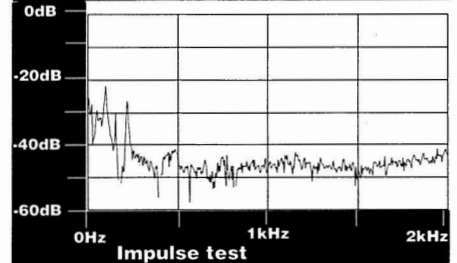
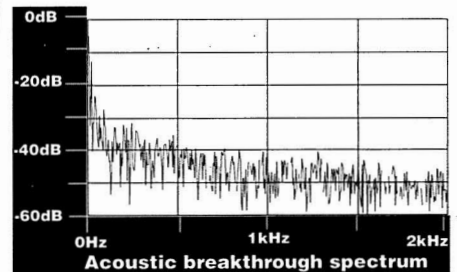
Type	manual belt-drive, 2 motors
Platter type	composite, solid
Build and finish	very good
Mains connection	connector for PSU or mains lead
Speeds	33/45rpm (45 with PSU only)
Wow and flutter (DIN wtd)	0.05%
Speed error	-0.2% (PSU as supplied, variable)
Start-up time	4s
Rumble (DIN B wtd)	-76dB

ARM SECTION

Approx effective mass	13g
Type	detachable, Linn geometry
Adjustments provided	height, overhang
Build and finish	very good
Ease of set-up/use	good
Friction approx, lat/vert	<20mg/<20mg
Bias application method	weight and thread
Bias force rim/centre (1.5g ellipt)	180mg/170mg
Downforce calibration error (2g)	0
Cue rate up/down	instant/5s
Arm resonances	moderate
Arm damping method	none

SYSTEM AS A WHOLE

Size (h x w x d/clearance for lid)	155 x 445 x 360mm/75mm
Ease of use	good
Acoustic breakthrough	good
Hum level	good
Vibration breakthrough	very good
Shock resistance	good
Subjective sound quality of system	very good
Typical price inc VAT	£720/£480/£340

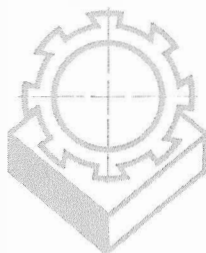


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BEST BUY



Who says the British can't produce budget hi-fi that is competitive on grounds of ergonomics and looks – sound apart – with German and Japanese product? Ariston (OK, Scottish) says it can and in support of this claim has recently added the *Icon* to its range. Supplied with its own arm but without a cartridge (at first one was fitted but Ariston found that almost everyone was rapidly upgrading it), the *Icon* is a deck that could well be used as the basis of a mid-price separates system or as an upgrade to a true budget set-up.

The *Icon* looks like most other 1980s' record decks – basically black on black, but quite nicely set off with the Ariston logo and subtly distinctive with its sloping platter edge. Construction is based on a true three-point suspended subchassis using conical springs without damping, and since the arm is factory-fitted it has been possible for Ariston to set up the suspension at the factory and simply lock it up for transport with one transit screw. All the user has to do, therefore, is fit the platter into the bearing well, locate the belt and fit a cartridge. Height adjustment is not provided, so the deck should sit on a level surface.

The platter is cajoled into rotation by a small DC motor, and to supply this with current without introducing a transformer into the deck Ariston has opted for an outboard power supply. Since there is a convenient low voltage supply on the deck, Ariston has taken the user friendly step of making the *Icon* semi-automatic in operation. When the arm is swung over a record, a magnet attached to the arm base operates a reed relay which starts the motor. At the end of an LP side another reed relay energises a solenoid which lifts the arm and turns off the motor. The only problem with this arrangement is that after the arm has been swung back to its rest position the manual arm-lift lever is down, and if it's not

raised there's a chance of hitting the record with the cartridge or stylus next time one plays a record. However, apart from this oversight, operation of the deck is good. The arm seems well made, although the bearings feel slightly sloppy – or is it give in the arm mount?

ON TEST

Any budget design involves compromises. Some cheaper turntables sacrifice looks, some concentrate on a particular sonic aspect and put up with flaws elsewhere, some look gorgeous and skimp on sound-influencing aspects. Ariston seems to have tried to spread the compromises as widely and therefore as thinly as possible, and has made the *Icon* the sort of deck that is unlikely to grab attention instantly but which grows on one with familiarity. Sound quality could perhaps best be described as 'a taste of the real thing'; not, and not pretending to be, a poor man's... *Reference* (insert manufacturer's name to choice!), but possessing many of the virtues of the finest decks around, only in smaller quantities.

The *Icon* recovers detail well, it has a nicely integrated frequency range and, importantly, it does not have the 'shout' that may well sell equipment at hi-fi shows but induces headaches after a couple of hours. An extended selection of favourites played on the *Icon* gave me no feeling of having missed out on something in the music, nor of a desire to turn it off. Resolution and clarity are good, and transients are handled with a control that extends to high levels without strain. The test results are reassuringly free of danger signs.

CONCLUSIONS

Ariston has managed to produce a very competent and satisfying turntable in the *Icon*, which at the price deserves to be rated a Best Buy.

TEST RESULTS

MOTOR SECTION

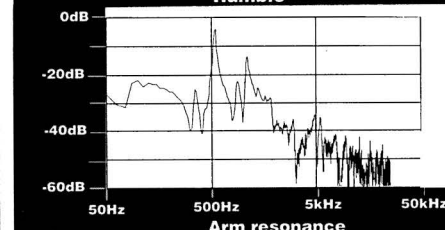
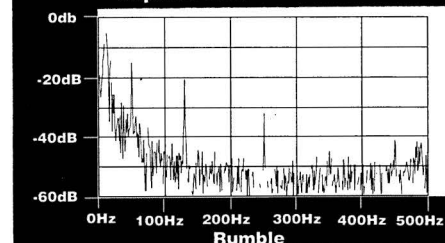
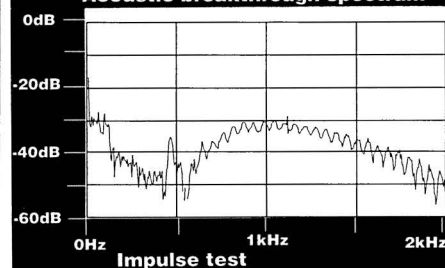
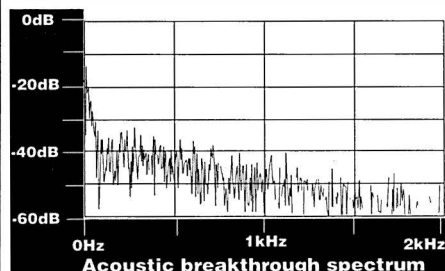
Type	semi-automatic, belt-drive
Platter type	cast metal, solid rubber mat
Build and finish	good
Mains connection	plug-in lead from adaptor
Speeds	33/45rpm
Wow and flutter (DIN wtd)	0.06%
Speed error	+0.2%
Start-up time	1.5s
Rumble (DIN B wtd)	-73dB

ARM SECTION

Approx effective mass	10g
Type	fixed
Adjustments provided	tracking force, bias, overhang
Build and finish	good
Ease of set-up/use	good
Friction approx, lat/vert	25mg/30mg
Bias application method	calibrated knob
Bias force rim/centre (1.5g ellipt)	250mg/220mg
Downforce calibration error (2g)	0
Cue rate up/down	instant/3s
Arm resonances	good
Arm damping method	none

SYSTEM AS A WHOLE

Size (h x w x d/clearance for lid)	130 x 410 x 335mm/70mm
Ease of use	very good
Acoustic breakthrough	good
Hum level	good
Vibration breakthrough	very good
Shock resistance	good
Subjective sound quality of system	good
Typical price inc VAT	£215



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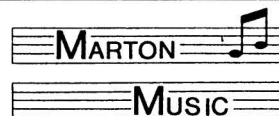
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John Bamford - Hi-Fi Choice, December 89

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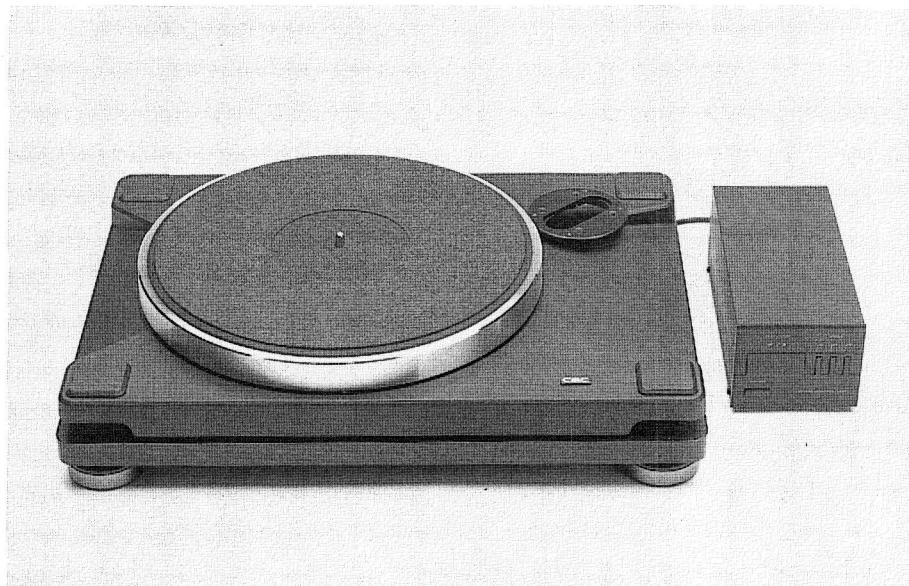
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RECOMMENDED



The *ST930* is one of four CEC decks from Japan imported into this country by Zenonlec, the other models consisting of a real cheapie, a slightly more expensive budget deck and a 'disco special'. The *ST930* was supplied with an armboard cut-out for SME arms and was reviewed using the SME *309* (also in this issue).

As one expects of Japanese product, finish and packaging are excellent, and instructions are fully adequate for the very simple setting-up involved. The main bearing needs no adjustment, and the four captive transit bolts are easily accessed from the top of the deck. The cast and machined alloy platter is a taper fit on the spindle, and the belt is fitted by reaching through one of the holes in the platter. This deck uses a two-layer rubber/fibre mat, which looks like felt but apparently includes stainless steel and silver fibres!

CEC makes great claims for its motor, a DC servo type which is reckoned to give great speed stability and freedom from cogging. Power is supplied by an outboard supply which also selects speed – 33, 45 and even 78 rpm. The suspension is composed of four spring/damper assemblies, one at each corner of the unit. The plinth is in what appears to be a rosewood veneer, the sub-chassis is black and the platter polished bare metal. A dust cover in smoked polycarbonate plastic is an optional extra.

ON TEST

Although the deck is obviously well made, it's not very reassuring that the main bearing has noticeable play, and that the subchassis is not that acoustically dead when struck. It was therefore a pleasant surprise that the sound produced had such unusually good clarity and focus. Because so many turntables smear the sound slightly it is all the more noticeable when one comes across one that is particularly free from this defect.

Admittedly the SME is an expensive arm, and of course arms do play an important part in the sound of record players, but no matter how extravagant the tonearm you use there are certain defects that are endemic in most record players, one of them being a slight feeling of insecurity and instability. This is a very difficult thing to explain or quantify, but is associated with *very* low wow and flutter (you get the same effect with tape decks). The CEC does not suffer from any such subjective effect, at least not by comparison with any other deck that we have tested. The manufacturer quotes a figure of 0.008 per cent (!) for wow and flutter – however, with my simple test record and W/F meter I was unable to confirm this.

Of course we wouldn't suggest that low wow and flutter is the be-all and end-all of turntable measurement, but it's difficult to find another plausible reason for the CEC's fine, 'solid' sound. The disc impulse plot is typical of a felt mat deck, not offensive but highish in level, and the other measurements are fine – but then so are those on decks that fared less well in listening tests. An arm resonance plot with the SME failed to show anything untoward either.

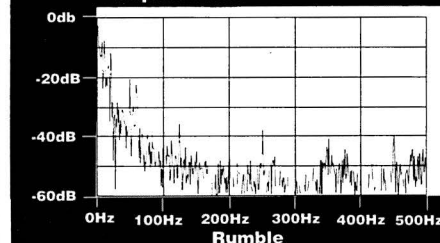
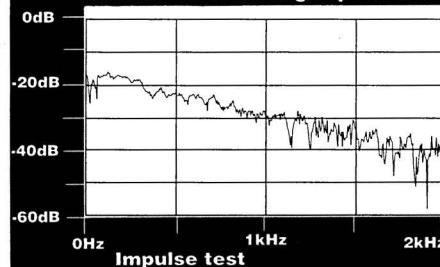
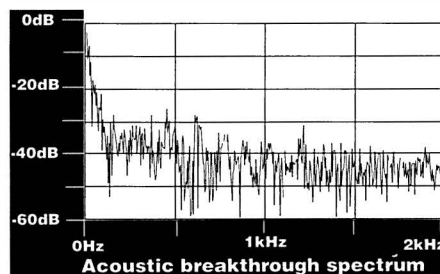
Comparisons with master tape recordings show the limitations of the CEC, such as they are – principally a slight thinning in tonal quality, but without any feeling of discrete colorations or resonances. Detail however, is very good, indeed it's bettered by few of the *ST930*'s competitors.

CONCLUSIONS

It is nice to come across a hi-fi product that is totally user-friendly (not to imply too much criticism of any other deck in these reviews, but the CEC ranks very high in this respect), well made and finished, aesthetically pleasing and aurally satisfying. The CEC is all of these and can be confidently Recommended.

TEST RESULTS

Type	manual belt-drive motor unit
Platter type	cast metal, rubber & felt mat
Build and finish	very good
Mains connection	connector from PSU
Speeds	33/45/78rpm
Wow and flutter (DIN wtd)	0.05%
Speed error	+0.2%
Start-up time	1.5s
Rumble (DIN B wtd)	-76dB
Size (h x w x d/clearance for lid)	145 x 485 x 350mm/n/a
Ease of use	good
Acoustic breakthrough	good
Hum level	good
Vibration breakthrough	good
Shock resistance	good
Subjective sound quality of system	very good
Typical price inc VAT	£599



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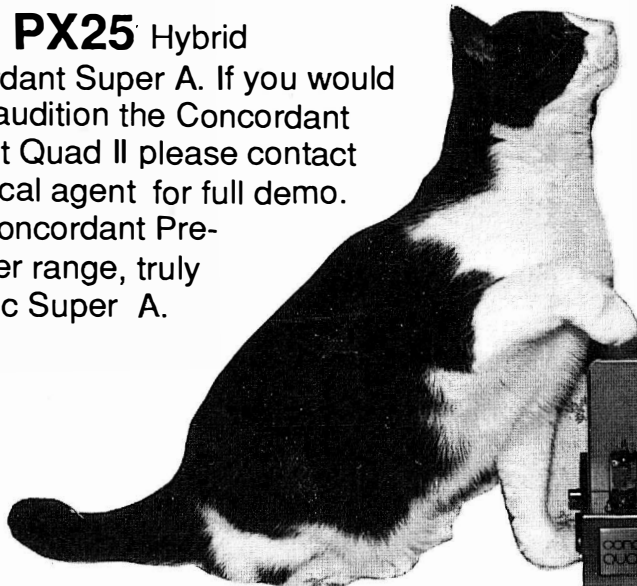
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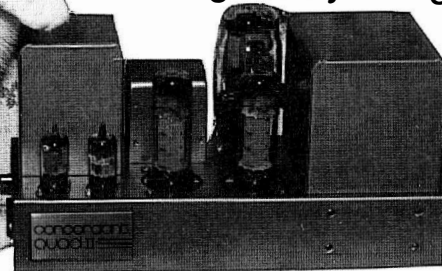
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RECOMMENDED



This after-market go-faster kit for Rega decks was reviewed as a working prototype in last year's *Hi-Fi Choice* turntables issue, but is re-evaluated here in its full production form. Actually, calling it a go-faster kit may be misleading, as it's a pretty comprehensive rebuild of the popular Rega Planar 2 and Planar 3 record players. For a few pennies short of £80, the screwdriver-happy Rega owner gets a new subchassis and plinth to change the erstwhile solid deck into a semi-suspended subchassis one.

The parts that are kept from the Rega are the motor, platter, subplatter, mat, main bearing, feet and lid. The Resan kit provides a new on/off switch, a new circuit board, all new screws and the new plinth, subchassis board and anti-vibration mounts for suspension. The job of swapping the parts from Rega to CS Audio base is described clearly and fully in the instructions supplied with the kit, and although the review Split-Slab was supplied ready assembled we would be surprised if anyone capable of putting up a couple of shelves would need more than an evening to do all the work. CS Audio has made sure that no irreversible modifications are made to any original Rega hardware, and the deck can be rebuilt as an original Rega if required – CS Audio offers a full money-back service for dissatisfied customers, of whom the company assures us there have been none so far.

The review sample *Split-Slab* was finished in colours originally intended for the German market, but which we understand will now be supplied as standard here too; the plinth is painted light grey, and the subchassis (made, unsurprisingly, of Medite, an inch thick in this case) is painted with blue-grey Nextel paint, with a bright red beading surrounding the central area. The beading is in fact a peripheral wave trap, and the central area is a pear-shaped section of board reminiscent of Pink Triangle's *Little Pink Thing*. This central area is attached at three points to the

rest of the subchassis board, and carries the main bearing and the arm. The motor is fixed to a separate piece of board, independently mounted on the plinth by more anti-vibration mounts. The package looks and feels highly professional.

ON TEST

For review purposes, the *Split-Slab* came with a Rega RB300 arm fitted. I also used an unmodified Rega Planar 3 for comparison. Sound quality of the Resan Split-Slab is a little like the curate's egg – good in parts. In fact in some areas it is in the top league of budget decks, bass being particularly fine as is resolution of detail in relatively quiet passages of music. However, with louder music and particularly in the upper midband, there is a degree of harshness, less obtrusive than with other felt-mat-and-Medite-subchassis decks I have encountered, but detectable and recognisable as an artefact of this type of construction. On the other hand it does not obscure detail too much, and seems fairly well confined to a narrow frequency band.

Comparison with a normal Rega is interesting. The *Split-Slab* has distinctly better (clearer and more extended) subjective bottom end, less harshness, considerably more resolution of detail and altogether a cleaner and tidier presentation. Measurements on the two decks confirm this, particularly measurement of acoustic breakthrough which shows distinct peaks on the Rega at around 300 and 600Hz, both attenuated by some 12dB on the *Split-Slab*. Vibration coupling is also much reduced, and several discrete resonances audible with the Rega are rendered inaudible by the *Split-Slab*'s enhanced environmental isolation. Rumble coupling is also lower by a couple of dB.

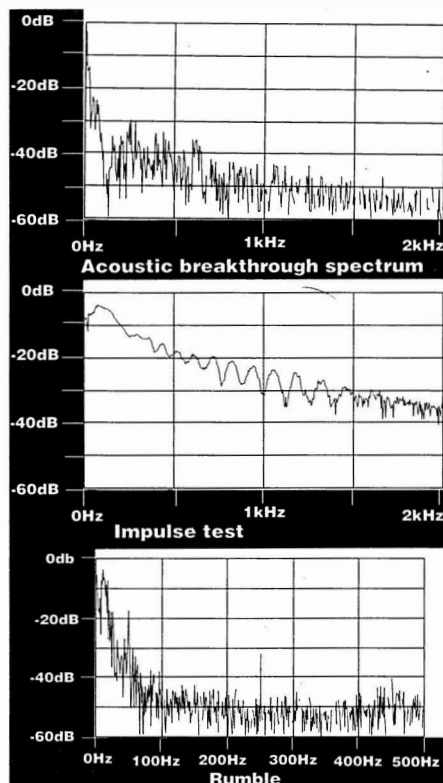
CONCLUSIONS

The Resan *Split-Slab* modification kit seems

to do a good job in tidying up the performance of the Rega, and would make a very cost-effective upgrade for owners of that deck. One could do worse than buy a Rega 2 and a kit, but bear in mind that Rega's guarantee is invalidated when the kit is fitted. A Best Buy would not be appropriate for this type of product, as its appeal is necessarily limited to audio enthusiasts on a budget rather than general consumers.

TEST RESULTS

Type	modification kit for Rega Planar 2/3
Platter type	glass, felt mat
Build and finish	very good
Mains connection	captive lead
Speeds	33/45rpm (manual)
Wow and flutter (DIN wtd)	0.06%
Speed error	+0.5%
Start-up time	3s
Rumble (DIN B wtd)	-74dB
Size (h x w x d/clearance for lid)	130 x 450 x 365mm/70mm
Ease of use	good
Acoustic breakthrough	good minus
Hum level	good
Vibration breakthrough	moderate
Shock resistance	good
Subjective sound quality of system	good
Typical price inc VAT	£80



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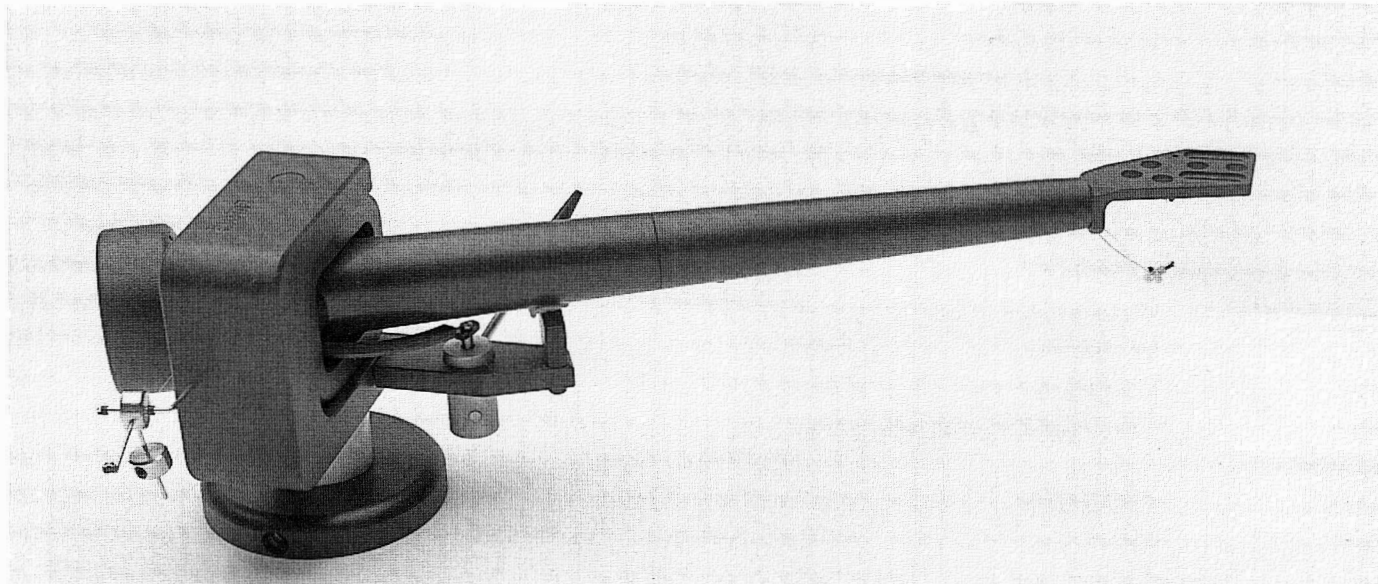
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RECOMMENDED



The Americans have a word for it: 'humungous'. The *Stogi Reference* arm could not be described as graceful, but it does have a certain purposeful air. With the aim of keeping the cartridge accurately in its place, the *Stogi* employs a large diameter tube and a truly huge yoke to carry the bearings. Despite this, the arm's effective mass is only 12g, which is only moderately high and compatible with most cartridges.

The *Stogi Reference* is based on the popular Linn-type geometry and is pretty minimalist in the assistance it offers to the user in setting up. Height is of course adjustable, cartridge overhang is conventionally set at the headshell (but the slots in the headshell for the nuts on the fixing bolts are for once strong enough to restrain the nuts without the metal crumbling), and tracking force is set by screwing the calibrated counterweight in and out on a nicely grease-damped thread. The bias assembly looks like a slight afterthought, using a pivoted lever-arm with a weight on one side and nylon thread tied to the other. This thread is fixed at its other end to the bearing yoke, and fouls the lever arm as it goes past. Bias is uncalibrated and arranged to increase towards the end of the side. (By my reckoning, for a cartridge set up with the 'Elite Alignment Gauge', bias should be based on a nominal 100 per cent – the actual value depending on cartridge – at 63mm and 119mm radius, and be +8 per cent at 146mm, -5 per cent at 82mm and +4 per cent at 58mm. Anyway, hands up all those who can hear the effect of anything less than a 50 per cent change in bias with any certainty.)

Unusually, the *Stogi* arm tube – machined, goodness only knows how, from solid aluminium – is of non-linear taper and is jointed in the middle. A grub screw can be loosened at the joint to allow cartridge azimuth to be adjusted. At the rear of the arm the precision bearings are housed in a yoke which in turn

sits on a strong aluminium pillar. The arm cable is captive. The arm tube is internally damped and the counterweight is slightly decoupled by a rubber bush between its inner and outer sections. Build quality is very high, and finish is a good quality black paint.

ON TEST

The *Stogi Reference* was tested on a *Rock*, without the damping trough (which tends to reduce differences between arms somewhat, and would make the listening a lot less representative of general practice). High expectations were not let down. Once fitted with a cartridge and carefully adjusted for VTA, it clearly had no trouble sitting still and holding on to the cartridge securely. The sound of a good cartridge on the end of a *Stogi* is apt to be clear, detailed and with excellent imaging. Complicated textures are well sorted out, low frequencies are presented cleanly and free from overhang effects, and high treble notes are kept sweet.

If there is a criticism to be made of the *Stogi Reference*, it's that sometimes the sound seems very slightly too bright, almost harsh. The effect is so slight that one might even think that other arms are softening the sound by a tad or two, but you could swear that there's something ever so subtly added to the upper midrange – possibly associated with some of the liveliness shown by the resonance plot around 5-10kHz. However, it is hardly an alarming transgression and is likely to offset the slack treble that afflicts very many LPs. That apart, the sound is highly praiseworthy in every respect. Measurements of friction etc. only go to show that the arm has been well made.

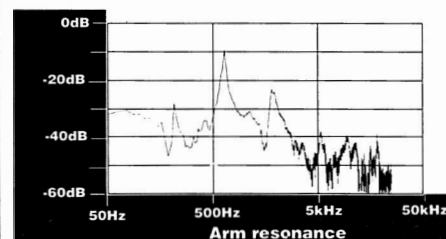
CONCLUSIONS

One small quibble about a product this good is not going to preclude a wholehearted Recommendation. The *Stogi Reference* is worthy of the finest turntables and will be

particularly well suited to those that have a slightly soft character.

TEST RESULTS

Approx effective mass	12g
Type	fixed headshell/Linn mount
Adjustments provided	height, overhang, azimuth
Build and finish	very good
Ease of set-up/use	good
Friction approx, lat/vert	<20mg/<20mg
Bias application method	lever, weight and thread
Bias force rim/centre (1.5g ellipt)	200mg/160mg
Downforce calibration error (2g)	0
Cue rate up/down	instant/3s
Arm resonances	good
Arm damping method	none
Typical price inc VAT	£699



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Now settling down as a well-established mid-price deck, the *Axis* has recently been updated with the new *Akito* arm, replacing the *Basik* and, more recently, *Basik Plus* arms. The turntable itself has undergone running detail changes in recent months. Previously the *Axis* had a *Medite* base and chipboard plinth, but now the whole structure is of *Medite*.

The *Axis* might best be described as a 'semi-suspended' design. Although the proprietary feet, which incorporate a simple but elegant silicone membrane suspension system, proffer a considerable amount of 'give', the subchassis is by no means hanging freely. Said subchassis is a piece of *Medite* board on which are mounted the arm, the main bearing and the on/off switch. The conventional bearing uses a plastic journal, and the platter is Linn's familiar two-piece design – beautifully turned and ringing like a bell. But of course it is separated from your vinyl by a felt mat.

Drive to the platter is from a synchronous motor powered by a rather clever circuit, mounted at the rear of the plinth, which gives the motor a good kick to get it going at start-up, then backs off the supply to a very low level, such that the motor is almost at the point of stalling. This ensures that motor vibration is as low as possible, and also reduces the radiated electromagnetic field from the motor. One switch selects 33, 45 or Off electronically. The plinth is finished in black ash veneer, the subchassis board in grey Melamine and there's a good quality acrylic lid.

At first glance the *Akito* could be confused with its predecessor, but is different in various respects, most obviously its Ittok-style wide diameter aluminium alloy arm tube and the fact that the calibration dial on the counterweight (now a diecast item, and decoupled from the rear of the arm) is no longer at the front but hidden around the back. It looks better that way, while the new

bearings are larger than the pin and cup arrangement used on the old *Basik Plus*. The *Akito* is an easy arm to set up and use, but it feels a little flimsy, and tapping it anywhere along its length makes a worryingly loud, high-pitched sound. Then again, it is indeed inexpensive, and important details like the bearings, which feel good, seem to have been attended to. It is also nicely finished.

ON TEST

As supplied, with a Linn *K9* cartridge fitted, the *Axis* sounded a trifle harsh and 'screchy'. Replacing the cartridge effected an improvement, but the harshness was still there. In addition, there was a strong sense of one-note bass. When tested for vibration sensitivity, a small shock applied to almost any part of the plinth results in a well-tuned 'thud' at around 55Hz, and I suspect that this is interfering with the sound and livening up the bass. Under short-term listening conditions this may give the impression of an enhancement with many mid-market systems but with loudspeakers that have a reasonably extended bass response it can become highly irritating long-term.

The measurements on the *Axis* give some clues as to its sound. Acoustic breakthrough appears to follow the vibration in peaking around 50-60Hz, with further peaks in the region of 250Hz. The arm plot shows some resonances in the 10kHz area, but at no higher level than many other arms/decks.

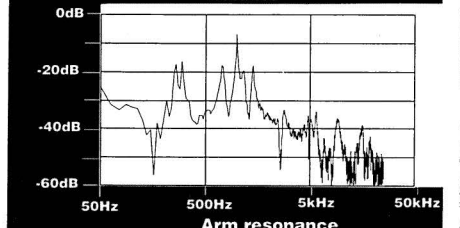
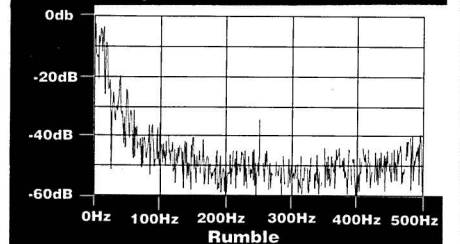
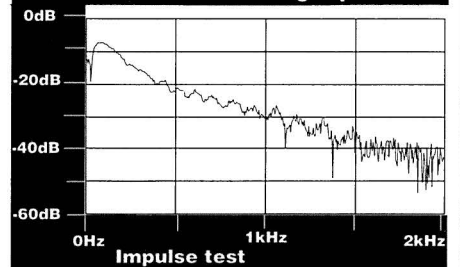
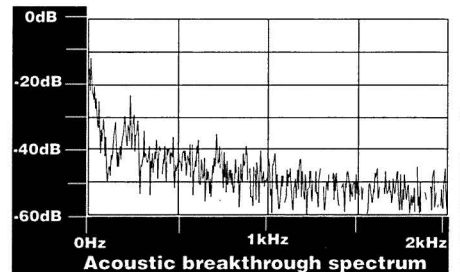
CONCLUSIONS

On sonic grounds alone the *Axis* doesn't seem to be one of the most competitive turntables around. However, it is professionally built and packaged, and aesthetics and quality of finish are undoubtedly very good.

In my system the *Axis*'s sonic limitations were clear to hear, but in a carefully matched system the deck will please some tastes and is clearly worth auditioning.

TEST RESULTS

AXIS	
Type	belt drive, manual
Platter type	two-piece metal/felt mat
Build and finish	good
Mains connection	IEC mains connector
Speeds	33/45rpm
Wow and flutter (DIN wtd)	0.06%
Speed error	-0.1%
Start-up time	2s
Rumble (DIN B wtd)	-75dB
AKITO	
Approx effective mass	10g
Type	Linn mount, fixed h/shell
Adjustments provided	overhang, height
Build and finish	good
Ease of set-up/use	good
Friction approx, lat/vert	30mg/35mg
Bias application method	calibrated dial
Bias force rim/centre (1.5g ellipt)	120mg/160mg
Downforce calibration error (2g)	0
Cue rate up/down	instant/5s
Arm resonances	fair
Arm damping method	none
SYSTEM AS A WHOLE	
Size (h x w x d/clearance for lid)	145 x 445 x 370mm/70mm
Ease of use	good
Acoustic breakthrough	moderate
Hum level	good
Vibration breakthrough	moderate
Shock resistance	good
Subjective sound quality of system	moderate
Typical price inc VAT	£399



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The *Mantra* came as thoughtfully packaged as any record deck I have seen, with good clear instructions and a mains plug (complete with 'Manticore' logo – nice touch) ready fitted. Assembly is a simple job, involving removal of a few pieces of foam rubber and then just screwing the hardboard plinth base in place.

Neatly presented in mahogany veneer (other finishes are available), the *Mantra* is fairly conventional in its style of construction. The strong steel subchassis is isolated by three springs, the platter is made of glass with a felt mat, and the drive system uses a mains-powered synchronous motor with a flat belt. The subplatter appears to be plastic, nicely turned and running on a standard style bearing. Speed can be changed by taking off the platter and swapping the belt from one pulley diameter to another – an easy enough job, but some users might consider this a nuisance. It'll depend on how many 45s you own.

The *Musician* arm, frequently (but not necessarily) fitted to the deck at the factory, is compatible with Linn type cut-outs and like the deck is a conventional design but with a high standard of construction. The bearings (ABEC3, for those interested) are arranged in an assembly cut from hexagonal bar, the sort of thing which is cost effective and at the same time not unattractive. Bias is applied by an uncalibrated dial/spring, and the whole is finished in gloss black.

Going rather against the current trend towards one-piece armtubes, the *Musician* is made in three distinct pieces. The headshell

is attached to the main tube by three socket screws, and the main tube is likewise attached at its rear end to the bearing assembly.

There has been much discussion over the years on the subject of armtubes – should they be rigid, flexible, one-piece, jointed, tapered, or what? In the light of the fact that no arm is rigid in at least the upper three octaves of audio, perhaps arm designers should adopt acoustic transmission line principles, make the tube as transmissive as possible and terminate it properly at the bearings so that vibration travels down the arm, through the bearings and into the subchassis where it's dealt with according to the deck. However, terminating an arm at its bearings is difficult, if not impossible, and there's probably a lot to be said for the *Musician's* style of construction which, although it will not prevent a certain amount of tube resonance, will provide an acoustic impedance mismatch between headshell and tube without their being so loosely connected as to rattle. In theory this could reduce very high frequency arm colorations in the sound.

The counterweight arrangement leaves something to be desired. For one thing there's no calibration, but then as one manufacturer recently pointed out – at least that means one has to set tracking force properly! More annoyingly, there's no way of locking the counterweight, which simply slides up and down the arm rear extension, restrained by the friction of two rubber rings. This wouldn't be a real problem except that with lightweight cartridges, such as the ever-

popular Audio Technica *AT-F5* I was using, the counterweight rides very close to the bearing assembly and if the arm is lifted high, the counterweight hits the bearing assembly and is made to slide back down the arm. You then have to set the tracking force all over again. A simple lock screw, or a small modification to the counterweight, could avoid this.

Apart from the aforementioned minor irritation, the arm is nice to use and feels very solid and reassuring. The turntable is also pretty easy to get on with, although the on/off switch requires a good hard poke to latch and this made the deck bounce around like crazy on my isolation table. Aesthetics of the pair are good if unadventurous. Perhaps the deck's small rubber feet could be improved, as on a slightly off-true surface it's necessary to use cardboard strips to level the deck properly.

ON TEST

I've never got on too well with glass platter turntables in the past, but the *Mantra* rather suited me. Its sound is clear and well defined, without most of the brittleness that put me off glass platters in the first place, although I did detect a trace of something in the upper treble region which grated slightly. However, the frequency range is nicely integrated and bass boom and overhang are at a low level.

Resolution of detail is also good. Comparisons with master tapes turned up no more than the usual flaws common to most record players, namely slight lack of bass weight on transients coupled with the feeling of a rather lumpy low-frequency response in the presence of sustained bass notes; not, however, to the extent of being 'one-note'.

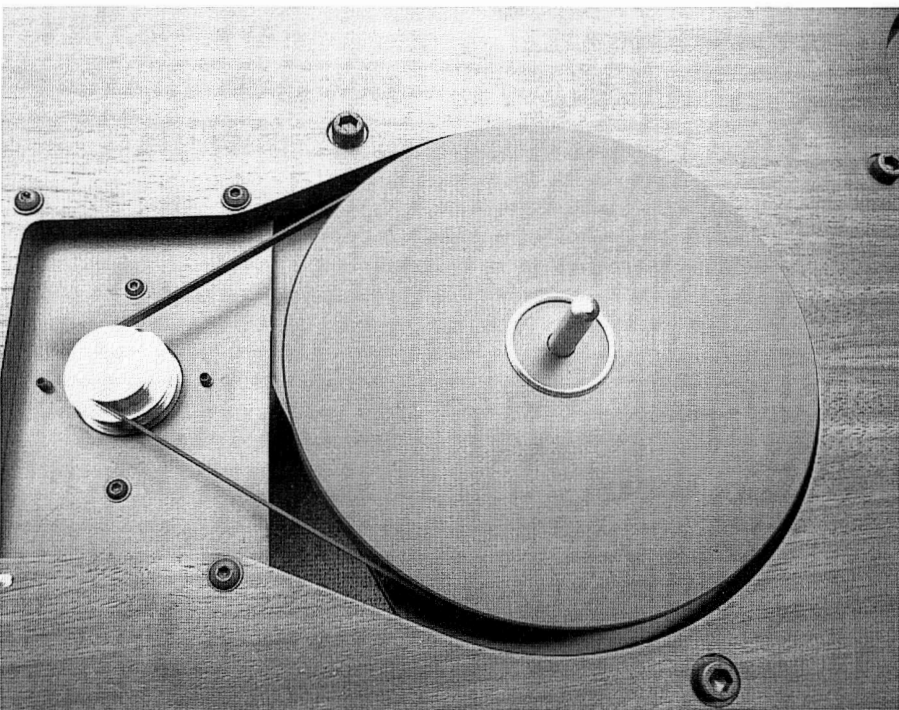
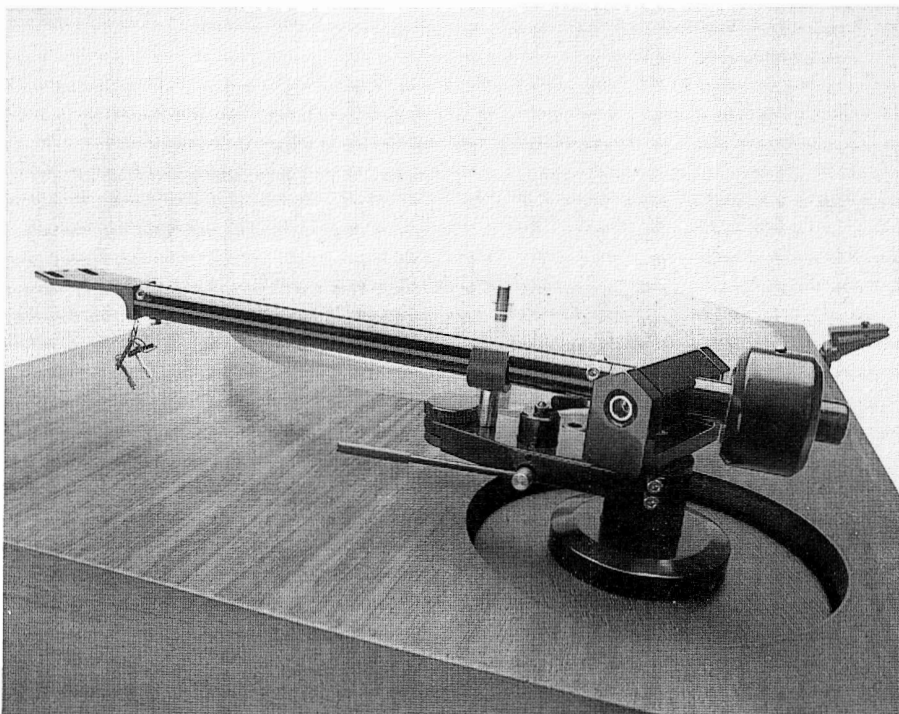
In the course of this month's substantial review project, I came to revise my opinion of the sound of arms somewhat, concluding that they have a rather more drastic effect on a turntable's performance than I had suspected. I was therefore curious to try the arm on the old Townshend *Rock* turntable which I use regularly at home, and this confirmed a feeling that the *Musician* is something of a bargain at its asking price. For whatever reason – and I would hazard a guess that the sheer standard of workmanship is part of it – this arm really seems to do the business. It doesn't sound 'rattly', nor does it impart a characteristic 'honk' to the sound, and it does provide a very stable platform for the cartridge (terminal low frequency instability in my *Mantra/Musician/AT-F5* set-up notwithstanding; a less compliant cartridge is preferable in an arm this heavy, and the Dyna-vector *DVI7D2* cartridge fared better).

As for the measurements, wow and flutter and speed are fine, and rumble is only spoiled (slightly) by some cyclical hum, hardly audible and probably a sample fluctuation. The disc impulse is typical of felt mat turntables, not as horrid as its high level might suggest since the spectrum is flat-ish. The arm is noticeably free of nasties.

CONCLUSIONS

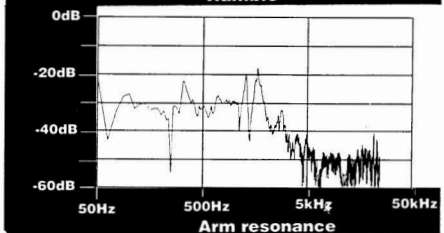
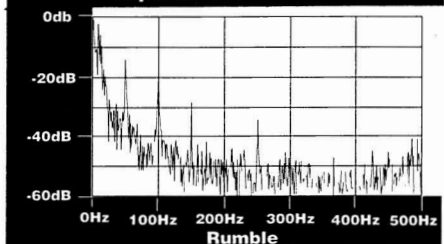
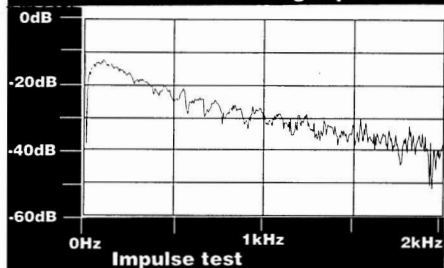
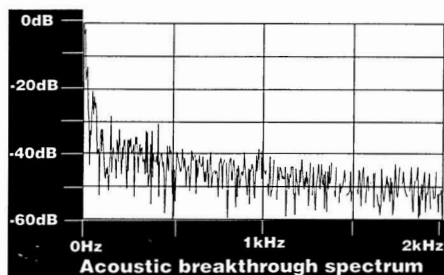
At the price, the *Mantra* and *Musician* make an attractive package which should suit those looking for a simple and effective upgrade from a budget system. Sound is quite neutral and detailed, aesthetics are pleasing, and I can't see that reliability is likely to be a problem given the straightforward design and solid engineering. The *Mantra* is Recommended; the *Musician*, Recommended with bells on.

Editor's note: just before going to press we learned that Manticore is soon to change the arm. The headshell is to be glued, along with some other detail changes, and price increased from £170 to £230. Clearly at the old price the Musician is/was a snip – and dealers' stocks are unlikely to last more than a couple of months.



TEST RESULTS

MANTRA	
Type	suspended subchassis, belt drive
Platter type	glass, felt mat
Build and finish	good
Mains connection	captive lead
Speeds	33/45rpm (manual)
Wow and flutter (DIN wtd)	0.05%
Speed error	+0.1%
Start-up time	3s
Rumble (DIN B wtd)	-71dB
MUSICIAN	
Approx effective mass	15g
Type	Linn compatible, det. h/shell
Adjustments provided	height, overhang, azimuth
Build and finish	very good
Ease of set-up/use	fair
Friction approx, lat/vert	<20mg/25mg
Bias application method	uncalibrated dial/spring
Bias force rim/centre (1.5g ellipt)	170mg/200mg
Downforce calibration error (2g)	n/a
Cue rate up/down	instant/2s
Arm resonances	good
Arm damping method	none
SYSTEM AS A WHOLE	
Size (h x w x d/clearance for lid)	150 x 465 x 375mm/75mm
Ease of use	fair
Acoustic breakthrough	moderate
Hum level	good
Vibration breakthrough	good minus
Shock resistance	poor
Subjective sound quality of system	good
Typical price inc VAT	£340 (deck)/£170 (arm)



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Not too keen on the lecture, I was, none the less, taken up by what he said, and decided to pay you a visit. This turned out to be quite an experience! After listening to a few systems I had already decided I would be buying my own combination and not the one recommended in the magazine. A MUSIC SYSTEM SHOULD, INDEED, BE LISTENED TO, BEFORE PURCHASING. In addition, the personal attention, friendly, untiring and "non pushy" attitude of your sales assistant, Jas, turned the daunting prospect of choosing the right hi-fi into A MOST PLEASANT EXPERIENCE.

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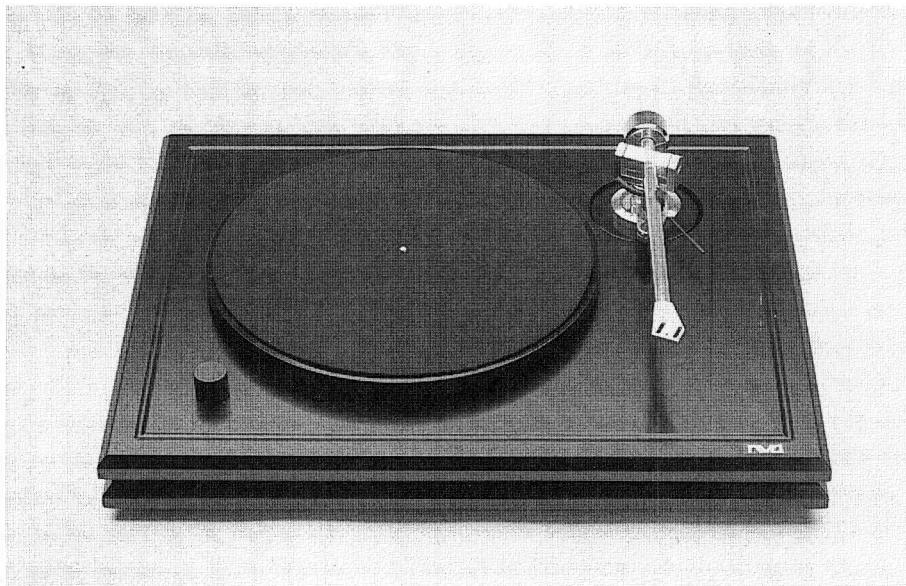
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NVA SENIOR

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People still manage to come up with new turntable ideas based on the familiar suspended subchassis design. This particular variation is a suspended subchassis in reverse, with the plinth and motor assembly suspended from the subchassis. This means that the subchassis, platter and arm are fixed rigidly to the floor, and NVA produces a massive and very strong steel stand (supplied with the review sample) to ensure that the coupled mass is as high as possible.

The baseboard of the *Senior* is a piece of Medite some 20 inches wide, on which are mounted the arm base and the main bearing; on the underside are four half squash balls for feet, should the user decide not to use the NVA stand. Also standing on the top are four springs supporting the Medite plinth which can be lifted off freely (revealing live mains wiring which should be better protected). The motor is mounted on the plinth, as is the transformerless electronic two-speed drive circuit. A flat belt from the motor drives the solid plastic subplatter, which carries a black glass platter and felt mat. The unit is very nicely finished in a semi-gloss black paint and is nicely proportioned – I'm sure it could have been made smaller and neater, but some products just look better larger and this is one of them.

Our photograph shows the turntable fitted with Manticore's latest top-flight *Magician* arm (which looks fabulous), but we had a mishap with the internal wiring so had to test the deck with the less costly (£170) *Musician* arm instead. A separate review of the *Magician* (£440) will have to wait for a future issue.

ON TEST

NVA is proud to take the attitude (surely shared by many other companies who do not admit to it), 'We make products that we want to listen to – if you don't like it, you had better buy something else'. This makes it dif-

ficult to say that NVA is wrong about any detail, after all the company obviously doesn't believe it is. However, I have to admit to some reservations about how the *Senior* presents music.

The sound is a little on the harsh side, and you can't quite escape the feeling that there's something placed between the listener and the music. In addition, the bass sounds rather peculiar – when something like a bass drum comes along, there's plenty of very low frequency information. However, when there's a continuous level of bass, for example in orchestral music with sustained double bass passages, it sounds distinctly shy and lacking, and the rest of the frequency band sounds confused. This effect was found to be worse with the NVA stand than with my home-made isolation table, although the former perhaps gives a better level of detail at lower levels.

In addition to the tests listed in our table, a spectrum analysis was run of what happens when the stand is struck, as picked up by the stylus on a stationary record. A quite loud and distinctly low-frequency sound is produced, which peaks around 100Hz but has considerable energy from 50Hz to 120Hz. A further peak exists around 430Hz.

One comes to the conjecture that this mechanical vibration is being induced by structure-borne feedback, and is producing a relatively high level of background hash around these frequencies. So perhaps the low-frequency noise causes the ear to adapt by filtering out the bass end of the spectrum, noise and music together, hence the subjective bass-lightness. This would tie in with the better bass resolution found with the isolation table, and is partly confirmed by a separate acoustic breakthrough plot taken with the stand in use, which shows increased feedback below 150Hz.

For the rest, measurements show no cause for concern except with the speed which is a

little high. Principally it's the confusion and bass characteristics of the deck that are worrying.

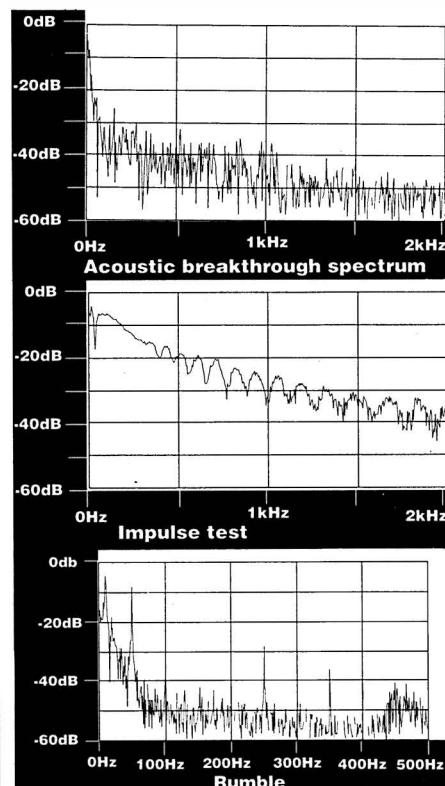
CONCLUSIONS

An idiosyncratic deck, offering some unusual solutions to the age-old problem of isolation, that may suit some tastes and systems well. As a component in a complete NVA system, the deck has been reported to be a considerable success. But assessed in isolation, the *Senior* is flawed in ways that preclude universal recommendation for use in all systems.

TEST RESULTS

Type	manual belt-drive motor unit
Platter type	glass, felt mat
Build and finish	good
Mains connection	captive lead
Speeds	33/45rpm (electronic)
Wow and flutter (DIN wtd)	0.07%
Speed error	+0.9%
Start-up time	3s
Rumble (DIN B wtd)	-74dB
Size (h x w x d/clearance for lid)	140 x 521 x 430mm/n/a mm
Ease of use	good
Acoustic breakthrough	good minus*
Hum level	good
Vibration breakthrough	see text
Shock resistance	good
Subjective sound quality of system	average
Typical price inc VAT	£450

*see text



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The *Oasis A* – 'A' stands for 'Advanced' – is the middle model of Origin Live's range, the others being the *B* (Basic), also reviewed in this issue, and the *S* (Super). Origin Live began life producing hi-fi equipment supports and stands, but has diversified into manufacturing record players, incorporating some quite unusual thinking into its designs. The company also produces an arm, the *Jubal*, which although supplied with our *Oasis A* review sample is not itself the subject of this test for two reasons: the sample arm was a bit of a lash-up, and it was subject to major revisions at the time of the review.

This particular *Oasis* model is a suspended subchassis design, the subchassis being made of welded steel box-section supported on three compression springs beneath the *Medite* plinth. Where the conventional main bearing attaches to the subchassis a number of spacing washers, apparently of *Medite* or some similar material, are employed to provide a very small degree of decoupling at the bearing mount. The bearing pin is fixed to the subplatter, an unusual item cut from fibreboard around which passes the flat belt. Drive is from a Landis & Gyr synchronous motor fixed to the plinth, and an outboard box (annoyingly hard-wired to the deck) contains a mains filter to improve the motor performance. The arm mount is rigidly attached to the 'space frame' subchassis, but the geometry is such that the whole arm and mounting assembly is liable to resonate in a vertical direction, little or no damping having been applied anywhere in the *Oasis A*'s construction. Rather alarmingly, the suspension springs creak if the subchassis is moved up and down by hand, and its motion if prodded is far from pistonic.

Possibly the most unusual-looking part of the *Oasis A* is its platter, which is a black item made of a 'plastic derivative' (PVC, I think). Plastic platters aren't in themselves news, but this one is a rather peculiar shape,

being substantially cut away underneath and only a few millimetres thick near the centre. If held up and tapped gently it is fairly non-resonant but does produce a good bit of sound.

Finish is not the deck's strong point. The plinth is quite nicely painted black, but doubtless many will consider its shape unattractive, and providing the turntable with three screw-heads for feet seems little short of cheapskate. The hole in the plinth where the arm mount comes through is larger than it needs to be and affords a view of the industrial-looking innards. The lid surmounting the unit is of dark polycarbonate which looks both substantial and quite attractive, but it rings when struck.

ON TEST

The *Oasis A* produced rather inconsistent results depending on siting and programme material. An Origin Live stand was supplied with the turntable, but in my home set-up this seemed to add more bass coloration – presumably feedback-induced – and I did most of the listening with the deck on my own isolation base.

The sound of the deck has a tendency to be coarse and confused, in both loud and soft passages. With rock'n'roll, the *Oasis A* can be quite an exciting performer, but with classical music it muddles the sound to a degree which I found unacceptable.

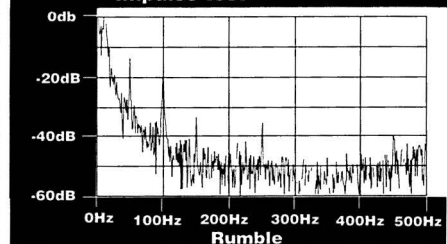
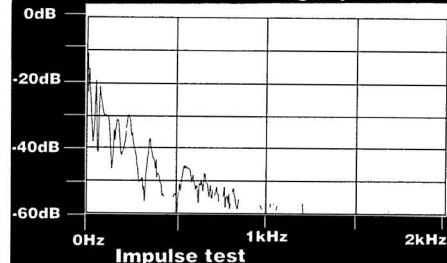
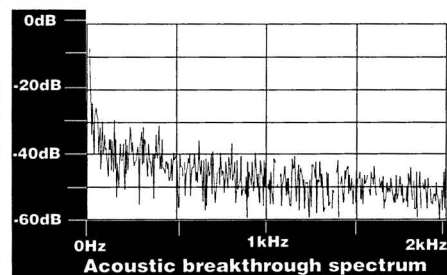
Acoustic breakthrough and impulse test plots show that there are several discrete resonances below 500Hz, and I suspect that these are being excited and adding some of the confusion observed. The arm termination is, as already noted, liable to be resonant, and this probably plays its part in producing spurious output which leaves the ear confused. Nevertheless, the sound has a good deal of 'get-up-and-go' which some listeners may well find outweighs the lack of 'finesse' and resolution.

CONCLUSIONS

An interesting product, which looks as if it's not quite finished yet and also sounds as if more work may be necessary if it's to become universally accepted by audiophiles. Perhaps 'idiosyncratic' would be a good description; if you like the styling, and are looking for a deck which is involving and exciting with rock music, the *Oasis A* could be exactly what you're looking for.

TEST RESULTS

Type	belt-drive, manual
Platter type	plastic/fibreboard subplatter
Build and finish	moderate
Mains connection	captive, filter in lead
Speeds	33rpm
Wow and flutter (DIN wtd)	0.08%
Speed error	-0.4%
Start-up time	4s
Rumble (DIN B wtd)	-71dB
Size (h x w x d/clearance for lid)	180 x 440 x 350mm/85mm
Ease of use	fair
Acoustic breakthrough	good minus
Hum level	moderate
Vibration breakthrough	good minus – unstable at LF
Shock resistance	moderate
Subjective sound quality of system	moderate
Typical price inc VAT	£495



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ORIGIN LIVE OASIS B

ORIGIN LIVE, 154 PRIORY ROAD, ST. DENYES, SOUTHAMPTON, HANTS. SO2 4BT. TEL: (0703) 671237.



One look at the *Oasis B* is sufficient to convince you that it's aimed pretty much at the dedicated enthusiast. With its basic on/off switch mounted like a wart on the front and three feet which turn out to be wood-screw heads, it can at best be described as functional and at worst (?) as rather unprepossessing. Still, the black finish and 'smoked' acrylic lid look rather smart. We were assured the platter will be better finished on samples reaching the shops than it was on our review sample.

The *Oasis B* is a simple design, based on a slab of Medite that's an inch or so thick. There's no separate armboard, but the arm is mounted on a section of the board which is separated by saw cuts from most of the bulk. Presumably this is to give some decoupling of the arm from the rest of the deck and break up standing waves somewhat, but it does mean that the arm and its bit of board can flap up and down at a highish frequency. Two more saw cuts partially decouple the main bearing. On the other hand, the motor (a Landis & Gyr synchronous, chosen because it has higher torque than the usual Philips type) is firmly coupled to the board and drives the fibreboard subplatter via a very slack flat belt. There is no speed change. The platter is the same one used on the *Oasis A* model (see separate review for details). Our review sample came fitted with a Rega *RB250* arm, and this is how it was auditioned for the tests.

ON TEST

Some hi-fi products are designed to a formula, some to a numerical specification, and some to taste. This one comes into the last category. You wouldn't describe the sound as strikingly neutral, but on the other hand it's by no means offensive. If anything, I preferred the *B* to its big brother. The sound is quite lively and dynamic, but certain limitations are in evidence, particularly in loud

passages where the sound tends to become a bit ragged and confused. Vibration and acoustic breakthrough on this deck are poor, not only high in level but coloured in character, and this tends to mask resolution of detail. With quieter music the deck is a bit happier, but there is a distinct coloration, possibly due to the arm, on leading edges and for example real weight on piano notes suffers somewhat.

Tying in with the coloration noticed is a peaky character to the impulse test results and acoustic breakthrough. Although the level of the former isn't too bad, the latter is poor and the frequencies at which things seem to resonate are such as to add a good deal of the deck's own sound to records. Hitting the baseboard with the stylus on a stationary disc confirmed this resonant tendency, producing a well tuned 'donk'.

The designer has obviously aimed for a good 'fast' sound, but it's possible that it's been achieved at the expense of, and possibly due to, pronounced in-band resonances which give the sound a lively, energetic and involving character but don't do much for neutrality.

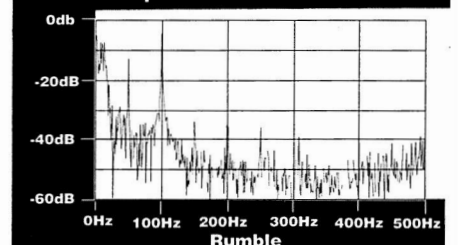
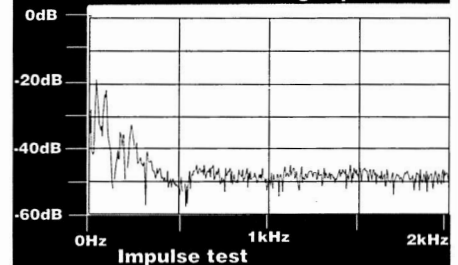
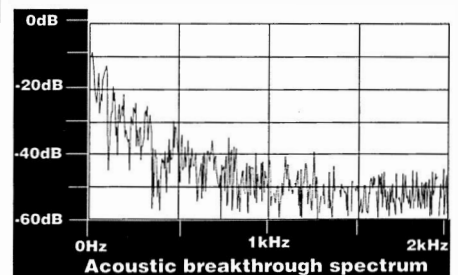
Wow and flutter seems fine, despite the less-than-perfect finish on the motor pulley and the belt's habit of wandering up and down as it runs. The only alarming measurement is rumble, which at -57dB (principally 100Hz hum from the motor) is clearly audible at high volume settings.

CONCLUSIONS

The *Oasis B* is just a little too coloured and too susceptible to feedback for formal *Choice* recommendation though some listeners may well find it an exciting performer in some systems. Indeed, some hi-fi dealers, both home and abroad, are reporting fine results with *Oasis* decks, and the price of the *Oasis B* is keen for a specialist motor unit, so this is clearly an appealing product. Try it and see.

TEST RESULTS

Type	manual belt-drive motor unit
Platter type	plastic, no mat
Build and finish	average
Mains connection	captive lead
Speeds	33rpm only
Wow and flutter (DIN wtd)	0.06%
Speed error	-0.05% (mains dependent)
Start-up time	2s
Rumble (DIN B wtd)	-57dB (see text)
Size (h x w x d/clearance for lid)	145 x 470 x 360mm/90mm
Ease of use	good
Acoustic breakthrough	poor
Hum level	good
Vibration breakthrough	poor
Shock resistance	average
Subjective sound quality of system	fair
Typical price inc VAT	£199



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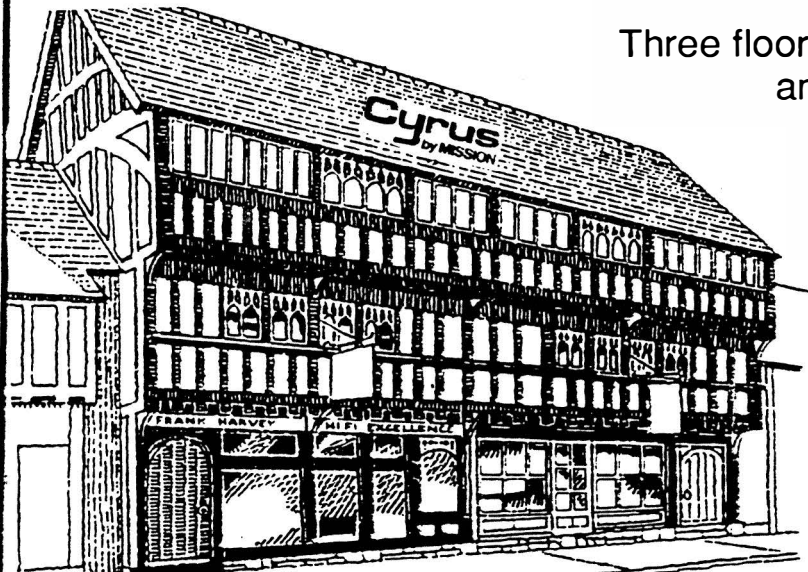
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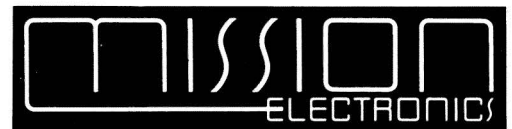
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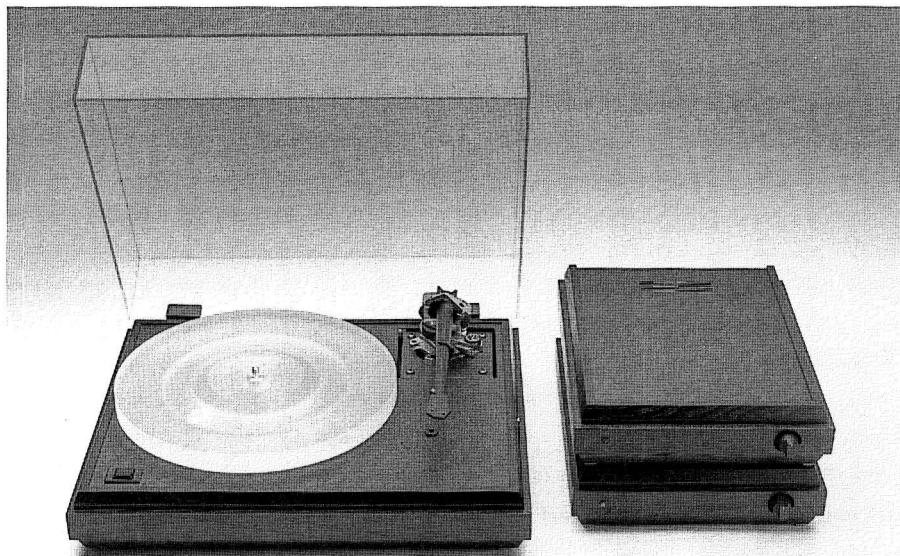
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PINK TRIANGLE PT TOO

PINK TRIANGLE PROJECTS LTD., 4 BRUNSWICK VILLAS, CAMBERWELL, LONDON SE5 7RR. TEL: (01) 703 5498.

RECOMMENDED



Ten years ago, Pink Triangle made a serious attempt to alter the image of the typical high-class record player, which at that time had a metal platter, felt mat, synchronous motor and metal subchassis. PT produced a design with a plastic (acrylic) platter, no mat, a DC servo motor and a light and rigid composite subchassis. And PT's basic design philosophy has not changed since then.

One significant change, however, was made to the motor. A while after the PT deck was introduced, it was suggested that the low torque supplied by the motor could cause the turntable to suffer from 'dynamic wow', or slowing under load. In other words, high modulation levels on the records might cause the platter to slow down, affecting the pitch of the music. PT took the suggestion seriously, investigated it, found it to be without foundation, told the world and was ignored. (I did a very simple but sensitive test myself, and could detect no effect in the PT or any other deck.)

In fact, although servo motors do have drawbacks they also have some real advantages. For commercial reasons, however, the PT has for the last few years been fitted with the more common synchronous motor which drives so many turntables and PT has done its best to suppress its relatively high vibration levels. This review is an evaluation of the *PT TOO* in its latest incarnation with a brand new power supply.

To recap briefly on the basic PT design, it has an acrylic platter, a subchassis made of Aerolam (an expensive aluminium honeycomb 'sandwich' material which is used extensively in the aerospace industry), three-point fully floating suspension and an inverted bearing. The acrylic platter is intended to match the record's acoustic impedance and absorb (and dissipate) vibration rapidly; the Aerolam subchassis is light yet very stiff in order to minimise intrinsic ringing while still dissipating vibration (or in

the rather misleading jargon used by some companies, avoiding 'storing energy'), and the bearing is designed to avoid the instability and precession that necessarily affect conventional geometry bearings (if only slightly). The motor is also unusual, mounted opposite the arm mounting so as to transmit a minimum of vibration into the platter in harmful directions.

ON TEST

The Pink was supplied with an armboard cut for an SME arm, and this is how it was tested. My initial reaction, not to put too fine a point on it, was, 'Well, I'll be . . .'. I'm accustomed to a pretty detailed sound off records, but the *PT TOO* has an edge on everything I have heard to date in terms of openness and clarity, without resorting to the coloration and what can perhaps be described as 'false transparency' of some hi-fi products. I listen to a lot of dense orchestral music and know several such records particularly well, yet the PT found detail on them that I had never fully appreciated before.

The *PT TOO* was duly compared with some master tapes, and in midrange and treble regions there's not a lot to choose. The tape is perceptibly clearer, but only just. Similarly, the odd coloration is detectable, but only by careful direct A/B comparison. Only in the bass does the PT lose out – and then, not by much. My favourite test of piano music shows that the PT lacks the total stability and weight of the tape, but at least the bass sounds quite natural and controlled.

Measurements on the *PT TOO* turned up one big surprise: the disc impulse is lower in level than with almost any other deck I have tested. Why it should be so much lower than on other acrylic-platter decks I'm not sure, but it does seem that PT has got its sums right. Elsewhere the *PT TOO* measures pretty well – the rumble figure is mostly hum picking up from the motor as I used a moving magnet

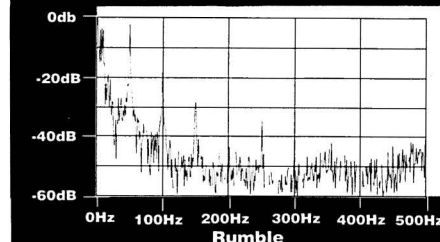
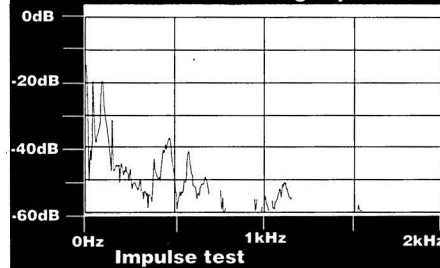
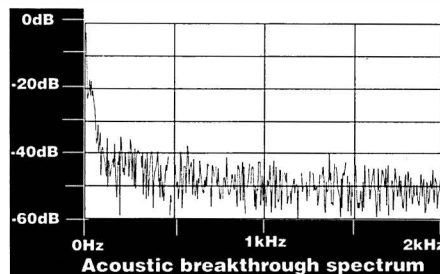
cartridge for this test – and highish wow and flutter, due I suspect to the bearing not having been sufficiently run in (wow follows disc rotation).

CONCLUSIONS

I have no doubt that this is one of the mega-decks. For clarity, it can be rated as 'first class plus'; for most other aspects, good to excellent. The *PT TOO* can be confidently Recommended.

TEST RESULTS

Type	manual belt-drive motor unit
Platter type	acrylic, no mat
Build and finish	good
Mains connection	captive lead plugs into ext. PSU
Speeds	33/45rpm
Wow and flutter (DIN wtd)	0.1%
Speed error	+0.1%
Start-up time	3s
Rumble (DIN B wtd)	-69dB (see text)
Size (h x w x d/clearance for lid)	155 x 450 x 390mm/70mm
Ease of use	fair
Acoustic breakthrough	good
Hum level	slight hum with MM cart.
Vibration breakthrough	excellent
Shock resistance	moderate
Subjective sound quality of system	excellent
Estimated typical purchase price	£650



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LITTLE PINK THING

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RECOMMENDED



What's in a name? A smile, in this case; if, as often seems to be the case, manufacturers can't think of sensible names for turntables, why not have a silly one? At least people will remember it!

The *Little Pink Thing* comes from the manufacturer of the highly regarded Pink Triangle *PT TOO*, which for years made only the one model, but has now joined in the trend of moving into lower-priced markets. It incorporates some of the key design elements of its big brother, with cost savings in other areas. In this case the main similarities are in the platter, which like the *PT* platter is acrylic, and the outline of the subchassis, a computer-modelled shape intended to be proof against standing waves. Differences include the subchassis material, now Medite instead of Aerolam, and in the suspension which employs standard industrial isolation mounts instead of springs.

The bearing is conventional rather than the *PT TOO*'s inverted one (although it is still jewelled and has a projected service life of 2,000 years) and the motor has been moved to its common position opposite the cartridge, better for hum rejection with inexpensive moving magnet cartridges but not so favourable from a vibration point of view.

Between a wooden plinth and an acrylic lid, the *LPT* subchassis board is supported at its corners, and is distinguished by a red beading which defines an irregular oval shape. The beading is a 'peripheral wave trap' around the subchassis area proper, a slot cut right through the Medite with three points of contact supporting the centre area. On this area are mounted the main bearing and the arm mount, the latter cut for Rega but adaptable, using only a Stanley knife, to Linn type arm bases. The motor stands separately on the plinth, again supported on isolation mounts, and drives the platter by a flat belt. A two-speed electronic drive, hidden under the subchassis, powers the motor.

The *LPT*'s aesthetics are pleasing; the top plate is finished in blue-grey Nextel and with the red beading and acrylic platter looks most attractive. The plinth is black, adorned only by a two-colour LED which indicates running speed. An acrylic lid is fitted, on spring hinges. Operation is simple, and because of the type of suspension used, setting up is limited to fitting the belt and leveling the deck.

ON TEST

The *LPT* was tested with a Rega *RB300* arm, which Pink Triangle sees as being a likely partner in practice. Having just reviewed a *PT TOO*, and several other decks using Medite subchassis boards, inevitably I had preconceptions about the sonic features, both good and bad, of this design. To get the bad out of the way first, the *LPT* adds a slight hardness or shrillness to the sound, but I had to compare it directly with its big brother and with master tape to confirm as much.

Otherwise, the sound is absolutely first class. Detail is of the same quality as with the finest decks I have heard, and the bass area, a weakness of 99 per cent of decks, is handled second-best to perfectly; it simply declines to go (subjectively) as low as with the very best, but it makes no attempt to conceal this by booming or adding coloration. All things taken into consideration the *Little Pink Thing* is a strikingly neutral deck.

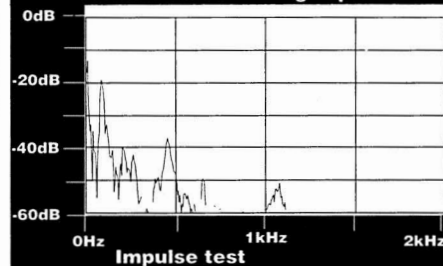
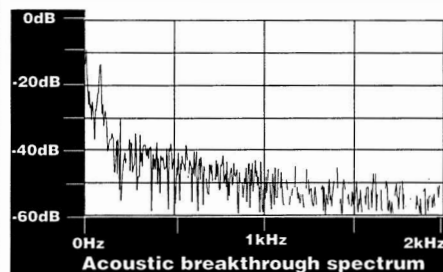
The disc impulse and acoustic breakthrough tests, and simple vibration sensitivity tests, show up some liveliness around 100Hz, but basically the measurements are good. Platter damping is clearly excellent.

CONCLUSIONS

The phrase has been used so often that it tends to be devalued, but the *Little Pink Thing* really does show up many decks at twice its price and more. A warm Recommendation is in order.

TEST RESULTS

Type	manual, belt-drive
Platter type	solid acrylic
Build and finish	very good
Mains connection	captive lead
Speeds	33/45rpm
Wow and flutter (DIN wtd)	0.05%
Speed error	+0.3%
Start-up time	3s
Rumble (DIN B wtd)	-72dB
Size (h x w x d/clearance for lid)	155 x 450 x 370cm/90mm
Ease of use	good
Acoustic breakthrough	good
Hum level	good
Vibration breakthrough	good minus - some 85Hz audible
Shock resistance	good
Subjective sound quality of system	very good
Typical price inc VAT	£345



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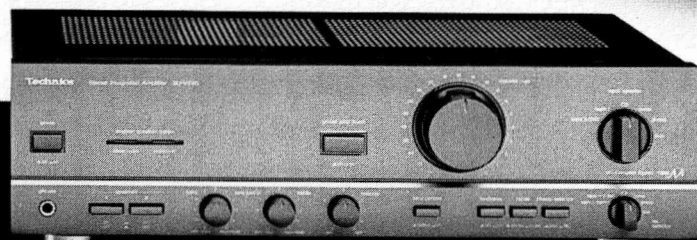
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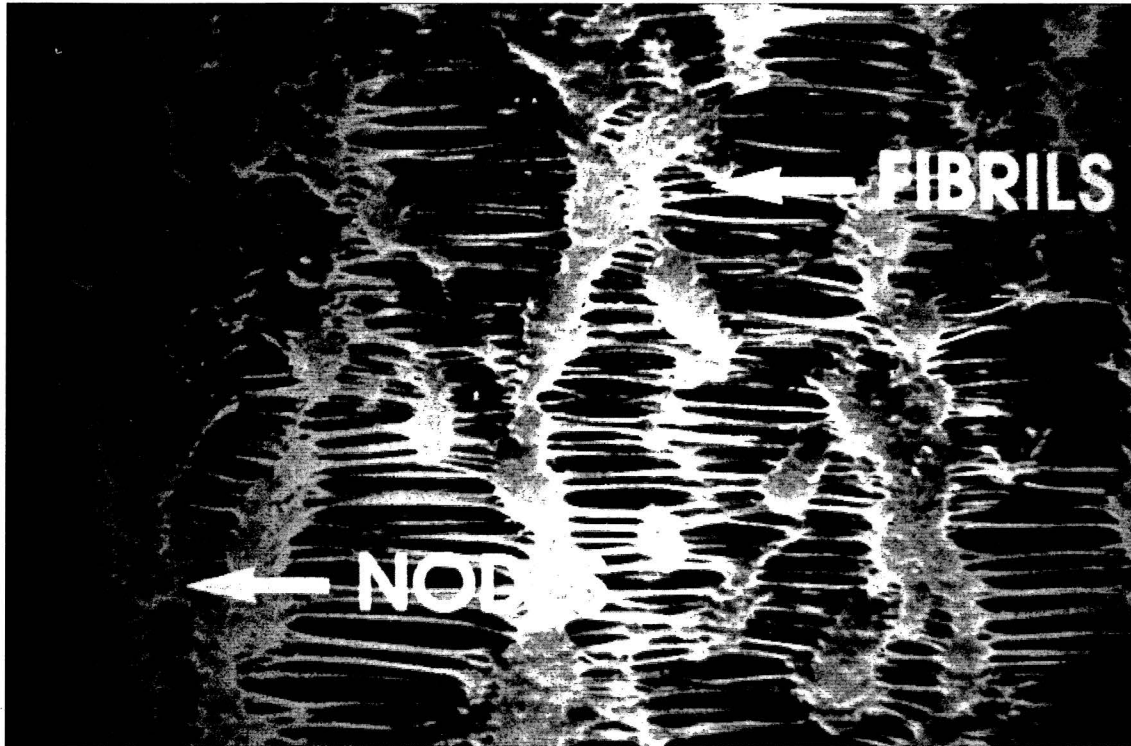
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BEST BUY



An honest-to-goodness budget deck, this recently launched Rotel model requires an absolute minimum of setting up. Just put on the platter, fit the belt over the motor pulley, mount a cartridge – preferably using a protractor rather than Rotel's slightly 'ho-hum' instructions for alignment. Then set the correct tracking weight and bias, choose a record and away you go.

The *RP-855* is isolated from the buffets of life only by four slightly springy feet, and has no suspension adjustment built in. One adjustment that is built in, slightly surprisingly, is speed control in the shape of two screwdriver slots accessible from underneath, but needing a very small screwdriver. Delivered running one per cent fast, our review sample benefited from some adjustment, and Rotel thoughtfully provides a stroboscope disc to make this job easier.

As is common with Japanese decks, the platter bearing is ready assembled, and in this case it feels like quite a high quality support. The platter is made of cast and machined aluminium, not damped but with sufficient casting imperfections on the bottom surface to stop it ringing very clearly. The motor – DC servo – is mounted in a mechanically favourable position, opposite the arm mount. Finish on the deck is good if unremarkable in black ash, topped with a slightly 'ringy' lid on spring hinges. The unit feels reasonably solid and seems well made all round.

Supplied with the deck is an arm and an Audio Technica *AT 110E* cartridge, a perfectly capable budget transducer. The arm feels slightly cheap and cheerful, but then it is cheap and the bearings seem perfectly OK. The headshell is detachable and locks in place firmly with a collet and socket screw. The counterweight is calibrated, as is the bias dial. The raise/lower lever is damped both down and up, a feature that would not go amiss on upmarket decks.

ON TEST

Apart from the speed error mentioned, the test results showed little to worry about. Rumble appears a bit high, but in fact a good deal is electrical hum, picked up in the wiring somewhere between cartridge and amplifier, and hardly at a sufficient level to be irritating in practice. Otherwise it's good – and the ears bear this out, whatever one's preconceptions about Japanese budget decks. The sound of this Rotel is well defined, clear, detailed and reasonably balanced in the bass, maybe not in the super-deck league but quite impressive for the price. The arm is often a weak link in a package like this, but I didn't hear any particular arm characteristics.

The *RP-855* was tried under various conditions, with different cartridges (including the one supplied), and some consistency was found in the sound but with variations in certain areas depending on siting. Because the feet provide only limited isolation, the deck suffers from a degree of structural feedback if not further isolated with a proprietary table, and loses a little in precision as a result. Nevertheless, under any conditions the feeling of information being masked is only very slight.

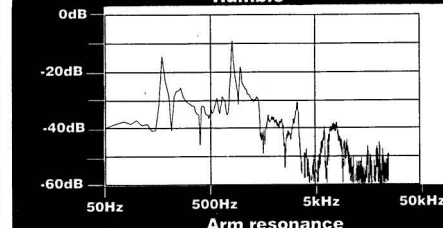
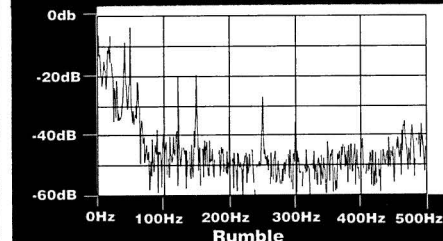
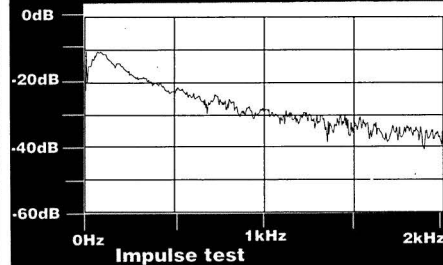
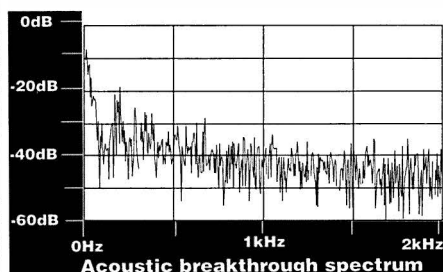
In common with many other record decks, the treble can sound a little harsh, but it is kept to a level at which it doesn't intrude unduly.

CONCLUSIONS

Rotel's *RP-855* is pleasant to use and enjoyable to listen to. At the front of a modest system it will serve well and should see you through a couple of upgrades to the rest of the system too. In particular, the cartridge (though good of its kind) can be upgraded to advantage. At the competitive price of £189 the Rotel *RP-855* clearly merits a Best Buy rating.

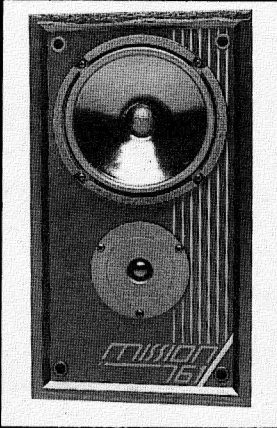
TEST RESULTS

MOTOR SECTION	
Type	manual belt-drive motor unit
Platter type	cast metal, rubber mat
Build and finish	good
Mains connection	captive 2-core lead
Speeds	33/45rpm
Wow and flutter (DIN wtd)	0.05%
Speed error	+1%
Start-up time	1s
Rumble (DIN B wtd)	-67dB (see text)
ARM SECTION	
Approx effective mass	9g
Type	fixed
Adjustments provided	overhang, azimuth
Build and finish	average/good
Ease of set-up/use	good
Friction approx, lat/vert	60mg/40mg
Bias application method	calibrated dial
Bias force rim/centre (1.5g ellipt)	135mg/180mg
Downforce calibration error (2g)	0
Cue rate up/down	0.5s/1s
Arm resonances	average
Arm damping method	none
SYSTEM AS A WHOLE	
Size (h x w x d/clearance for lid)	140 x 430 x 360mm/75mm
Ease of use	good
Acoustic breakthrough	fine
Hum level	audible
Vibration breakthrough	average
Shock resistance	good
Subjective sound quality of system	good
Typical price inc VAT	£189

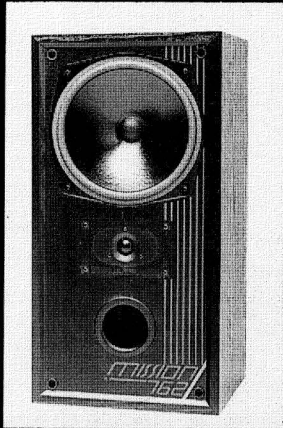


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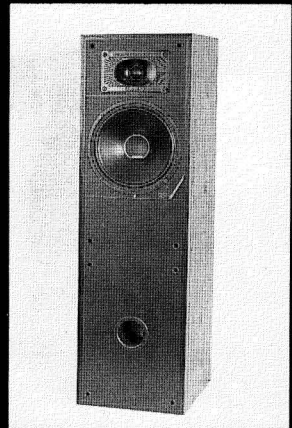
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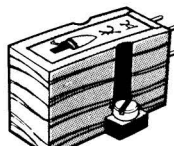
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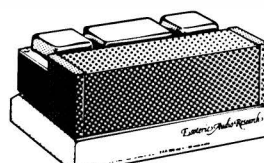
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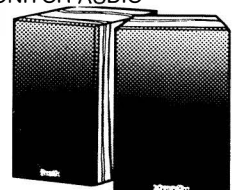
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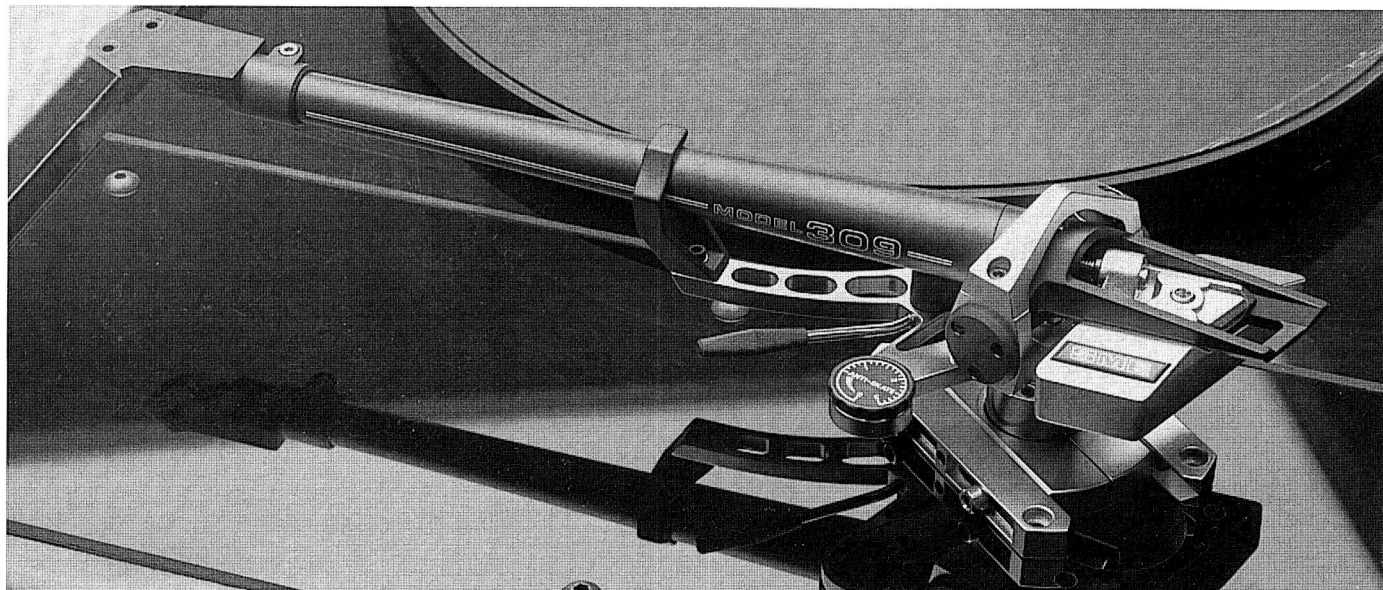


PRO AC TABLETTE

SME 309 ARM

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RECOMMENDED



SME has been making tonearms for three decades, under the proud banner, 'The Best Pick-up Arm in the World'. The early models developed almost a cult following but were arguably superseded by other manufacturers' arms. However, a few years ago, SME added new strength to its claim with the *Series V* arm. Since then, the slightly less exotic, though similar, *Series IV* has appeared and, more recently still, the *300* series – the *309* (9 inches long), the *310* (10 inches) and the *312* (12 inches, useful for playing lacquers and some historic records).

Whether or not the *SME 309* is the best arm in the world, it is certainly one of the best finished and presented. Everything, from the cardboard box it comes in to the headshell wires, exudes an air of painstaking professionalism. SME's instructions serve as a model for the industry.

As for the arm itself, I spent a good ten minutes just turning it over in my hands, admiring the standard of workmanship. Of course, this in itself guarantees nothing in the way of sound quality, but SME clearly believes in pride of ownership among its customers and they certainly earn it.

The *309* is unlike the *Series IV* and *V* in having a detachable headshell, which means that the fussy user can keep two or more headshells with cartridges ready fitted, say for stereo and mono LPs which strictly require a different stylus size (it does make a difference). Cartridge fitting is of course also that much easier. The headshell is firmly secured in place, and the electrical contacts between it and the arm are spring-loaded. The arm tube is conical in section, designed to be very rigid and also relatively free of discrete resonances, which are further reduced by internal damping. The bearing assembly is a solid and precise affair and the counterweight is underslung to preserve centres of gravity at the right height.

Adjustment of the *309*, one of the arm's

strongest features, is well thought out. The cartridge fixing holes in the headshell give no options on cartridge offset angle, while horizontal tracking adjustment is carried out by moving the whole arm back and forward on a rack and pinion assembly at the pillar base. A key is provided for this, and two socket screws lock the arm pillar in position once HTA and VTA have been set correctly. Tracking force adjustment is effected with a ball-ended hexagon wrench, which is supplied with the arm and embossed with the SME logo. Bias is applied by a dial and spring mechanism. The only adjustment that can be a bit fiddly is setting azimuth if the headshell has been removed, but it's not difficult if SME's advice of using a mirror to examine the cantilever angle is followed.

ON TEST

The *309* supplied for review got a lot of use. It was tested with an old Rock, as well as *PT 100*, *VPI* and *CEC* turntables also reviewed in this month's test project. It carried an *AT-F5*, a *Dynavector 17D2*, a *Highphonic* and a couple of moving magnet cartridges at various stages. I really can't think of a single occasion when I felt it was letting anything in the system down.

There are certain characteristics which arms can show up in terms of resonances and rattles which, once identified, are quickly recognisable as subtly different from turntable noises – the *SME 309* shows none of them.

In the company of few other arms, it seems to hold the cartridge with a firm grip, without using that grip to impart its own character to the sound. The sound therefore comes across cleanly and naturally, lacking the 'hyped-up' leading-edge coloration that makes some products sound misleadingly over-lively. Some critics have complained that this arm 'slows the music down', but my feeling is that real music does not have the so-called 'speed'

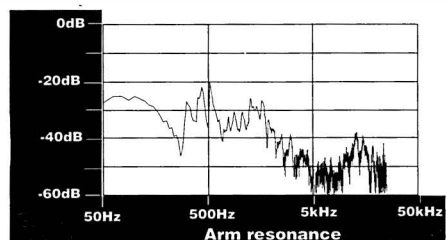
of many a hi-fi system; there is every difference in the world between rendering a waveform without bandwidth limiting, which good hi-fi like this does, and adding a bit of overshoot and ringing, which plenty of arms, cartridges and especially loudspeakers do. Essentially, the *309* is neutral. Partner it with a neutral record player and the results are likely to be impressive.

CONCLUSIONS

Evidently well designed, well made, well presented; admittedly well expensive but assuredly well liked. Recommended.

TEST RESULTS

Approx effective mass	9.7g
Type	detachable headshell
Adjustments provided	everything!
Build and finish	excellent
Ease of set-up/use	very good
Friction approx, lat/vert	<20mg/<20mg
Bias application method	calibrated dial
Bias force rim/centre (1.5g ellipt)	180mg/180mg
Downforce calibration error (2g)	-0.1g
Cue rate up/down	instant/1.5s
Arm resonances	good
Arm damping method	none
Typical price inc VAT	£495



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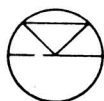
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BEST BUY



When Alvin Gold reviewed this turntable in last year's turntables issue, he had a *166 Mk II*. Does this mean that Thorens really went through three updates in one year? Whatever, the *TD166* has been around for quite a while, and the *Mk V* is the latest in a genealogy that stretches back to the *TD150* of the '60s. Even the appearance is fundamentally the same, which would seem to prove that up-to-the-minute styling is not the only thing that sells a turntable.

The *166* is a true suspended subchassis turntable, the main bearing and arm mount being attached to a metal member which is hidden beneath the brushed aluminium top plate. As on all Thorens decks, drive is from a synchronous motor, in this case driven directly by the mains frequency (albeit at 17V to ensure power adaptor compatibility between models), rather than using a synthesised supply as in more recent Thorens designs. Speed change uses the traditional Thorens device of a lever arm connected to the speed change-cum-on/off switch, which derails the belt from one pulley to the other as necessary. The cast zinc outer platter sits on a plastic subplatter incorporating a high quality bearing.

The arm does not appear to have its own model number but is obviously based on the *TP28 ES* fitted to the *TD280* and others. Differences from the basic *TP28* are in the mounting, which is modified for use with the *166*'s subchassis, and the arm rest which is mounted on the plinth rather than the subchassis. As usual, the cueing lever is at the front of the deck. Operation is completely manual, although a semi-automatic model – *TD146* – is available.

Despite its age, the *TD166* is not an unattractive package, and feels reassuring in use apart from two rather less good features: the arm rest, which is very tight and scrapes the arm as it is brought home, and the lid, which has neither friction hinges nor springs,

but must be lifted right up if it's not to fall back down. The standard of finish and build of everything, of course, is excellent, as are the (trilingual) instructions.

ON TEST

It is not too hard to see why the *TD150/160/166* etc. turntables have proved so popular over the years. Although the *166* cannot claim reference status in the way that the *150* arguably once could, it turns in a tidy performance in most areas, whether using the supplied *OMB 10* cartridge or something a little more exotic. If anything lets it down it is a slight lack of control over the bottom couple of octaves. Over the rest of the band, however, it is basically well behaved, quite neutral, perhaps not the very clearest in its class but with a satisfying level of definition. The sound is equally likely to please both classical and rock listeners – there is enough resolution for the former and enough punch for the latter.

It is customary for Thorens decks at any price to turn in a good-to-excellent set of measurements in basic parameters like wow and flutter and rumble and this is no exception. Acoustic breakthrough and, more particularly, vibration testing show a certain sensitivity to feedback around 100Hz which probably accounts for the lack of bass control; the disc impulse plot is typical of a rubber mat design. The arm seems moderately well behaved, giving a similar plot to the (almost identical) arms on the *TD280* and *TD316* turntables.

CONCLUSIONS

The *TD166* is a well made and good sounding deck, which in its *Mk V* guise undoubtedly offers better value than ever. With decks as good as this available at this price, LP is still more than competitive with CD on cost and sonic grounds. The *Mk V* certainly achieves a Best Buy status.

TEST RESULTS

MOTOR SECTION

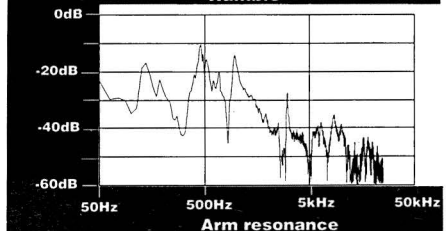
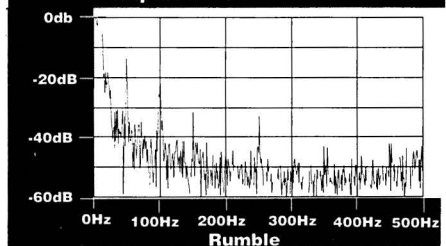
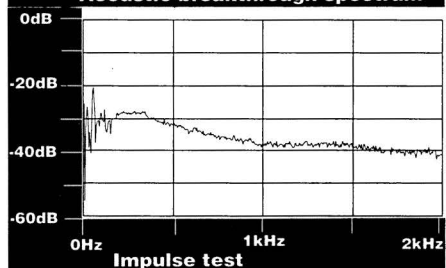
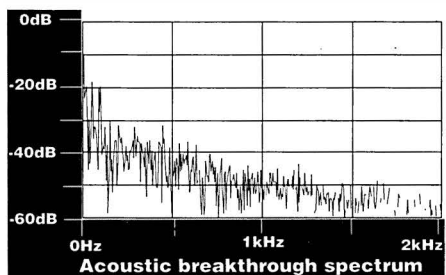
Type	belt drive, manual, integrated
Platter type	two piece metal/plastic, rubber mat
Build and finish	good
Mains connection	connector from outboard transformer
Speeds	33/45rpm
Wow and flutter (DIN wtd)	0.04%
Speed error	-0.2%
Start-up time	3s
Rumble (DIN B wtd)	-74dB

ARM SECTION

Approx effective mass	12g
Type	fixed
Adjustments provided	overhang, azimuth, cartridge height
Build and finish	good
Ease of set-up/use	good
Friction approx, lat/vert	<20mg/20mg
Bias application method	calibrated dial
Bias force rim/centre (1.5g ellipt)	160mg/180mg
Downforce calibration error (2g)	-0.1g
Cue rate up/down	0.5s/2s
Arm resonances	moderate
Arm damping method	none

SYSTEM AS A WHOLE

Size (h x w x d/clearance for lid)	155 x 435 x 340mm/85mm
Ease of use	good
Acoustic breakthrough	good
Hum level	good
Vibration breakthrough	moderate – resonance around 100Hz
Shock resistance	fair
Subjective sound quality of system	good minus
Typical price inc VAT	£200



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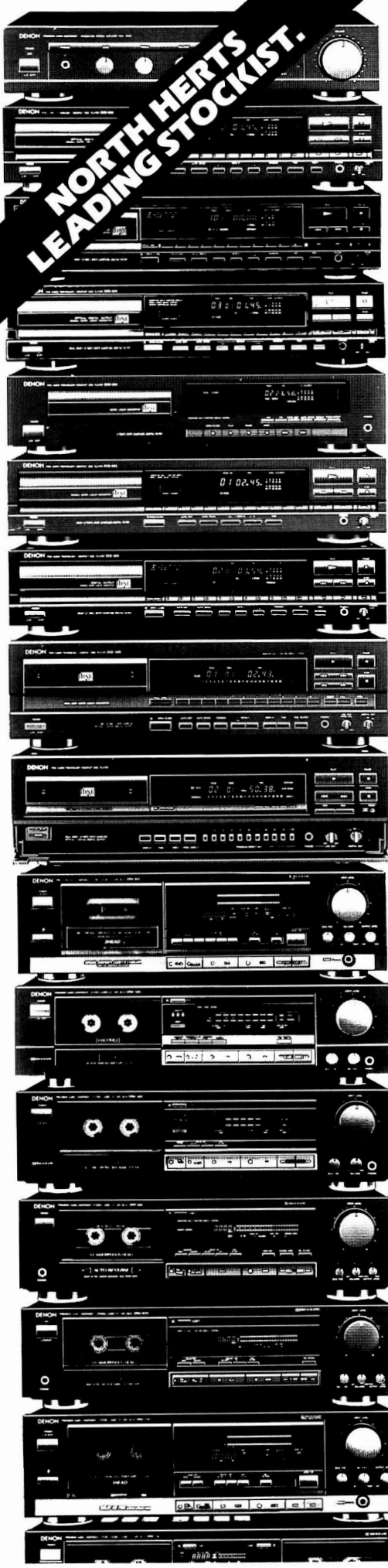
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RECOMMENDED



The 300 series turntables embody the 'new look' (OK, not quite so new now) of Thorens models – fashionable black with a split top-plate construction instead of the traditional suspended subchassis hidden beneath a single-piece top. Operation is still distinctively Thorens, however, with a two speed switch on the left and cueing lever on the plinth. Construction is also still Thorens, and the *TD316* has a reassuringly solid, not to mention heavy, feel as one assembles it. The unit is supplied with an arm already fitted, and setting up is simple and quick. Thorens' usual two-piece platter is used, the outer part being a high inertia metal casting and the inner a plastic moulding, evidently made to a very close tolerance.

As on the other 300 series decks, the motor used is a low voltage type running from a synthesised supply, – speed switching is therefore electronic. The motor pulley is plastic and is fitted to the shaft via a slipping clutch to give better starting characteristics than would a motor alone. As with all new Thorens models, a small outboard transformer appropriate to the country of sale supplies low voltage to the deck via a plug-in lead. This is quite a cost-effective way of doing things, as only the transformer box and wiring has to meet electrical safety regulations.

The *TD300* series decks use leaf springs instead of the conical coil springs more commonly found. These are adjustable from the top of the deck, but since they are set up at the factory and the arm (a *TP28ES*, as fitted to the *TD280*) is fixed it's unlikely they will ever need attention. They give a very free suspension, which bounces happily in any direction and makes the deck a little sensitive as regards footfalls and other large shocks.

Operation is manual, with Thorens' customary front-mounted three-way switch for speed selection and off, and cueing lever.

The 'smoked' plastic lid is supported on spring hinges.

ON TEST

I found the *TD316* ever so slightly disappointing. The sound seems a trifle coarse by comparison with other decks in this price range, be they from Thorens or others. This is not to say that the *316* sounds unacceptable, in fact by the standards of only a few years ago it would probably seem sonically competitive, but in clarity or, perhaps more accurately, purity of sound it is shown up by its better rivals. The bass also sounds out of control, wallowing slightly though fortunately without booming or honking unpleasantly.

Nevertheless, given these reservations, the *316* is obviously a capable reproducer. Heavy and dense textures are reasonably well sorted out, and less complex music sounds clear and bright despite the coarseness. In fact in some systems I can imagine this deck suiting classical music well, pop perhaps less so.

Measurements are typical of a Thorens: good drive stability and bearing, a fair degree of damping from the rubber mat and pretty good immunity to feedback, although the metal base of the deck can be heard ringing if the turntable support is struck. The arm is a little lively, but not alarmingly so for a budget design.

CONCLUSIONS

Sonics are good but not necessarily better than in other, cheaper, decks – including some models from the same manufacturer. However, build quality, finish, ease of operation and reliability are all excellent and the *TD316 Mk II* is undoubtedly good value for money. Although not quite in the Best Buy league, on the basis of its competitive price this well made and competent deck still merits Recommendation.

TEST RESULTS

MOTOR SECTION

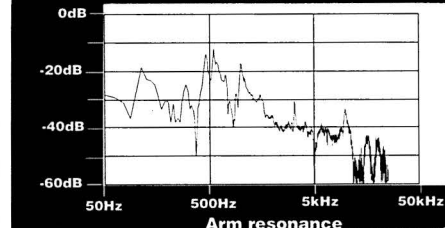
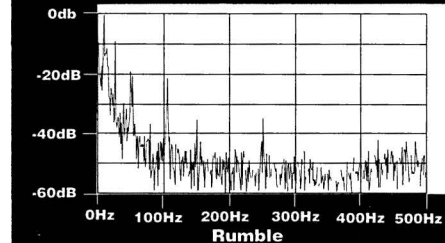
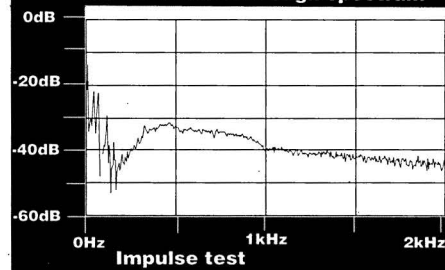
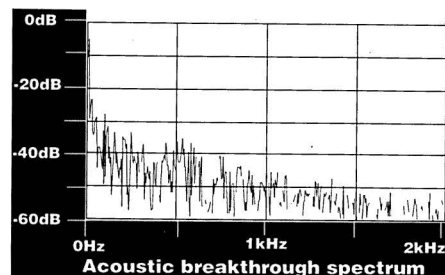
Type	belt drive, manual, integrated
Platter type	two piece metal/plastic, rubber mat
Build and finish	good
Mains connection	connector from outboard transformer
Speeds	33/45rpm
Wow and flutter (DIN wtd)	0.04%
Speed error	-0.4%
Start-up time	4s
Rumble (DIN B wtd)	-74dB

ARM SECTION

Approx effective mass	12g
Type	fixed
Adjustments provided	overhang, azimuth, cartridge height
Build and finish	good
Ease of set-up/use	good
Friction approx, lat/vert	<20mg/20mg
Bias application method	calibrated dial
Bias force rim/centre (1.5g ellipt)	160mg/180mg
Downforce calibration error (2g)	-0.1g
Cue rate up/down	0.5s/2s
Arm resonances	moderate
Arm damping method	none

SYSTEM AS A WHOLE

Size (h x w x d/clearance for lid)	158 x 440 x 350mm/90mm
Ease of use	good
Acoustic breakthrough	good
Hum level	good
Vibration breakthrough	good minus
Shock resistance	fair
Subjective sound quality of system	good minus
Typical price inc VAT	£220



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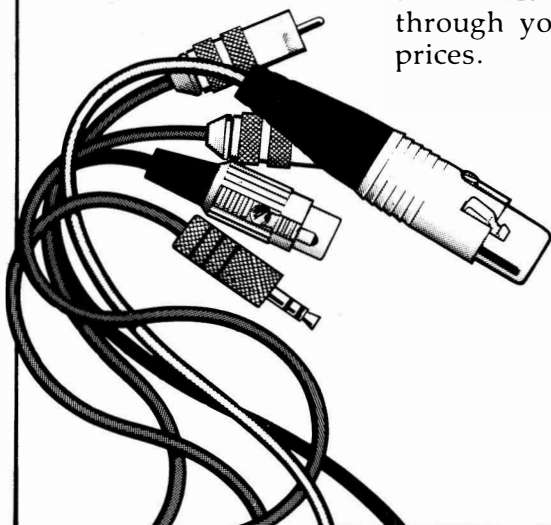
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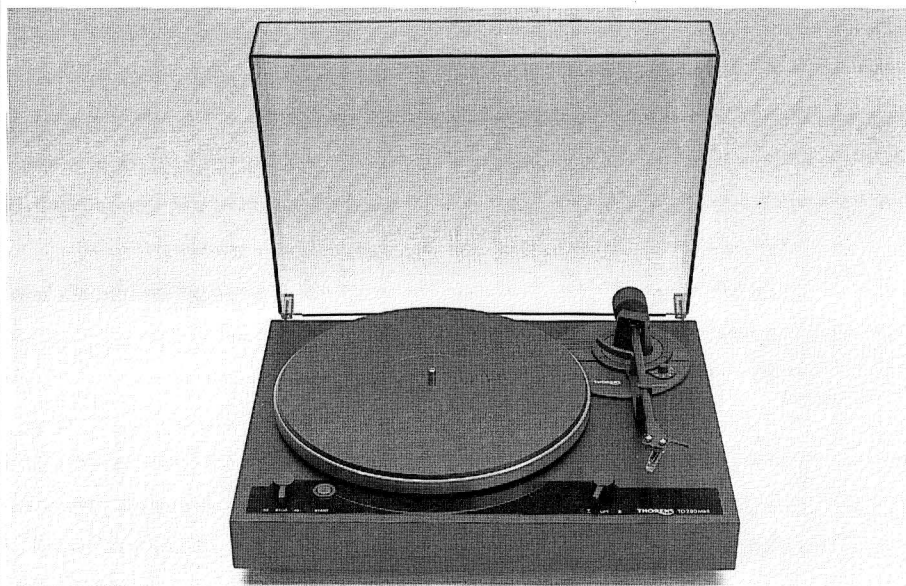
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BEST BUY



In last year's *Hi-Fi Choice* turntables issue, Alvin Gold commented favourably on the sheer amount of turntable one gets for the money in the *TD280*, and I can only agree. A glance at the deck and its instruction manual reveals that the package includes an arm, an Ortofon *OMB 10* cartridge, semi-automatic operation and electronic speed selection with a two-phase generator driving the motor.

Several smaller manufacturers charge the price of this turntable, and then some, just for a two-phase drive add-on! It just goes to show how important economies of scale can be. Thorens makes huge numbers of record decks, and can afford and justify full mass-production tooling for its products. The various models also share certain parts, which of course reduces cost; and why not design turntables along given lines so that one can mix and match platters, drive circuits, arms etc? It makes sense especially if the ingredients are good.

Over the last year the *TD280* has attained Mk II status, hence the new review, but in essence it hasn't changed very much. It is unusual for a Thorens product in not having a suspended subchassis of some type, using instead four springy feet for isolation. However, other features are more in keeping with the house style, including the two-piece platter with plastic subplatter, the controls layout and the general appearance.

The arm fitted to this deck is the *TP 28 ES*, a fixed item that appears to be becoming standard issue on the cheaper Thorens models. Although it feels slightly tacky, this arm is basically well made and easy to use and also to set up.

The *280's* controls are slightly different from many Thorens decks by virtue of the arm auto-lift at the end of the side. At the left of the plinth, in addition to the 33/Off/45rpm selector, is a 'start' button which will restart the deck after the auto-lift has stopped it. It

also allows the arm to drop if the cueing lever is flicked, and makes the deck pretty much foolproof in operation. Actually I found myself using the three-way selector to turn off, as often as not. It depends on what you're used to.

ON TEST

As an *OMB 10* was fitted when the deck came out of its box it seemed a shame not to try it, despite some unfortunate sounds heard emanating from systems starting with a similar cartridge years ago. In the event it turns out that Ortofon has not been idle – the cartridge definitely sounds better than remembered. First impressions of the *280* are of a pretty raunchy deck – not terribly subtle, not stunningly free of colorations, not the clearest sound in the world, but with plenty of punch and attack. Changing to the *AT-F5* cartridge tamed the response a bit, but the impression remained that the *TD280* is not the world's most neutral deck. On the other hand, given the price it sells for, and likely partnering systems which may not be over-strong on impact and force, it could well be ideal.

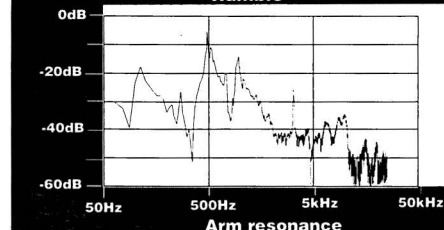
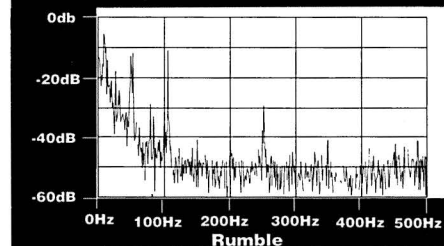
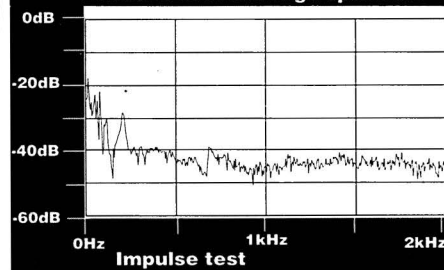
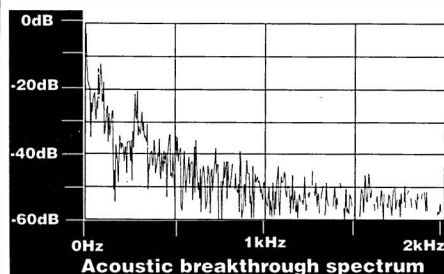
Classical music is perhaps less well treated by this deck than is rock'n'roll or anything else with a good rhythm line, which stays this side of one-note bass by just about a large enough margin to remain enjoyable. In fact, on the whole the sound is very good, just a tad coarse. The acoustic breakthrough plot gives a clue to this in the high levels of feedback at 100Hz and 300Hz. However, measurements are mainly exemplary, rumble let down slightly by vibration coupling through the plinth.

CONCLUSIONS

If the above sounds a bit disparaging, consider this: the *TD280* is lively and liveable-with, excellently made, easy to use and very affordable. It would be hard not to confirm its Best Buy status.

TEST RESULTS

MOTOR SECTION	
Type	belt drive, integrated, semi-automatic
Platter type	two piece plastic/metal/rubber mat
Build and finish	very good
Mains connection	connector from outboard transformer
Speeds	33/45rpm
Wow and flutter (DIN wtd)	0.05%
Speed error	-0.3%
Start-up time	3s
Rumble (DIN B wtd)	-67dB
ARM SECTION	
Approx effective mass	12g
Type	fixed
Adjustments provided	overhang, azimuth, cartridge height
Build and finish	good
Ease of set-up/use	good
Friction approx, lat/vert	<20mg/20mg
Bias application method	calibrated dial
Bias force rim/centre (1.5g ellipt)	160mg/180mg
Downforce calibration error (2g)	-0.1g
Cue rate up/down	0.5s/2s
Arm resonances	moderate
Arm damping method	none
SYSTEM AS A WHOLE	
Size (h x w x d/clearance for lid)	158 x 440 x 350mm/90mm
Ease of use	good
Acoustic breakthrough	moderate
Hum level	good
Vibration breakthrough	fair
Shock resistance	good
Subjective sound quality of system	good minus
Typical price inc VAT	£180



TOWNSHEND ROCK REFERENCE/ EXCALIBUR ARM

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The *Rock* design has been around in various guises for several years, all sharing a predilection for composite, highly damped (strictly speaking, 'dissipative') materials and the Cranfield-originated 'Fluid Coupler' trough at the front of the arm. With the possible exception of the ever-popular *Sondek*, I guess no other deck has so strongly divided opinion as to whether it can or cannot work.

According to the inventor and manufacturer, the main argument for the trough feature is that it suppresses the effects of the low frequency resonance caused by cantilever mounting compliance and arm effective mass. In an undamped arm this resonance can cause a frequency response lift of several decibels at 12Hz or so; tests with a well-damped arm (using front- or rear-end damping) show that this lift can be reduced to fractions of a dB. However, since a tonearm can be considered more or less as a rigid beam at 12Hz, there must be another effect which makes the trough supposedly preferable to rear-end damping. This is that the front-end trough transforms the arm from a cantilever to a beam supported at both ends, and completes the 'energy path' from arm bearing to headshell to trough to subchassis to arm bearing.

As mentioned in *Choosing and Using*, making a tonearm that is rigid across the entire audio band is impossible, since the wavelength of mechanical vibration in even a solid steel arm at 20kHz is very close to the length of an arm and most arms are more or less floppy above 3kHz or so. The aim with the front-end damping arrangement is to reduce effective arm length from 23cm to about 2cm and thus move the arm's maximum frequency of rigid beam operation to

above audibility. Nice theory. But does it work, and are there audible benefits?

Before investigating that, here's a description of the rest of the system. The *Reference* is a heavy lump – the platter weighing 18lb and the subchassis and plinth something like 30lb. Both are made of materials chosen more for acoustic 'deadness' than stiffness. The platter consists of layers of bitumen, lead and plaster in an aluminium skin, and integrally bonded to a thick PVC mat. The subchassis is plaster-and-lead based with a solid PVC armboard. An 'inverted' bearing gives a bearing point at the centre of gravity of the platter, aiding stability.

The *Rock's* drive system uses the popular Philips synchronous motor, mounted opposite the cartridge and driving the subplatter by a flat belt. An electronic, two-speed, drive circuit is hidden in the rear of the plinth, which in turn is powered from an outboard box containing the mains transformer.

Unusually for such an out and out 'audiophile' turntable the control switches are quite sophisticated, consisting of three touch switches on the front of the plinth for Off, 33 and 45. These are illuminated by red LEDs, as is the *Rock Reference* logo under the arm, and the fancy part is that the brightness of the LEDs is controlled by a light detector to adjust for ambient lighting conditions.

The *Reference* trough is metal and finished in black crackle paint. It's supported on two pillars and locks into position over the record, adding a minute amount of extra stability (the difference is audible if you know it's there). A small outrigger paddle assembly is supplied for use with any arm other than the *Excalibur*, the headshell of which features an integral paddle.

Under the subchassis, isolation is achieved by three dashpot spring/damper assemblies, and as an extra measure the plinth stands on seven Sorbothane feet. Finish of the whole unit is very good, and although it is pretty much unrelieved black, aesthetic variety is provided by the polished brass knob on the trough locking mechanism, the brass and acrylic screw-down record clamp and of course the illuminated logo and controls. For a unit of its size, the *Reference* is quite elegant, and certainly looks as if it means business. A good quality clear acrylic lid is let down by friction hinges which didn't quite fit on this sample.

The *Excalibur* arm has been reviewed previously in *Choice*, but minor internal changes and some major cosmetic ones prompted a re-test. It's an unconventional design intended for use only on Townshend decks, being shorter than normal by a couple of centimetres, and also having a trough paddle fixed to its end. The tube is of stainless steel with internal foam damping, and the bearings are damped. The magnesium headshell is rigidly glued to the arm tube, and has tapped holes to make inaccurate cartridge mounting difficult.

ON TEST

Before waxing lyrical about this deck, it seems only fair to point out that no deck is perfect; to read some reviews one would think some hi-fi products actually improve the sound they are trying to reproduce, but ultimately the best product is the one that has the least effect on the musical signal. With this in mind it's odd how some components seem to stand head and shoulders above most of the competition.

Nevertheless, the *Rock Reference* does provide a level of performance I have only heard equalled by one other deck and that's not in commercial production. Within the constraints of what can be cut on to a record it's very difficult to fault the *Reference*, as I'm no longer sure where the limitations of the record player leave off and those of the record cutting system begin. Obvious points: rumble and wow and flutter are what they ought to be in any high-end deck – down around the measurement limits. The disc impulse test results are good, but not dramatically better than some other decks; however, the subjective test of hitting a record at various points while the arm is down is more impressive, yielding remarkably little sound. Breakthrough is very low, and the effects of the trough can be seen in lowering the level of high frequency arm resonances which are already quite respectable.

Sound quality is definitely very close to the master tape. The master tape still has a free and open quality not absolutely rendered by the deck, but for once the true weight of the

attack on a piano note is brought across. This attack, though subtle, is very hard to reproduce and therefore an excellent test of reproducing equipment. The difficulty lies in correcting the very low level, low frequency 'thud' part of the note caused by the piano frame, floor and recording venue resonances, without masking it with the dominant part of the note due to the string starting to sound.

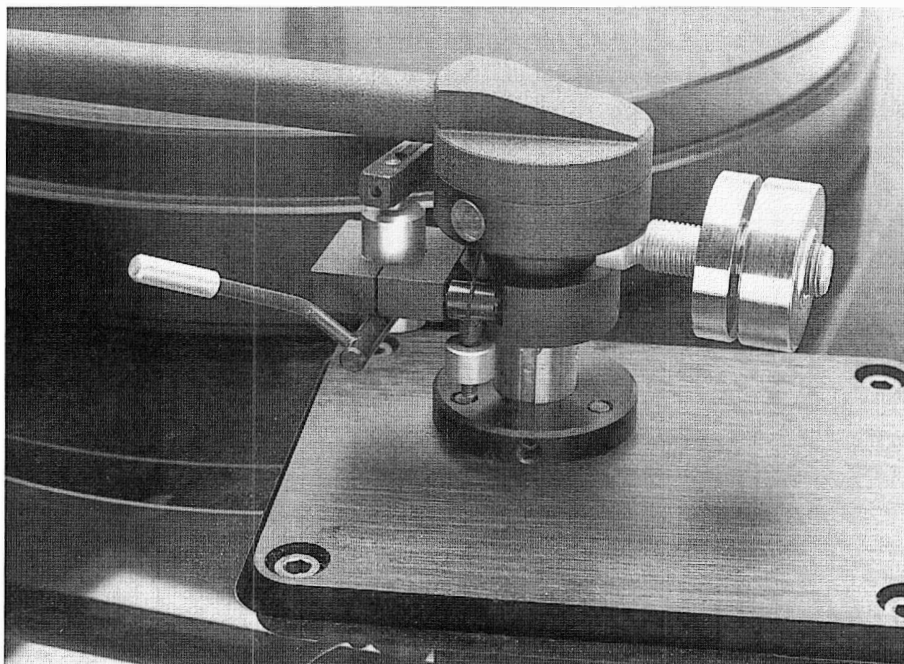
The *Rock* has been described as sounding 'dry' and 'overdamped'. Overdamped, by how much and at what frequency? A more apt description would be 'controlled', as in the opposite of 'out of control', which by comparison could describe the low frequency response of practically every other turntable that the author has encountered. The *Rock Reference* is in a class of its own in recovering bass detail; it's also unexcelled, though maybe equalled, in higher frequency regions.

In order to try the *Excalibur* under more exacting circumstances, I played some records without the trough. Yes, the trough

does do a good bit to clean up bass and keep transients fresh and uncorrupted, and no, the *Excalibur* does not seem to be a weak link in the chain. Not being able to try it on other turntables, it's hard to evaluate the arm fully, but as I used a *Rock* to check out the other arms in these reviews I could compare it under a limited set of conditions. Its sound is solid and clear, on a par more or less with the *SME 309* reviewed here, but as it will rarely be used without the trough it perhaps suffices to say that it seems uniquely well suited to it and is therefore an ideal choice for the *Rock Reference*.

CONCLUSIONS

Expensive it may be, but this system is the essence of what a hi-fi record player should be; in a word, faithful. The feeling of replay equipment character is less with this deck than with any other, and for that simple reason it deserves a confident and unreversed Recommendation.



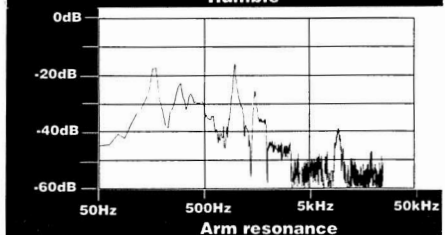
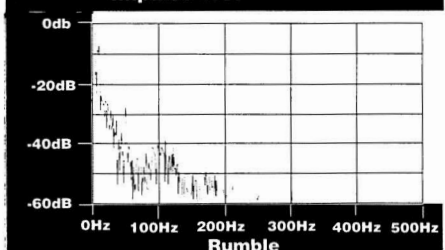
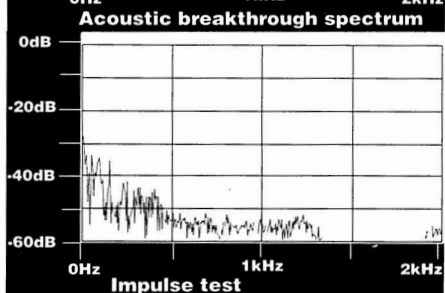
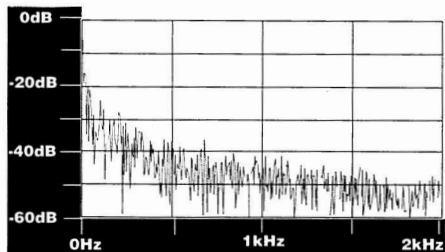
TEST RESULTS

ROCK REFERENCE

Type	belt-drive motor unit
Platter type	plaster/lead composite, solid
Build and finish	very good
Mains connection	connector from PSU
Speeds	33/45rpm
Wow and flutter (DIN wtd)	0.04%
Speed error	-0.1%
Start-up time	7s
Rumble (DIN B wtd)	-77dB

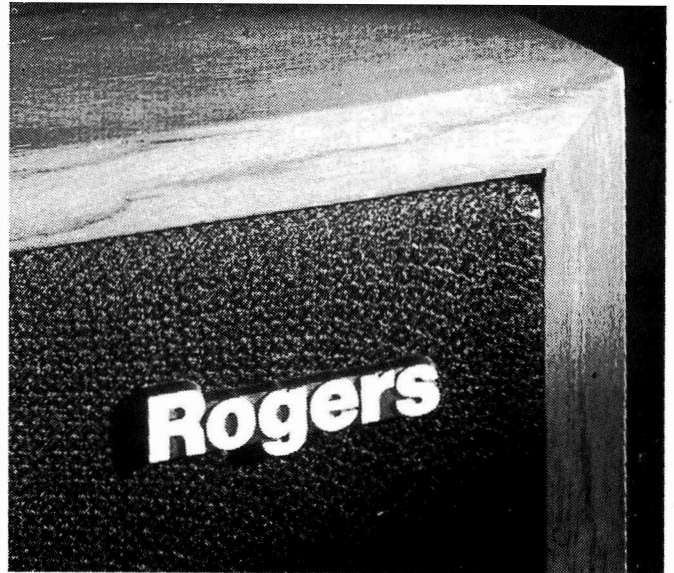
EXCALIBUR

Approx effective mass	12g
Type	special for Townsend decks
Adjustments provided	height, overhang (at base)
Build and finish	very good
Ease of set-up/use	fair
Friction approx, lat/vert	25mg/20mg
Bias application method	weight and thread
Bias force rim/centre (1.5g ellipt)	90mg/180mg
Downforce calibration error (2g)	N/A
Cue rate up/down	instant/3s
Arm resonances	good
Arm damping method	front-end trough (on deck)
SYSTEM AS A WHOLE	
Size (h x w x d/clearance for lid)	210 x 510 x 410mm/105mm
Ease of use	good
Acoustic breakthrough	good
Hum level	good
Vibration breakthrough	very good
Shock resistance	very good
Subjective sound quality of system	excellent
Typical price inc VAT	£1,800/£650

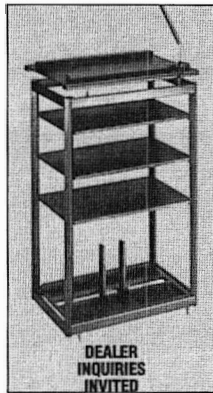


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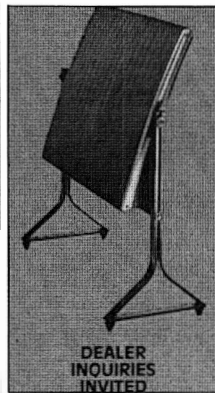


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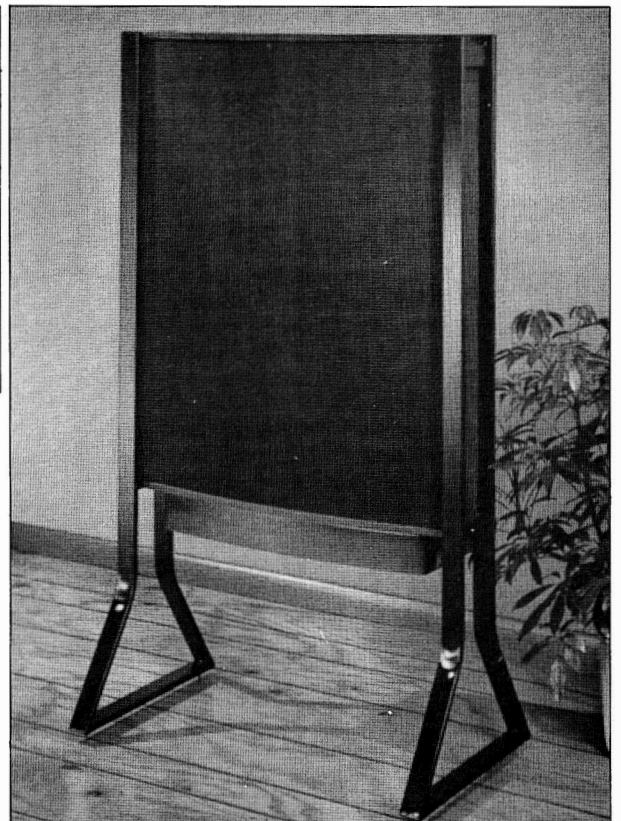
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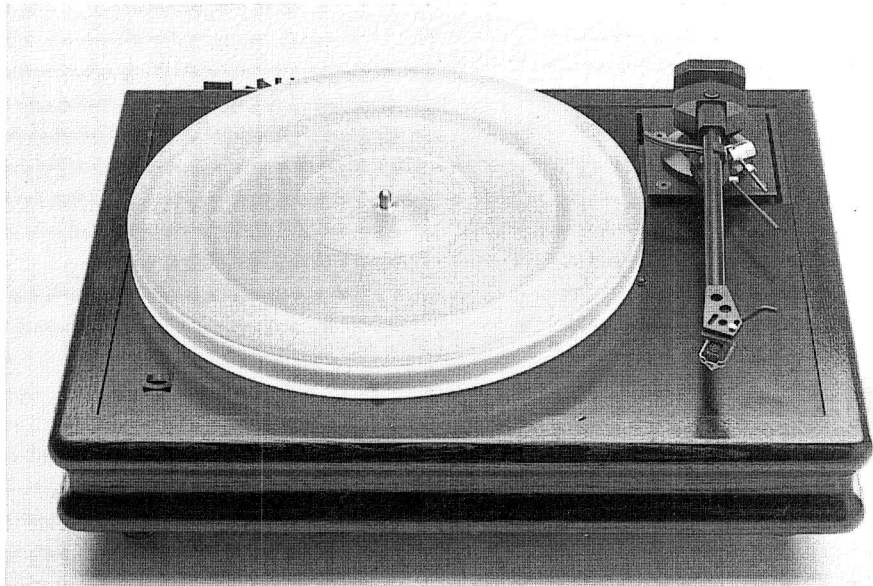
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As the prime mover behind any turntable, the motor is obviously an important component, and not surprisingly there is considerable difference of opinion over what sort of motor and drive system is best for turntable use. The designers at Voyd feel strongly that a motor system must be sufficiently powerful to overcome 'dynamic wow' or slowing under load. Voyd considers this to be a fault common to most turntables that have a relatively low mass platter, but the phenomenon has yet to be proved beyond doubt a significant factor in turntable performance. Another turntable manufacturer, who has researched 'dynamic wow' has calculated it to occur at a maximum level of only 0.00001 per cent in a typical deck. As I said, there are considerable differences of opinion amongst turntable designers.

Voyd has gone to uncompromising lengths to incorporate two- and three-motor drive systems into its designs. The *Valdi* uses two high precision, high inertia and high torque Papst synchronous motors, arranged on opposite sides of the platter spindle. This configuration, complete with a quite tightly stretched flat belt, certainly ensures that the platter is firmly driven. The belt is fitted over the motor pulleys after the acrylic platter has been placed on the spindle, using a special tool provided with the deck. It sounds a bit hairy, but is actually perfectly straightforward.

For the rest, the *Valdi* has a strong aluminium suspended subchassis, an integral power supply for the motors with the transformer outboard in a small box, electronic speed switching (33 and 45rpm) and three large metal cones for feet – watch out for these when unpacking! Suspension adjustment is from below, but no more fiddly than on many a deck.

ON TEST

Our review sample *Valdi* was supplied with a

Helius *Aureus* arm, and this is how it was tested. A Goldring *1040* cartridge was also fitted and seemed to match the system well, although the faithful *AT-F5* was used for most of the listening. The first impression was of a quite lively and musical-sounding deck... but there seemed to be something missing. There is plenty of punch delivered, for sure, but I found the feeling growing on me that the *Valdi* suffers from a degree of 'one-note bass', a lump in the bass response that produces a kind of 'thud' every time something exciting happens in the record groove. Comparison with the master tape helped me put my finger on a certain coarseness to the sound, which masks leading edge detail somewhat, not exactly blurring it but roughening it. Associated with the bass lumpiness is a thin quality on what should be thick bass textures. (I believe this is due to the ear adapting to the high levels of bass in the 'thud' and masking out some genuine bass information.)

Measurements on the *Valdi* showed up two areas for concern: vibration sensitivity and drive problems. Tapping the plinth or the surface it stands on shows up two resonances, one at about 70Hz and one near 450Hz. These are not very high, but the 70Hz component (the dominant one, in fact) may well be responsible for the one-note effect mentioned, via structure-borne feedback. The lower level 450Hz resonance is less worrying, as such a frequency is not often transmitted effectively by building structures.

Drive problems are shown up by the poor wow and flutter figure (and the absolute speed figure, which is further out than it should be). Spectral analysis of the wow and flutter shows up a dominant effect at 13Hz or so, presumably once per revolution of the motors. This is slightly worse with both motors driving than with either alone, but it looks as if the drive pulleys were not running

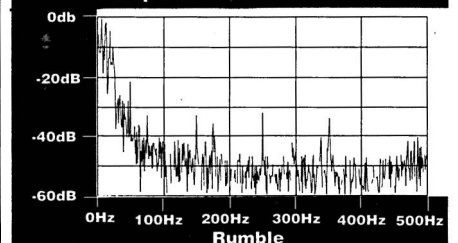
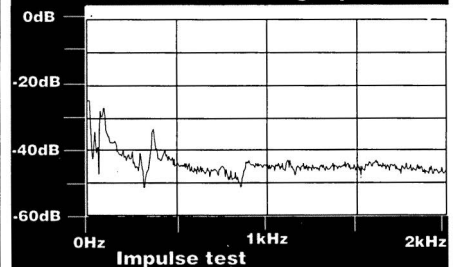
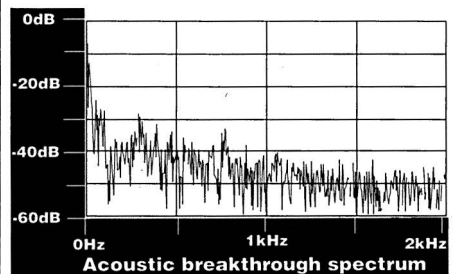
quite true on our review deck. This could be related to the loss of clarity on transients.

CONCLUSIONS

Despite its lack of any gross flaws, our sample of the *Valdi* was a little disappointing and, in the test systems used, its performance a little too 'obvious' in character. As someone who values absolute accuracy more than anything else, I didn't get on too well with the deck – but don't let that put you off investigating the *Valdi* for yourself. Recent price increases have resulted in the turntable being not quite as good value as it once was, however its elegant visual design and superb quality of finish are major plus points and its 'lively' and engaging sonic character might be just the tonic for some hi-fi systems.

TEST RESULTS

Type	manual, belt-drive, 2 motors
Platter type	acrylic, no mat
Build and finish	good
Mains connection	connector from PSU
Speeds	33/45rpm (electronic)
Wow and flutter (DIN wtd)	0.12%
Speed error	+0.9%
Start-up time	<1s
Rumble (DIN B wtd)	-74dB
Size (h x w x d/clearance for lid)	150 x 450 x 360mm/60mm
Ease of use	good minus
Acoustic breakthrough	good
Hum level	good
Vibration breakthrough	good
Shock resistance	fair
Subjective sound quality of system	good minus
Typical price inc VAT	£680



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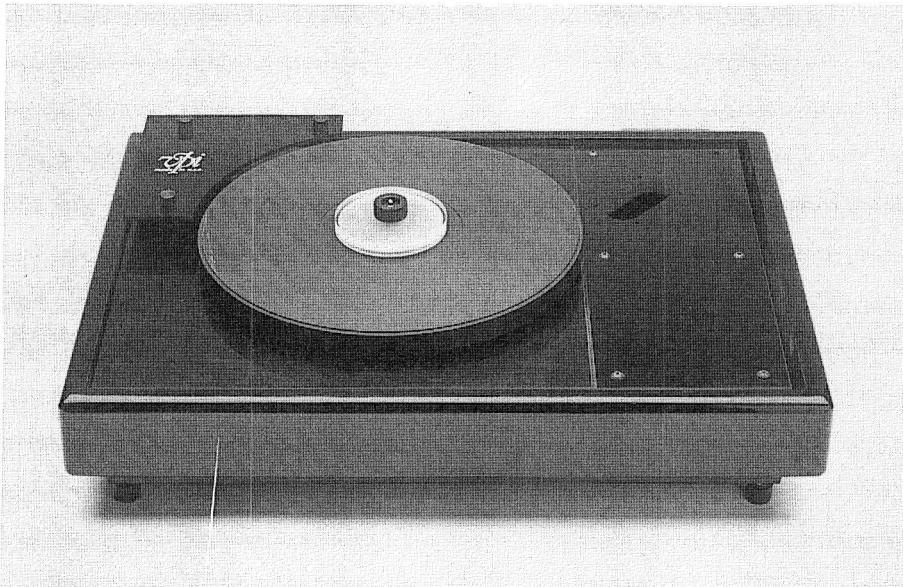


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VPI HW-19 Mk III

MOTH MARKETING, 10 DANE LANE, WILSTEAD, BEDFORD MK45 3HT.TEL: (0234) 741152.

RECOMMENDED



VPI first came to our attention as a manufacturer of record cleaning machines (still available, and highly recommendable), but more recently has produced sundry hi-fi components of which this deck is one. The *HW-19*, produced in Cliffwood, New Jersey, is an example of a species of product that doesn't get around much in this country, that of American esoterica. As in the UK, and indeed many other countries, the USA has several smaller manufacturers doing things slightly differently because that's the way they want to do them, and since the market over there is large and healthy many of these manufacturers do it in real style. This is particularly true of record decks, and the *HW-19* is a beautifully made and finished product with several unusual features.

One of the most unusual features is its size. Some 21 inches across, it is extended on the left by the motor mounting and on the right by the huge armboard area. This area is intended to support linear tracking arms, which the VPI's designers rate highly. The review sample was actually supplied with most of a Forsell linear tracker, but at the request of the distributor was reviewed with an SME 309 installed on a suitable armboard.

The *HW-19* is a suspended subchassis player using plastics in its construction. The top plate and armboard are cut from half-inch black acrylic (which looks gorgeous until scratched, which is done all too easily) and the platter is made of composite materials topped with plastic. It has obviously been the intention to use materials which tend not to 'ring' and colour the sound. In order to keep the record firmly attached to the platter (an important detail on plastic-platter decks, especially with very slightly warped records) a screw-down clamp is used which bends the record over a rubber washer under the label.

Continuing the black acrylic theme, a triangular cover, emblazoned with the VPI

logo, covers the motor. The latter is a synchronous type which drives the platter via a transparent polyurethane belt that's round in section. This belt passes around the rim of the platter, and some care is required in lifting off records to avoid dislodging it with a stray finger. However, that apart, operation is simple.

ON TEST

The *HW-19* made a good initial impression. Some decks give an immediate sense of authority and of being able to cope – this is one of them. The sound is above all clean, free from obvious coloration or distortion of any kind, and cartridge tracking is subjectively improved compared with many other decks using the same arm. (Perhaps because of good arm termination? With the large area of comparatively dissipative acrylic in the arm board, the *HW-19* is likely to be good in this respect.)

Particularly impressive is the degree of subjective bass extension the deck can provide given recordings with some real low frequency information. This extension is not perhaps as neutral as with some decks, sounding just slightly plummy and unsure, a small but noticeable effect, but that is about the only real criticism one could level at the turntable.

Reproduction of solo piano is in the top league, with a high degree of realism and likeness to the master tape.

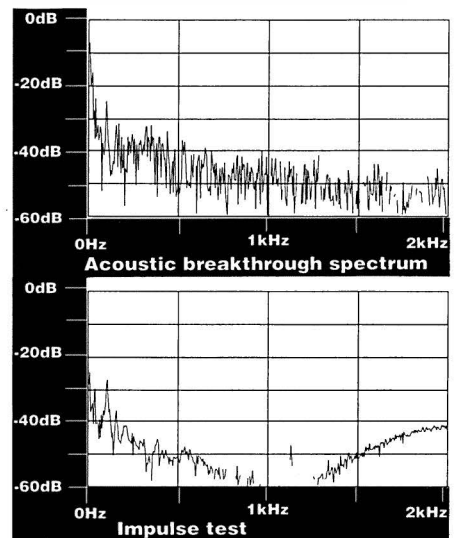
Measurements on the *HW-19* indicate that platter-to-disc coupling is very good, isolation from external vibration is excellent and sensitivity to shocks pretty low. Interestingly, an arm plot taken with the SME showed a certain high-frequency liveliness (compared with other decks on which arm resonance plots were taken, using the very same SME 309) which I simply didn't hear – further evidence that measurements alone can never tell the whole story!

CONCLUSIONS

It's perhaps not enormously competitive on price, but VPI's *HW-19* does have a very refined sound that makes it worth considering along with the finest offerings from the UK and elsewhere. Recommended.

TEST RESULTS

Type	belt drive, manual
Platter type	composite, solid
Build and finish	very good
Mains connection	captive lead
Speeds	33/45rpm (manual)
Wow and flutter (DIN wtd)	0.08%
Speed error	-0.8%
Start-up time	1s
Rumble (DIN B wtd)	? (rumble coupler could not be fitted – rumble figure estimated at -75dB)
Size (h x w x d/clearance for lid)	165 x 550 x 415mm/W/A
Ease of use	moderate
Acoustic breakthrough	good
Hum level	good
Vibration breakthrough	very good
Shock resistance	good
Subjective sound quality of system	very good
Typical price inc VAT	£1,317





TECH TALK

Richard Black outlines the test procedures used in his reviews of turntables and tonearms.

Ring the changes somewhat for this month's test project on turntables and tonearms, I chose to lump the laboratory tests together under the simple 'On Test' heading in the reviews. This is principally because I regard our ears as being as much a test instrument as the oscilloscopes and computer; indeed ears are the only test instrument most prospective purchasers will ever use when choosing a record player.

So why measure at all? Ultimately, the answer must be so that we can, one hopes, relate measurements to what is heard and use the measurements as a kind of shorthand to simplify the lengthy process of evaluation. The measurements *on their own* are useless, or if not useless then worse than useless, since they don't refer to any useful datum or criterion of acceptability. If, however, we can relate them to what we hear in a consistent and reliable way we can produce genuinely valuable information. For example, I have discovered that I find very low wow and flutter – say, 0.05 per cent or lower – important in record players; were I now to try to make a record deck I should first make certain that wow and flutter were as low as possible before expending very much effort on improving any other areas of the deck's performance.

But don't be overawed by the measurements. They are carried out, in the context of reviews of this nature, principally out of interest – and it *is* interesting to compare measured parameters on record decks, especially if one can also compare the decks by ear. The most value they have is as a preselector mechanism whereby one can learn what to look for in the way of limitations in a particular product, which might well be of help, say, in a demonstration at a dealer's showroom. It's a bit like buying a car. If you know, for example, that a certain car has a tendency to heavy steering you will probably try it out on a few parking manoeuvres, something you perhaps would not think of on a test drive without prior warning. Use test results as a guide, not as a judgement of absolute merit.

LISTENING

Listening to hi-fi components is clearly the crucial part of reviewing, important though measurements are. Indeed, I was very careful to give each record player a fair crack at the front of my system. For one thing, no deck was listened to just once; rather, they were swapped around in largely random order with at least one major listening session for each. Turntables were tried on various stands, including of course any supplied by each manufacturer, along with one that I made for this test project which seemed to suit almost all decks. It consisted of a paving slab stuck to plenty of lead sheet, 'floating' on a car tyre inner tube. Crude and far from ideal in a domestic situation, it nevertheless cut structure-borne vibration by an astronomical amount. Low-frequency instability was a bit of a problem, but I learned to walk gently!

Ancillary equipment varied but was based on my own apparently modest system – Musical Fidelity *A100* integrated amplifier, custom-made loudspeakers and custom-made cables. I also used EAR and my own design amplifiers along with Townshend and SD loudspeakers. The simple reason for using this system was that I am very familiar with it, I know exactly where its strengths and weaknesses lie, and indeed prefer it to many of the more

exotic systems I have heard.

In any case, all the record players were compared with second generation master tapes played through the same system from an EAR-modified Revox *G36* tape deck (this was possible thanks to the kind co-operation of Altarus Records who provided the tapes). Since I was present at the recording sessions, I think it fair to say I have a pretty good idea of what the sound off disc should be like, and I hope this has given at least some consistency to the reviews. Opinions of various passing friends were sought whenever available, especially opinions of female friends (women generally have much sharper hearing than men) and of friends who know nothing about hi-fi.

As for the cartridges, we are grateful to Audio Technica, who loaned the *AT-F5* moving coil used with every product. Apart from this, decks supplied with a cartridge were tried more or less briefly with it fitted, and the more expensive decks were also tried with a Dynavector *17D2* kindly loaned, along with an *XXIL*, by Dynavector Systems. The *AT-F5* we chose as being at the top end of what one might fit to a budget record deck (and I would not consider it out of place on the budget decks reviewed here) and at the starter end of cartridges worthy of 'mega-decks'. The Dynavector I originally intended to use

principally for measurements, but enjoyed listening to it so much that it got a good bit of use throughout the reviews. Its treble is peerless, the rest of the range on a par with my own (rare) Highphonic.

Given the scope of the reviews, I got through a good bit of my wide-ranging LP collection but took care to use certain records with every product. I shall refrain from listing all these, but mention some less common records I much enjoyed, which should refresh the palette of the most jaded audiophile: Nielsen *6th Symphony* – LSO/Ole Schmidt (Unicorn); Grainger *Country Gardens* et al – Sydney SO/John Hopkins (EMI); Busoni piano concerto – John Ogden/RPO/Daniel Revenaugh (EMI); Ravel *Daphnis & Chloe* – Boston SO/Charles Munch (Chesky); Bhundu Boys *Tsvimbodemoto* (Discafrique); Tchaikovsky *Manfred* symphony – LSO/Markevitch (Philips). Plus the entire Altarus catalogue (quick plug!).

THE MEASURING

My approach to measuring hi-fi is to use simple yet flexible equipment rather than large, expensive and dedicated (if highly efficient) instruments. Particularly with record decks, there are certain measurements which are best done 'pseudo-subjectively', and I like the hands-on feel of simple test equipment. The basis of most measurements was a digital storage unit connected to a fast personal computer which did all the digital signal processing. I also used a Nakamichi Audio Analyser and a clever non-contact speed indicator – thanks to Townshend International for the loan.

Measuring record decks is just one of those things – it has too many variables involved to be wholly comfortable. It is not possible to review either a deck or an arm in isolation, nor yet a cartridge. The best one can do is remove some variables by standardising some of the test equipment. To this end I used a single cartridge for most of the measurements, and another cartridge for the rest, on all decks.



Audio Technica AT-F5 moving coil: used predominantly in the listening tests, it's equally at home in budget and top-flight record players.

Please take great care when looking at hi-fi review measurements – these or any others. There is a marvellous book, published years ago by Collancz, entitled *How to Lie with Statistics*. It makes amusing and eye-opening reading, and should be taken in large doses with hi-fi specifications of any sort. In an effort to avoid some of the greatest pitfalls described in that work, I have adhered to the following rules as far as possible:

All graphs of a particular parameter are given with identical scales, and measurements taken by identical methods. (The only exception to this is a slight variation in noise floor between some graphs, due to measuring kit dynamic range limitations.)

Figures are not given to 'spurious accuracy', eg. wow and flutter of 0.12345 per cent when 0.12 per cent is adequate, nor are measurements 'guesstimated' to better than my measurement limits.

Figures are not given at all when numerically repeatable measurement is not possible or practical – this applies principally to vibration breakthrough.

Remember, a reviewer's graph scales and measurement methods are not in general the same as another reviewer's, so beware!

Turning briefly to each measurement: **Wow and flutter** is a simple DIN-weighted figure which I find correlates well with subjective effects – measurement limit with a carefully centred test record about 0.04 per cent; **Speed** is tested with a record on and playing; **Rumble** is quoted as a DIN B-weighted figure (measurement limit with the rumble coupled I used is about 78dB), and shown unweighted to 500Hz in the corresponding graph; **Acoustic breakthrough** was measured by blasting pink noise (off a CD) from a loudspeaker (reasonably flat to 40Hz) a couple of metres away, at a deck with the lid down (if fitted) and the stylus in the groove, and is plotted to 2kHz.

I couldn't convince myself that **vibration breakthrough** is readily measurable at all. Where

does one put the record player? Where does one apply a blow or other vibration? I decided it is easier to hit the plinth or support of each deck gently, with the stylus in the groove, and form instead a subjective opinion as to the susceptibility of the deck to vibration and its character (aural spectrum analysis, if you like). This method is surprisingly efficient and consistent, and it probably makes more sense and is less misleading than a measurement which will most likely only apply accurately in a very limited set of circumstances.

The **disc impulse** test is unlike the usual version – a 5mm ball bearing was rolled two inches down a 45 degree incline on to the edge of a stationary record one inch from the cartridge to simulate more closely than usual (I hope) the effect of a stylus bashing around in the groove – plotted to 2kHz (spectrum, rather than trace as is more

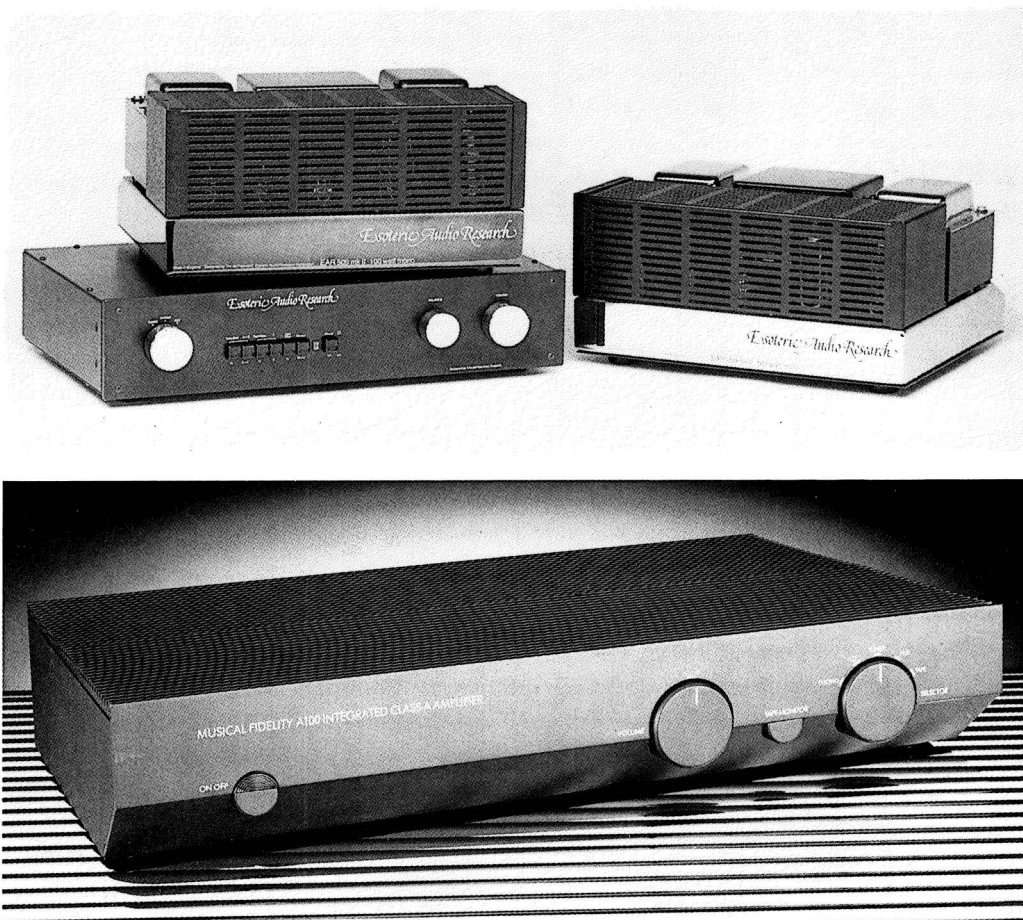
common). I hoped to calibrate this test in absolute terms, but it's a bit involved and I'm not sufficiently confident to put that bit into print yet.

The **arm resonance** test is also unusual, and like the disc impulse test involved dropping a ball bearing (same ball, same height) on to the headshell with the stylus resting on the disc. This gives a signal from the cartridge which is amplified by the phono amplifier, RIAA and all, to give what again I hope is a more lifelike spectrum than other methods. The measurement bandwidth covers 250Hz to 25kHz.

As for interpreting the data, all is not as simple as finding 'the best figure' or 'the lowest graph'. For a start, although the graphs show RIAA-equalised spectra, they are not weighted for hearing and some resonant peaks will be more prominent than others. Resonance between 100Hz and

about 600Hz seems to be relatively innocuous, for example, whereas at 3kHz and up it is likely to be unpleasant. Disc impulse test graphs that show a smoothish, downward-tilting line reflect an RIAA-equalised broadband pulse, not half as nasty as a set of discrete high-frequency resonances of similar amplitude.

Oh dear! A book could easily be written on the interpretation of audio measurements, and every page would be fiercely contested by someone. I can only stress again that the main point of publishing measurements in a review is for interest, and if you do not feel sure of your personal correlation between certain measurements and your subjective hearing, don't assume that your hearing is defective! Use the test measurements carefully to highlight specific problems – that's about their limit.

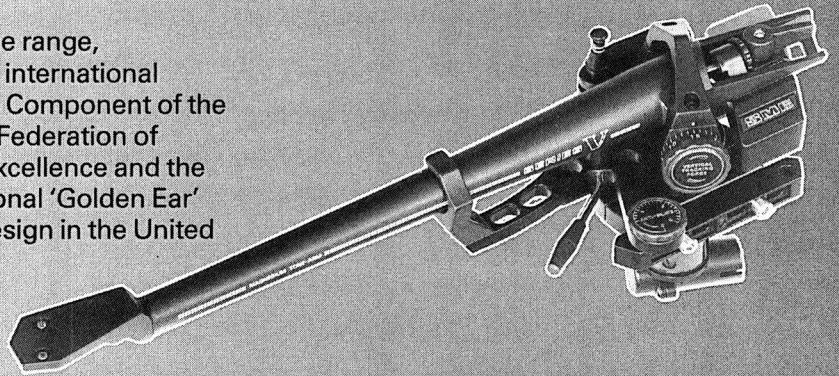


Used in our reviewer's system: Musical Fidelity's A100 integrated amplifier and, top, EAR's 802/509 valve pre/power combination.

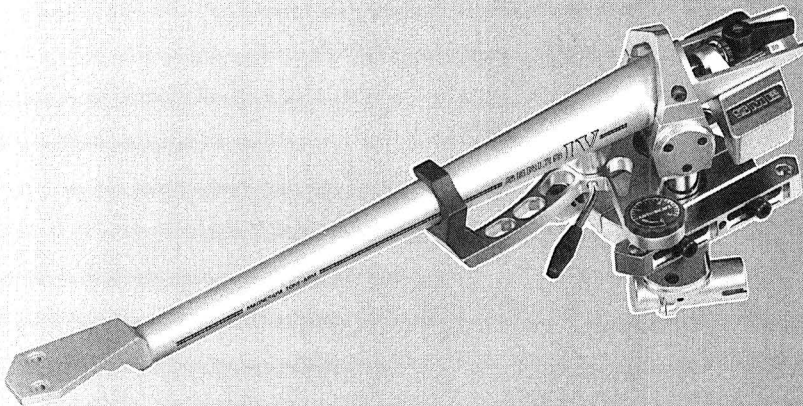
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TURNTABLES & TONEARMS: CONCLUSIONS, BEST BUYS AND RECOMMENDATIONS

Richard Black sums up the best of the batch of record players and arms reviewed this month.

It's nice to think that a process of natural selection, whether or not accelerated by the rise of CD, has weeded out some of the less impressive specimens of the record player breed. At any rate, whatever the cause, the standard of LP reproduction seems to be at an all-time high. At the esoteric end of the market, the last few years have seen more honing of already fine designs than introduction of wholly new design ideas, while in the budget and mid-price categories value for money has improved steadily as prices rise more slowly than inflation and quality creeps upwards.

If you are thinking of buying a record player in the near future, the news is, 'you've never had it so good'. After all, the players reviewed here are only those that are new on the market or have been substantially revised in recent months, and the variety available is not inconsiderable. These reviews cover decks with a price range of £180 to about £2,500 (including arm), but the range available in the shops is wider still, respectable-sounding products starting under £100 and prices for some particularly esoteric decks well into five figures.

BEST BUYS AND RECOMMENDATIONS

At the bottom end of the price scale, five decks rub shoulder-to-shoulder. The cheapest of these is the Thorens *TD280 Mk II* at £180 (including cartridge), with the Rotel *RP-855* coming in at £189 (inc. cartridge), the Thorens *TD166 Mk V* at £199 (also inc. cartridge) and Ariston *Icon* at £215, Thorens *TD316 Mk II* at £220. It is good, if possibly slightly unhelpful to the undecided, to be able to report that all of these decks look like fine value for money. In the context of the very cheapest hi-fi (leaving aside the mid-fi world of music centres and the like), £200

is a substantial amount of money to fork out, and the purchaser can quite reasonably expect a pretty well iced cake. In addition to good sound quality, the decks should offer user convenience, reliability and good looks, and all of these five make that grade.

With the Thorens models in particular, it is really quite remarkable how much record player one gets for the money. The cheapest of these, the *280*, is likely to be a satisfactory front-end for systems in the range of £400 to perhaps £600 or even more. Thorens' record for reliability, by the way, is second to none, so no worries there. The extra £20 for the *166* buys you a suspended subchassis player with a slightly more refined sound, and 'dated' aesthetics that I'm sure some will prefer. The other two sub-£200 decks also provide considerable value; if pressed I would express a very marginal preference for the Rotel, but the Ariston is just as capable a deck with excellent build quality and particularly good environmental isolation via its suspension, something the Rotel lacks. The Ariston is also semi-automatic in operation, as is the *TD280*. All four of these decks are classic Best Buy material. The *TD316* just misses a Best Buy but is well worth considering alongside its cheaper brethren and is Recommended.

Next up the price scale is an interesting 'niche product' with an inherently limited market. The CS Audio *Resan Split-Slab* upgrade kit for Rega *Planar* turntables turns a budget favourite into quite an impressive motor unit with enhanced feedback isolation and neutrality. If you own a Rega *Planar 2* or *3* an extra £80 gives you a highly cost-effective upgrade which also looks good.

At a likely system price (including arm) of £400 to £500, the Manticore *Mantra* and Pink Triangle Projects *Little Pink Thing* provide very different

views of entry to true high-fidelity. Both are very well made and attractive packages able to show many more expensive decks a thing or two. Subjectively the *LPT* is more neutral, in fact its neutrality is first rate by any standards and easily the best in its class. It also has more clearly defined bass, but both decks are well worth hearing and are Recommended. The Manticore *Musician* arm, supplied with the *Mantra* for this review, is a particularly attractive piece of equipment both sonically and visually, and is strongly Recommended.

Further up the price scale, the £600 CEC *ST-930* is unusual in combining good aesthetics, a 'mass market' fully tooled engineering feel, and good sound. With a suitable arm and cartridge (perhaps importer Zenonlec could consider making available a wider range of arm boards?) this deck can be very satisfying and is both good looking and very easy to use. It also plays 78s – excellent! It bridges the gap between 'consumer' and 'enthusiast' hi-fi most successfully, and is Recommended for its combination of strengths.

The remaining decks represent differing attempts by four manufacturers to provide the utmost in LP replay. The cheapest is the Pink Triangle *PT TOO* (£650), a singularly well-researched record player with as clear a sound as you'll hear this side of a master tape or (preferably, of course) a concert, excellent neutrality and good bass. Lacking its own 'hi-fi sound', it can sound understated, but remember that the best statement any reproducing equipment can make is none at all – the musicians and their instruments already do that. At this price, for what one gets inside the deck, a Best Buy would be in order if the category extended this high; but Recommendation is assured.

The VPI *HW-19*, Alphason *Sonata* and Townshend *Rock Reference* all use large amounts of damping materials to try to keep the record in its place, and all succeed in producing neutral, clear, balanced sound with well extended bass. At £1,317, the *HW-19* compares more favourably with the *Sonata* (£770) plus *Atlas PSU* (£360) system than with the *Sonata* alone. On the one hand, the *HW-19* can take linear tracking arms easily and is very easy to set up and use. On the other hand, its sound is similar to the *Sonata sans Atlas*, and the *Atlas*, although pricey, is a definite upgrade to the *Sonata*. At any rate, both are Recommendable. The *Sonata* came with Alphason's top arm, the *HR-100S MCS*, which seems very capable but was not tested on other decks; the Recommendation thus applies to the system as a whole.

The *Rock Reference* is the most successful deck at retrieving bass information, the massive platter and the trough ensuring a minimum of spurious movement in the system. At higher frequencies it is only marginally less successful, and overall is the closest deck to reproducing 'master tape sound'. Its high price of £1,800 does not preclude confident Recommendation – what price do you put on the best? The partnering arm, the *Excalibur* (£650) is included in the Recommendation but unfortunately is not applicable to other decks.

The two arms reviewed separately in this issue, the Kuzma *Stogi Reference* (£699) and the SME *309* (£495), are in a way two of a kind. Both use strong, stiff arms with high grade bearings, both are well made and they could well suit similar record decks. The SME is also one of the best engineered and finished products in the audio industry. Both arms are highly capable and confidently Recommended.



PERSPECTIVES

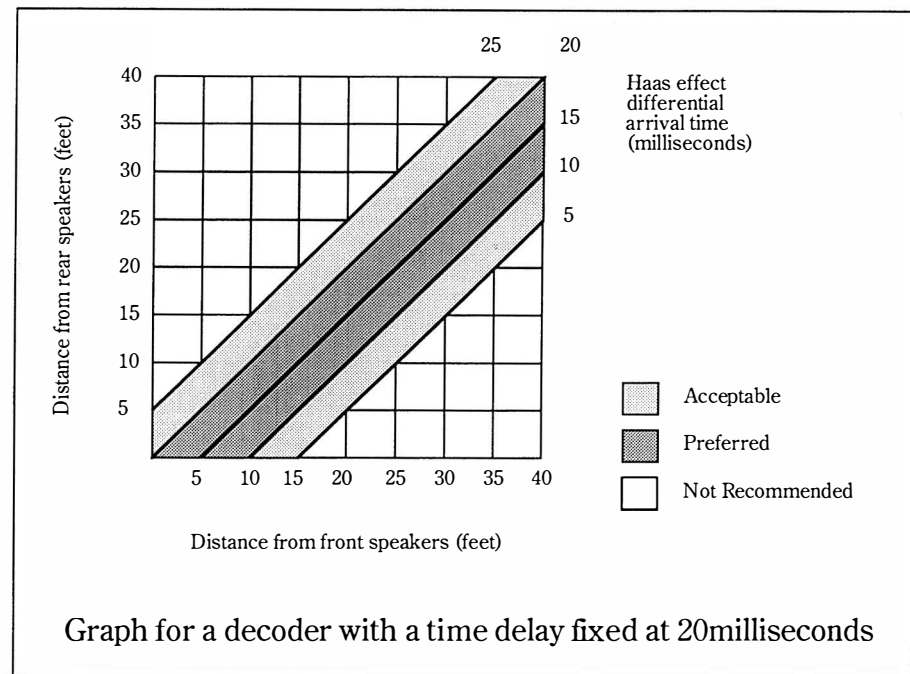
Marantz's SP-50 heralds a new generation of Dolby Pro-Logic processors for decoding surround-sound information on video feature films. Andy Benham outlines the history of Dolby Stereo, Dolby Surround, and Dolby Pro-Logic and explains how it all works.

Until recently, the ability to recreate high quality cinema sound in the home was limited to those of us who didn't mind laying out cash figures the size of telephone numbers. Although there are many inexpensive Dolby Surround decoders on the market which give an approximation of the effects you hear in West End cinemas, the real McCoy, known in its domestic form as Dolby Pro-Logic, has so far been limited to up-market units such as the Lexicon CP2 processor. As even this 'budget' model retails for £750, by the time you've added in the cost of the extra amplification and loudspeakers you are talking serious money.

All this is set to change, the reason being that Sanyo has succeeded in making a single integrated circuit which will perform all the necessary processing to give full Pro-Logic decoding. Devices such as the Lexicon took the idea behind Pro-Logic and built a small computer into the unit which processed the signal provided by an on-board digital to analogue converter and then turned it back into analogue to feed out to the speakers. Not surprisingly this was very expensive to produce – hence the relatively high cost of the Lexicon units. With Sanyo's breakthrough, Dolby Pro-Logic will quickly replace Dolby Surround as the standard domestic format for creating cinema-style Surround Sound.

The first machine based around this new chip to arrive on these shores is the Marantz SP-50, a mere £200 for full Pro-Logic decoding as well as a built-in rear channel amplifier. Building a system around this unit, you can have a full set-up in your front room for little more than £300 over and above the cost of your basic stereo hi-fi set-up.

In order to understand just what the SP-50 does, and how it differs from a conventional, passive, Dolby Surround decoder, you need to know a little about how film soundtracks are put together and what happens to them when a cinema print is transferred to video. In the 70 years since Al Jolson mouthed those immortal words, "You ain't seen nothing yet", there has been a non-stop search for ways to improve film sound. A plethora of different formats emerged over the years and all fell by the wayside, either because the sound quality wasn't up to it or because they were just too expensive to put into practice. Cinemiracle, Dimension 150, TODD-AO, Ciner-



Firing on all five

ama, all went to the great cinema in the sky. By the end of the '60s, only the four track 35mm Cinemascope and the six track 70mm formats survived.

The system that was to revolutionise cinema sound was invented by Ray Dolby, he of the noise reduction fame, and is known as Dolby Stereo. The idea behind his new system was three fold: to reduce background noise by employing Dolby A type noise reduction; to license cinemas to run Dolby Stereo films, and thus have control over the systems they used; and to introduce both stereo and surround tracks to a conventional optical print.

Using an optical film print was one of the major factors in Dolby's success. With a 70mm print the soundtrack was magnetically recorded along strips of magnetic

oxide stuck down the sides of the film, rather like glueing a strip of cassette tape down one edge and then recording on it. Not only was this very expensive and time consuming, but when the print was finished you had all the problems of wear to both the magnetic strip itself and to the playback heads of the projector.

The Dolby Stereo system emerged in 1975, an optical system providing four soundtracks, left, centre, right and surround. The soundtrack was recorded as a pair of lines of varying width down one side of the print. By passing a beam of light through the print and on to a photoelectric cell at the other side you produced a fluctuating electrical signal. The clever part was to combine the four soundtracks in such a way that they could be recorded

on the two tracks placed on the film and then be recovered once it was played in the cinema. As not every cinema would have Dolby Stereo playback equipment, the system also had to be compatible with conventional stereo and mono presentations.

The coding process takes place in a device known as a Dolby MP 4;2;4 matrix. The left and right channels are allowed to pass straight through this device, while the centre channel is split in half and added equally to each signal, with a drop of 3dB to ensure the correct volume is achieved when the two halves of the signal are recombined. As the signal is present in both left and right channels, and as both parts are in phase, playing the signal in a conventional stereo set-up will simply mean that the centre channel information images inbetween the two speakers.

For the rear channel information the signal is again split in two and reduced by 3dB. However, this time the phase of the signal is inverted by plus 90 degrees before it is fed to the left signal and by minus 90 degrees before it is fed to the right signal. When played in stereo it will tend to give a 'spread out' feel to it, rather like the effect you get when you reverse the polarity on one of the speakers in a stereo hi-fi system, while in mono it should cancel out.

When films are mixed for the cinema the sound engineer uses a device which encodes the four channels into the Dolby Stereo format and then decodes them back into the left, centre, right and rear channels. These are then monitored in a

cinema environment to make sure that the signals have retained their relative positions. When Dolby Stereo encoded prints are replayed the four channels are recovered and fed to the speakers. In most cinema set-ups you will have conventional left and right speakers as well as a centre speaker hidden away behind the acoustically transparent screen. Surround speakers are placed either along the back of the auditorium or down the sides, or both.

SCREEN GEMS

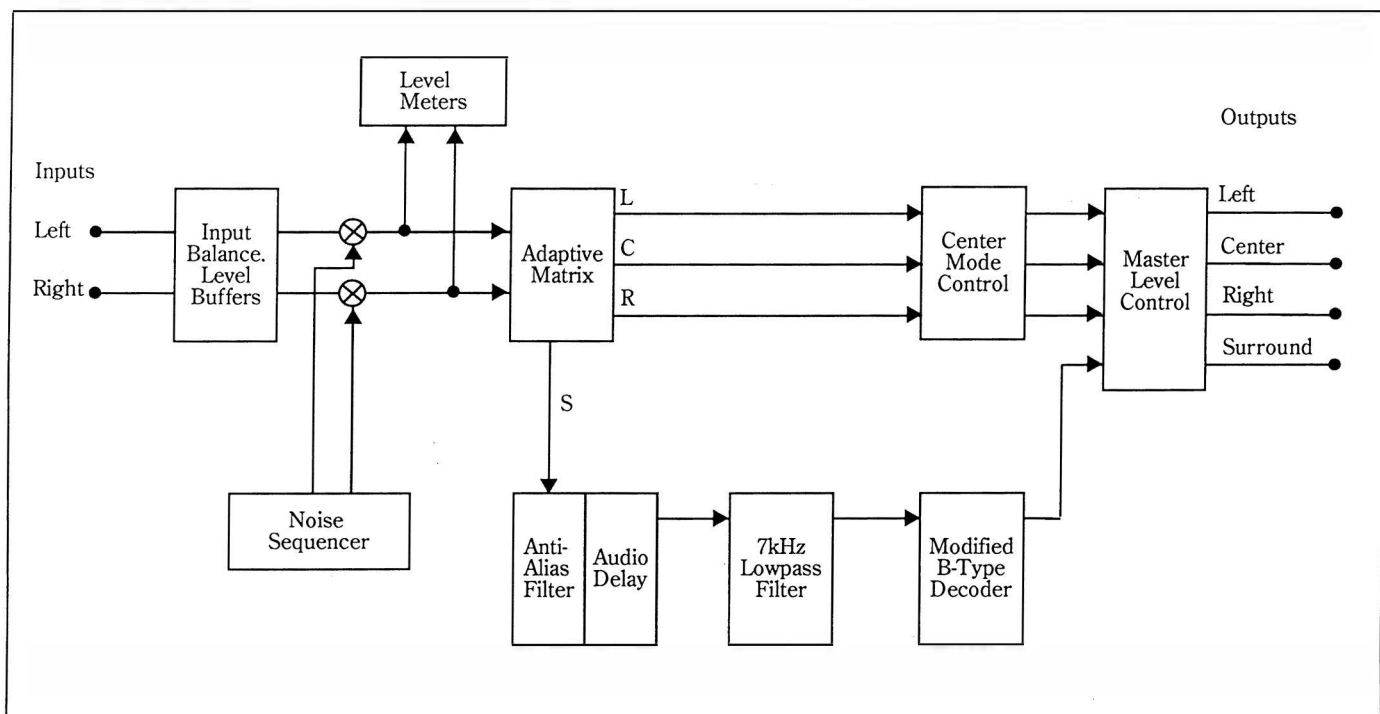
Although the marketing started in 1975, it wasn't until the release of *Star Wars* in 1976 that Dolby Stereo really took off. Even today people still talk about those opening scenes, and the fact that half the audience actually ducked as the Empire's Battlecruiser appeared to fly directly overhead proves just how effectively sound can be used to add to a feature film's impact. The effectiveness of the Dolby Stereo format can be judged by the fact that for the past decade all the Academy Award-winning soundtracks have been Dolby Stereo releases, a fact the Academy acknowledged in 1988 when they awarded Dolby an Oscar for his services to the industry.

So much for the effectiveness of the rear channel but why, you might ask, do you need a centre speaker? The answer is that it helps tie the dialogue into the picture for people sitting off-centre. In the domestic environment it is usually possible to sit in between the speakers and in front of the TV set. In the cinema the chances are that

you will be sitting off to one side – on the far left of the front row, for example. With conventional stereo the sound from the left speaker will reach your ears long before sound from the right. Your ears will then tell you that the action is taking place on your left, although your eyes will be trying to follow what is happening in the centre of the screen. The results aren't particularly pleasant and research has shown that by providing a central channel to anchor the dialogue to the action people enjoy the film far more, because their eyes then agree with their ears.

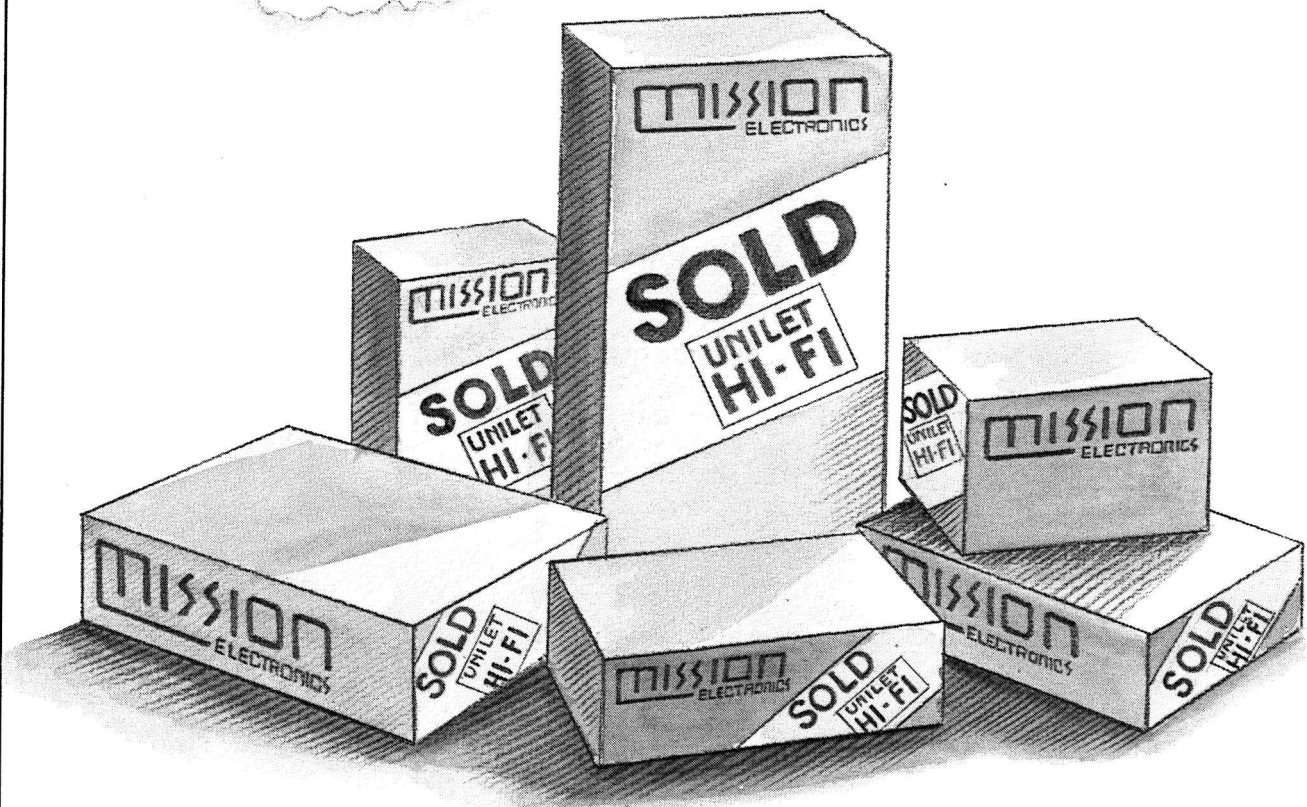
When a Dolby Stereo film is transferred on to video tape, the left and right total signals are stripped of the Dolby A type noise reduction and passed straight on to the video tape. In some cases Dolby B type noise reduction is added, but basically the video tape carries the same centre channel and rear channel information as the cinema release. Because, as previously mentioned, the format is fully compatible this doesn't cause any problems when watching the film on an 'ordinary' video recorder and TV set without Hi-fi stereo sound or the benefit of Dolby decoding.

Although practically the same system, Dolby Stereo soundtracks, when transferred to video tapes, are henceforth to be known as *Dolby Surround* soundtracks, with cassette boxes carrying the new Dolby Surround logo to aid identification. In the past some confusion has arisen with cassette tape boxes carrying a prominent 'Dolby' logo when referring merely to the



Signal decoding in a Dolby Pro-Logic Surround unit

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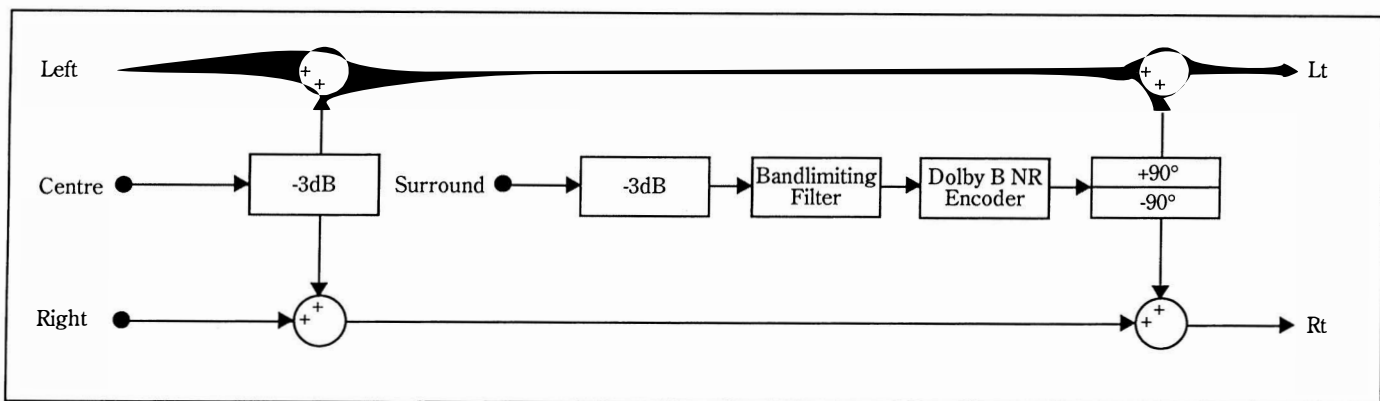
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Signal encoding using the Dolby Stereo format

noise reduction used on the linear (low-fi) soundtracks rather than the FM-multiplexed Hi-fi stereo tracks. The change in logo should clear all that up. All domestic variants of decoding system will become known as Dolby Surround, with active matrix versions of the system being referred to as Dolby Pro-Logic Surround.

DOING IT AT HOME

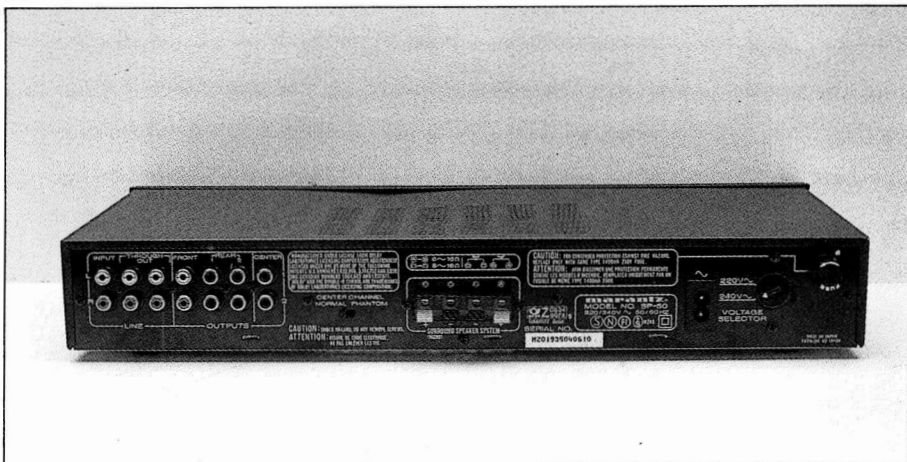
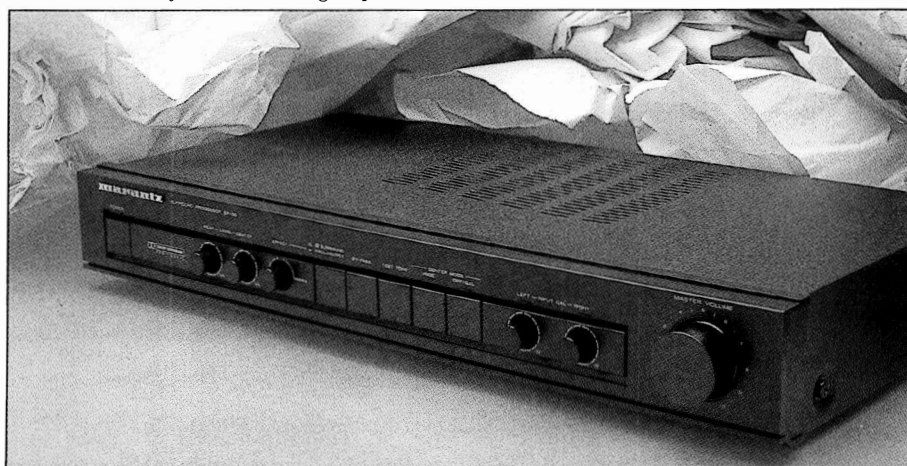
As the information necessary to recreate the full cinema-style sound experience in the home has always been available on the video tapes we hire from our local rental shops, there was an obvious market for home decoders. The first attempt to tap the domestic market came in 1982 with the launch of Dolby Surround. The success of this format can be judged by the fact that well over a million Dolby Surround units have been sold, and these days they can be found built in to many Japanese A/V amplifiers and even a Hi-fi VCR or two! With this passive version of the system no attempt is made to recover the centre channel information and the surround information is recovered by a simple left minus right signal subtraction. As the surround material is out of phase the result of the subtraction is to remove the main signal and to separate out the surround information. Obviously there will be some leakage from the front channel into the rear channel but this can be taken care of by means of delaying the rear channel. This delay time is very important because of a psycho-acoustic phenomenon known as the Haas effect. This states that the ear will attribute direction according to the first sound to arrive, with no regard to later, stronger signals – ie if you hear the sound from behind you first, no matter how quietly, the brain will think that the sound is coming from there. Clearly it would be disastrous if you began to think that the dialogue, etc was coming from behind you, so a delay is introduced to the rear channel, usually fixed at 20 milliseconds, although some more sophisticated units have a variable delay time for increased flexibility.

The more advanced Dolby Pro-Logic Surround first saw the light of day towards the end of 1987, the Lexicon *CPI* appear-

ing in shops in spring 1988 and offering a full digital implementation of Pro-Logic, albeit at the rather hefty price tag of £1,000. Pro-Logic is far closer to the original Dolby Stereo system than the passive system and is based around a device known as an active matrix.

Active decoders work by employing directional enhancement techniques which attempt to remove crosstalk between the various signals by manipulating the output signals of the decoder. This might ring a bell with anyone who remembers the old SQ quadrophonic decoders, but in fact it employs a quite different system from the logic enhancement circuits used by SQ. While SQ relied on a concept known as gain riding, Pro-Logic works by a process known as cancellation. Consider the case where you have dialogue present

Front and rear of Marantz's new SP-50 Pro-Logic decoder. An on-board two-channel amplifier will drive your rear channel loudspeakers.



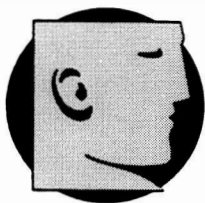
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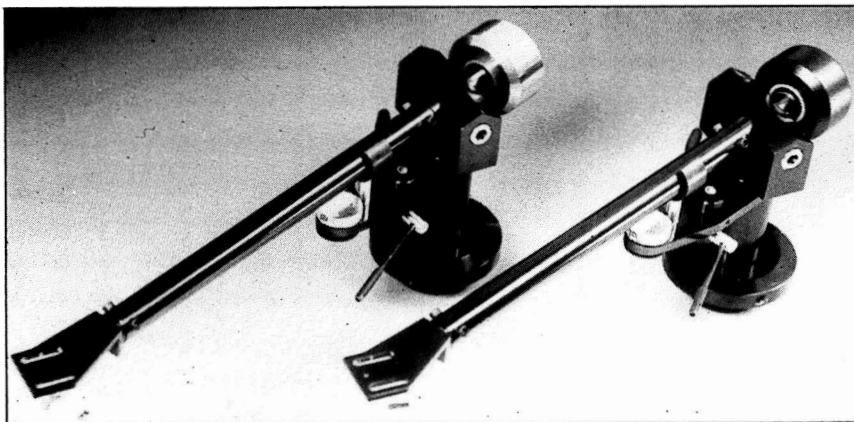
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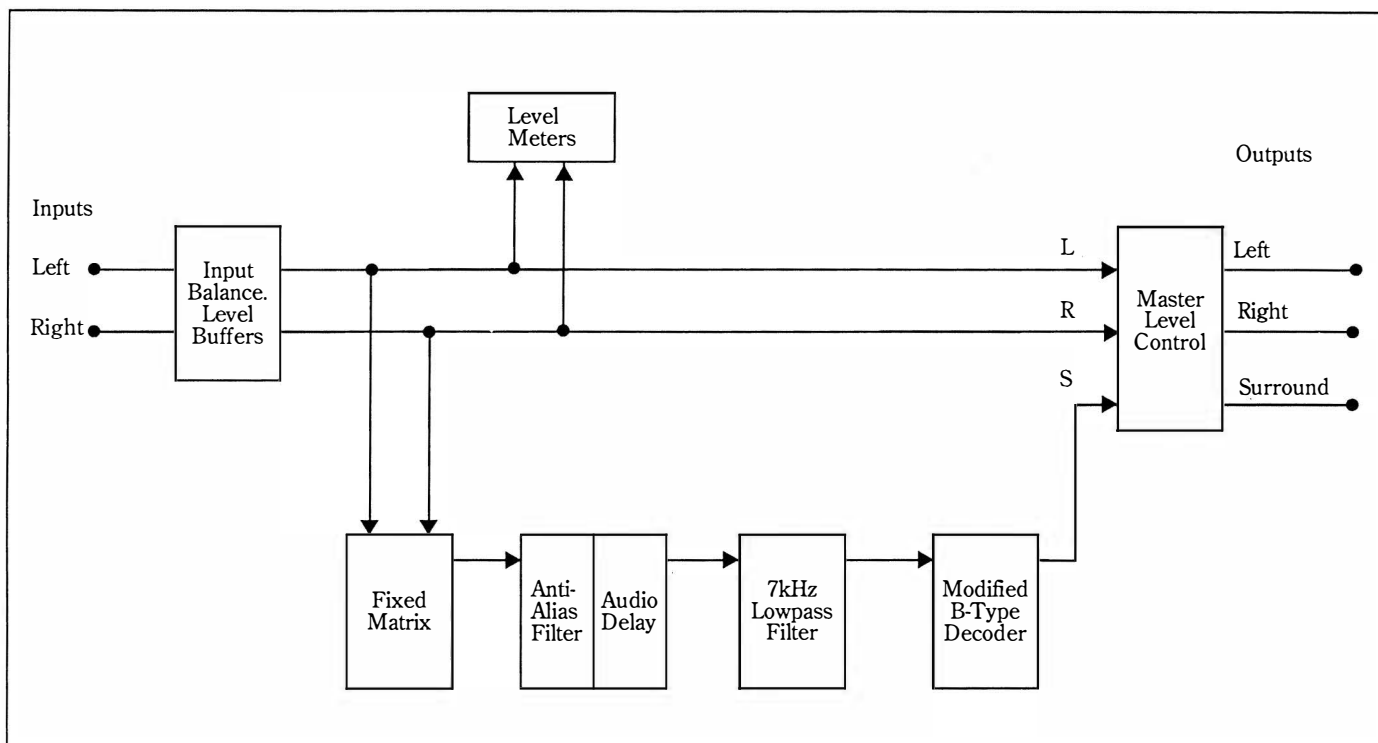
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Signal decoding in a passive Dolby Surround unit

at the same time as high volume background music. In its most basic form the cancellation principle would take the right hand channel information, invert the polarity, and blend this into the left hand channel information. The centre signal components, being equal and opposite, will cancel out completely, thus eliminating any dialogue leakage into the left output.

Obviously in the above example the soundtrack has been altered as the left channel now contains out of phase components of the right, and vice versa, however, unlike SQ, there has been no overall increase in level and the ear is fooled into concentrating on the dialogue and tends not to notice the out of phase components. As the decoder operates dominant sounds are focused, while non-dominant sounds are redistributed among the remaining speakers. The principle is that the dominant sound will temporarily limit the listener's ability to detect a change in directionality of the non-dominant sounds. Since no overall change in loudness occurs, 'pumping' and noise modulation effects should be almost imperceptible.

Of course there are times when directional enhancement isn't needed. The sound of rain falling, for example, should come from all around the listener, and in these circumstances, ie when the signal is present in all of the channels, the active matrix operates in an almost passive mode, applying little or no steering. The actual operation of the adaptive matrix is far too complicated for the scope of this article but it is this complexity that led to the delay in a single chip implementation of Pro-Logic and thus the expense of the first domestic decoders.

When it comes to material to use the

system on, it is obviously compatible with the vast amount of Dolby Surround encoded video tapes. So far over 2,000 have been released. The interesting part of the system is that transmitting the signal over the new NICAM stereo TV system doesn't corrupt the signal in any way, thus when you watch movies on the TV there is no reason not to decode the surround information. This fact has not been lost on TV companies and some have gone one step further and started to produce 'standard' TV programmes with Dolby Surround encoding.

For the last couple of years the Super-bowl American Football finals have been transmitted to the United States with Dolby Surround soundtracks and Spielberg's *Amazing Stories*, *Miami Vice* and *Private Eye* have all gone out in Dolby Surround.

In Japan both Sumo wrestling and baseball go out with Dolby sound tracks and there have even been a couple of trial concerts - in 1988 63 programmes were made with Dolby soundtracks and that number is certain to increase this year. As much of

the TV we see is bought from America, there is every chance that we will soon begin to see Dolby Surround programmes in this country, while the transmission of feature films with Dolby Surround soundtracks has already begun.

Machines such as the Marantz *SP-50* are simplicity itself to set up. With its built-in rear channel amplifier all you have to add is one or more loudspeakers for the rear channel and an amplifier and separate speaker for the centre channel. The Dolby Pro-Logic specification insists on a built-in noise sequencer which sends noise to each of the speakers in turn. To set up the system all you have to do is turn on the test tone and adjust the channel balance until the level is the same from each speaker.

If you really want to get carried away with the whole cinema sound experience, some available decoders also have provision for connection of a subwoofer. When properly set up, a complete system with subwoofer will come extremely close to the standards of performance that we are coming to expect from today's top cinema installations.



DOLBY SURROUND

During coming months this new logo (above) should start appearing on video cassette boxes, so movies with full Hi-fi stereo **and** Dolby 'surround' encoding will be easily identified in future. Of course, some tapes will remain labelled simply as 'Hi-fi stereo', while the logo on the right will tell us that Dolby noise reduction has been used on the linear (low-fi) soundtrack.



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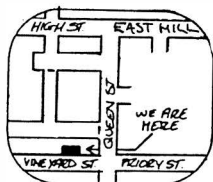
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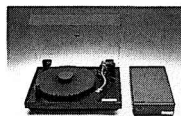
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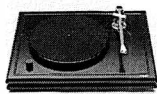
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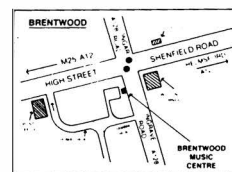
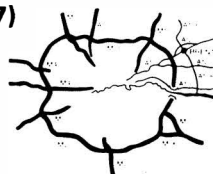
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
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
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THE AUDIO SHOP, 128 Poole Road, Westbourne, Bournemouth. (0202) 762160. Arcam, Quad, Michell, Marantz, Linn, Celestion, Spendor, Cambridge Audio, Absolute Sounds, Revox. 2 dem areas. Appts nec. Home trial. Free installation. Access, Visa. Tues-Fri 10-6, Sat 9-5.

ESSEX

A.T. LABS, 442/4 Cranbrook Rd, Gants Hill, Ilford. (01) 518 0915. Mon-Sat, 10-6. Two dem rooms. Access, Visa. Sony Hi-Fi News Best Dealer '86 & '88 (National). BADA MEMBER 

RAYLEIGH HI-FI, 44a High Street, Rayleigh, Essex. (0268) 779762/747571. 216 Moulsham St, On-the-Parkway, Chelmsford, Essex. (0245) 265245. A&R, Creek, Cyrus, Denon, Epos, Ion, Linn, Mission, Naim, Quad, Rega, Roksan, Rotel, Royd, 0% finance. BADA MEMBER 

BRENTWOOD MUSIC & HI-FI CENTRE, 2 Ingrave Rd, Brentwood. (0277) 221210. Alphason, B&W, Cambridge Audio, Denon, Harman Kardon, Marantz, QED, Quad, Yamaha. Dem and home trial facilities. Mon-Sat 9.30-5.30 (Thurs from 10am, Sat from 9am). Free installation, credit facilities. Access, Visa, Hi-Fi Markets. Service dept.


LYON AUDIO, 16 Peartree Business Centre, Peartree Road, Stanway, Colchester, Essex CO3 5JN. (0206) 560259. Quad, Rogers, Mission, Denon, Celestion, Marantz, Audiolab, Heybrook, Rotel, NAD. Dem facilities. Mon-Sat 9-6. Installations. Access, Visa, Hi-Fi Markets, Instant credit. Service dept available.


PRO MUSIC A, 6 Vineyard Street, Colchester. (0206) 577519. Linn Products, Naim Audio, Rega Research, Creek, A&R Cambridge, Ion Systems, Denon, Rotel, Epos,

Ruark etc. Two single speaker dem rooms. Credit facilities. Access, Visa. Appointments bookable. Mon-Sat 10am-6pm.

THOMSONS, 2 High Street, Great Baddow, Chelmsford, Essex. Tel (0245) 71465. JVC, Kenwood, Mitsubishi, Toshiba, Tannoy, Mordaunt-Short, Acoustic Research, Wharfedale, Philips, Audio-Visual dealer. Home trial. Free installation. Service dept. Access, Visa, HP. Open 9-1, 2-5.30 Mon-Sat. Open 9-1 Wed.


GLOUCESTERSHIRE


ABSOLUTE SOUND AND VIDEO, 40/42 Albion St, Cheltenham. (0242) 583960. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER 

AUDIO EXCELLENCE, 58 Bristol Road, Gloucester. (0452) 30046. Audio Research, Dual, Krell, Linn, Magnepanar, Naim, NAD, Yamaha and lots more. Closed Mon. BADA MEMBER 

ROBBS OF GLOUCESTER, 13/15 Worcester Street, Gloucester GL1 3AJ. Sony, Technics, Aiwa, Pioneer, Denon, Bose, Celestion, Dual, Kenwood, JVC. Largest selection in Gloucestershire. Dem facilities. Home trial. In house service dept. Access, Visa. 9-5.30 6 days.

HAMPSHIRE

ABSOLUTE SOUND AND VIDEO, 4 Feathers Lane, Basingstoke. (0256) 24311. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER 

HAMPSHIRE AUDIO LTD, 2-12 Hursley Rd, Chandlers Ford. (0703) 252827/265232. Quality CD and analogue agencies. 5 dem studios. Large free car park. BADA MEMBER 


HOPKINS HI-FI, 38/40 Fratton Rd, Portsmouth PO1 5BX. (822155) 830753. Technics, Quad, Monitor Audio, Tannoy, Denon, Nad, Heybrook, Ariston, Onkyo, plus others. Dem facilities, appointments necessary. Access, Visa. 9-5.30. Open to 6 Thurs. Closed Wed. Service dept.


HEREFORDSHIRE

ENGLISH AUDIO, 95 Whitecross Road, Hereford. (0432) 355081. Musical Fidelity, Pink Triangle, Heybrook, Arcam, Nakamichi, Systemdek, Denon, Cambridge Audio, Rogers and others. Dem room. Home trial. Free installation. Service dept. Access, Visa. Open Mon-Sat 10am-6pm.

HERTFORDSHIRE

AUDIO IMAGE, 15 Middle Row, Stevenage, Herts SG1 3AW. Tel: 0438 360606. Aiwa, Goodmans, Harman Kardon, JBL, JVC, Kenwood, Panasonic, Pioneer, Sony, Technics. Dem room & lounge. Home trial. Free installation. Service dept. Access, Visa. Instant credit £1500. Closed Weds. Open 9-6.

ACOUSTIC ARTS Ltd, 101 St Albans Rd, Watford, Herts. (0923) 45250. A&R, Audiolab, Denon, Magnepanar, Quad, Rogers, Meridian, TDL, Jadis, Krell. Mon-Sat 9.30-5.30. BADA MEMBER 

THE AUDIO FILE, 27 Hockerill St, Bishops Stortford, Herts CM23 2DH. (0279) 506576. 9.30-5.30 6 days. Dealer Of The Year 1988/89. Linn, Naim, Rega, Quad, Cyrus, Arcam, Musical Fidelity. 0% credit. BADA MEMBER 

HYPERTEC, 6 Bancroft Road, Hitchin, Herts. (0462) 452248. B&W, Denon, Dual, Marantz, Pioneer, Rotel, Tannoy, Technics, Wharfedale, Bang & Olufsen. 2 dem rooms without appointment. Private dem room with appointment. Home trial. Free Installation. Service dept. Access, Visa, Hypertec creditcharge. 9.30-5.30 6 days per week. Evening dem by appointment.

W. DARBY & CO (TB) Ltd., 6 Market Place, near the clock tower, St. Albans, Herts. (0727) 50961. Alphason, A&R Cambridge, Bang & Olufsen, Denon, JPW, JBL, Harman Kardon, Quad, Ruark, Sony, Yamaha. Home demonstrations, free delivery and installation. Sales rental service. In house credit. Lombard, Tricity. Mon-Sat 9-6.

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ISLAND COMPACT DISC CENTRE, Parliament Square, Ramsey. (0624) 815521. Arcam, Ariston, Audio Innovations, Celestion, E.A.R., Marantz, QED, SD Acoustics, Snell, Sugden. Mon-Sat 9-5.00. Dem and home trial facilities. Free installation. Full credit, no limit. Access, Elite. Service dept.

KENT

JOHN MARLEY HI-FI CENTRES, 2 Station Rd West,

Canterbury. (Canterbury) 69329. Also at Dover - (0304) 207562. B&W, Heybrook, Magnum, M.Y.S.T., Nakamichi, Pink Triangle, Rotel, Sansui, Technics, Quad. Dem and home trial facilities. Mon-Sat 9-5.30 closed Thurs. Free installation. Credit to £1,000. Access, Visa, Creditcharge. Service dept.
VJ HI-FI, 29 Guildhall St, Folkestone. (0303) 56860. Mon-Sat 9-6. NAD, Yamaha, Marantz, Cambridge Audio, Denon, Kenwood, Rogers, Dual, Musical Fidelity, Quad. Dem and home trial facilities, free installation, credit to £1000. Amex, Diners, Visa, Access. Service dept.
PHOTOCRAFT HI-FI, 40 High St, Ashford. (0233) 624441. No. 1 in Kent for Linn, Naim, Rega, Roksan, Exposure, Onix, Epos, Royd, Creek. But before you choose equipment choose where to buy it. Dem room, appts. necessary. Home trial and free installation. Visa, Access, Bada Chargecard. 9-5.30 Mon-Fri (Wed & Sat to 5 only). Service Dept.
TONBRIDGE HI-FI, 31 High Street, Tonbridge Wells, Kent TN1 1XL. (0892) 24677. If your interest is music pay us a visit and find out what we do. BADA MEMBER

LANCASHIRE

MONITOR SOUND, 54 Chapel St, Chorley. (02572) 71935. A&R, Dual, Mission, Quad, Rogers, Rotel, Spendor, Thorens, Nakamichi, Yamaha, etc. 2 dem rooms. Open Mon-Sat, closed Weds. Free installation. Credit to £1,000. Access, Visa. Service dept.

LEICESTERSHIRE

MJS HI-FI, 80 Stapleton Lane, Barwell, Leicester LE9 8HE. (0455) 46977. The Rock, Audio Innovations, Kelvin Labs, Snell, Helius, Sugden, Ruark, Concordant, Valdi, JPW. Our main aim is for our customers to enjoy music. Dem and home trial facilities. Mon-Sat 9.30-7.00. Free installation and service dept. Visa, Access.
THE LEICESTER HI-FI CO, 6 Silver Walk, St. Martins Square, Leicester LE1 5EW. (0533) 539753. 6 days 9.30-5.30. A&R Cambridge, Heybrook, Marantz, Mission, Musical Fidelity, Nakamichi, QED HI-FI, Quad, Revox, Roksan "and oodles more". Largest selection in Leicestershire. 2 dem rooms. Home trial arranged + free installation. Credit facilities. Hi-Fi Markets, Access, Visa, Am. Exp. Service dept.

LINCOLNSHIRE

BOSTON HI FI CENTRE, 65a Wide Bargate, John Adams Way, Boston, Lincs PE21 6SG. (0205) 65477. Quad, Nakamichi, Creek, Ariston, NAD, Denon, Marantz, Castle, JPW, B&W. Separate demo studio. Home trial, free installation, service department. Access, Visa, Hi-Fi Markets Chargecard. Tues-Sat 9-5.30 pm.

LONDON

A.T.LABS, 190 West End Lane, London NW6. (01) 794 7848. Mon-Sat 10-6. Two dem rooms. Access/Visa. Sony Hi-Fi News Best Dealer '86 & '88 (National). BADA MEMBER
AUDIO T, 190 West End Lane, London NW6. (01) 794 7848. Mon-Sat, 10-6. Two single speaker dem rooms. Access, Amex, Visa. BADA MEMBER
CORNFLAKE SHOP, 37 Windmill Street (just off Tottenham Court Road), London W1. (01) 631 0472. Mon-Sat 10-7. Rega, Roksan, Naim, Monitor Audio, Koetsu, Marantz, Yamaha, SME, DNM, Epos. Three dem rooms, friendly, knowledgeable service. We design and install multi-room systems. Delivery and installation service. Credit facilities. Access, Visa.
COVENT GARDEN RECORDS, 84 Charing Cross Road. (01) 379 7635/7427. Quad, B&W, Meridian, Mission, Yamaha, Sony, A&R Cambridge, Nakamichi, Rotel, etc. Dem facilities - no appointment reqd. Mon-Sat 10-7.30. Home trial facilities, free installation. Access, Visa, American Express, Diners Club. Service dept. BADA MEMBER
DIN, 25 Melcombe Street, London NW1 6AG. Tel: (01) 224 4413. Roksan, Quad, Denon, Meridian, Mission, Celestion, Krell, Apogee, Arcam, Nakamichi. Full demonstration and delivery. Free installation. Access, Visa, Amex, Diners.
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HI-FI CONFIDENTIAL, 35/37 Marsham St., London SW1. (01) 233 0774. Open Mon-Fri 10-6, Sat 10-3. Creek, Denon, Hafler, Kelvin Lab, Musical Fidelity, Oracle, Quad, Rotel, S.D. Acoustic, S.M.E. etc. Large single speaker dem room. Limited home trial facilities. Export worldwide.
H.L. SMITH & Co Ltd, 287-289 Edgware Rd, London W2 1BE. (01) 723 5891. Aiwa, B&W, Denon, Dual, KEF, Ortofon, Panasonic, Sony, Technics, Yamaha. Dem facilities. Mon-Sat 9-5.30, Thurs 9-1. Credit to £1,000. Access, Visa, Diners. Service dept.
JUST MUSIC, 52 Upper Tooting Road, London SW17 7PB. (01) 767 1233. Aiwa, Dual, Denon, Marantz, Quad, Rogers, Thorens, Musical Fidelity, Sugden, Heybrook and many more. Dem facilities. Appts can be arranged. Home trial.

Free installation available. Access, Visa, Amex, Hi-Fi Markets, Chargecard, Creditcharge, finance arranged. 10am-7pm Mon-Thurs, 10-6 Fri & Sat.

KAMLA ELECTRONICS, 251 Tottenham Court Road, London W1. (01) 323 274. Amadens, Ariston, BLQ, Gale, Incatech, JPW, Linn, Mordaunt Short, SME, Systemdek, Thorens, Townshend, Ruark, Wharfedale.
KJ WEST ONE, 26 New Cavendish St, London W1M 7LH. (01) 486 8262/63. Fax (01) 487 3452. Arcam, Audio Research, Croft, Epos, Linn, Marantz, Musical Fidelity, Quad, Systemdek, Voyd. 2 dem studios. Appts. nec. Home trial. Free installation. Service dept. Major credit cards. Mon-Sat 10-6pm. (Late night Thursday til 7pm.)

NICHOLLS HI-FI, 430-434 Lee High Street, Lewisham, London SE12 8RW. (01) 852 5780. Sony, Technics, Harman, JBL, Mordaunt Short, Kenwood, Panasonic, Hafler, Sumo, B&W. Dem facilities. Home trial. Free installation. Service dept. Credit available. Visa, Access. 9.30-6 Mon-Sat, Thurs till 1 o'clock.
ORPHEUS HOME DEMONSTRATIONS. (01) 299 0075. Alexander, Alphason, Cadence, Castle, Kiseki, Moth, Proton, Thorens, Townshend, Systemdek. Home demonstrations only. Appts. necessary. Home trial, free installation. Service dept. Three month interest free credit. Open 24 hours. All goods guaranteed two years.

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THE SOUND SHOP, 58 The Broadway, Mill Hill, London NW7. (01) 906 3364. Denon, Kenwood, JPW, Marantz, Monitor Audio, Musical Fidelity, NAD, Ruark, SD Acoustics, Tannoy etc. Home trial. Free installation. Service department. Access, Visa, Amex, Diners. Credit facilities. £1000 instant credit. 10-6 Mon-Sat.

MIDDLESEX

A.T. LABS, 173-175 Station Rd, Edgware, Middx. (01) 952 5535. Mon-Sat 10-6. 2 dem rooms. Access, Visa. Sony/Hi-Fi News Best Dealer '86 & '88 (National). BADA MEMBER

UXBRIDGE AUDIO LTD, 278 High St, Uxbridge, Middx UB8 1LZ. (0895) 30404 (Multi-line). A&R, AR, Ariston, Creek, Cyrus, Denon, Dual, JPW, KEF, Manticore, Meridian, NAD, Nakamichi, Quad, Rotel, Wharfedale, Yamaha, etc. 2 dem rooms. Mon-Sat 10-6. BADA MEMBER

HARROW AUDIO, 27 Springfield Rd, Harrow. (01) 863 0938. Mon-Sat 9.30-5.30. A&R, Audiolab, Cyrus, Denon, Dual, Heybrook, Linn, Monitor Audio, Musical Fidelity, Quad, Rotel, Tannoy etc. BADA MEMBER
A.T.LABS, 159 Chase Side, Enfield, Middx. (01) 367 3132. Mon-Sat 10-6. Two dem rooms. Car Park. Access/Visa. Sony/Hi-Fi News Best Dealer '86 & '88.

MERSEYSIDE

IN CONCERT HI-FI, 144 Seaview Road, Wallasey, Wirral, Merseyside. (051) 630 5055. Denon, Kenwood, QED, Alexander, Spica, Shan Acoustics, Monitor Audio, Tannoy, Audio Dynamics, Dual, Systemdek, Audio Technica, Target, Musical Fidelity, Audio Dimensions, Voyd. Single speaker dem room. Home trial + free installation. 10-6 - closed Mon. Open till 8pm Thurs and Fri. Access + Visa. W.A. BRADY & SON, 401 Smithdown Rd, Liverpool L15 3JJ. (051) 733 6859. 'Largest choice of specialist Hi-Fi in N.W. £100-£20K'. All credit cards. 3 dem rooms. Closed Monday. BADA MEMBER
PURE SOUND - Birkenhead 051 645 6690 24hrs. Acoustic Energy, Aragon, Audio Technica, Beard, Celestion, Deltec, Denon, Michel, Cyrodec, Ortofon. Home demonstration a pleasure, plus evenings and weekends (Sundays by appointment).

RICHER SOUNDS, 99 Renshaw Street, Liverpool L1 2ST. (051) 708 7484. Virtually every major 'budget' name - small store with big discounts and special offers. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard.

NORFOLK

BASICALLY SOUND, The Old School, School Rd, Bracon Ash, Norwich NR14 8HE. (0508) 70829. Arcam, Linn, Naim, Denon, Spendor, Heybrook, Audio Technica, Creek, Rega, Epos, etc. 2 comprehensive dem rooms. Home trial. Free installation. Visa, Access. HP facilities. Tues-Sat 9.30-1, 2-5.30.
SOUND APPROACH, 161 Unithank Road, Norwich. (0603) 622833. Kuzma, Ariston, Castle, Denon, Exposure, Ion, Royd, NVA, Roksan, Ruark, etc. etc. Dem and home trial facilities. Mon-Sat 9-6.30. Free installation. Credit to £1,500. Visa, Access, Diners Club. Service dept.

NORTHAMPTONSHIRE

CLASSIC HI-FI + VIDEO, School Lane, Kettering, Northants. (0536) 515766. ADC, Marantz, Onkyo, Sansui, Teac, Harman Kardon, Pioneer, Proton, Ariston, Thorens, Mantra, Goodmans, Castle, JPL, Mordaunt Short, Seleco TV, Monitor Cable + others.
THE AUDIO SHOP, Coffee Tavern Court, High St, Rush-

den. (0933) 56651. Audio Technica, Denons, Goodmans, Rotel, Tannoy, Ion Systems, Thorens, Gale, BLQ, Royd. Dem room. Home trial and free installation. Mon-Sat 9.30-5.30 (Thurs 9.30-2). Service dept.
SOUND PRINCIPLES, 52 Queen Street, Wellingborough, Northants. (0933) 441907. Aura, Celestion, Heybrook, Marantz, Mission, Nakamichi, QED, Rotel, Spendor, Systemline, Yamaha and others. Demo room. Home demo's by appt. Appts advisable. Free installation. Access, Visa + credit scheme available. Mon-Fri 10-6, Sat 9-5. Out of hour appts can be made.

NOTTINGHAMSHIRE

DEFINITIVE AUDIO, Nottingham. (0602) 813562. Voyd, Valdi, Systemdek, Helius, Audionote, Golding, JPW, Snell, Target, Pirate. Home demonstrations throughout Nottingham and East Midlands. Please telephone (0602) 813562 for further information.
CHANTRY AUDIO, Chantry Walk, 18a Eldon Street, Tuxford, Newark, Notts NG22 0LH. (0777) 870372. Ariston, ADC, Gale, Infinity, JPW, Kelvin Labs, Proton, Rotel, Space Acoustics, Thorens. Single speaker dem room. Appts preferred. Home trial, free installation. Access, Visa + credit facilities. Mon-Fri 10am-4pm. Sat 9-30-5.30. Sun home dem by appt. Closed Weds.

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HORTON ELECTRONICS (1987) LTD, 8-9 Lower Temple St, Birmingham B2 4JD. (021) 643 0972. Aiwa, Dual, Marantz, Goodmans, JVC, Mission, Sony, Technics, Wharfedale, Sennheiser. Dem facilities. Credit to £1000. Access, Visa. 9-5.30 Mon-Sat. Service dept.

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RICHER SOUNDS, 12 Smallbrook Queensway, Birmingham B5 4EN. (021) 643 6664. Popular esoteric hi-fi for upgrades, monthly special offers. Dem facilities, expert advice, free local delivery/installation (£500+), 2 Yr G'tee. Hi-Fi Guide and monthly Newsletters; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard. Service Dept.

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FIVEWAYS HI-FIDELITY LTD, 12 Islington Row, Edgbaston, Birmingham. (021) 4550667. Alphason, A&R, Denon, Meridian, Musical Fidelity, Nakamichi, Quad, Revox, TDL, Thorens, etc. Dem and home trial facilities. Tues-Sat 9.30-6. Free installation. Access, Visa. Service Dept.
BRIDGE HI-FI, 3 Tudor House, Bridge St, Walsall. (0922) 640456. NAD, Dual, Yamaha, Kenwood, Technics, Pioneer, Mission, Celestion, Denon, Mordaunt Short. Appts required. Home trial and free installations. Access, Visa, Diners, Amex. Credit to £1,000. 9.15-5.30 Mon-Sat. Service dept.

OXFORDSHIRE

ABSOLUTE SOUND AND VIDEO, 19 Old High St, Headington, Oxford. (0256) 24311. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER

ASTLEY AUDIO LTD, 3 Marketplace, Wallingford. (0491) 39305/34349. AR, Dual, Kenwood, Mordaunt-Short, Mission, Monitor Audio, Philips, Technics, Tannoy, Yamaha. Tues-Fri 9-5.30, Sat 9-5. Records, tapes, 1000+ CD's. Service Dept. Access, Visa, Diners.

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WITNEY AUDIO & VIDEO, 28 High St, Witney, Oxford. (0993) 2414. A&R, Aiwa, Akai, Bose, Denon, Dual, Goldstar, JBL, Mordaunt-Short. Dem facilities. Mon-Sat 9-5.30. Free installation, credit to £1,000. Access, Visa. Service dept.

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THE CHOICE DEALER DIRECTORY

Aragon, Stax, Marantz, Wharfedale, Cambridge Audio. Home trial and free installation. Instant Credit. Access, Amex, Visa. 10-6 Tues-Sat. Service dept.
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SHROPSHIRE

AVON HI-FI Ltd, 12 Barker St, Shrewsbury. (0743) 55166. A&R, B&W, JBL, Dual, NAD, Nakamichi, Revolver, Trio, Quad, Yamaha. Dem and home trial facilities. Mon-Sat 9-5.30, closed Thur. Free installation, credit to £1,000. Access, Visa. Service dept.

MID SHROPSHIRE AUDIO, 2 Holland Court, High Street, Dawley, Telford, Shropshire. (0952) 630172. Cambridge Audio, Marantz, Onkyo, Rubric, Tannoy, Alexander, Appolo, Ion Systems, Audio Innovations, SD Acoustics. 2 dem lounge. Home trial. Free Installation. Service dept. Access, Visa. Credit facilities available. Instant credit subject to status. Mon-Sat 10-5 evenings/Sunday by special arrangement.

CREATIVE AUDIO, 9 Dogpole, Shrewsbury. (0743) 241924. Marantz, Meridian, Linn, Naim, A&R, Mission, Nakamichi, Revolver, Castle, Audio Technica. Dem room. Home trial and free installation. Credit to £1000. Access, Visa. Tues-Sat 9.30-5.30. Service dept.

SOMERSET

WATTS RADIO - THE ENGINEERS, Jim Badman, 1 West Street, Somerton. (0458) 72440. Castle, Dual, Denon, KEF, Mordaunt-Short, Ortofon, Quad, Rogers, Thorens, Yamaha. Dem and home trial facilities. Mon-Sat 9-1, 2-5.30, Wed 9-1. Free installation. Credit to £1,000. Access, Visa. Service dept.

STAFFORDSHIRE

GRANGE HI-FI LTD, 153 Branston Road, Burton-on-Trent DE14 3DQ. (0283) 33655. Audio Innovations, Arcam, Creek, Systemdek, Snell, Spondor, Cambridge, Pink Triangle, Quad, Voyd, etc. 2 dem rooms. Mon, Tues, Thurs, Fri, Sat. 9-6. Closed Wed. Free installation. Credit facilities. Visa, Access. Service dept.

ACTIVE AUDIO, 29 Market Street, Tamworth, Staffordshire. (0827) 53355. Arcam, Ariston, Celestion, Denon, Heybrook, Kef, Cyrus, Musical Fidelity, Marantz, Revox, Rotel, Rogers, etc. etc. The only BADA Member in Staffordshire. Full demonstration and home trial facilities. Account and credit cards. Ring for opening times and free 'Fact Pack'. BADA MEMBER

MUSICAL APPROACH, 137A Newport Road, Stafford (above Royal London Insurance). (0785) 55154. Linn Products, Arcam, Creek, NVA, Revolver, Audiotec, Onix, Epos, Marantz, Rotel and more. Home trial. Free installation. Service dept. Credit facilities available, Access, Visa. 9.30-5.30 Mon-Sat.

SUFFOLK

EASTERN AUDIO 41 Bramford Rd Ipswich. (0473) 217217. Quad Audio Lab Denon Dual Marantz Mission NAD Nakamichi Technics Arcam. Mon-Sat 9.30-6. BADA MEMBER

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PJ HI-FI - The Hi-Fi Shop, 3 Bridge Street, Guildford, Surrey GU1 4RY. Tel: (0483) 504801. 9-6 Mon-Sat. Linn, Creek, Arcam, Quad, Revox, Musical Fidelity, Rotel, NAD, Nakamichi, Marantz. BADA MEMBER

ROGERS HI-FI, 13 Bridge Street, Guildford (0483) 61049. Ariston, Acoustic Research, Akai, Denon, JPW, Mordaunt-Short, Marantz, Onkyo, QED, Tannoy etc. Mon-Sat 9.30-6. Dem. facilities. Instant Credit. Access, Visa. Service dept.

SURBITON PARK RADIO, 48 Surbiton Rd, Kingston-Upon-Thames, Surrey. (01) 546 5549. Quad, Dual, Denon, Kenwood, Nakamichi, Rotel, Pioneer, QED, B&W, Tannoy. Dem and home trial facilities. Access, Visa. 9.30-5.00 Tues-Sat. Service dept.

TRU-FI SOUND AND VISION, 2 Central Parade, Redhill, Surrey. (0737) 767400/766128. Akai, Aiwa, B&W, Nakamichi, JPW, Mission, Mordaunt-Short, Nagaoka, Sony, Technics. Dem. facilities. Mon-Sat 9.30-6. Free installation, credit to £1,200. Access, Visa. Service dept.
UNILET PRODUCTS Ltd, 35 High St, New Malden, Surrey KT3 4BY. (01) 942 9567. Mon-Sat 9-6. Thurs 9-7. Dem facilities. Large stock. Amex, Access, Diners, Visa.
SPALDINGS HI-FI, 352-4 Lower Addiscombe Rd, Croydon, Surrey. (01) 654 1231. 3 dem rooms + home dem. Free installation, credit. Mon-Sat 9-6, Tues to 8. Closed Wed. Service dept. BADA MEMBER

TRU-FI SOUND & VISION, 10 Church St, Leatherhead, Surrey. (0372) 378780. Sony, Technics, Panasonic, Mit-

subishi, Ferguson, Aiwa, Pioneer, Sanyo, B&W, Mission. Free installation. Credit facilities. Access, Visa. 9.15-5.30 Mon-Sat. Closed Wed. Service dept.

SUSSEX (EAST)

DEFINITIVE AUDIO BRIGHTON, 8 Dyke Road Mews, 74-76 Dyke Road, Brighton BN1 3JD. (0273) 208649. Voyd, Systemdek, Audio Innovations, Helius, Audionote, JPW, Snell, Pirate Stands, Goldring etc. Home dems throughout Sussex. Credit facilities. Visa.

LASER SOUND & VISION, 72 Terminus Road, Eastbourne, East Sussex BN21 3LX. (0323) 640911. Marantz, Cambridge, Kenwood, Denon, Rotel, Infinity, Tannoy, Michell, KEF, Heco etc. Dem room. Home trial. Free installation. Service dept. Visa, Access. 9am-6pm Mon-Sat.

JEFFRIES HI-FI, 69 London Rd, Brighton, East Sussex. (0273) 609 431. 2 dem rooms, closed Mon, late night Wed. Parking, bus route. Credit facilities. BADA MEMBER

JEFFRIES HI-FI, 4 Albert Parade, Green St, Eastbourne, East Sussex. (0323) 31336. 2 dem rooms, closed Mon. Late night Wed. Parking, bus route. Credit facilities.

BADA MEMBER
HASTINGS HI-FI, 31-32 Western Rd, St Leonards On Sea. (0424) 442975. A&R, B&W, Mission/Cyrus, NAD, Nakamichi, Quad, Rotel, Systemdek, Tannoy, Yamaha. 2 dem rooms. Mon-Sat 9-6. Home trial facilities. Free installation. Credit facilities. Access, Amex, Visa. Service dept.

SUSSEX (WEST)

BOWERS AND WILKINS Ltd, 1 Becket Buildings, Little hampton Rd, Worthing. (0903) 64141. B&W, Cambridge, Dual, JVC, Mordaunt-Short, Nakamichi, Philips, Shure, Quad, Sony. 2 dem rooms. Mon-Sat 9-5.30, Weds 9-1. Home trial facilities, free installation, credit to £1,000. Access, Visa. Service dept.

CHICHESTER HI FI, 7 St Pancras, Chichester, W. Sussex PO19 1SJ. Tel: (0243) 776402. Linn, Naim, Rega, Creek, Nakamichi, A&R, Denon, Roksan etc. Tues-Sat, 10-1, 2-5.15 (closed Mon). BADA MEMBER

TYNE & WEAR

RED RADIO SHOP AND HI-FI CENTRE, 11 Olive St. (Off Park Lane) Sunderland. (Sunderland) 5672087. Bose, Castle, Denon, JVC (Hi-Fi and Portable TV), Luxman, Michell, Mordaunt-Short, Pickering, Tannoy. Dem facilities. Mon-Sat 9-5.30. Free installation, interest free credit. Visa. Service dept.

WARWICKSHIRE

AUTHENTIC AUDIO, 25 Henley Street, Stratford-upon-Avon, Warwickshire CV37 6QW. (0789) 414533. Linn, Quad, M.F., Denon, NAD, etc. Dem room. Home trials. Part-ex. Service dept. Mon-Sat 9.30-5.30.

WILTSHIRE

ABSOLUTE SOUND AND VIDEO, 60 Fleet Street, Swindon. (0793) 538222. Arcam, Denon, Exposure, Heybrook, Linn, Marantz, Musical Fidelity, Mission, NAD, Rotel, Sony, Yamaha. BADA MEMBER

YORKSHIRE (NORTH)

ELITE HI-FI, 178 Kings Road, Harrogate HG1 5JG (0423) 521 831. Voyd, Valdi, Avalon, Systemdek, Helius, Audionote, Goldring, Audio Innovations, Sugden, Marantz. Mon-Sat 9-5.30. Free installation. Service dept.
SCARBOROUGH HI-FI CENTRE, 53 Dean Road, Scarborough YO12 7SN. (0723) 374547. A&R, Bose, QED, Denon, Nad (incl. Monitor series), Thorens, Onkyo, Tannoy, Marantz, Ruark. Dem Room. Appts preferred. Home trial facilities. Mail order and part exchange. Visa, Access, Diners, Hi-Fi Markets' Chargecard facilities. Open 10-6 Mon-Sat.

RICHER SOUNDS, 66 Walmgate, York YO1. (0904) 645535. Probably the smallest hi-fi store in York; but stocks the A-Z of popular budget hi-fi at special discount prices. Facilities: expert advice; free 48 page Hi-Fi Guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard.

YORKSHIRE (WEST)

AUDIO PROJECTS, 45 Headingley Lane, Leeds. (0532) 304565. A&R, Audiolab, Creek, Heybrook, Linn, Musical Fidelity, Naim, Quad, Rega, etc. Tues-Fri 9.30-6, Sat 2.30-5.30. BADA MEMBER

ERRICKS, Hi-Fi Experience, Fotonoson House, Rawson Square, Bradford (0274) 309266. Dem facilities. Sales/service agents for A&R, Linn, Quad, Naim, Nakamichi, Mission etc. BADA MEMBER

Huddersfield HI-FI CENTRE, 4 Cross Church St, Huddersfield. (0484) 544668. B&W, Kenwood, Denon, Dual, A&R Cambridge, Musical Fidelity, Quad, NVA, Audio Lab, Philips, Mission, etc. Dem facilities - appointment reqd. Mon-Sat 9-5.30, Thurs 9-8. Closed Wed. Free installation, credit facilities. Access, Visa.

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SELECTIVE AUDIO, The Forge Cottage, 19 Crossgate, Otley. (0943) 467689. Exclusively handles Alphason, Roksan, NVA, ProAc, TDL, JDI, in the area and other minimalist British designer products for the discerning listener. Dem facility. Member of the Cognoscenti. Mon-Sat 10-6.

IRELAND

CEOL PRODUCTS, 185 Lower Rathmines Road, Dublin 6. Tel: 0001 975984 961358. Alphason, Audio Innovation, Exposure, Linn, Marantz, Monitor Audio, Mordaunt Short, Musical Fidelity, Rega, Roksan. Single Speaker listening rooms. Free installation. All major cards. Mon-Sat 9.30-6.00.

CLONEY AUDIO, 55 Main St, Blackrock, Dublin. 0001 889449/888477. Arcam, Acoustic Energy, Apogee, Linn, Naim, Creek, Rega, Rogers, Sony, Nakamichi. 2 single speaker dem rooms. Home trial. Free installation. Service dept. All major credit cards. Interest free credit. Tues-Sat 10-6, Thurs and Fri till 9pm.

SCOTLAND

EAST KILBRIDE

DAVID STEVEN HI-FI, 1-3 Main Street, East Kilbride, Strathclyde. (03552) 44145. Denon, Infinity, KEF, Marantz, Mission, Quad, Technics, Sony, Yamaha. Dem room. Home trial facilities. Installation facilities available. Service dept. Access, Visa. Licenced credit broker. 9.30-5.30 Mon-Sat, 5.30-9.30 Mon-Fri by appointment.

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RICHER SOUNDS, 1B Chambers St, Edinburgh EH1 1HR. (031) 226 3544. Discount hi-fi near the Royal Scottish Museum; affordable culture with monthly special offers on major names. Facilities: expert advice; free 48 page Hi-Fi guide and monthly Newsletters; mail order; part exchange. Mon-Fri 10-6, Sat 10-5. Access, Visa, Richer ChargeCard.

BILL HUTCHINSON Ltd, 43 Clarke St, Edinburgh. (031) 667 2877. AR, Aiwa, Denon, Dual, JVC, Mission, Mordaunt-Short, Omar, Technics, Yamaha. Dem facilities. Mon-Sat 10-6. Free installation. Instant credit. Credit cards: Access, Visa. Service dept.

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HOLBURN HI FI Ltd, 441 Holburn St, Aberdeen (0224) 585713. Linn, Rega, Quad, Audiolab, Mission Cyrus, Rotel, QED, NAD, Krell, Nakamichi, Denon, Sony, KEF, Wharfedale, Monitor Audio, Kenwood, etc. 9.30-5.30 Mon-Sat. BADA MEMBER

WALES

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AUDIO EXCELLENCE, 134 Crwys Road, Cardiff. (0222) 28565. Audio Research, Dual, Krell, Linn, Magneplanar, Naim, NAD, Yamaha, etc. Closed Mon.

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AUDIO EXCELLENCE, 9 High St, Swansea. (0792) 474608. Audio Research, Dual, Krell, Linn, Magneplanar, Naim, NAD, Yamaha, etc. Closed Mon. BADA MEMBER

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NORTH WALES

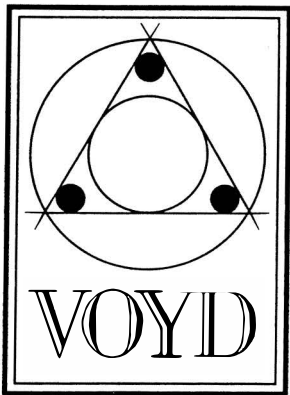
ELECTRO TRADER, 19 Colwyn Crescent, Rhos On Sea, Colwyn Bay, Clwyd. (0492) 48932. Ariston, Arcam, B&W, Heco, Infinity, Onkyo, Rotel, Tannoy, TDL, Yamaha etc. Dem room. Appts preferred. Home trial. Free installation. Access, Visa, American Express, Diners. 9.30 1.00, 2.00-5.30 Mon-Sat.

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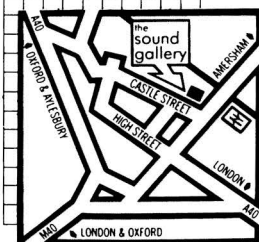
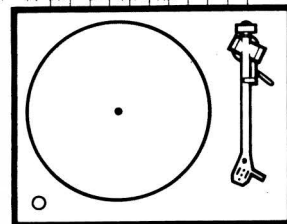
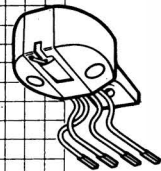
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THE DIRECTORY

The *Hi-Fi Choice Directory* was conceived as a reference guide to all the audio products reviewed by *Choice* that are currently available. The products are split into suitable categories, each with its own introduction containing information about the product type and its applications. They are particularly relevant to the uninitiated first time buyer and help sort out the order of priorities when buying a piece of equipment.

Each product along with its retail price is placed in its respective category in alphabetical order. For instance the Acoustic Research *EB101* is presently at the beginning of the Turntables and Tonearms section; however, the Ariston *RD90 Superior* heads the Motor Units section as it is sold and was reviewed as a separate component – requiring a separate arm. Where there are several products with the same name but different model numbers these are in price ascending order.

Then come the ratings for the standard achieved in laboratory and listening tests, with the exception of certain product groups where lab tests were not carried out. One important point to remember is that they cannot be used to compare products from different categories – ie a cassette deck rated 'excellent' in sound quality will not usually offer the same standard of fidelity as a similarly rated

turntable or CD player (unless you can get hold of first generation copies of the master tape!).

The Comments column contains a potted summary based on the original review, emphasising the salient points of a product's character and sonic performance. The space available doesn't allow for great detail but in the 20 or so words we have attempted to put across the essence of the review, in some cases using quotes from the review itself. Obviously, important information on compatibility or auxiliary equipment used in the test cannot be included, and it is best to refer to the original review for this, of which more later.

The next column(s) varies from category to category but is usually either features or specifications, the former being facilities available on a cassette deck or amplifier or the type of drive system on a turntable.

Specifications vary with product type but usually relate to suitability or capability, for instance arm matching figures are given with the cartridges which tie in with the mass figures for the tonearms themselves, making it easier to avoid compliance/mass mismatches.

Perhaps the most influential letters in the Directory are those found in the Value column, the *Rs* and *Bs* denoting the Recommended and Best Buy ratings that are appended to products we consider meritorious. The Best Buy tag means that a product not only offers good sound quality but is reasonably priced as well. With source components a price limit of approximately £300 is usually used as a

guide. Recommended means that either the performance of a product is particularly good irrespective of price or, alternatively that a good value standard is achieved but overall attainment falls short of Best Buy classification. An ideal situation would be to choose suitably priced Best Buy or Recommended products from relevant categories and create a Best Buy system, but, due to the variety in tonal balance that exists in much audio equipment (especially the electromechanical elements – ie cartridge and speaker) system building is not quite that simple. These ratings make a useful guideline for shortlisting components, but only experiencing the actual combination will tell you whether it works for you.

The final column contains a reference to the issue of *Hi-Fi Choice* which featured the complete review. If you wish to get a better idea of a product by reading the complete review it is possible to order a copy (if still in print) through our back issues department. Every *Choice* issue contains a Back Issues page for this purpose.

The Directory is constantly updated with the latest reviews and price changes as well as having discontinued products removed. If a listed product is updated to a 'mark two' form and the alterations are purely cosmetic or not too extensive we sometimes leave the product in with its current model number and an asterisk to denote that it has changed since our original review was published.

SYSTEM BUILDING

Pre-packaged one-make systems have been commercially very successful, with advantages like cosmetic consistency, competitive pricing, and (assumed) technical compatibility. However, despite the mass market clout of the consumer electronics giants, the hi-fi tradition of specialised separate components seems as strong as ever, and certainly represents the route taken by those who place sound quality ahead of other criteria.

Yet those who choose the separates route still have lingering doubts – usually completely unjustified – over the compatibility of components from different manufacturers. Gross incompatibilities are very rare nowadays, only likely to rear their heads amongst the most exotic components. Here the delicate art of 'supercompatibility' really takes over the major role and might be regarded as the key to 'real' hi-fi.

There are now three different pre-recorded music media competing for the attention of the hi-fi user, and to go for all three will either cost a lot of money or involve substantial compromises in the sound quality of each. For this reason many separates purchasers may start with just one source, adding others or a tuner when funds permit.

There will always be controversy over the relative qualities of LP, CD and cassette. LP is still the choice for ultimate sound quality – particularly for those prepared to spend a substantial sum on a good quality turntable system. Furthermore the vinyl repertoire is still the cheapest, largest and most varied.

Cassette has never really challenged vinyl's superior quality, but it is a multiple role format, offering 'go anywhere' flexibility, a uniquely useful recording capability, plus a broad catalogue of pre-recorded music cassette material. As a hi-fi medium cassette suffers from pre-recorded material which has been improving but is still patchy in quality, and can usually be bettered by a home recording. There is also the worry that a tape made on a specific machine usually replays best on that machine, which may cause aggravation when upgrading a few years hence. It is worth remembering that though such opportunities are rarely possible or practical, a live recording onto cassette using good quality microphones can be the hi-fi equal of any other source.

CD is the latest challenger to these two established media, using a digital instead of analogue storage format. The sound quality remains controversial, hailed as near perfect by its fans but derided by vinyl freaks, so it is probably fairest to say that CD is fine for most listeners, but may not suit everyone; certainly the lack of background noise, defects and deterioration over time are major strengths.

While there will always be arguments about the different music storage and transmission formats available to the hi-fi listener, there is also controversy over the relative importance of the different components which make up the system chain – by which is meant the source, the amplification, and the loudspeakers (and for the pedantic the room itself, though there's often little that can be done here).

For many years the 'weakest link' theory proposed that the loudspeakers needed the most attention, that amplifiers merely had to have sufficient power, and that turntables were pretty well perfect. However, this perspective has become steadily discredited by an alternative 'theory of precedence', which stresses that no subsequent component can make up for the inadequacies of its predecessors – all it can do is supply its own additional degradations. In such a context it is not uncommon to find more than half the system budget allocated to the record player, with scrimping and saving made on amplifiers and loudspeakers, even though these are used all the time whatever the source.

Choosing the components of a system is only part of the task of getting the system as a whole working as well as possible. Good turntables and loudspeakers both benefit to a surprising degree from proper support – from stands that enable them to give their best performance, whether floor-standing or wall mounted.

Siting of components within a room can play a significant role, as can the room itself. Some people may prefer an acoustically more 'live' room than others, but most will agree that the larger it is the better, because this tends to provide smoother and better extended bass reproduction. All rooms create reflections and standing waves, and the effects of these are more severe if all opposing walls are parallel, similar distances apart, and with hard reflective surfaces. Provided that the loudspeakers can be placed fairly symmetrically, slight asymmetry elsewhere in the room is usually helpful.

The loudspeakers are most critical of placement, because it is their job to create the stereo image, and it will be impossible to do this if the sound from each is not roughly similar at the listening position. Each loudspeaker should operate in a similar immediate acoustic environment, unencumbered by other furnishings and structure, and a similar distance from listener, nearby walls, and corners. Some loudspeakers are designed to operate close to a rear wall, others a metre or so out into the room, but all loudspeakers benefit from being closely mechanically coupled via proper stands to the floor.

There is some debate about the best form of fixing, however, adjustable spikes through to the

floor proper or seated into the tops of cross-head screws are generally regarded as the best solution in most circumstances. There is no need for paranoia about using spikes through normal pile carpets because the holes will be almost impossible to find when the stands are removed.

Most decent quality turntables are fairly immune to feedback from loudspeakers, so it should not matter too much if these items are sited fairly close to each other. Indeed it is debatable whether any advantages gained from keeping the turntable well away are not lost through the need to use longer connecting cables.

Mixing and matching the components of a record player to get optimum results can be something of a black art, over and beyond the fairly simple business of choosing a cartridge of roughly the right compliance to suit the arm effective mass. Certainly the combining of turntables and tonearms is not a simple matter, and this is where a good specialist dealer will come into his own, both in terms of recommending good combinations from the models he holds in stock, and then in correctly carrying out the sometimes tricky set up procedures which are often required to get the best results.

The key to getting the best results from a separates system lies in finding an experienced and skilled dealer in the first place, one who takes the trouble to find out what you really want and then demonstrate some likely alternatives, without trying to cram his own particular prejudices down your throat. To some extent the customer's task must be to discover for himself whether the dealer in question is competent or not. Membership of trade organisations like BADA can be a worthwhile pointer to a degree of professionalism, but the bottom line is whether the dealer in question can create a good sound in his own shop. If he can't, there is precious little chance of him doing so in your home. The best dealers should lay on demonstrations so you can hear the differences between components for yourself, and hear the sort of improvements which can be had at different price strata. You can then establish the sort of performance you are prepared to accept within whatever budgetary constraints you have set.

The Directory has been compiled so that it can be used by *Choice* readers as a buying guide. A guide in the sense that you should use the information in it to make a shortlist of equipment suited to your needs and budget, and then audition it at a dealers before taking the plunge. Because tastes inevitably differ it would be unwise to buy purely on the basis of our recommendation and dealers are the most experienced people around when it comes to making systems work as a whole.

THE DIRECTORY

TURNTABLES & TONEARMS

The schizophrenic split between consumer electronics and 'real hi-fi' is most obvious amongst turntables. The former are supplied simply as a means of playing vinyl in a system context. Cheaply manufactured in the Far East, these are complete players with a variety of automatic facilities, sometimes tied into system remote control. But engineering compromises severely limit sound quality, cartridge choice may be P-mount restricted, and such machines are rarely stocked by specialist hi-fi dealers these days.

Specialist turntables offer big sound quality

improvements, but lack so-called convenience features (that practised users often find irksome). Such turntables at the cheaper end of the market (sub-£350) tend to be supplied with matching tonearm, and often include a 'starter' cartridge. Still better quality is found at higher prices amongst the separate motor units and tonearms. Careful partnering and set-up is essential for these individual components, but 'naturally sympathetic' combinations do exist, and the good dealer can help.

Listed separately as integrated players and as turntable motor units and tonearms, our **sound**

quality rating is based on results achieved using a high quality system – but in point of fact the turntable is usually the limiting factor soundwise in any system. **Lab performance** summarises the speed stability, vibration generation and environmental isolation of turntables, along with the friction, alignment and adjustment of tonearms. The tonearm's physical characteristics also define a range of mechanically compatible cartridges (see cartridge listings).

INTEGRATED TURNTABLES

NAME PRICE	LAB SOUND	COMMENTS	FEATURES ARM EFF. MASS	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research EB101 £230	Good Good	This genuine high fidelity product offers an impressive package at a competitive price	Subchassis, manual, 13.5g	BB	48
Alphason Solo/Xenon MCS £420/£300	Average+ Good	The deck is warm and euphonious with high levels of clarity. Wow artefacts occasionally just audible.	3 point suspended motor unit, optional quartz PSU/speed change 13g		67
Ariston Q-Deck £165	Good Average+	Well engineered and good sounding low cost package which is both easy to set up and to use	Semi-auto, belt drive, solid	BB*	67
Ariston Forte £350	Average— Average	Heavy on engineering, short of soul? The Forte almost makes it, losing out only because of some residual pitch variations and a lack of bass power. The arm is modestly good	Manual 2-speed belt drive player and detachable arm, 10g		67
Dual CS430 £89	Average Average—	Ragged, sometimes unpleasant cartridge mixes with a modest pleasing player in a very sharply priced package.	Belt drive, with cartridge, auto return, 5g	R	67
Dual CS503-1 £115	Poor Average	Slated as a replacement for the CS505, the 503-1 needs careful system matching to mask rumble and microphony, but is good enough to benefit from a better cartridge	Semi auto, belt drive, low mass arm	R	55
Dual CS505-3 £139	Very Good Good	Continuous steady improvements have kept this model at the forefront of the budget market. Practicality is excellent and the deck has excellent timing bass/mid and stereo imaging	Semi-auto belt-drive, 8g	BB	67
Dual CS5000 £209	Average Average+	The rare 78 facility may give grandma's collection a new lease of life but the player did not merit recommendation on price vs sound	Electronic, belt drive, subchassis, 10g		48
Goldmund ST4 £4,550	Very Good Excellent	The Studio turntable takes on a cheaper tonearm than the T3F, yet provides a similar reference standard objective and subjective performance at £2,000 less, in a neatly integrated though bulky package.	Solid subchassis, direct drive, parallel arm, detachable headshell	R	60
Heybrook TT2 turntable & arm £424/£269	Average Good+	A gradual process of informed evolution and a sensibly designed arm combine to make this a good sounding middle of the road package. Well supported by dealers	Manual subchassis motor with arm, belt drive, 14g	R	67
JVC AL-FQ555 £170	Below Average Poor	Clear midband sound but woolly bass and crude treble. Ease of use however ranks highly, and there's little to go out of adjustment	Auto, direct drive, 5.5g		67
Kenwood DP-990 £400	Average Average	Smart, slick and massive player suitable for low compliance cartridges only. A good but not inspired performer.	Semi-auto 2 speed direct drive, 16g		67
Kuzma Stabi/Stogi £699/£399	Average+ Stabi: Good; Stogi: Excellent	Stabi is powerful, spacious but not sufficiently subtle. Stogi is an excellent all rounder with even spread of abilities.	Manual, belt drive, subchassis. 12.5g	Stogi: R	60
Linn Sondek/Ittok/Troika* £549/£483/£669	Excellent Very Good	Superb sound – the best LP12 combination yet. The Troika gives the system real solidity and strength, stretching the deck and arm qualities to the full. Arm has since been upgraded	Manual subchassis player, belt drive, 14g	R	60
NAD 5120 £90	Average Average	A number of running improvements have given this player a range and tautness denied its lazier sounding antecedents.	Semi-auto belt drive, detachable armtube/weight, 9g	BB	67
Omega Point Silver/Black £895/£295	Good Good+	An avowedly stripped down turntable that lacks even an on/off switch, the Omega Point Silver offers fine midrange clarity and good stereo, but some HF compression and a lack of 'wellie'	Manual, solid, belt drive, unipivot, 11g		55
Opus 3 Continuo/Decca London International (Revised)* £599/£99	Poor Good	Heavyweight motor unit with many fine properties, but which needs further development. The idiosyncratic arm is a suitable (though not ideal) platform for the Decca cartridge. For all its faults though, the whole transcends the sum of the parts	Belt-drive manual, damped unipivot arm, 12g		67
Rega Planar 2 £155	Average+ Good	A remarkable product at the price, surprisingly articulate and confident	Integrated turntable, manual, 11.5g	BB	48
Rega Planar 3 £207	Good Good	A long time leader in its price category, the '3 (with its excellent RB300 arm) sounded nicely 'musical' in a balanced and coherent manner	Integrated turntable, manual, 11.5g	BB	48
Revolver Rebel £169	Average— Average—	Fat, assured and forward presentation, but ragged and subjective speed stability problems. With a little further development, it will be a winner	Manual, 2-speed belt drive inc cartridge, 13g		67
Revox B291* £892	Average— Average—	Sound quality ranks as below average. Subjective bandwidth is narrow and the music lacks grace and energy. Ease of use however is unrivalled	Automatic, remote controllable, direct drive parallel arm, prefitted cartridge		55
Roksan Xerxes/Artemiz/Shiraz £695, £495, £595	n/a Very Good	Imaginatively designed, sophisticated front-end system, a little drier than some perhaps, with superior stereo, resolution and presence	2-speed manual, MC cartridge, 9g	R	72
Systemdek IX £248	Good Average+	Poised, clean sounding deck, forward and explicit in character. A good value deck under £250, and a relatively cheap and satisfactory suspended model	2 speed belt drive manual turntable and arm, 11g	R	67
Technics SLBD-22 £90	Average— Average—	Not bad for the price and a great improvement on the L20, it performs reasonably when not stretched	Semi automatic, solid plinth, electronic, 6g P-mount	R	48
Technics SL-DD33 £110	Average Average	As with the QD33 though better value	Automatic, direct drive, solid plinth, 7.5g, P-mount	BB	48
Technics SL-L20 £115	Poor Average—	A rather lightweight parallel tracker achieving a poor overall rating, with little to recommend it unless you dig facilities	Electronic, solid plinth, 5g, P-mount		48
Technics SL-QD33 £140	Average Average	The quartz speed controlled version of the DD is short on sound quality but not features. But it did have fair focus and some depth	Automatic, Quartz, direct drive, solid plinth, 7.5g, P-mount	R	48
Thorens TD320 Mk II £350	Good Good	Good, consistent sounding deck with much improved (but not ideal) arm. A little expensive for performance offered	Semi-auto two speed belt drive, 14g		67
Well Tempered Turntable & Arm £1690	Average Very Good	Intriguing and challenging design. Musically it is not ideal, but it has a limpid quality and a lack of artificiality that sets standards as well as turning the ear, though it's not completely uncoloured. A charmer yet mainstream enough in its virtues to be viable	Manual 2-speed, damped, suspended arm, 7.5g	R	67
Zarathustra S4/Pluto S4 Prestige/PSU £1500/£2500/£500	n/a Excellent	The very well made and finished heavy platter S4 with the superb Pluto arm make a devastating combination ranking up there with the very best	Subchassis, manual, available without PSU	R	72

THE DIRECTORY

MOTOR UNITS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Ariston Superior £598	Good+ Good	Good but slightly damped sound quality, with powerful and stable bass. The pro quo is a certain lack of pace, energy and resolution	Belt drive, subchassis, electronic		55
Micell Syntho £265	Good Good	A particularly happy blend of qualities endows the Syntho with a blend of subtlety and force – the mailed fist in the velvet glove. Easy on the ear in the best sense.	Manual, belt drive, suspended motor unit	R	67
Micell Gyrodec £595	Good Good	Sweet and natural sounding player, well exploited by the Rega RB300 arm. Aesthetics, and the acres of acrylic, are unique	Manual, belt drive, suspended motor unit		55
Oracle Alexandria Mk III £995 – £1095	Very Good Very Good	One of the most beautifully presented players made, and fully supported by superb separation, dynamics and a euphonious style of delivery.	Manual 2-speed belt drive	R	67
Oxford Acoustics Crystal Reference £2395	Very Good Excellent	This big, open and powerful sounding turntable works beautifully with Airtangent arm to give superb 3-D imagery	Manual, belt drive, subchassis, stand	R*	60
Revolver £150	Average Average	Nicely balanced, but unimpressive timing and lightweight bass made this deck rather average for the price. Manufacturer has since made several changes, but not re-submitted for review	Manual, belt drive, solid plinth		48
Roksan Xerxes £695	Excellent Very Good	This unique design cuts a swathe through the conventions of turntable design, providing superb resolution and stereo. Power supply has since been upgraded	Manual, belt drive, solid/decoupled	R	67
Systemdek IIXE £248	Good Very Good	Fine, honestly specified and well built player which easily better its closest stablemate, the IIX. Frankly, at the price it's a sonic bargain	Manual 2-speed, external PSU	R	67
Systemdek IV £495	Good Very Good	The level of wow is a theoretical concern at least, but elsewhere this player shines, combining euphony, information and imaging in a polished, untemperamental package	Two-speed manual belt drive	R	67
Voyd "The Voyd Plus" £2,777	n/a Excellent	Based on the standard 3-motor Voyd but with upgrade options (better bearing, platter, etc) which take it half way to a Voyd Reference, so we've dubbed it The Voyd Plus. Superb build and finish; colourful, dramatic performance. A thoroughbred	Belt drive, 3 motors, subchassis, outboard PSU	R	72

TONEARMS

NAME PRICE	LAB SOUND	COMMENTS	ARM EFF. MAS	VALUE	BACK ISSUE FULL REVIEW
Alphason Opal £130	Good Average	This is a straightforward adequate sounding low cost arm, priced just above where it rightly belongs	10g		55
Alphason Delta £190	Good Average+	A highly competent design from Alphason gives good sound quality but with slight blurring and treble fizz	16g	R	48
Alphason Xenon £240	Good Good+	A trimmed down HR100S, the Xenon has inferior bearings and a simpler finish, but sounds crisp and coherent. Fits any Linn cutout	12.75g	R	55
Alphason HR100S £420	Good++ Very Good	This S-shaped arm sounds smooth, but nevertheless reproduces transients with fine attack	10g	R	48/Coll
Ariston Enigma £99	Average Average+	Good but not the best in its class: mid-band sounds a little uneven; treble a trifle "brash"	11.5g		48
Audio Technica AT1130 £186	Good Good	Well suited to most cartridges including high compliance ones, the AT is smooth and tonally neutral, if slightly lacking in 'balls'	8.5g	R	67
Decca London International £49	Average+ Average+	This uni-pivot design gives a rather rich tonal balance and some bass muddling. Could be good with Decca cartridges, but not well built	12g		48/Summary
Eminent Technology £1000	Good+ Good++	One of the best sounding tonearms around, the linear tracking Eminent delivers impressive stereo imagery, focus and transparent sound	9g (vertical)	R	48/Coll
Goldmund T3F arm £3950	Excellent Excellent	This complex parallel tracker created an "ear-opening" experience when tested with a (since updated) Goldmund Studio turntable	16.5g	R	Coll 2
Grace G707 £299	Good Good+	This venerable is still capable, if not competitive with modern alternatives	7g		48
Helios Orion 2 £490	Very Good Very Good	Excellent engineering with rigid bearings, free from slack. It remains expensive but the level of performance deserves Recommendation	12g	R	48
Linn Ekos £895	Very Good Very Good	Superb, state of the art design which builds significantly on Ittok's strengths	9g	R	67
Mission Mechanic £900	Good Good+	Nearly right, but inconsistency with level and vague imagery spoil what is otherwise a firm, powerful advocate for black vinyl	11g		55
Moth Arm £78	Good Good+	The ultimate budget arm? Refined, detailed, sweet and natural – performance improves in line with the rest of the system	12g	BB	60
Rega RB300 £115	Good++ Good++	Despite its modest price this sets exceptional performance standards and could be used on a number of high-quality turntables	10-11g	BB	60
Roksan Artemiz £495	Average Good	Interesting design which works a treat on the Xerxes deck. Fits Rega cut-out. See issue 72 for up to date assessment	8g		67
SME 3009 Series IHS £165	Good Average+	A simplified less flexible (as regards adjustment) Series III with a 'similarly 'soft' sonic character	5g		48
SME 3009 Series III £229	Good Average+	Comprehensively adjustable and very well made, suited to MM and high compliance MC cartridges	5g		48
SME 3009R £291	Average+ Average+	A higher mass version of the Series III designed for low compliance MC cartridges	12g		48
SME Series IV £810	Excellent Very Good	Superb engineering and finish with a finely balanced sound giving impressive stereo focus and low coloration	10.5g	R	60
SME Series V £1206	Excellent Very Good	Excellent in terms of design engineering and sound quality, this arm arguably sets a new reference standard regardless of price	10.5g	R	60
Souther Tri-Quartz £895	Average Good	A unique parallel tracking arm that makes up for what it lacks sonically in its unusual appearance	3-4g		48

* rating refers to original tested model

TO ORDER BACK ISSUES
OF HI-FI CHOICE SEE PAGE 16

THE DIRECTORY

CARTRIDGES

Very much the 'slave' of turntable and tonearm and to some extent undermined by the supply of free 'starter' cartridges on many turntable systems, the cartridge is still worth taking seriously. The quality of both the stylus itself and the cartridge's tracking performance are important in preserving that most important part of the hi-fi system – the record collection – and the cartridge also plays a significant role in determining the overall balance of a system.

Cartridges fall into two groups: high output models, capable of working directly into any amplifier, and more expensive low output models. Stereotypically, low output cartridges use the moving coil principle of operation, have better mechanical integrity and tighter tolerances, and give better performance but at much higher cost. Most under-£150 amplifiers and many valve designs need either an extra head amp or transformer to cope with the low output. **Cartridge/amplifier**

interfacing can be very subtle, but even basic high output moving magnet designs benefit in overall balance from optimised amplifier capacitance loading. Still more important, the mechanical cartridge characteristic of cantilever compliance ('springiness') needs to be considered in the light of the effective mass of the tonearm which will be used (see Turntable & Tonearm entries).

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Arcam C77 £22	Average+ Average+	A sensible moving magnet package with good bounce at a competitive price	6-16g Normal, MM	BB	48
Arcam C77Mg £30	Average- Average	Punchy sound quality with plenty of extra energy to liven things up. The solid body seems well worth the extra £10	4-8g Normal, MM	BB	67
Arcam E77Mg £50	Average Average	Our sample had a disappointing stylus, but gave a coherent, rich and laid back sound, with good 'scale'	3-8g Normal, MM	R	48
Arcam P77Mg £60	Average+ Average+	Cautiously recommended, the P77Mg was preferred to its cheaper partner by virtue of a better tip. Channel balance could have been better	4-9g Normal, MM	R	48
Audionote IO2VDH £795	Good Very Good	One of the best, giving 'an extraordinarily relaxing midrange clarity'. But it picked up a bit of surface noise and dust and needs a transformer	8-18g Very low (transformer), MC	R	43
Audioquest MC5 £220	Average Average	Offers high-output benefits but the drooping frequency response and severe VTA error preclude recommendation	10-20g Normal, MC		54
Audio Technica AT95E £17	Average- Average	Clear, dynamic if richly balanced, the magnetic '95E is a definite Best Buy	8-14g Normal, MM	BB	48
Audio Technica AT-420E OCC £30	Average Average	Better suited to pop recordings this MM bears some of the sonic hallmarks of the Linn K5	7-14g (damp) Normal, MM	R	67
Audio Technica AT-430E OCC £42	Average+ Average	A rising high frequency response yields something of a treble sting, not a good all-rounder	3-7g Normal, MM		67
Audio Technica AT-F3/OCC LE £70	Average+ Good	Though the 'limited edition' badge is a trifle tongue-in-cheek the 'F3 still offers excellent value	8-15g Low, MC	BB	67
Audio Technica AT-F5OCC £100	Average+ Good	Decent output, good channel balance and a thoroughly refined sound sets the standard at £100	9-20g Low, MC	BB	54
Audio Technica AT-F5/OCC LE £100	Average Good+	This latest sample demonstrated some technical weaknesses but its spacious, fluid sound quality still represents a benchmark at this price	4-10g Low, MC	BB	67
Audio Technica ATOC7 £250	Good+ Good+	The OC9 is better if you can afford the extra. But OC7 is at least a taste of the high-end at a sensible price	6-13g Low, MC	R	54
Audio Technica ATOC9 £400	Average+ Very Good	Tonal colours are reproduced faithfully and it rarely puts a foot wrong. Slightly less transparent than more costly MCs but it has real wellie. Good value (really!)	6-14g Low, MC	R	60
Audio Technica ART1 £800	Good+ Very Good	This is a delicate and very fluid-sounding MC that tracks well, offers very low distortion and exceptionally good stereo separation	9-18g Low, MC	R	72
Azden YM10VE £12.50	Average Average-	A good tracker. Sounds rather bunched-up but not totally incoherent – for very basic systems only	5-15g Normal, MM		54
Azden GM1E £30	Average- Average-	Of academic interest only, this high o/p MC is seriously flawed in sonic terms	8-18g Low/normal, MC		54
Azden GMP5L £108	Average+ Average+	Although no P-mount system will do this cartridge justice, it can still be enjoyed in its universal mode. The subtle balance may prove irresistible to some	4-10g Low, MC	R	54
B&O MMC5 £24	Average+ Average	Cheapest in the family – smooth treble and good focus, but the bass was left in the wings	5-15g Normal, MM		38 (Summary)
B&O MMC4 £43	Good Average+	Solid and well balanced in the midrange, the '4 lacks bass impact	5-15g Normal, MM		48
B&O MMC3 £57	Good Average	Slightly "laid back" sound quality but a good performer for the price. Best suited to B&O equipment	5-15g Normal, MM		48
B&O MMC2 £87	Good Average+	Only a modest improvement on its cheaper brothers (and sisters)	5-15g Normal, MM		48
B&O MMC1 £112	Very Good Good	Great clarity and detail at high frequencies but a slightly plodding bass. It may appeal more to the classical enthusiast	5-13g Normal, MM		48
Cello Chorale £590	Average+ Good	Now available through a new distributor at a saving of some £300, the Chorale is still blessed with a delicate but highly detailed treble. Arm matching is a problem	3-9g Low, MC		72
Clear Audio Gamma £295	Average Average+	Brimming over with enthusiasm, the unusual-looking Gamma is more than an audio oddity, but it lacks a little subtlety at times	4-11g Low, MC		54
Clear Audio Delta £450	Average+ Good	Midway between the Gamma and exotic Pradikat, the Delta sounds like neither! Nevertheless, it delivers the goods	6-17g Low, MC	R	54
Clear Audio Signature £995	Average+ Good	This latest MC to emerge from Clearaudio features yet another graded version of its proprietary generator. Its sound strikes a balance between the Delta and Prad	4-11g Low, MC		72
Clear Audio Pradikat £1225	Average+ Very Good	Sounded absolutely glorious, creating a full sense of scale and a large well-focused soundstage – but watch for record wear	8-18g MC		Coll
Clear Audio Accurate £2,000	Good Excellent	A remarkable cartridge, not only by virtue of its effortless and highly neutral sound quality but also because this has been achieved with the same basic design as Clearaudio's cheapest MCs	4-11g Low, MC	R	60
Denon DL110 £69	Good Good	Firmly recommended as a fine all-rounder, this high-output moving coil model is likely to perform well in nearly all circumstances	6-16g Normal, MC	BB	48
Denon DL160 £89	Average+ Good	Although listeners just preferred the 110 its brother here proved a twin in lab tests and is still "thoroughly competent"	6-16g Normal, MC		43
Denon DL 103 £99	Average Good	This classic spherical stylus model gives a lively sound with powerful bass, and is popular in broadcast studios	6-16g Low, MC	R	48
Dynavector DV-50X £60	Good Average	A high-output MC model with impressive lab performance, but whose tip and sound quality both disappointed	6-14g Normal, MC		48
Dynavector DV10X IV £60	Average Average+	Fine sounding and realistically priced, damping is recommended to ensure successful tracking ability	8-18g Normal, MC	R	48

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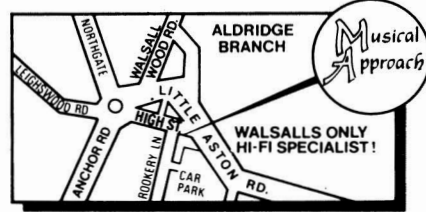
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THE DIRECTORY

CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Dynavector DV23RS £150	Average+ Good	Sound quality was described as "shut-in", lacking energy and sparkle but with some "edginess" in high frequencies	10-22g Low, MC		28
Dynavector DV XX-1 £360	Good Good+	The XX-1 embodies a power and solidity rarely encountered amongst the breed, nevertheless it did exhibit a peculiarly suppressed character that will suit lively rather than wholly neutral systems	7-17g Normal, MC		60
Empire 800 Mk II £33	Good Average	This very high output MM appears to be based on the classic Ortofon VMS series. A trifle uninspiring overall	7-17g Normal, MM		67
Empire MC-5M £110	Average+ Good	A very low compliance renders this MC best suited to heavy tonearms while its sweet, non-aggressive sound quality earns it a recommendation	13-20g Low, MC	R	67
Empire Benz Micro MC-2 £600	Average Good+	Similar to both the Empire MC1000 and vdH MC2 in design, the Benz offers a warmer and very transparent account of the music. Its tracking prowess is slightly limited	5-12g Low, MC	R	72
Glanz MFG 110EX £24	Average Average	A little bright but giving detailed bass and clear treble this was competitive at the price	6-16g Normal, MM	R	Systems
Glanz GMC-10EH £49	Good Good	The rising HF trend of this high o/p MC may cause problems in certain systems but with a favourable wind its seductive qualities will win out	8-14g Normal, MC	R	67
Glanz GMC-10LX £79	Average+ Average+	Bearing some of the hallmarks of the '10EH, the '10LX is still less competitive in the sonic stakes	7-15g Low, MC		67
Glanz GMC20E £129	Average Average	You could try haggling but we thought the makers of this number were demanding too much lucre for their product	3-6g Low, MC		48
Goldmund Clearaudio £1500	Average+ Very Good	Something of a mixed bag overall, its sonic character bears a strong resemblance to the Pradikat though it shares some of the hallmarks of the more expensive Accurate	5-12g Low, MC		60
Goldring Elan £15	Average+ Average	A lightweight and frisky-sounding MM that appears to be based upon the same body as the Nagaoka mm4	7-15g Normal, MM	R	67
Goldring Epic II £23	Average Average+	An excellent budget choice though the limitations of the stylus are rather obvious at higher frequencies	5-12g Normal, MM	R	67
Goldring G1020 £53	Average+ Average-	This one strutted finely onto stage but couldn't project to the "gods"	8-16g Normal, MM		43
Goldring G1040 £79	Average+ Average-	High frequency extension was improved by the van den Hul tip, nice looking model - no great actress	8-16g Normal, MM		48
Goldring Eroica L £95	Average Average+	Open and relaxed sounding, the L version is just that bit more refined than its high output brother	7-18g Low, MC	R	54
Goldring Electro II £149 complete	Average Average+	A pretty decent allrounder; a good cartridge, in fact - but a bit pricey	8-16g Normal, MC		43
Goldring Excel £500	Average+ Good	Goldring's most expensive cartridge to date errs on the warm and heavy side of neutral. Strong bass lines are its forte though its ability to resolve subtle treble details is weaker	6-13g Low, MC		72
Grace F9E II £240	Good Good	For lively presentation, excellent separation and generally satisfactory sonic delivery - consider this model	5-10g Normal, MM		48
Grado XTE + 1 £22.50	Average- Average	Bass and treble are a trifle coloured but the midband proved highly enjoyable. Ideal for budget systems	6-13g (damping) Normal, MM	R	54
Grado XF3E + £43	Average- Average	Downtilting balance disguises the brightness of this cartridge; bit of a mixed bag at this price	9-20g (damping) Normal, MM		54
Highphonic MCA3 £360	Very Good Good+	Exquisitely crafted by a group of ex-Denon engineers, this superb tracker had a sweet and seductive (if rather bright) treble	5-12g Low, MC		43
Kiseki Blue Silver Spot £395	Average+ Good	Solid performance from a very solid cartridge but lacks some of the magic of other Kisekis. Compliance too high	5-12g Low, MC		54
Kiseki Purpleheart Sapphire £695	Good+ Good+	Rare, beautiful to look at and sweet to listen to, our review of this high-flyer conjured up images of Japanese art	5-14g Low, MC		Collection
Kiseki Blackheart £1595	Good Good	This cartridge demonstrated refined poise and a delicate but at once potent security, however, the price did seem a little on the high side compared to other Kisekis	6-16g Low, MC		60
Kiseki Lapis Lazuli £3500	Good Very Good	Combining very sensible design concepts at a silly price, the Lapis Lazuli is best thought of as combining the detail of the MC3000 and the fluidity of the Clearaudios	4-12g Low, MC		60
Koetsu Black S £599	Average Good+	The S is an OEM design built to Koetsu's blueprint. It features a sturdier fixing plate and offers a brighter, faster and more tactile sound than the earlier K	8-15g Low, MC	R	72
Koetsu Red £896	Good+ Very Good	Named like a rare, and perhaps dangerous, little oriental fish this famous cartridge sounded "almost larger than life"	10-25g Low, MC	R	48/Coll
Koetsu Red Signature £1391	Good Excellent	Technically this cartridge suffers no faults whilst on a subjective level it offers rare musical insight	10-21g Low, MC	R	60
Krell KC-100 £700	Average Good	Apparently based around a similar generator as the Cello Chorale, the Krell provides a similarly light and airy sound. Low mass arms with damping are best used	3-9g Low, MC		72
Linn K5 £30	Average Average+	Not as crisply focused as the costlier Linn magnetics, the K5 offers a smoother presentation	7-16g Normal, MM	R	67
Linn K9 £75	Average Good	Linn threw this model into the leading pack by beefing up the Basik's bodywork, adding a super stylus, and keeping the price fair	6-15g Normal, MM	BB	48/Coll
Linn Asaka £299	Good+ Good+	Disciples of Linn who are trying to realise their true "Karma" may find that saving money is not a short cut to heaven	9-18g Low, MC	R	48/Coll
Linn Karma £435	Very Good Very Good	A specialist which is strongly recommended for Linn-based systems; results may be less predictable in more general application	9-18g Low, MC	R	48/Coll
Linn Troika £669	N/A Very Good	Ex-Karma users have been seen with glazed expressions indicating smug self-indulgence the morning after fitting a Troika	8-18g Low, MC		Coll
London Maroon £109	Average Average+	Now manufactured under the London brandname this Decca cartridge is as iconoclastic as ever	9-20g (damp) Normal, MM		67
London Super Gold £248	Average- Good+	Sometimes a bit fierce in emphasising record surface faults, it is perhaps best at revealing the excitement and tension in music	8-20g + damping Normal, MM	R	48/Coll
Madrigal Carnegie One £685	Average+ Good	Looks like a duck but sounds much better, certainly worth auditioning. Compliance too high	5-11g Low, MC		54
Milltek Aurora £198	Good+ Good+	An overall feeling of relaxed ease characterised this clear and atmospheric Kiseki-built cartridge	8-16g Normal, MC	R	48/Coll
Milltek Olympia £298	Average+ Good+	Warm and detailed sound - packs the punch of the best MCs with high output as a bonus	12-20g (damping) Normal, MC	R	54
Mission 773HC £150	Good Good	A sufficiently well-balanced and competitively priced "old-timer" which still warrants recommendation	6-16g Low, MC	R	38

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 16

THE DIRECTORY

CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Monster Alpha 2 £479	Good Good+	In the final analysis this fine allrounder is insufficiently exceptional in any specific respect to justify fully its high price	6-14g Low, MC		Collection
Nagaoka MM4 £8	Average— Average—	Clear punchy sound that delivers the rudiments of a good performance	6-16g Normal, MM	R	54
Nagaoka MP10 £17	Average Average	High frequencies sounded "shut-in" with this spherical-stylus model, but mid and mass were energetic, bouncy and punchy	5-13g Normal, MM	R	48
Nagaoka MP11 Boron £38	Average Average+	Responding well overall in PM's equipment and listening room, this model was mildly criticised for low level and dynamic limitations	5-13g Normal, MM	BB	48
Nagaoka MP10SB £40	Average Average+	Stilton's mods have improved the fine detail resolution of this popular budget model	5-15g Normal, MM	R	54
Nagaoka MP11 Gold £45	Average— Average+	There were mild criticisms directed at most areas, but in general the sound was clear, open and even	3-8g Normal, MM	R	48
Nagaoka MP11 Gold SB £70	Average— Average	Excessive price loading for a blob of aluminium	2-6g Normal, MM		54
Ortofon OM5E £15	Average— Average—	The OM10 is a hi-fi cartridge – the OM5E is not	5-16g Normal, MM		43
Ortofon VMS5E II £14	Average Average	Sound quality was thought fair for the price, though a little 'untidy'	8-18g Normal, MM		38 (Summary)
Ortofon OM10 £20	Average Average	One of the leading "cheapies", this gives a fine level of sound quality for the price, with good matching compatibility	5-15g Normal, MM	BB	48
Ortofon VMS 10E II £21	Average— Average—	Some of its stablemates fared rather better, and showed less evidence of tracking problems to boot	Normal, MM		38
Ortofon VMS20E II £35	Average Average	One of the most popular cartridges ever, sound quality was a bit laid-back and tracking could have been better	3-10g Normal, MM		48
Ortofon OM20 £40	Average Average+	This turned out to be the listening panel's favourite among Ortofon's moving magnet models	5-16g Normal, MM	R	48
Ortofon 520 £50	Average Average+	Very sensitive to load capacitance this new Ortofon maintains the company tradition for a lively, effervescent SQ	7-16g Normal, MM	R	67
Ortofon X1 £50	Average Average	The cheaper X1 scored higher marks with our listening panel than the X3, but both were a disappointment	6-15g Normal, MC		48
Ortofon VMS30E II £52	Average+ Average	Rather an old soldier in relation to turntable technology, it will perform undemandingly in demanding circumstances	5-13g Normal, MM		38
Ortofon MC10 Super £70	Average Good	"What a delightfully sweet-sounding cartridge this is..." we said	5-15g Low, MC	BB	48
Ortofon X3 £70	Average Average	A lack of bass power, definition and a "zitty" top end makes this competent but uninvolved	5-15g Normal, MC		48
Ortofon OM40 £80	Average Average+	Highly competent engineering, secure tracking and decent sound quality are major strengths. But it's a little cold, a little polite	3-8g Normal, MM		48
Ortofon 540 £100	Average— Average	Graced with an advanced FGII stylus our sample possessed too high a compliance for broad arm matching. It could also sound a little unforgiving	3-8g Normal, MM		67
Ortofon MC20 Super £170	Average+ Good+	An "inviting" sound quality; polite rather than exciting it approaches much more expensive models, but does not better them	6-15g Low, MC	R	48/Coll
Ortofon MC30 Super £250	Very Good Good+	Beautifully engineered and well-balanced, it was slightly criticised as bland, though some may appreciate the lack of rough edges	5-14g Low, MC		Coll
Ortofon MC3000 £800	Good Excellent	Quite simply, the most accurate transcription device yet created – not one for the faint hearted	6-16g V. Low, MC	R	60
RATA RP20 £22	Average— Average	Good integration, a clear dynamic midrange and the beginnings of fine stereo imagery merits clear recommendation	6-14g Normal, MM	R	48
RATA RP40 £44	Average Average+	The '40 did a good job of sorting out the layers and complexity of the mix, with good focus, excellent stereo spread and fine scale	6-15g Normal, MM	R	48
RATA RP70 £77*	Average Average+	Clearer and sweeter than the '40 this also seemed heavier and less lively. For £99 you can have a van den Hul stylus	6-14g Normal, MM		43
RATA RP70vdH £99	Average+ Good	Able to retrieve bags of musical detail (thanks to the vdH stylus), RATA's top cartridge ranks as one of the most articulate MM's available	11-18g Normal, MM	R	67
Rega Bias £34	Average Average+	Difficult to mount in some arms due to its shallow build, the bias offers a gentile, refined SQ that certainly makes it worthy of audition	4-10g Normal, MM		67
Rega RB100 £38	Average Average+	Remarkable mechanical performance in the right system context, but "try before you buy"	5-12g Normal, MM	R	48
Rega Elys £74	Good Good	Clearly superior to the Bias, despite their common heritage, the Elys is both more detailed, accurate and musically convincing	8-15g Normal, MM	R	67
Revolver £20	Average+ Average	This modified AT-95E enjoys a very lively mid and treble even if the bass is somewhat 'slower' in protection. A firm budget buy	8-16g Normal, MM	BB	67
Shure M92E £15	Average— Average	Though lacking depth, the overall sound quality was competent, but treble was not its forte	10-15g Normal, MM		43
Shure M99E £26	Average— Average—	Sister to the 92E this is a solid but not particularly exciting cartridge	5-10g Normal, MM		38 (Summary)
Shure ME75ED £24	Average Average—	Rather bright and splashy in the high frequencies but nevertheless a competent model	5-10g Normal, MM		38
Shure M104E £32	Average— Average	Capable in many ways, but giving no substantial improvement over the 92E in our view	5-15g Normal, MM		38
Shure ME97HE £44	Average Average+	It won't turn a sow's ear of a turntable into a silk purse, but will at least keep going and produce an acceptable result	8-20g Normal, MM	R	48
Shure M105E £45	Average Average—	A slightly 'spitty' sound lacking deep bass and dynamic contrast, but can be used in virtually every system where it will perform "unobtrusively"	5-12g Normal, MM		38 (Summary)
Shure M110HE £55	Average Average	Sound quality was thought eminently presentable, but not exciting; smooth clear high frequencies, but a loss of bass definition	5-10g Normal, MM		38 (Summary)
Shure M111HE £67	Average Average	Early reviews of this cartridge complained principally of the price – which has since come down	5-10g Normal, MM		38 (Summary)
Shure ML120HE £95	Average+ Average+	Quite decent sound quality and a generally fine balanced performance	6-18g Normal, MM		48
Shure ML140HE £120	Average+ Good	Qualitatively the treble of this well-balanced moving magnet model was a match for many moving coil cartridges	6-16g Normal, MM		43

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

CARTRIDGES

NAME PRICE	LAB SOUND	COMMENTS	ARM OUTPUT/TYPE	VALUE	BACK ISSUE FULL REVIEW
Shure V15 VMR £195	Good Average+	Initial listening gave promising results, but extended familiarity gave the feeling of a lack of energy and a "shut-in" sound	5-12g Normal, MM		38
Shure Ultra 500 £452	Good Good	There was no doubting the accomplishments of what could well be the finest moving magnet cartridge around	6-14g Normal, MM		48
Stilton/AT-F3 £110	Good+ Good+	At a premium of some £40 this modified AT-F3 offers a startlingly refined performance and is strongly recommended	8-18g Low, MC	R	67
Supex SM100E £115	Average Average+	Delivers as much musical information as many moving coils – the bass in particular having an attractive bounce	6-15g Normal, MM		38
Supex SD900IV £350	Average+ Good+	The 900 is an inherently fine cartridge, but despite a recent update it is beginning to show its age	10-18g Low, MC		48/Coll
Supex SD901IV £375	Average+ Good+	This high output model delivered sufficient subjective and objective performance, plus good compatibility, to justify its price tag	8-18g Normal, MC	R	48
Supex SDX2000 £651 L £721 H	Good Good+	The high-o/p 2000 was preferred on listening tests to the low-o/p model, which even so has a unique place among the top designs	6-16g Either, MC		48
van den Hul MC10 £699	Good Good+	A neutral balanced performer giving transparent midrange, fine depth and focus with firm extended bass. Gosh!	5-10g Low, MC	R	60
van den Hul MC One £699	Good Very Good	This extended all the positive qualities of the '10 but added greater authority and scale – worth it for the extra money	6-12g Low, MC	R	60
van den Hul MC Two £899	Good Very Good	Connected directly to any standard MM input the vdH MC Two rewards with a highly detailed yet fluid and musically convincing portrayal	6-13g Normal, MC	R	72

* rating refers to original tested model

AMPLIFIERS

The amplifier sits at the heart of the system, processing the outputs from all the various music sources as necessary and then driving the loudspeakers. These two (quite separate) functions are integrated into a single box at the low-to-middle price points; separated pre- and power amplifiers become increasingly common as one moves upmarket. At the upper end of the specialist market, valve amplifiers provide a popular alternative to the transistor types amongst enthusiasts.

There is a substantial difference between specialist (sound quality oriented) amplifiers and the consumer electronics style models. The former

are bleakly simple, avoiding all unnecessary features to provide the most direct signal path in the interests of best sound quality. The latter range from models with just basic tone controls and tape recorder switching, to those with elaborate facilities such as graphic equalisers, remote control (including volume), surround sound options etc. etc.

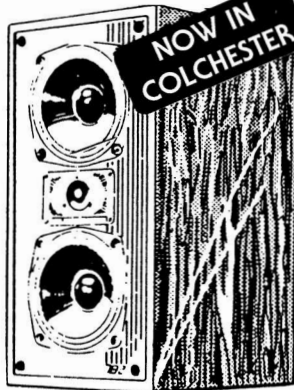
Lab measurement provides some useful data, particularly in regard to an amplifier's ability to drive a wide range of different types of loudspeakers, but this is only obliquely related to sound quality. We also include our measured power output (RMS, 8ohm load, 1 channel driven) – but

again, paradoxically, this doesn't necessarily correspond to the loudness capability of the amplifier, which has as much to do with the elegance of the overload characteristics within a given system (valve amplifiers invariably sound more powerful than their rating would suggest). The listing of features provides some indication to the complexity of an amplifier: many users prefer to retain the option of tone controls to 'shape' the overall sound according to taste; many others have found living without tone controls surprisingly easy, with additional benefits in terms of transparency.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research A03 £160	Average+ Average	New slimmed down version of the A04 with less power and facilities but also a slightly 'fuzzy' sound	38W, MM disc, CD direct and 3 aux inputs		74
Acoustic Research A07 £280	Very Good Average+	Relatively smooth but ineffectual sound quality that lacks some weight and impetus at very low frequencies	75W, 4 line, 2AV and MM/MC inputs		68
ADC A-2080E £400	Good+ Average+	Clean and neutral sound but one that lacked depth and spaciousness; MM input favoured above MC or CD	108W, logic sw. for 5 line and MM/MC inputs		68
Akai AM-52 £230	Average+ Average-	Basically equipped, this amplifier offers a comfortable but hardly over-detailed sound	95W, MM/MC disc, 5 line inputs, loudness		74
Akai AM-93 £550	Average Average-	Unfortunately Akai's on-board D/A converters were less successful than its conventional analogue CD input.	112W, coax and optical dig inputs. MM/MC		68
Albarr M408 II £895 pr.	Good+ Good+	Unusually styled transistor monoblok power amplifiers reintroduced with improved performance and sound quality. Needs good warm-up for best sweetness and clarity	40W Power amp only	R	56
Albarr M1008 II £1095	Very Good Good	A larger version of the similarly styled M408II, fairly good all round but only of average quality for the price	80W, monoblok		62
Amadeus Gold £360	Average- Good	There is some indication of instability but otherwise sounds very rich, warm and musical. High-ish IMD.	56W, MM/MC plug-in cards, 3 line inputs	R	74
Analogue Electronics PR3/PA4 £280/£280	Poor- Fair	Our samples, though certainly not prototypes, were technically compromised. Preamp sounds very bass light while the power amp sounds very coarse	29W, MM/MC, separate source and record out, recessed 4mm sockets		74
Aragon 4004 £1795	Good Good	Despite its imposing bulk the Aragon is something of a softy at heart. It can deliver oodles of power but its musical presentation is more laid-back	231W power amp		72
Arcam Alpha II £170	Good Good+	Very confident, convincingly musical and punchy sound that sets the standard for other budget amps	41W, 4 line and MM inputs	BB	68
Arcam Delta 60 £260	Good Good+	Very refined and highly detailed sound via MM and CD without any of the hardness noted via the MC stage	59W, 4 line, MM/MC inputs, no tone controls	R	68
Arcam Delta 90.2 £350	Average+ Average+	Dark but slightly dead or conservative sounding version of the original Delta 90. Improved disc stage	73W, MM/MC, 4 line inputs, tone bypass, bi-wire	R	74
Ariston Amp £219	Average Average+	Slightly veiled and thin sound but proved suitably attractive in the listening tests	32W, full logic control, MM and 4 line inputs	R	68
Audio Innovations Series 200 £375	Poor Good++	Like most 'Innovations valve power amps, compatibility with other brands is unpredictable. Hardly a powerhouse, but nicely 'open', transparent and dynamic sound in small(ish) systems	12W	R	77
Audio Innovations Series 300 £425	Poor Good++	Something of an anomaly the 300 is an integrated valve amp that looks awful in the lab but sounds remarkable in a system	10W, MM, 6 inputs	BB	63
Audio Innovations Series 400 £575	Poor Good++	Superior styling and better build quality than the Series 300 make for a very attractive integrated valve amp. Capable of fine results in the right system, but can sound too 'thin' and lacking in welly	12W, MM and 4 line inputs	R	77
Audio Innovations Series 1000/2nd Audio Amplifier £1299/2250	Poor Excellent	This valve combination offered awesome dynamic range with superb transparency and power to match. Compatibility with other brands is unpredictable	15W, MM, 6 inputs, monobloks	R	63
Audio Research SP9 £1698	Very Good Very Good	This new high performance valve FET hybrid preamplifier sets a high standard for versatility, build quality and sound	5 inputs, MM/MC	R	60

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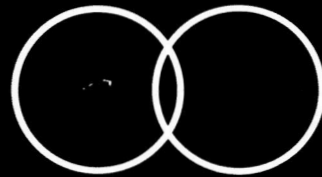
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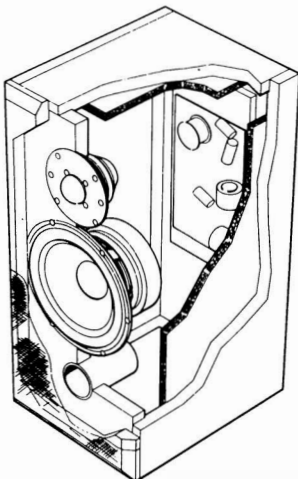
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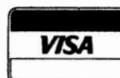
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NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Audio Research SP11 II £5250	Very Good Excellent	Current state of the valve preamp art. A reference point	Straight line MM/MC Disc + phase invert	R	60
Audiolab 8000C £325	Excellent Good	A well established preamp with a highly controlled sound, though it could do with more life and depth	MM/MC, 5 inputs, hdph, tone controls	R	62
Audiolab 8000A £350	Very Good Good+	Exceptionally detailed, tactile and transparent via CD but slightly more clouded via disc. A stalwart design	72W, MM/MC, 4 line and full record out selection	R	74
Audiolab 8000P £495	Excellent Good+	A dynamic powerhouse, load tolerant and sonically reliable	100W	R	62
Audion CD-1 £399	Average+ Good++	Nicely presented valve (line-only) preamplifier with fine bandwidth and enjoyable, musical sound. Great – if you can justify the cost. Well worth hearing	5 line inputs		77
Beard Audio CA35/P35mkII £595/£795	Fair+ Very Good	Good build quality and a very smart finish combine with a characteristic valve sound to make a first class amplifier capable of giving hours of musical enjoyment	35W, MM/MC, 4 inputs	R	63
Beard 506 £1195	Good+ Good+	A versatile valve preamp – the bass sounded lively if a touch softened while the treble was detailed but lacked a little sparkle and air.	4 inputs MM/MC		50
Beard M70 £1995 pair	Good Good+	A substantial British monoblok power amplifier, but not a great deal more impressive than the P35 at half the price	70W		50
Bryston 0.5B/2B £595/£695	Very Good Good	Very rugged Canadian pre/power combo that sounds cool confident and punchy. Headamp available to suit MC cartridges	65W, MM and 4 line sources, overload LEDs on power amp	R	74
Bryston 12B/4B Pre/Power £995/£1395	Good+ Good	Bryston's massive 4B power amp stood out as the backbone of this combo, the preamp sounding a trifle unbalanced between MM and MC inputs	272W, bridgeable to 800W. 6 line, 2 disc inputs, subsonic filter		68
Cambridge Audio P40 £200	Good Good+	A very fine sounding integrated amplifier with simple facilities and MC cartridge capability	5 inputs 40W MM/MC straight line	BB	50
Cambridge Audio C75 £279	Good+ Good+	Whilst not quite on par with its A75 companion this preamp provided excellent stereo imagery but was a touch "heavy" in character	MM/MC disc	R	50
Cambridge Audio P55 £290	Very Good Very Good	A grown up P40, the P55 suffers slight noise on the moving coil input but offers great sound for the money	55W, MM/MC, 5 inputs, hdph	BB	62
Cambridge Audio A75 £299	Very Good Very Good	This strong power amplifier sounded open and effortless, with fine bass drive and dynamics, albeit a touch grainy and harsh at high frequencies	100W	R	50
Cello Audio Suite £5280	Excellent V Good/Excellent	Cello's preamp represents a whole new ball game in flexibility and sound quality (or war of attrition on your wallet)	Optional inputs MC etc	R	50
Concordant Excelsior £856	Good+ + Excellent	Cottage industry styling might not inspire confidence, but sonically this preamp is tremendously vivid and detailed. Real high-end performance. We loved it!	MM plus 3 line inputs. External power supply	R	77
Conrad Johnson PV10 £1,395	Excellent Excellent	Pricey, yes, but a fabulous preamplifier which confirms C-J's high reputation in the States. Beautiful imaging, superb detail, plenty of gain on the phono stage – classy build quality too.	MM plus 4 line inputs	R	78
Conrad Johnson MV50 £1699	Good+ Good+	Coupled with the PV5, this CJ power amp performed well on audition	50W		Collection
Conrad Johnson Motif MC-8 £1995	Very Good Very Good	A cheaper alternative to the '7, this preamp is an undoubted success in maintaining the Motif sound but does not compare on sound quality	MM/MC	R	50
Conrad-Johnson Premier Seven £8995	n/a Excellent	Price has increased since we tested it – but at this price who cares? The 'Seven is designed without compromise, and it's clearly one of the finest (valve) preamplifiers money can buy. Absolutely gorgeous!	MM, 4 line inputs, sep. Rec Out, versatile cartridge matching	R	72
Counterpoint SA12 £1250	Good+ Good+	A real power-house power amp, beefy and load-tolerant although like the SA7 a trifle untidy at frequency extremes	100W		Collection
Creek CAS 4040 S2 £179	Good Good	More neutral than its predecessor tonally, substantial improvements in transparency were also noted, while the lively punchy, character is retained	30W, MM, 4 inputs, tone controls	BB	62
Creek CAS 4140 S2 £219	Good+ Good	Redesigned for '88, this is a fine allrounder with good moving coil input, plain presentation	40W MM/MC 3 line inputs	BB	62
Creek CAS-5050 £399	Average Good	Strong RF IMD compromises the sound of the CD input which contrasts with the delightful performance via MM/MC	72W, MM/MC, aux CD and video + pre/power mode	R	74
Croft Micro £150	Average+ Good	A real upsetter, this excellent valve preamp put the cat among the pigeons proving good sounds can be made at budget price levels	4 inputs MM straight line	R	Collection
Croft Super Micro A £500	Average+ Very Good	The looks are somewhat improved, while this 'hot rod' version with tuned components performed very well indeed. There is still no gain on the line inputs	4 inputs, MM, straight line	R	57
Croft Series IV(S) £730	Good Good	The original IV is still available now supplemented by the higher price and power (S); both are fine performers	40(60)W channel	R	57
Croft Series IVSA £1000	Good Very Good	Featuring tuned components chosen for their sound quality, the 'A' variant is an impressive example of Croft's technique in valve design	60W special supply regulation	R	57
Deltec OSP-50S DPA-50S Pre/Power £675/£825	Excellent Very Good+	Remarkable pre/power combo based around the highly linear DH-0A32 hybrid op-amp. Unmatched detail resolution, control and transparency	63W, external feedback wiring. 3 line, MM/MC no tone controls	R	68
Deltec DPA 100S £2200	Very Good Very Good	A top-quality transistor power amp, sounding fast, articulate and well controlled, though maybe a touch clinical for some tastes	80W	R	50
Denon DAP-2500 POA-4400A Pre/Power £549/£599 pr.	Very Good Good	Denon's fully-fledged preamp also incorporates D/A converters that did not improve the sound of our £299 CD player. The power amps are brilliant!	172W, monobloks Opt/Coax dig + 2 tape, 4 line and MM/MC inputs		68
Denon POA-6600 £1,000/pair	Excellent Very Good	Delivers abundant high quality sound, solid engineering expertise and content clearly compensating for any compromising of purist audiophile principles	250W monoblok, remote power	R	60
DNM 3A From £1000	Good+ Very Good	The DNM3 in its acrylic case is a remarkably revealing and neutral state of the art preamp	5 inputs MM/MC twin vol controls	R*	44

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AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
E.A.R. 802/509mkII £920/£1550	Average Very Good	Extremely well made and combining the sonic strengths of both transistors and valves this EAR combo warrants attention	100W, MM, 6 inputs, monobloks	R	63
E.A.R. 549 £3,000/pair	Very Good Very Good	A valve monoblok that measures like a solid state amp is itself an achievement, but exceptional power delivery and bass 'slam' is not fully matched by delicacy and transparency elsewhere	200W monoblok, bias setting		60
Exposure VII/VIII £360/£340	Very Good Good	Supplied as a combination without the separate preamp power supply, this pre power combination performed satisfactorily especially on the moving coil input	50W, MM/MC, 3 inputs, straight line		62
Exposure VI/VII Dual/VIII Pre/Power £449/£219/£379	Good Very Good	An established company like Exposure could do more to improve the 'look' of these amps which, nevertheless, sounded confident, dry and musical	63W, Super mod. 4 line and 2 disc inputs with full rec-out switching	R	68
Grant 660AMS £948	Good Very Good	This neat and compact 60W valve monoblok gave good sound on the 8ohm tap, better still on 4ohms. The midrange was particularly natural	60W monobloks 8ohms	R	57
Grundig A-9000 £650	Good+ Average-	Very large integrated design culled from Marantz, however is far too expensive to be fully competitive	153W, MM/MC, full record out selection		74
Hafner DH120 kit form £325	n/a Fair	We didn't build one; see below	60W		44
Hafner DH-110/XL-600 £360/£995	Very Good Very Good	Preamp is available in kit form. Both sound remarkably open, transparent and inherently 'musical'. XL-600 is tremendously powerful and very compatible	426W in stereo mode, 1.5kW in bridge, 2mm, tone + processor loop	R	74
Hafner DH120 assembled £396	Very Good Fair	Sound quality results were decent enough, but this power amp won't set the world on fire at this price	60W		44
Harman Kardon PM635i £159	Good Good	An improved version of the classic PM635 amp which sounds typically dry and articulate. Price is frozen	49W, 4 line and MM inputs A/B speaker o/p	R	68
Harman Kardon 640 Vxi £225	Good+ + Good	Moderately priced but built to HK's high standards; good value and good load tolerance	50W MM, 5 line inputs tone controls		56
Harman Kardon PM645Vxi £300	Very Good Good	Fits in well with the Harman Kardon series, giving a competent all round performance at a fair price	75W, MM/MC, 5 inputs, hdph, tone controls		62
Harman Kardon PM650Vxi £369	Average+ Good	A tight and slightly over-damped sound lacks any essential warmth or richness. Reduced headroom on MC	71W, 6 line, MM/MC and true A/V inputs		68
Harman Kardon 655 Vxi £449	Very Good Good	Plenty of well built integrated amplifier for the money, with lots of power to drive almost anything, plus versatile inputs	100W MM/MC 6 line inputs tone controls		56
Harman Kardon Citation 25/22 £599/£859	Good Average+	Not as outrageous as previous Citation amplifiers but neither as punchy nor exciting in the sonic stakes. A good all-rounder but lacks sparkle	138W, MM/MC full range of input and record out		74
Harman Kardon PM665Vxi £699	Good Good	A versatile and meaty amplifier with high current capability, but sound quality lags behind certain home grown alternatives	150W MM/MC tone controls (switchable)		60
ITL MA-80 £169	Good Good	A promising start for this young company, the MA-80 gave a fine sound with CD but was less wonderful on the moving coil input	30W, MM/MC, 5 inputs	R	62
Jadis JP30/JA30 £7,425	Fair Excellent	Two-box preamp plus monoblok power amps, classic valve design gives stereotype valve sound. Beautiful build, nostalgic styling and delightful sounding midrange transcend limitations at frequency extremes, in lab, and re cartridge matching	30W 2-box pre-, monoblok power, MM-only, 4 line inputs	R	60
Jeff Rowland Coherence One/Model 7 £3750/£4950 each	Very Good Very Good	The technical design of these amps is very elaborate but ensures they achieve an extraordinarily transparent and potent sound. However, the CD i/p is clearly superior to the disc inputs	448W monoblok MM/MC with variable loading options. Balanced topology	R	72
JVC AX-222 £110	Good Fair	Not very impressive, JVC need to pull their socks up if their budget amplifiers are to score	35W, MM, 4 inputs, hdph, tone controls		62
Kelvin Labs Absolute Zero/M30 £395 + £295/£595pr.	Good+ Average+	Latest versions of the M30 offers a true 30W Class A and a slightly muddled but very comfortable sound. MC preamp is a very linear design	33W monoblok MC only + 4 line inputs. Separate L/R balance	R	74
Kenwood KA-550D £120	Very Good Fair	Having dropped its moving coil input, this latest version has British style dynamics and rhythm but is not first grade	35W, MM, 4 inputs, hdph, tone controls	R	62
Kenwood KA-5010 £210	Good Good	Offers a slightly bass-light but very smooth, fresh and alive sound. Well built and sensibly equipped	101W, MM/MC, CD 3 tape, tuner, aux + direct	R	74
Kenwood KA-7010 £300	Average+ Average+	More powerful version of the 5010 but less successful in the listening tests. RF IMD is the likely cause.	123W, as above plus -20dB mute facility		74
Klyne SK5a £2590	Very Good Very Good	Beautifully made and presented this American thoroughbred has a good lab performance, but although versatile, is rather expensive for the quality of sound offered	Balanced output, versatile cartridge loading		72
Krell KSA-200 £5050	n/a Very Good	Value derives partly from excellence of sound, but equally from imperturbability, flexibility, consistency, build and after sales care	200W	R	72
LFD £2,995+	Very Good Excellent	Can set the subjective standards that others merely aspire to, but this outstanding if unconventional multi-box preamp needs careful matching to ancillary components (cartridge, power amp)	MC (with care), passive line extra	R	60
Lectron JH50 £2,300	Average Very Good	Sexily presented valve power amplifier from France. Lovely valve sound too, with delicate and airy top end. Not especially powerful and rather expensive - but very desirable!	50W		78
Linn LK1/LK280 Pre/Power £495/£645	Good Good-	A very modern, logic-controlled amp with distinctive and inoffensive sound quality. Its restrained sound could do with extra insight and zip.	84W, compact amp CMOS sw. for 2 tape, 2 line and MM/MC. XLR sockets.		68
Marantz PM25 £129	Good Fair	Soft and sweet like the rest of the range, the PM25 is inoffensive and undemanding	35W, MM, 5 inputs, hdph, tone controls		62
Marantz PM35 £149	Very Good Good	This new generation Marantz is a good allrounder, and shows that extra care is being taken over sound quality; well equipped and versatile	45W MM/MC 3 line inputs tone controls		56
Marantz PM45 £200	Good+ Fair	Generally pleasant and polite with above average clarity; there was some softening in the bass, restricting dynamic output somewhat	40W MM/MC tone controls		50
Marantz PM-65AV £250	Average+ Fair	One of the few amps to actually sound worse via CD direct! Unbalanced character but packed with AV inputs	82W, MM only wide range of aux/video		74
Marantz PM-75 £450	Good Average	More successful than most amps with on-board DACs but still not as balanced as other Marantz products	136W, opt/coax dig inputs, 6 line + MM/MC		68
Marantz PM94 £1,000	Very Good Good	At 23kg the PM94 is no lightweight in either physical or sonic respects. A very powerful and comprehensively equipped amplifier	140W MM/MC tone controls (switchable)		60

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AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Marantz PM-95 £1,800	Very Good Average+	Beautifully constructed, this amp was less convincing via its digital i/p than via line. Class A option best suited to sensitive speakers. Costly	151W with 30W available in Class A. Opt + coax inputs	R	74
Meridian 201/205 £599/£425 each	Very Good Good+	A fine preamp with additional luxury option of full system remote, plus competent and attractive monoblok power amplifiers with generally good performance	100W MM/MC 6 line inputs remote capable straight line	R/—	62
Mission Cyrus One £180	Very Good Good	A red hot class winner, which caused the whole issue to be re-rated! It's even well built – however, the headphone socket will only take a 3.5mm jack	30W, MM/MC, 5 inputs, hdph, straight line	BB	62
Mission Cyrus PSX £230	Very Good Very Good	The PSX does make the Cyrus Two sound better; and also improves the PCM II CD player giving more wallop and clarity	Auxiliary power supply	R	62
Mission Cyrus Two £300	Very Good Very Good	Also a top performer in its group with fine moving coil and compact disc sound. Since our review Mission has omitted the headphone socket on the Cyrus Two	50W, MM/MC, 5 inputs, straight line	R	62
Mordaunt Short MS-A5000 £350	Very Good Good	With a recognisable pedigree, Mordaunt Short engineers have made a good job of this one. A musical all rounder	50W, MM/MC, 6 inputs, hdph, tone controls	R	62
Musical Fidelity A1 £269	Good Good++	Fine-ranking in terms of overall sound quality for money, the excessive heat output could be hazardous to your vinyl if you're careless	20W MM/MC 4 inputs straight line	BB	56
Musical Fidelity B200 £299	Very Good Good+	Running cooler than other MFs, the B200 delivered fine musical and dynamic sounds with plenty of power	80W MM/MC 4 line inputs straight line	BB	62
Musical Fidelity 3A-X/MA100-X £379/£1,499pr.	Average Very Good	Power amps get extremely hot as a result of Class A operation. Sounds exceptionally rich, lush and effortlessly musical. Lacks transparency	105W, MM/MC + 4 line inputs, passive line out bi-wire option	R	74
Musical Fidelity Pre 3/P140 £379/£349	Very Good Very Good	Delivering true audiophile sound quality well ahead of their price, both components shine in their own right	70W MM/MC 4 line inputs straight line	R	56
Musical Fidelity A100 £459	Good+ Very Good	This is another one recommended for fine sound with which you could keep your Chinese carry-outs warm	50W MM/MC 5 inputs straight line	R	62
Musical Fidelity P170 £599	Very Good Very Good	Acquitted itself well, later samples showing steadily increasing refinements	85W	R	50
Musical Fidelity MA-50 £875 pair	Good Excellent	An audiophile bargain. One of the best sounding power amplifiers made	50W, monoblok	R	62
Musical Fidelity MVT Mk 3 £1199	Very Good Very Good	The MVT preamp was "strong in its class", providing competition for £1500-plus amplifier systems, now rivalled by the MF3B	MM/MC 5 inputs	R	50
Musical Fidelity P270 £1299	Very Good Very Good	If the hot-box aspect is not a deterrent, this is something of a bargain. A big amplifier scale of sound which is just a little rough-edged	135W	R	50
Musical Fidelity MVX & A370 £2300/£2299	n/a Excellent	In its latest guise, the A370 confirms its status alongside the MVX as amongst the best indigenous components for both sound and presentation	MVX – MM/MC/4 line/phase invert. A370 – 150W	R	72
NAD 3020e £130	Good Fair	A little light in balance and "weight" but superior to run-of-the-mill budget amplifiers	20W MM/MC 4 inputs	R	50
NAD 3225PE £150	Average+ Average+	Light and detailed if not as rich or weighty sounding as others. MM input sounds warmer than CD clipping, MM only	42W + 70W dyn. headroom; soft-clipping, MM only	R	68
Naim NAIT 2 £322	Average+ Fair	Well built with good load tolerance the NAIT delivered a fully competitive sound in spite of its modest measured power output. Recent modifications as yet unchecked	15W pc MM 3 inputs	R*	50
Naim Separates £560-£8,000	Very Good Good	A consistent and coherent series of 'building blocks' for conventional passive or active operation. Sound quality ignores conventional audiophile standards of presentation, but achieves fine musical communication	40-70W, MM/MC etc	R*	60
Nakamichi CA-5E £750	Very Good Good	A fine lab performance and high build quality but rather disappointing sound quality for a preamp of this price	MM/MC, 6 inputs, hdph, tone controls		62
Nakamichi PA-5E £1150	Very Good Good	A strong sound in several respects but one which ultimately failed to satisfy	100W		62
Nakamichi CA7E/PAT7E £2500/£1700	Very good Good/Good+	Exceptional build and finish, plus good general performance, remote control and versatility, but expensive	200W MM/MC 6 line inputs, remote, tone controls		56
Nuance £795	Very Good Good	A subtle civilised pre-amp though a little lacking in resolution and detail; suited to some tastes but not top-drawer	4 inputs MC		50
Oakley Image S £499	Good Very Good	Much improved version of the original Image preamp from Yugoslavia. This one won't disgrace itself even in top-notch systems. Image Six model (£100 more) is really fabulous	MM plus 3 line inputs	R	78
Orell SA-040 £359	Good Good+	This promising newcomer from a brand new company sounded pretty good and should improve as production settles	45W MM/MC, 4 line inputs, straight line	R	56
Philips FA-880 £200	Good Average	A new and cheaper design from Philips that sounds best via MM disc. Can appear soft and unbalanced via CD	108W, MM/MC source-direct tone		74
Philips FA960 MkII £299	Good+ Average	The MkII '960 still failed to grasp our listeners' attention but it remains a competent amp nonetheless	122W, 6 line & 2 disc inputs + tone controls		68
Philips DFA-888 £300	Good Average	As above but including a modified disc input and onboard DAC. Sounds tight but also slightly thin	107W, as above + opt and coax digital inputs		74
Pink Triangle PIP £2670	Excellent Excellent	This state-of-the-art preamp is one of the few truly high end products to come out of this country this year. It will most certainly worry the competition	MM/MC, 4 inputs, battery supply	R	62
Proton 520 £115	Average Average	Very well equipped budget amp with a slightly flat and undynamic sound – acceptable at the price though	31W, MM/MC with variable MC gain, 4 line inputs	R	74
QED A240 CD II £169	Good+ Good	Latest 240CD is fine value for CD and has competent MM disc input as well	45W MM 5 line inputs straight line	BB	62
QED A240 SA II £219	Good+ Good+	Redesigned 240SA represents a significant allround improvement over its predecessor, and provides a good moving-coil disc input in a competitive price	45W MM/MC 5 line inputs straight line	BB	62
QED A270 £329	Good+ Good+	Building on the strengths of the '240, the '270 sounds weighty, fast and dynamic. A bit 'lumpy' via MC	51W, 5 line and 2 disc inputs, pre-out	R	68
Quad 34 £285	Very Good Fair	This well-built durable preamp has useful filtering and above average tone controls but was found lacking in sound quality (viz: detail/dynamics)	4 inputs MM/MC tone controls		44
Quad 405 £349	Very Good Fair	Not an impressive power amp but easy on the ear if not pushed and very reliable	100W		44
Radford SC25 £862.50	Very Good Very Good	A very fair price for a solid, well built valve preamp, combining good allround performance and a neutral sound	5 inputs, MM, straight line	R	57
Radford MA75 £977.50	Good Very Good	A fine quality valve monoblok with good load tolerance and a neutral accurate sound, offering significant gains in power and focus over the STA25	75W monobloks	R	57
Radford STA25 Renaissance £1115.50	Good Good+	Offering superb midrange performance if not quite as good at the extremes, the Renaissance valve power amp is a genuine audiophile product	25W	R	50
Ray Lumley Model 75 £1,995 pr	Average Good+	Monstrous valve monobloks which represent good value. What they lack in musical subtlety they make up for in sheer muscle. And these are Lumley's small monobloks!	75W monoblok		78

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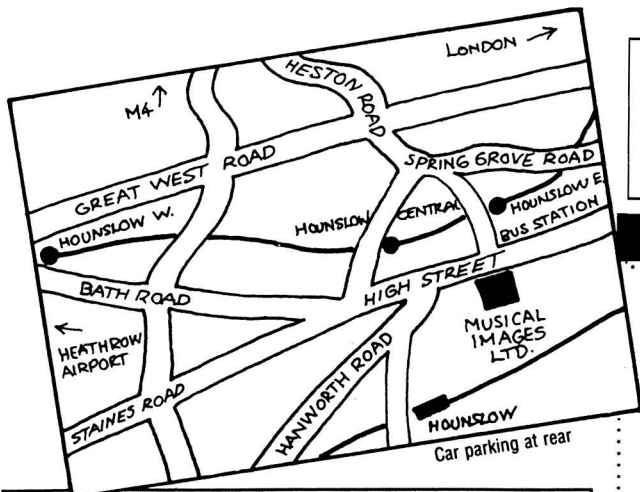
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THE DIRECTORY

AMPLIFIERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Revox B150 £875	Very Good Average+	Beautifully constructed but hampered by Revox's convoluted logic control. Open and smooth sound. Still costly.	117W, CMOS sw. for 3 line, 2 tape and MM		68
Revox B250 £1188	Very Good Good	With much improved sound over its predecessors plus amazing remote control facilities, this could form the heart of a round-the-dream-house system	150W MM/MC system/house remote tone controls		56
Rose RV-23 £395	Good Very Good	Beautifully built classy British 'hybrid' preamplifier. You can spend more to get a more transparent sound - but it's hard to criticise the Rose given the competitive price	MM plus 3 line inputs	R	77
Rotel RA810A £100	Very Good Fair	As a cut price RA820AII this is a very successful little amp that loses little in sound quality to its predecessor. Excellent value	20W, MM, 5 inputs, hdp, tone controls	BB	62
Rotel RA820A £130	Good + + Good	This A version of an established budget favourite delivers the goods sonically and is fine value for money	35W MM 4 line inputs tone controls	BB	56
Rotel RB/RC850 £150/£125	Good + + Good+	Quality separate pre and power amplifiers at near budget integrated amplifier prices. A notable achievement	60W MM/MC 4 line inputs tone controls	BB	62
Rotel RA820BX3 £170	Very Good Good	The latest upgrade is not that impressive, but the BX remains a fine amplifier and now has a moving coil disc input	30W, MM/MC, 5 inputs, hdp, straight line	BB	62
Rotel RC-870BX/RB-870BX Pre/Power £199/£210	Excellent Good+	Reduced price makes the 870 combo better value but, despite mods to the preamp, it is the power amp that must take the lion's share of credit	128W or 208W in bridged mode. CD direct, 4 line, 2 tape and MM/MC	R	68
Rotel RA840BX3 £220	Very Good Good+	Requires a very long warm-up period but rewards with a refined sound that should suit 'lively' systems	59W, 2 tape, 2 line, MM/MC and A/V inputs	R	68
Rotel RA870BX £300	Very Good Good+	A powerful blockbuster with solid and well focused sound, good versatility and fine load tolerance	85W MM/MC 7 line inputs tone controls	R	56
SAE P102/A202 £499/£599	Average+ Average+	Microprocessor-controlled pre and power amp that sounds much better at low rather than high volume levels. Pro-oriented aesthetics	151W, MM/MC + CD tuner and 2 tape tone memory, spk switching		74
Sony TA-F200 £130	Average- Average	Over-ambitious protection circuit is hardly in keeping with modern amp design. Lean but 'dead' sound quality.	74W, 2 tape, 3 line and MM/MC inputs		68
Sony TA-F400 £200	Good Average+	Some lack of integration across the frequency range but still offers a more open and detailed sound than the 'F200	76W, 2 tape, 3 line and MM/MC inputs. Rec-out		68
Sony TA-F530ES £300	Good Average+	Chunky UK-oriented design that offers a rich, smooth and full sound. Slight loss of focus via MM/MC disc	120W, MM/MC, 4 line sources + record out + tone	R	74
Sony TAF 500ES £349	Good + Fair	Not too hot at the price, lacking in bass action, rating poorly on vinyl, and only marginally improving on CD	75W hdp tone controls MM/MC		50
Sony TA-F630ESD £350	Good Average	Based on the '530 but equipped with PDM D/A convertor. Amp is competent but DAC sounds truly magnificent!	130W, as above + opt. and coax digital inputs	R	74
Sony TAF 700ES £500	Good + + Fair	Scoring higher than the 500 but still not offering the sort of standards set by the competition. But many buttons to push	100W MM/MC tone controls		50
Sumo Nine + £1200	Very Good Excellent	Macho styling of this class A stereo power amp conceals a sonic subtlety that is exceptional for the price, limited by lots of waste heat and a noisy fan on our sample (being improved)	65W	R	60
Sumo Andromeda £1585	Very Good Very Good	Well made with lots of power from a sensibly sized box. It was good in the lab and demonstrated a sound which offers a fine blend of performance at an almost reasonable price	200W, balanced input	R	72
Tannoy SR-840 £1713	Very Good Good	A "muscle" power amp, capable of impressive levels into difficult loads while remaining quite subtle and revealing	250W		50
Technics SU-V660 £250	Good Fair	Chunky build but integrated output stage infers a weak, insubstantial and rather monophonic sound	107W, MM/MC, CD aux, tape + tuner + power amp-direct		74
Technics SE-M100 £550	Very Good Good+	An unusual disc-less poweramp with volume control. Standard line input sounds very open and clean. Digital input is harsher and less convincing	123W, coax and opt digital inputs, var and direct CD no MM or MC disc	R	74
Vacuum State FVP £999	Good Very Good	This well thought out valve preamplifier is designed for optimum musicality and transparency, a goal which is handsomely achieved	5 inputs, MM, straight line	R	57
Yamaha AX-300 £100	Good Fair	A lively and dynamic performer, offering a credible if bright sound at a competitive price	30W hdp tone controls (MM)		50
YBA Model 3 Pre/Power £995/£995	Good Good	Suited to high sens. loudspeakers this duo produced see-through, ethereal stereo images that were more convincing towards the centre of the soundstage than at the edges	56W stereo amp MM only with 3 line i/p's. Separate L/R volume controls		72
YBA 2 pre & pwr £1395/£1695	Good + + V Good/Excellent	Superbly finished French audiophile separates, with very good space and transparency, slightly softened bass. Needs extra transformer (£300) for MC cartridges	70W MM (MC extra) straight line	R	56
YBA 1 preamp £2895	Very Good Excellent	A front line French audiophile product. Great stereo and a fine Krell style finish	MM/MC, 3 inputs, straight line	R	62
YBA 1 power amp £2995	Good Excellent	This equally well finished power amp offers front rank stereo staging and transparency, and is capable of driving the most difficult loads	85W	R	62

* rating refers to original, tested model

LOUDSPEAKERS

Last item in the hi-fi chain, to some extent the loudspeaker is merely the slave of what has gone before, capable only of reproducing a signal as good as it is fed. Nevertheless the distortions (colorations and stereo effects) introduced by loudspeakers (and rooms) tend to be more immediately obvious than those anywhere else in the chain, so careful choosing according to taste is very important.

The average loudspeaker consists of a smallish enclosure, much of which may have begun life as

part of a tree, plus a couple of drive units hidden behind a removable grille. Inside the box lurks a simple electrical circuit known as a crossover, which divides the incoming (full range) signal into the right bits for the drivers to handle. Variations on the above formula are specifically identified in the entries. The designer's primary task is to balance the sensitivity of the loudspeaker (how loud it goes for a given electrical input) against the bass extension (how low does it go) for the given box size. After that such subtleties as coloration and

dispersion come into the equation.

Careful placement of the loudspeakers within the room is as important as the initial choice of model. For good stereo they need to be more or less the same distance from nearby walls, and preferably on similar rigid stands. The listener should be about the same distance from and listening angle to each loudspeaker. The ideal placement depends on the way a particular model has been balanced (not to mention a number of other factors), and our recommendation is given in the entries.

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Acoustic Energy AE1 £696	Good Very Good	To the author's knowledge, the most awesomely dynamic and articulate miniature ever made	29.5 x 18 x 25cm semi-open space	88dB/W 60Hz	R	59
Acoustic Energy AE2 £1138	Good Very Good	Dynamic, solid and lively, a great allrounder if a bit small considering the price. AE proves that metal cone/dome drivers really work.	39 x 23.5 x 29.5cm heavy stands in free space	88.5dB/W 45Hz	R	66
Acoustic Energy AE4 £1880 (stands £550)	Good Good	Magnificent but also seriously flawed, the AE4 possesses tremendous dynamic realism but a very mid-dominant balance. Large rooms and wallets only need apply.	54 x 32.5 x 44cm own stands in free space	90dB/W 40Hz		71
Acoustic Research Red Box £100	Average Average	Lively and balanced if a bit crude and uneven, this under-£100 econobox succeeds partly because of its simplicity, and works well with some rear wall assistance.	32 x 19.5 x 17cm close to rear wall	87dB/W 85Hz	R	74

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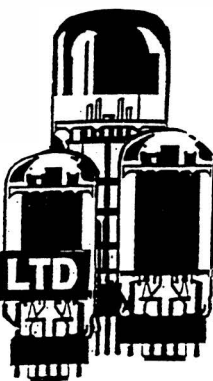
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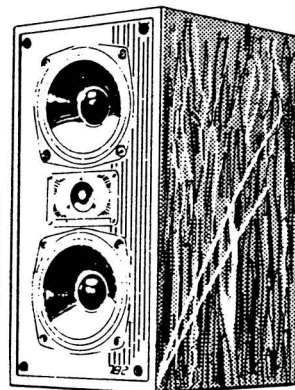
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THE DIRECTORY

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research AR112 £125	Average Average—	Nicely presented and engineered, but sounds a bit small and boxy without true coherence.	36 x 19 x 18.5cm stands near rear wall	87dB/W 75Hz		66
Acoustic Research AR122 £150	Average Average	Despite a promising enough list of ingredients, the 122 failed to excite real enthusiasm amongst the listening panel	38.5 x 19 x 22cm stands near rear wall	87dB/W 68Hz		68
Acoustic Research AR132 £200	Average+ Average—	Good presentation and detail engineering was not sufficient to counter bass heavy balance problems on auditioning	44.5 x 23 x 25.5cm stands 1ft from rear wall	87dB/W 50Hz		66
Alexander SE5 £189	Average Average	Particularly well suited to surround sound A/V applications, the SE5 can give any miniature a run for its money on bass performance; hardness and coloration mar good detail and clarity, and price is a little high	40.5 x 12 x 15cm ALS stands near wall	82dB/W 50Hz (in room)		78
Allison AL105 £150	Average Average—	Pretty enough in appearance, sonically the AL105 doesn't really make the grade at the £150 asking price	37 x 24 x 21cm high stands against wall	87dB/W 45Hz (in room)		78
Allison CD6 £290	Average Good—	An unusual cube-shaped model designed for wall mounting gives exceptional bass extension from a small box, though it's also a bit heavy, coloured and slow	28.5 x 28.5 x 28.5cm stands against rear wall	88dB/W 45Hz	R	71
Alphason Amphion £680	Good Good	This fine-sounding, nicely finished compact wall-mount is just a little too expensive for formal Recommendation, but is a good performer for all that	44 x 23 x 27.5cm high stands against wall	88dB/W 47Hz (in room)		78
Alphason Orpheus £990	Good Good+	Large hi-tech two-way features unusual, sweet-sounding isodynamic tweeter, well engineered and balanced if a shade odd in appearance	65.5 x 28 x 34cm stands near rear wall	87dB/W 43Hz	R	71
Apogee Scintilla £4990	Good Very Good	These take-me-to-your-leader speakers gave exceptional transparency and can achieve excellent results in a true audiophile system	145 x 88 x 9cm free space on floor	79dB/W 20Hz	R	46
Arcam Three £150	Average+ Average—	Arcam's baby speaker did not delight our listeners, but it might do better in less expensive systems	34 x 18 x 23cm close to wall at head height	88.5dB/W 95Hz		53
Arcam Two £280	Good Average	Most things to most men this compact is unlikely to disappoint with its lively "bally" character though lacking weight... a bit	38 x 23 x 28cm near wall shelf or 40cm stands	88dB/W 55Hz		59
Arcam One Plus £380	Good Average	Provides a solid, weighty and rich sound, but is a little raw in the treble and indefinite in the midband	22.3 x 28.1 x 37.8cm open space, on stands	88.5dB/W 60Hz		59
Audio Electronics TC10 II £599	Good— Good+	Oddball appearance is rescued by a respectable technical performance, interesting and impressive engineering and fine sound quality at a realistic price.	70 x 33.5 x 33.5cm low stands in free space	87.5dB/W 40Hz	R	68
Avance 120 £279	Average+ Average+	This unusual "after eighties" looking speaker has the recipe for success, but not quite the right seasoning yet	42 x 30 x 30cm 30cm from wall on 40cm stands	86.5dB/W 60Hz		53
B&W DM550 £149	Good+ Average—	Beautifully presented, well engineered near-miniature with precise sound but a distinct lack of 'wellie'. Ideal for considerate flat dwellers	35 x 20.5 x 22.5cm stands in free space	86dB/W 70Hz		71
B&W DM560 £200	Average+ Average—	Fine cosmetic presentation and good engineering for the price; overload protection may be handy but listening panel was underwhelmed	49 x 23.5 x 30cm stands in free space	88dB/W 55Hz		66
B&W LM1 Mk II £249	Average+ Average	Probably one of the best 'micros' ever made, worth considering for special applications (boats or vehicles). Upgraded since our review	24 x 15.5 x 20cm shelf or flush mount	86.5dB/W 80Hz		31*
B&W CM1 £345	Good Average	Cleverly thought out luxury design package is also fundamentally well engineered, if a shade pricey on 'sound for pound' basis	24.5 x 16 x 22cm close to rear wall	84dB/W 90Hz		74
B&W DM1600 £369	Good Good	Crisp, dynamic loudspeaker with tight but not especially deep bass and a tweeter that sometimes sounds overcooked	49 x 23.6 x 30cm free space, open stands	87.5dB/W 60Hz	R	59
BLQ Q2 £275	Average— Average	Nearly a good loudspeaker, the basic balance is good, but the midband is very uneven and there are severe losses of resolution, 'space' and dynamics	43 x 25.1 x 24.5 semi open on stands	87.5dB/W 70Hz		59
Bose Interaudio 3000XL £140	Average Average—	Lots of perceived value and well enough balanced, but low cost cabinet and driver engineering results in a crude and unsubtle sound	46.5 x 29 x 23cm stands in free space	86dB/W 45Hz		71
Bose 305 £350	Average Good—	A bit of an oddball, fine dynamic liveliness and a good room match more than make up for the strange stereo imaging and treble	28 x 45 x 23cm high stands near wall	88dB/W 40Hz (in room)	R	78
Boston A4011 £120	Average Average—	Competent performance for size and price but below average relative to the UK competition	34 x 21 x 20cm on stands near wall	88.5dB/W 63Hz		41
Canton Plus S £140	Average Poor	Bright treble and virtual absence of any bass at all is too high a price to pay for an almost invisible loudspeaker	20 x 12 x 12cm against rear wall	87dB/W 130Hz		74
Canton Karat 20 £300	Good+ Average+	Very prettily finished and accomplished near-miniature, the bright-sounding '20's only difficulty lies in justifying its high price	34 x 22 x 20cm stands in free space	87dB/W 55Hz	R	71
Canton Karat 30 £360	Average+ Average	The slightly 'boom'n'tizz balance is attractive at low levels, but starts to pall as the dynamic range is explored. Pretty though	42.5 x 26.5 x 28cm solid stands	88dB/W 35Hz (in room)		78
Canton Karat 40 £550	Average Average	Pretty and compact three-way for those who mourn the passing of the loudness control — definitely errs on the boom'n'tizz side	50 x 27 x 27cm stands in free space	88dB/W 50Hz		71
Canton 60 Karat £630	Average+ Good	Looks a bit of a throwback designwise, but is nicely presented and has a lively, dynamic and generous sound	58 x 31.5 x 31cm stands in open space	90dB/W 48Hz	R	66
Castle Clyde £149	Average+ Average	A tidy little performer packing punch, but beginning to show its age in the light of new competition	37 x 21.5 x 22cm open space on stands	89.5dB/W 64Hz	R	46
Castle Durham £199	Average+ Average	Listening results were encouraging, well engineered and finished, but lean on treble and a bit weak on bass; still recommended	41 x 21.5 x 25cm near rear wall	89dB/W 67Hz	R	46
Castle Pembroke £309	Good Average+	Comfortably recommended, a sweet smooth sound with good overall balance of engineering-based performance	55 x 37.5 x 30.5cm open space on stands	88dB/W 46Hz	R	31
Castle Warwick £169	Good Average—	Excellent presentation and fine engineering with overload protection, but a sonic disappointment in bass and dynamic qualities	46.5 x 25 x 23cm stands 1ft from rear wall	88dB/W 50Hz		66
Celef Cirrus £180	Average Good	It's nice to see Celef back in the UK, with this decent sounding small reflex box that seems unusually tolerant of siting	39 x 20.5 x 23cm stands in free space	84dB/W 60Hz	R	66
Celef CF2 Nimbus £230	Good— Good—	Nicely balanced overall but a little uneven with it, this lively and dynamic large bookshelf model came close to Recommendation	46 x 25.2 x 24cm stands in free space	88dB/W 55Hz		71
Celestion 3 £109	Average+ Average	This attractive little wall-mount gives good balance and stereo imagery, with a character which leans more towards inoffensiveness than excitement	31 x 18.5 x 21cm high stands against wall	86dB/W 55Hz (in room)	R	78
Celestion DL6 Series Two £159	Good Average	Good tonal colouring and plenty of bass for the enclosure size; the metal dome tweeter is excellent, but bass and mid lack clarity and 'bite'	45.4 x 24.5 x 26.2cm near wall, on stands	87dB/W 65Hz		59
Celestion DL8 Series Two £199	Very Good Good	A refined middle market speaker has a smooth but slightly dull quality, with good definition and deep, if slightly boxy bass	50 x 27.5 x 27.8cm open, stands	87.5dB/W 60Hz	R	59
Celestion SL12Si £579	Average Average	Careful setting up does reveal elements of fine sound quality, but this 'grown up' SL6 variation has a lumpy response alongside its improved power handling	53 x 20 x 27cm matching stands clear of walls	85dB/W 50Hz		66
Celestion SL600Si £799	Good+ Good	This Aerolam high tech miniature has certain remarkable qualities that some will find irresistible, and which go a long way towards justifying the highish price. Needs careful system and room matching.	27 x 20 x 23cm matching stands in free space	82dB/W 52Hz		68
Celestion SL700 £1349 inc stands	Good Good	Very sophisticated, mostly smooth and accurate transducer, with fast but not very deep bass and a rather bright treble	37.5 x 20 x 23.5cm free air on tall stands	83dB/W 45Hz		60

TO ORDER BACK ISSUES OF HI-FI CHOICE SEE PAGE 16

THE DIRECTORY

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Celestion 6000 £1470	Very Good Very Good	A genuine fullrange audiophile quality speaker system – with Star Wars styling to suit a high tech environment	Complex, on floor in free space	82.5dB/W	R	60
Chameleon 500 £349	Average— Average—	Sounding badly coloured, dull and compressed, it is also amateurishly constructed, despite using good quality materials	38 x 25.3 x 31.3cm free, stands	89.5dB/W 75Hz		59
Duntech PCL500 Marquis £3998	n/a Very Good	Better value for money than the Crown Prince – and arguably more dynamic, with real bass 'slam' – but a little less refined in the higher registers	147.5 x 27 x 40 free standing away from walls	92dB/W 48Hz	R	65
Duntech PCL1000 Crown Prince £6120	n/a Very Good+	Immensely 'listenable', refined sounding speaker capable of creating lifesize musical images. Not overly transparent to source, but very civilised nonetheless	180 x 30.5 x 43.5 free standing away from walls	90dB/W 42Hz	R	72
Energy 22 Pro Monitor £600	Good Good	Presentation is a bit rough for the price, but this Canadian entrant is an impressive sonic allrounder that will appeal to most listeners	62.5 x 27 x 30cm stands in free space	87dB/W 40Hz	R	66
Gale 301 £300	Average Average+	Of unusual, distinctive appearance this produced a mixed response, being lively but lacking depth	44 x 23.5 x 22cm on stands quite near wall	86.5dB/W 63Hz	*	46
Gale GS402 £700	Average+ Average+	Clean but rich and powerful bass; stereo focus was not a strong point, but it is worth considering. (Recent revisions not checked)	61 x 35.5 x 28cm on matching stands near wall	88dB/W 48Hz	*	46
Goodmans Maxim Two £90	Average+ Average	More wham-bam-thankyou-mam sound that imitates much bigger speakers when you let these babies yell. (A well-controlled yell)	26 x 17 x 19cm near wall on shelf or stand	86dB/W 85Hz	BB	59
Goodmans B-Max/Maxim Two £90 + £90	Poor Average—	Stick with the Maxims on their own until you can afford some real grown up loudspeakers	60 x 21 x 26 + 2x (26 x 17 x 10)cm suck and see	89dB/W 55Hz (in room)		78
Goodmans Point 3 £100	Average+ Average—	Recommended as good value for money, but our listeners' differing opinions mean your ears should judge for themselves	47 x 25 x 20cm shelf/ high stand near wall	90dB/W 80Hz	R	53
Goodmans Sterling Point 5s £130	Good— Average—	Looks a remarkably good deal with apparently good engineering, but the room drive is mid-dominant and the sound is loud but not that likeable.	56 x 29 x 26cm stands in free space	89dB/W 60Hz		71
Goodmans Point 7 £180	Average+ Average	Basically competent performance-mix and a lot of speaker for the money, but a certain lack of refinement nonetheless	69 x 33 x 26cm free space on 35cm stand	89dB/W 47Hz		53
Harbeth LS3/5A £330	Good Average	Still a classic miniature, though not to every taste, and none the better for the recent update under our listening conditions. Limited dynamic range	30.5 x 19 x 16cm stands in free space	81dB/W 60Hz		66
Harbeth HL Compact From £499	Very Good Average	The clean and neutral sound lacks resolution and gives rather unobtrusive though well differentiated stereo. Can be bi-wired to advantage	52 x 27.2 x 28.1cm open space, on high stands	87.5dB/W 65Hz		59
Heco Interior 90S £129	Good Average—	Neatly finished and engineered miniature, but the disappointingly 'lifeless' sound left the listening panel decidedly underwhelmed	27 x 18 x 16cm on high stands	87.5dB/W 90Hz		74
Heco Interior 120 £149	Good Average	Drab appearance belies a lively enough character, though the balance is altogether a bit bright for UK tastes	32 x 23 x 23cm high stands against wall	88dB/W 50Hz (in room)		78
Heco Interior 430s £399	Good Good—	This tall floorstanding enclosure delivers an impressively even sound balance with good bass extension, if not the lively dynamics to satisfy enthusiasts	85 x 24 x 27.5cm free space	88dB/W 43Hz	R	71
Heco Superior 740 £599	Good Good—	A similar sonic package to the cheaper Interior 530, these Superior clothes are very pretty indeed, though spikes are still awaited	84.5 x 22 x 25cm on floor in free space	88dB/W 30Hz (in room)		78
Heybrook Point 5 £139	Average Average	"Uncouth yet still satisfying", the Point 5 gives good dynamics and bass for a compact wall-mount, but is burdened by a somewhat unhappy treble	37.5 x 23 x 24cm high stands against wall	85dB/W 32Hz (in room)		78
Heybrook Point 7 £185	Average Average	Physically an attractive package, but not entirely convincing in lab or listening panel test; interesting for all that	40.5 x 23 x 23cm stands against rear wall	85dB/W 60Hz		68
Heybrook HB1 £199	Good Average+	No longer an over-bright character, a strikingly clear sound and fine transient performance now merits recommendation	47 x 29 x 23cm on stands near wall	88dB/W 61Hz	R	46
Heybrook HB100 £255	Average+ Good	Well matched for wall sitting, the HB100 is a lively and informative performer in the tradition of the popular HB1	47 x 26 x 28cm stands near rear wall	86dB/W 50Hz	BB	66
Heybrook HB200 £399	Average Average	This luxury successor to the HB2 is lively and informative, but sounded insufficiently balanced to convince our listening panel	46 x 23 x 26cm stands against rear wall	87dB/W 55Hz		66
Infinity RS2001 £169	Average Average+	A little coloured and unruly in the treble, the 2001 nevertheless retains the lively dynamic bounce of its predecessor; pity the price has gone	36.5 x 22.5 x 20cm lightweight stands	87dB/W 50Hz (in room)	R	78
Infinity Kappa 6 £795	Good Good	Interestingly styled US loudspeaker has unusual high tech drivers and good neutrality, but the sound seriously lacks excitement	63 x 38 x 24cm stands, free space	85dB/W 35Hz		66
Infinity Kappa 8 £1795	n/a Good++	Very nicely made and unobtrusive but large four-way speakers which have a tendency to sound bass heavy unless used with solid core cables	118 x 51.5 x 17.5cm floor standing, open space	89dB/W 33Hz		72
Jamo Concert 2 £230	Good Average—	A thoroughly respectable 'bookshelf' performer that needs free space sitting but includes attractive cabinetwork and a neat grille	41 x 24 x 25cm stands in free space	85dB/W 48Hz		66
JBL TLX12 £149	Good— Average	This smart near-miniature has a 'boppy', lively bottom end, but beware of the fizz in its top	37 x 23 x 23cm stands 0.5m from rear wall	87dB/W 55Hz	R	71
JBL LX44 £340	Good— Average	This generously built model offers good power handling, bass extension and dynamic range, but suffers from the 'three-way syndrome', with middle muddle	58.5 x 30 x 29cm stands in free space	89dB/W 40Hz		71
JPW Sonata £99	Good Average+	Well balanced and integrated, this near-miniature offers fine sound if limited bass and dynamic range, plus real tree wood at a nearly silly price	32 x 23 x 20cm stands near rear wall	86dB/W 55Hz	BB	71
JPW P1 £139	Good Average+	Honest and basically articulate if not very sophisticated, resolution is good but it can sound a little wearing in bright systems or with rough sounding material	44 x 25.9 x 26.1cm free space on stands	89dB/W 60Hz	R	59
JPW AP2 £165	Good Good	Few grounds for criticism but purchasers should check out the treble qualities to avoid hammering the ear anvils	46 x 26 x 25cm 40cm from wall on 45cm stands	89dB/W 65Hz	R	53
JPW AP3 £219	Good Average+	Pretty good stereo and well balanced overall it had its own character which is well suited to vinyl replay	52 x 25 x 29.5cm near wall on stands	90dB/W 57Hz	R	46
KEF C15 £99	Good Average	One of the tiniest around delivers a surprisingly 'big' and well balanced sound, with excellent stereo from free space sitting	26.5 x 18 x 14cm stands in free space	85dB/W 60Hz	R	71

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THE DIRECTORY

LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
KEF C25 £139	Average+ Average-	Very safe and competent, but rather short on inspiration, the '25 lacks the brio and flair of its smaller C15 brother	34 x 20.5 x 17cm high stands near wall	87dB/W 60Hz (in room)		78
KEF C75 £349	Good Good	Compact floorstanding model's Uni-Q driver provides fine crossover integration, giving stable stereo and fine dynamic range within a slightly 'rich' balance	72 x 24.5 x 25.5cm floor in free space	90dB/W 45Hz	R	71
KEF R102 £365	Very Good Very Good	High class near-miniature with expressive, articulate midband and clean, accurate bass and top. The sound quality of the Kube circuitry, however, is suspect; what would an audiophile Kube sound like?	33 x 20.7 x 26.3cm near wall or open on stands	89.5dB/W 60Hz	R	59
KEF C95 £599	Good Good	Rich and lazy, but nonetheless very endearing in a cosy sort of a way, the '95 is a lot of speaker for the money, and delivers a big sound with grace and subtlety	88.5 x 24.5 x 31cm floor in free space	90dB/W 28Hz (in room)	R	78
KEF 103/3 £680	Good+ Good	Technically impressive, excellent bass/power handling for size, but not for the audiophile system. Better among cheaper components, and good in a large room	56 x 27 x 30cm supplied stands free space	90-95dB/W 35Hz		53
KEF 104/2 (inc KUBE equaliser) £895 (£994)	Very Good Good++	A reference point for dynamics, preferred without KUBE, suited to many rooms. Good stereo, high sound levels	90 x 28 x 41.5cm floor standing in free space	92dB/W 50Hz	R	60
KEF 107 £2025	Very Good Good+	A welcome sense of ease and lack of strain at most normal levels. Minor criticisms included a dulling in the extreme treble. Excellent bass extension	116.5 x 33 x 45cm on floor in free space	87.5dB/W 20Hz	R	60
Linn Helix £279	Average+ Good	Attractive presentation is coupled with an attractively lively sound which is more neutral if less committed than earlier Linn loudspeakers	51 x 25.5 x 28cm stands 1ft from rear wall	88dB/W 53Hz	R	66
Linn Kan 2 £339	Average+ Average+	A niche product for those prepared to tolerate its strong character for the sake of its fine bass performance and near invisibility	30.5 x 18.5 x 16.5cm Kan stands against wall	82dB/W 35Hz (in room)		78
Linn Nexus £379	Good Average	Good features include a solid, meaty bass plus good imagery and tonal balance. The catch is that Nexus lacks resolution and timing	49 x 23.5 x 30.4cm near rear wall supplied stands	89dB/W 60Hz		59
Magneplanar SMGa £675	Average- Average	Tonally 'rich', in the right room it proved a satisfactory musical experience	122 x 48 x 4.5cm on floor clear of wall	85dB/W 56Hz		46
Magneplanar MG1.4 £1190	Good+ Good+	Replaces the stalwart MG1c with a revised panel layout. Offers a very crisp and articulate sound, particularly revealing of upper mid vocal details	155 x 8 x 57cm open space	88dB 40Hz	R	72
Magneplanar MG2.5R £1998	Good Good	Offers the low coloration and profound musical insight of better electrostatic loudspeakers but without loss of low frequency extension	183 x 56 x 4.5cm Open space	83-85dB/W 35Hz	R	60
Magneplanar MG11a £2700	Good Very Good	Another excellent true-audiophile loudspeaker this American panel speaker helps to convey much of the original character of the music	180 x 62 x 38cm well clear of walls	84-86dB/W 35Hz	R	46
Marantz LD20 DMS £150	Average Average	Recommended more for CD users than vinyl keepers, soundly engineered and built but should be heard before bought	36 x 23 x 24cm free space on 45cm stands	86.5dB/W 55Hz		53
Marantz LD50DMS £200	Very Good Good-	Well behaved larger two-way has fine balance, stereo and integration with good bass extension, albeit with mild 'boxy', 'chesty' and 'fizzy' effects	42.5 x 27 x 28cm stands in free space	87dB/W 50Hz	R	71
Martin Logan CLS II £3998	n/a Very Good	Much improved high resolution design, fussy about system set-up and demanding of ancillaries and software alike. It rewards the efforts though	60 x 28 x 7.5cm open space	86dB/W 45Hz	R	72
MB Quart 220 £270	Average- Average	The elaborate and pretty enclosure in a wide range of finishes works better than the drivers and crossover, which impose a lumpy balance	30 x 22.5 x 21cm stands in free space	87.5dB/W 80Hz		74
MB Quart 280 £340	Average- Average	Despite redoubtable build quality and good dynamics, the 280 has a rather 'obvious' mid bass and a balance that adds rather too much of its own character	44 x 27 x 29cm uncritical	88dB/W 40Hz (in room)		78
MB Quart 390 £469	Below Average Poor	An aggressive, messy sounding design whose uncoothness undermines the positive level of detail	52 x 31 x 30.5cm open space, on stands	89.5dB/W 60Hz		59
Meridian M30 £775	Average+ Average	Pricy but easy on the ears and worth considering especially where space is at a premium	38.5 x 18 x 32cm free space on stands	Active 40Hz		46
Mission 761 £120	Average Good	One helluva speaker for the price, if a shade small and short of subtlety and refinement - should prove a worthy successor to the 70 and 700	38 x 21 x 21cm stands near rear wall	87dB/W 60Hz	BB	66
Mission 762 £180	Average Average-	Mission's 'bookshelf middleweight' offers high sensitivity and loudness capability, but at the expense of a somewhat untidy and rather 'heavy' sound	50 x 25 x 27cm stand, experiment advised	91dB/W 55Hz		66
Mission Cyrus 781 £240	Average+ Average+	Superb build, finish, presentation and engineering for the price, this romantic sounding Cyrus needs careful system matching to achieve good results	43 x 22.5 x 28cm medium stands near wall	88dB/W 40Hz (in room)		78
Mission 763 £280	Average+ Average+	A very artful combination of generous volume and good bass extension at a modest price. Works well in the listening room despite a few rough edges	77 x 25 x 32cm near rear wall	86dB 40Hz	BB	68
Mission Cyrus 782 £340 (stands £80)	Good- Good-	Lively, articulate and beautifully finished, this compact wall-mount model with twin main drivers has good integration but a rather rich, 'loudness' balance	50 x 25 x 32.5cm Cyrus stands near wall	90dB/W 50Hz		71
Mission 764 £400	Good Good-	Large floorstander has fine bass extension but limited dynamic range, and sounds 'lazier' than Best Buy 763	86 x 25 x 32cm 0.5+m from rear wall	86dB/W 43Hz		71
Monitor Audio Monitor 7 £150	Average- Average	This lively and punchy near-miniature looks pretty enough and is good value but is let down by an unruly and indifferently integrated tweeter	34 x 16.5 x 17cm stands 1ft from wall	84dB/W 70Hz		74
Monitor Audio Monitor 9 £190	Good Average	Despite a much better treble balance than the 7, the Monitor 9 is less engaging and lively at low frequencies than its smaller sibling, though it's nevertheless a very competent overall design	37 x 20 x 21cm high stands near wall	84dB/W 40Hz (in room)		78
Monitor Audio R300/MD £250	Average Average-	An attractive 'large bookshelf' model that's handicapped by poor crossover and integration between paper cone bass and metal dome tweeter	47.5 x 25 x 30.5cm stands in free space	88dB/W 50Hz		71
Monitor Audio R352/MD £299	Average+ Good	A good value large box that sounds more engaging than subtle, providing a good compromise between bandwidth and sensitivity	64 x 25 x 32cm stands in free space	89dB/W 45Hz	R	66
Monitor Audio R852/Gold MD £449	Good Good	Luxury build and 'high tech' tweeter or not, this compact model offers good refinement and detail on an open soundstage	45 x 25 x 26cm stands in free space	86dB/W 50Hz	R	66
Monitor Audio 1200 Gold MD £799	Average Average+	This smooth and civilised slimline floorstanding loudspeaker is well built and nicely presented. But it is also expensive	94 x 20 x 26cm in free space	85dB/W 48Hz		68
Mordaunt-Short MS10 II £90	Average Average-	One of the best miniatures around. A borderline Best Buy because of the bass limitations, which may depend on your taste	29 x 20 x 17cm wall bracket	86dB/W 75Hz	R	53
Mordaunt-Short 3.10 £99	Average Average+	Probably the liveliest and most communicative miniature around, this beautifully presented design is probably better suited to budget 'real hi-fi' than the blandness of the midi system	28.5 x 17.5 x 20cm high stands near wall	84dB/W 50Hz (in room)	BB	78
Mordaunt-Short 3.30 £180	Average Average+	A little too mid-forward for neutrality or formal recommendation, this attractive, good-sized model nevertheless has more than enough appealing qualities to merit serious consideration	46 x 23.5 x 27cm high stands 1-2ft from wall	87dB/W 38Hz (in room)		78
Mordaunt-Short MS100 £189	Average+ Average+	A 'mid forward' tonal balance is its main drawback but other aspects such as ambience, transparency and stereo depth compensate	32.5 x 22.5 x 21.5cm stands near wall	85dB/W 80Hz	R	46
Mordaunt-Short 45Ti £230	Good Average	A sensitive tandem-bass number that can be driven loud but loses its balance a bit and can be unsubtle	63 x 26 x 30cm low (20cm) stand near wall	90.5dB/W 52Hz		53

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MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Mordaunt-Short MS300 £319	Average+ Average+	Not considered particularly competitive in its class, though it has good power handling and stereo focus	54 x 22.5 x 25cm on stands near wall	89dB/W 65Hz		46
Mordaunt-Short 442 £1150	Good+ Good++	A resounding success with the listening panels. Make sure your room can accommodate the bass	95 x 26 x 38cm floor standing in free space	87.5dB/W 40Hz	R	60
Musical Fidelity Reference 2 £199	Good— Good—	This compact wall-mount design with advanced drivers has good dynamics, balance and stereo, plus flashy styling and some midband 'boxy' coloration	38 x 25 x 20cm stands near rear wall	88dB/W 50Hz		71
Musical Fidelity MC-2* £299	Very Good Good++	This exceptionally clean and clear design offers real subtlety and finesse. Bass quality is light but exceptionally clear; the treble is smooth if slightly shallow	48.5 x 25.5 x 16.5cm open space and stands	87.5dB/W 65Hz	BB	66
Musical Fidelity MC-4* £499	Very Good+ Good++	Achieving a very high standard, the MC-4 sounds detailed and coherent like the MC-2, but with more bass depth and solidity, and large image scale	56.5 x 26.9 x 29cm open space on stands	87.5dB/W 60Hz	R	59
NVA Cube 1 £600 (stands £200)	Good— Good+	Attractive, cube-shaped semi-omni is very sturdily built, and gives an idiosyncratic but unusually open, spacious and informative sound	33 x 32 x 32cm own stands c0.5m from wall	85dB/W 52Hz	R	71
NVA Cubix £1,100	Average Good	Too idiosyncratic for formal recommendation, the Cubix possesses remarkable bass extension for its size, but is tricky to optimise and has some aggressive tendencies	60 x 32.5 x 32.5cm low stands against wall	88dB/W 20Hz (in room)		78
Opus 3 Credo £399	Average Average	Credo's odd-shaped silicate-based cabinet confers good box and bass performance, but the sound could be more neutral for the price	32 x 28 x 32cm stands in free space	88dB/W 65Hz		74
Opus 3 Capella £599	Good Good	The sound of this Scandinavian curiosity certainly benefits from the crushed marble enclosure, though presentation is strictly DIY	32 x 40.5 x 26(ave)cm amongst books in bookcase	86.5dB/W 45Hz		66
Pearl & Oakley Victoria 200 £900	Average— Average—	Extraordinary – and to many very attractive – 'ginger jar' presentation in Staffordshire ceramics, but let down by need for further acoustic and mechanical development	93 x 33 x 33cm on floor in free space	87dB/W 30Hz (in room)		78
QLN Signature £1,100	Good Good	Beautiful but expensive luxury compact has a rather laid back and 'heavy' sound, but coloration is low and stereo imaging very good	37 x 18 x 36cm heavy stands in free space	83dB/W 30Hz (in room)		78
Quad ESL-63 £1690	Good+ Good++	With its unusual but subtle characteristics this classic electrostatic may not be punchy in the bass, but has strengths that some cannot live without	92 x 66 x 27cm open stand well clear of wall	84dB/W 34Hz	R	60
Richard Allan CD5 £184	Average— Average—	This neatly presented small reflex design can sound engagingly communicative, but is flawed sonically and technically and quite expensive too	38 x 19 x 23cm on rigid stands	88dB/W 80Hz		68
Rogers LS4A £219	Good Good—	This artfully voiced and well balanced compact gives a fair flavour of the classical 'BBC sound' at a very reasonable price	43 x 25.5 x 24.5cm stands 1ft+ from wall	87dB/W 32Hz (in room)	R	78
Rogers LS7t £399	Good+ Good+	A fine combination of classic qualities at reasonable price produces the "R" tag, but try to get a pair home on approval to check for bass 'heaviness'	56 x 27 x 28cm free space on 40cm stands	88.5dB/W 48Hz	R	59
Rogers Studio 1a £579	Very Good Good—	The classic BBC monitor style sound sensitively updated – transparent and natural with fine stereo, but a touch 'heavy' in balance	63.5 x 30.5 x 30.5cm stands in free space	87dB/W 36Hz	R	66
Rotal RL810 £99	Average+ Average—	A competent but not particularly inspiring miniature – little to criticise but not much to get excited about either	30 x 18 x 17.5cm stands near rear wall	83dB/W 55Hz (in room)		78
Rotal RL850 II £130	Average+ Average+	Strongly recommended. Well-balanced, clear, with decent focus and fine stereo, but tendency to 'heaviness' needs decent stands and space	44 x 25 x 24cm free space on 40cm stands	86.5dB/W 50Hz	BB	59
Royd A7 Series 11 £99	Average+ Average	Lively clear sound; good upper bass and dynamics, but treble "ramp" made vocals sound shut in. Try before you buy	31 x 20 x 17cm shelf or 50cm stands near wall	86dB/W 75Hz	R	53
Royd Eden £235	Average Average+	Delightful mid/treble speed and transparency but determinedly bass light, this oddball miniature threatens cult status but could use a sweeter tweeter	31 x 20.5 x 18.5cm stands close to rear wall	87dB/W 85Hz	R	66
Royd Apex £485	Average+ Good	This upgrade-flexible floorstanding transmission line is fine value for money: not the smoothest sound around, it more than compensates with an impressively communicative and informative musical presentation	85.5 x 20 x 30cm on floor close to wall	87dB/W 33Hz (in room)	R	78
Ruark Swordsman £200	Good Average	Very attractively styled and finished, the Swordsman is a well built 'small bookshelf' model that delivered better test than listening results	38.5 x 20 x 27.5cm stands 0.5m from wall	84dB/W 50Hz		71
SD Acoustics OBS £695	Average Good+	Large but unusually pretty, needs a big(ish) room and has a sting at the top, but the transparent dipole midband provides an unusually open and dynamic sound	102 x 35 x 25cm spiked, in free space	86dB/W 45Hz	R	71
SD Acoustics SD1 £1150	Average Very Good	A large scale, airy and unusually detailed system with excellent dynamics. Balance is light and bright, and the original model could upset some systems/listeners. Current model has more civilised top-end and warmer overall balance	123.5 x 38.2 x 31.9cm free standing, away from walls	90dB/W 50Hz	R	60
Shan Shimna £280 (stands £75)	Average+ Good—	Pretty little miniature in cast mineral/plastics has limited dynamic range and could sound smoother, but integration is good and box effects slight	31 x 16 x 17cm stands near rear wall	84dB/W 65Hz	R	71
Snell Type C £2350	n/a Very Good	Pricy, yes, but an extremely capable loudspeaker. Musical and transparent; excellent bass extension	112 x 38 x 33 free standing away from walls	90dB 35Hz	R	65
Sony APM-101ES £99	Good Average	Big hearted sound from small bookshelf successor to BB '10ES, sounds a little untidy at frequency extremes, so suits CD better than vinyl	39.5 x 22.5 x 23.5 stands in open space	86dB/W 52Hz	R	71
Sony APM-141ES £200	Average Average	A great deal of loudspeaker for the money, the rich-sounding '141 needs a big room and still shows significant 'loudness' (boom'n'tizz) tendencies	61.5 x 26 x 32cm large room, free space	88dB/W 30Hz (in room)	R	78
Sony APM-181ES £300	Very Good Average	Big and beefy but also somewhat fat and bass heavy, this well engineered three-way has notable strengths but lacks transparency and sounds better at lower levels	57.5 x 29 x 36cm stands in open space	87dB/W 40Hz		71
Sony APM 66ES £700	Average+ Average+	Powerful heavyweight sound with a brilliant midband – clear articulate and transparent. But the bass is on the boomy side and the treble can sound grainy	66 x 38 x 36.5cm open space, low stands	89dB/W 60Hz		59
Spendor SP2 £470	Very Good Good+	Conceding little to the SP1, this 30 litre model displayed good tonal balance with a highly articulate midrange, only slightly marred at frequency extremes	50 x 25 x 30cm free space, stands	87dB/W 45Hz	R*	59
Spendor SP1 £710	Very Good Good	A very subtle and musical performer that works particularly well with digital material. An exceptional allrounder	63.5 x 29.5 x 30.5cm stands in open space	87dB/W 41Hz	R	60
Spendor SA3 Passive £1500	— Good+	Same as Spendor SA3 active	85 x 38 x 46cm low	89dB/W 32Hz	R	46
Spendor SA3 Active £2900	Good+ Very Good	Substantial speakers designed to deliver high sound levels and killer bass. Suited to larger rooms and power hungry ears	85 x 38 x 46cm low rigid stands in free space	89dB/W 32Hz	R	46
Spica TC50 £599	Good— Good	This triangular-profile 'grown up' miniature is a shade boxy and laid back but has good rhythmic and musical integrity	40.5 x 33 x 29cm stands in open space	88dB/W 55Hz		71
Spica TC50SE £799	Good— Good	A heavily UK-modified TC50, the SE sounds less boxy and more spacious, but lacks some of the urgency of the standard model	40.5 x 33 x 29cm stands in open space	88dB/W 55Hz		71
Spica Angelus £1295	Good Average	A little bass shy and soft in the bass and lower mid, the Angelus is otherwise tidy, extremely lively and fluid, if uneven overall	116.8 x 53.3 x 26cm free standing away from walls	86.5dB/W 50Hz		60
Studio Power Sapphire £100	Poor Average—	Balance difficulties are improving, though still prevent the potential of this interesting metal-cone new miniature from being fully realised	30 x 20 x 19.5cm stands near rear wall	85dB/W 70Hz		66

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LOUDSPEAKERS

MODEL PRICE	LAB SOUND	COMMENTS	SIZE PLACEMENT	SENSITIVITY BASS FROM	VALUE	BACK ISSUE FULL REVIEW
Sugden CL £275	Average+ Good-	A thoroughly impressive and likeable near-miniature, the CL is prettily and properly built, and needs a good driving amplifier	35.5 x 18 x 26.5cm high stands in free space	86dB/W 35Hz	R	78
Tannoy M15 Mercury £170	Good Average+	Somehow lacking the magic of its predecessors, the M15 remains a fine value compact that needs careful set-up to give optimum results	50 x 25 x 21cm Blu-tack to stands 1-2ft from wall	88dB/W 40Hz (in room)	R	78
Tannoy DC1000 £200	Average Average-	The smaller of two DC models with dual concentric drivers, the '1000 is much less well balanced than the larger, floorstanding '2000	50 x 24 x 25cm	91dB/W 53Hz		71
Tannoy DC2000 £300	Good Good	Remarkably high sensitivity from unique dual concentric driver that has an involving but characteristic sound. Bass could be better	68.5 x 26 x 27cm floor in free space	93dB/W 55Hz	R	66
Tannoy DC3000 £600	Good Good	Giving new meaning to terms like dynamic range and headroom, the magnificent '3000 is a must for those who enjoy high-level monitoring. But spare a thought for the neighbours	94 x 26 x 31cm floor 1ft+ from wall	94dB/W 30Hz (in room)	R	78
Tannoy Westminster £3600	n/a Good+	These awesome horn loaded speakers are remarkably controlled and impressive, if only suited to a few pockets and rooms	Huge, flat against rear wall, away from corners	96dB/W (manuf.)	R	Coll
TDL Studio 1 £549	Average+ Good	Delivering genuinely extended bass from a compact floorstanding enclosure, the Studio is very detailed but a shade clinical and detached in presentation	76 x 23 x 33cm low stands in free space	84dB/W 25Hz (in room)	R	78
TDL Monitor £1600	Very Good Very Good	Fine solidity and good accuracy, with enough bass extension to satisfy even organ freaks. Needs a big room and can sound a bit lazy and a shade tinkly	118.5 x 30 x 47cm 0.5m from walls	85dB/W 28Hz	R	66
Technics SBC 250 £130	Average+ Average-	Despite a fairly even tonal balance, the 250EK sounded muddled in the midrange and dull in character	36.5 x 23.5 x 20.5cm free space, stands	86dB/W 60Hz		46
Technics SB-RX50 £500	Very Good Average+	With its unique coaxial drive unit the RX50 proved a smooth and well balanced loudspeaker, its minor weakness being a mildly excessive low bass	48 x 30 x 26cm free space on 40cm stands	86dB/W 40Hz	R	46
Toshiba SS33-M £100	Average Average	Providing a benchmark for budget loudspeakers, this Toshiba-inspired but UK designed and manufactured model is a lot of loudspeaker for the money, if a shade on the cheap	40 x 26 x 21.5cm stands in free space	86dB/W 55Hz	BB	68
Townshend Glastonbury II £1700	n/a Very Good	What? No bass? Actually, like the KEF 107, Glastonbury II goes down so low you might not notice how good it is. A truly remarkable performer. Superb soundstaging too	91.5 x 28 x 46 free standing in room corners	88dB 27Hz	R	65
Videotone Minimax 2 £80	Poor Average-	Cheap in build and QC as well as price, but cheerful (if coarse) with it - if a little too cheerful after extended listening...	27.5 x 17 x 20cm near rear wall	84dB/W 90Hz	R	74
Visonik David 6000i £160	Average- Poor	Sharp styling a classy looking miniature makes, but the complex grillwork worsens a sound which starts off with too much top and not enough bottom	20 x 12 x 13cm against rear wall	87dB/W 130Hz		74
Wharfedale Delta 30 £80	Good Average	Very clear and surprisingly neutral for the price, with good dynamics and stereo within limited volume ceiling	37.9 x 20 x 16.9cm near wall on high stands	88.5dB/W 80Hz	BB	59
Wharfedale Delta 50 £100	Average+ Average-	"There's nothing obviously wrong, but it seems a bit mundane," is what we said when the Delta 50 was £129. But since then the price has dropped by 30 per cent, making it great value	48 x 27 x 19cm near wall on 40cm stands	88dB/W 55Hz		53
Wharfedale Diamond III £100	Below Average Average-	This latest version of the long running Diamond sports a better tweeter, but bass, though deep, is soft, and the midband is indistinct and uneven	24 x 18.5 x 20.5cm near wall, stands	86.5dB/W 75Hz		59
Wharfedale Super Diamond £140	Average Average-	Although there are improvements on the basic "legendary" model, listening panelists did not get airborne about this upgrade	24 x 19 x 19cm close to wall at head height	88dB/W 57Hz		53
Wharfedale 504/2 £150	Average Average	Not strictly accurate, this musically involving miniature sounds unusually coherent and well integrated, if a shade dull in balance	29 x 18.5 x 19cm stands against rear wall	84dB/W 60Hz	R	68
Wharfedale 505/2 £180	Average Good	This lively Wharfedale provides plenty of speaker with unusual refinement for the money, and should be fairly tolerant of room siting	44 x 25.5 x 24cm stands 1ft from wall	86dB/W 55Hz	BB	66
Wharfedale 507 £219	Average+ Average-	Generous in size but unimpressive sonically, the 507 doesn't seem to gel in the way the smaller 505.2 does, finding a good in-room balance difficult to achieve	49 x 25.5 x 29.5cm high stands 1ft+ from wall	86dB/W 35Hz (in room)		78
Yamaha NS 1000M £899	Good Good+	Living up to its monitor label, and tonally well suited to digital material, the NS 1000M is superbly crafted and capable of high levels	67.5 x 37.5 x 32.5cm 30cm from wall, stands	90dB/W 40Hz	R	46

* rating refers to original, tested model.

CASSETTE DECKS

The bad odour of copyright theft hangs around the compact cassette, but there is no doubt it is the world's most versatile and ubiquitous music storage medium. Hi-fi buffs may wrinkle their noses pointedly, but are still happy to use cassette decks to make up tapes for the car or personal - at the same time complaining loudly about the quality of pre-recorded material. (In fact the very best decks can do a surprisingly good job with musicassettes.)

There is no problem in connecting a cassette deck to any normal amplifier, but some care needs

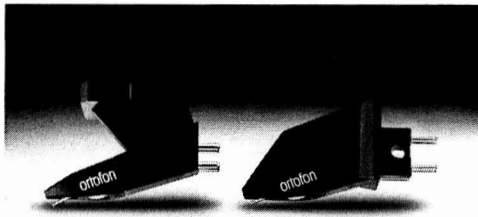
to be taken in choosing the best tapes for a specific machine. (Trial and error is one effective technique, but many decks have manual bias adjustment and some match up to the tape automatically.) Lab performance and sound quality often go hand in hand, and are frequently somewhat dependent upon factory alignment. The mechanical integrity of the mechanism itself is another crucial factor, that is often reflected in the asking price.

All modern hi-fi decks have Dolby B and the majority have Dolby C besides; the very worthwhile

HX Pro system is becoming steadily more widespread. Remote control remains rare, though sometimes it is available as a system option. Three-head recorders allow simultaneous checking of the recording being made. Auto-reverse is a useful convenience feature, but usually with some mechanical compromise, while double-mechanism 'dubbing' decks of dubious quality are fashionable at the bottom end of the market. The welter of different 'music search' systems available is some indication of their frequent ineffectiveness.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Acoustic Research RD-06 £280	Average Average+	Acceptable middle market player with very simple facilities and cramped control section, but unusually good looks	Dolby B/C HX Pro, fine bias, counter memory, repeat		69
Aiwa AD-F270 £90	Average Average+	An excellent budget machine, adequately equipped and satisfactorily built. Sound quality is in severe danger of transcending the price category	Dolby B/C, fine bias adjust	BB	75
Aiwa AD-F370 £130	Average Average	Adequate but uninspiring recorder with detail shortcomings but good control layout and successful sounding with recorded musicassettes	Dolby B, C, HX Pro, bias adjust		63
Aiwa AD-R470 £150	Average Good	For once, an auto-reverse deck with the performance of a decent unidirectional one at a similar price. The Aiwa is modern in concept and execution, and has good, transparent electronics	Dolby B/C/HX Pro, auto reverse, cue & review, bias adjust	BB	69
Aiwa AD-WX777 £179	Very Good Very Good	Excellent, middle price dual deck with quick side change and a living, breathing sound - though prerecorded tapes sound bright	Twin auto-reverse, one records. Dolby B/C, fine bias	BB	75
Aiwa AD-F700 £199	Good Average-	Somewhat less than the sum of the (most fine) individual parts, this deck has an artificial quality which spoiled the efforts of a fine transport	Dolby B/C/HX Pro, fine bias, CD Direct input		75
Aiwa AD-F800 £249	Good Very Good	Close to first class performance - and superb value. The Aiwa is purposeful and finely engineered. It provides a near irresistible blend of good mechanics and electronics	3 head, dual capstan, Dolby B/C/HX Pro, tape calibration	BB	75
Aiwa AD-WX888 £249	Good Good	Inaccurate set-up spoils metal tape operation, but with other tapes the deck works well. This deck offers fine engineering, facilities and sound	Dual auto-reverse twin deck, Dolby B, C and HX Pro	R	75

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CASSETTE DECKS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa XK-007 Excelia £400	Good Good	Downmarket version of XK-009 with simplified bias/equalisation adjustment section and more forgiving but less informative sound. Still good, but less exciting than XK-009	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment		63
Aiwa AD-WX909 £400	Good Good	Convenience meets sound quality, and both win. An essentially clean, positive recorder which works alongside an auto-reverse player of lower standard – a sensible compromise	Dual deck, auto-reverse, track search, Dolby B/C/HX Pro, bias adjust, 3 Head	R	57
Aiwa XK-009 Excelia £550	Very Good Very Good	Excellent detail, stable articulate midband and slightly obvious treble. The most interesting Aiwa for yonks	Dolby B, C, dbx, HX Pro, 3 Head, tape alignment, CD direct	R	63
Akai GX-32 £200	Average Poor	Constrained and smeared sum this deck well. It has poor bass and treble definition alike, though it proved well aligned for prerecorded cassettes	Dolby B/C, variable bias, headphone out, track search		69
Akai GX-52 £249	Very Good Very Good	Well finished and a pleasure to use this well specified deck sounds clean and defined with all tape groups, with or without Dolby	Dolby B, C, HX Pro, track locate features	BB	57
Akai GX-6 £350	Good Good	There is a strong sense that someone has really thought this one through; it has an indefinable 'specialness'	Real-time counter, track search, Dolby B, C, bias adjust	R	52
Akai GX-95 £400	Good Very Good	Well designed and finished cassette deck with features well judged to please the audiophile – especially switchable Dolby HX Pro and switchable panel display. The calibration system is simple and effective, and the deck sounds great	Dolby B/C/HX Pro, 3 head, manual tape set-up	R	69
Denon DR-M07 £125	Poor+ Average	There were several problems with the test player that render it an unsafe purchase. This is a pity since despite the antiquated control system, the deck is capable of refined sound quality	Dolby B/C, fine bias adjust		69
Denon DRM-500 £170	Good Very Good	Powerful, refined and detailed sound, and an excellent transport are keys to the success of this cleanly styled addition to the range – but why no timer standby?	Dolby B/C/HX Pro, variable bias	BB	75
Denon DR-M12HX £220	Good Good+	Well constructed and pleasant to use, a lack of true pitch constancy kept it from sounding superb	Track search, Dolby B, C, HX Pro, bias adjust	R	57
Denon DRW-750 £229	Good Good	Polished and articulate, the only significant shortcoming is poor performance with prerecorded material	Dolby B/C/HX Pro, twin unidirectional, one records	R	69
Denon DR-M24HX £290	Good Good+	This deck will slot into many high grade systems without disgracing itself – or the cassette medium. Very presentable high resolution sound with good stereo with or without Dolby	Dolby B, C, HX Pro, bias adjust, 3 Head	R	60
Denon DRM-800 £299	Good Very Good	There are some niggling faults and limitations (no timer standby is particularly annoying), but as a means of recording music it sets a very high standard	Dolby B/C/HX Pro, offtape monitoring, dual capstan	R	75
Denon DR-M34HR £320	Very Good Good+	Prerecorded cassettes sounded grey and dull, but this may have been a sample fault. As a recorder, the DR-M34 is refined and detailed – and good value	Dolby B, C, HX Pro, 3 Head, manual tape calibration, memory counter		63
Dual CC8010 £110	Average Average+	The only limitation worth noting is a slight opaqueness; the Dual otherwise sounds stable and effective. An excellent low-cost design	Dolby B & C, microphone input	BB	63
Goodmans GSW-5200 £90	Poor Poor	Musically unimpressive but at least it's cheap!	Dolby B, twin, one records		69
Grundig Fine Arts CCT-903 n/a (system component)	Good Good-	[Competent part of complete Grundig system]. Solid and well engineered deck with small but significant problems preventing it scoring highly. Basic design generally – and transport specifically – are excellent	Dolby B/C, twin auto reverse, one records		69
Harman Kardon CD491 £695	Good Good+	Excellent audio engineering and tremendous flexibility make this an audiophile cassette deck 'par excellence'	Real-time counter, auto reverse, track search, Dolby B, C, HX Pro, bias adjust	R	52
Kenwood KX-440HX £140	Average+ Poor	Uneven, unstable sounding player with limited resolving power, but good control layout and finish	Dolby B, C, HX Pro, intro scan		63
Kenwood KX-3010 £170	Average+ Average	Minor ergonomic shortcomings notwithstanding, this is a workmanlike deck that only misses recommendation due to an azimuth problem leading to very dull sound with prerecorded tapes.	Dolby B, C, HX Pro, auto bias		75
Kenwood KX-5010 £269	Very Good Excellent	This important new middle price deck is a well thought through and thoroughly developed design which eschews gimmicks for the sake of musical excellence	Dolby B/C/HX Pro, auto tape calibration, track/intro search	BB	69
Kenwood KX-9010 £400	Very Good Average+	Clean, detailed but flat and overtly hi-fi-ish sound quality makes the 9010 a little less than the sum of its parts.	3-head, auto tape calibration, Dolby B/C/HX Pro, remote control		75
Marantz SD-35 £150	Good Good+	Rock steady tape transport gives very competitive sound quality for the price, but the slightly bright replay may not appeal to some	Dolby B & C, bias adjust	R	52
Marantz SD-45II £200	Good+ Good+	Well built and dynamic sounding player, working better as a recorder than with musicassettes	Dolby B & C, bias adjust Auto selection	R	52
Marantz CP230 £300	Average Average	This is a competitively priced portable recorder though not suited to replay of musicassettes	Dolby B, bias adjust	R	52
Marantz SD-55 £349	Good Very Good	Slightly tacky feel and restricted signal/noise performance are the main shortcomings of an excellent sounding piece of kit	Real-time counter, track search, Dolby B/C/HX Pro, bias adjust, 3 Head	R	57
Marantz SD585 £300	Average Average-	Sound quality is a little sat upon, and control ergonomics are somewhat opaque, though the twin auto-reverse/recording capability makes this a powerful machine	Dolby B/C, twin auto-reverse & record, parallel recording etc		69
Memorex SCT-84 £200	Average+ Average+	The playback only transport is a little disappointing, but the record one is a quality item and the deck works well. Ergonomics are good, but styling and control feel are decidedly tacky.	Dolby B/C, fine bias, twin with auto-reverse record, unidirectional play	R	69
NAD 6300 £550	Very Good Very Good	Solid and homogeneous sound quality and very good replay compatibility thanks to 'play trim'. Distinctive, musical – and costly	Dolby B, C, HX Pro, 3 Head, bias adjust	R	63
Nakamichi CR-1E £345	Very Good Good	Modestly equipped by any standards, the CR-1E stands or falls by its build quality, which is high, and sound which is highly competent	Dolby B & C		57
Nakamichi CR-2E £395	Very Good Good+	Ordinary to look at, in some respects rather awkward to use (tape switching especially), the CR-2E sounds very slightly better than the CR-1E, and therefore ranks well. But it doesn't come cheap	Dolby B & C, bias adjust, remote control	R	57
Nakamichi RX-202E £545	Good Very Good+	Fine, clear and articulate sounding player. Excellent with prerecorded material, but idiosyncratic and sometimes obstructive control system	Auto reverse, Dolby B, C, 2 Head	R	63
Nakamichi CR-3E £595	Very Good Very Good	The user interface is a little clumsy, though conceptually straightforward. Sound quality approaches the CR-4E, and is amongst the best at the price.	Dolby B & C, bias adjust, remote control	R	57
Nakamichi CR-4E £745	Very Good+ Very Good+	High class deck with a reasonably full range of features and superb sound at a slightly unlikely price	Dolby B & C, bias adjust, remote control, 3 Head	R	57
Nakamichi CR-5E £995	Excellent Excellent	A slightly simplified version of the all-conquering CR-7, the CR-5 has a very similar standard of audio performance – the best	Dolby B/C, fine bias, 3-head	R	69
Nakamichi CR-7E £1500	Excellent Excellent	Remarkably this deck is not only ergonomically but also sonically superior to the Dragon, particularly on record/replay	Real-time counter, track search, Dolby B & C, tape alignment adjust, bias adjust, remote control, 3 Head	R	60
Nakamichi Dragon £1750	Excellent Excellent	Previous to the birth of the CR-7E, this machine stood head and shoulders above the rest. It is still the ultimate for musicassette replay	Auto reverse, Dolby B & C, tape alignment adjust, bias adjust, remote		60
Onkyo TA-2120 £130	Average+ Good	Clear, vivid sound with good timing and resolution when using Type II tapes without Dolby. The controls are less inspiring – the meters in particular are plainly inadequate	Dolby B/C, auto tape sensing, block/side repeat	R	63
Onkyo TA 2130 £160	Average+ Average+	Rating fairly well on both pre-recorded and record/playback, ergonomics were a little poor but overall performance was generally consistent	Track search, Dolby B & C, bias adjust		52

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

THE DIRECTORY

CASSETTE DECKS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Philips FC566 £179	Average+ Average+	Mostly well equipped, though some tape search facilities fail to exploit the auto-reverse capability. Sounds clean and stable – with prerecorded tapes too	Auto reverse, track search, Dolby B & C		57
Philips FC567 £279	Average Poor	Well equipped but ergonomically substandard; sound quality is messy and lacking in clarity and dynamics	Dual deck, auto reverse, track search, Dolby B & C		57
Pioneer CT-656 £250	Good Good	Well conceived and executed low cost 3-head recorder. It benefits from and makes good use of metal tapes, but is never less than couth and stable sounding – even with ferric tapes	3 heads, off tape monitoring, fine bias, Dolby B/C/HX Pro	R	75
Pioneer CT-737 Mk II £350	Good Average+	Easy to use and sensibly equipped, the CT-737 is much improved, but sound quality is still a tad lacklustre	3-head, Dolby B/C/HX Pro, manual record bias/sensitivity		75
Pioneer CT-91a £500	Very Good+ Very Good+	Superb, near state of the art recorder with an excellent dual capstan transport and very capable electronics. At the price, this one is a mould breaker	3-head, tape calibration, Dolby B/C/HX Pro	R	75
Proton AD-200 £140	Poor Poor	Sound quality is essentially on a par with many portables, and has nothing to do with high fidelity. The main problems are an unrelenting hardness and an almost total lack of detail	Dolby B & C		57
Proton AD-300 £200	Average- Poor	High levels of flutter give sound a roughness and coarseness that rules it out for high quality work. The record and replay electronics certainly deserve better	Auto reverse, Dolby B & C		57
Revox B215-S £1481	Very Good Very Good+	This is a superbly engineered deck with a classically fine performance that almost transcends the stereotypes. Ergonomics are flawed but the user interface is both powerful and flexible	3-head, dual capstan, Dolby B/C/HX Pro, auto calibration	R	75
Rotel RD-865 £200	Good Very Good	Fine, architecturally solid sound quality in a package with a low gimmick count and strong audiophile appeal	Dolby B/C/HX Pro, fine bias	BB	75
SAE C102 £549	Average+ Good	Looking most unlike a cassette deck designed in the States and proving competitive in its price group. Not sonically that outstanding, however	Real-time counter, track search, Dolby B & C		52
Sansui D-X301i £150	Average+ Good	Lively, informative and well equipped basic deck, if rather obscure operationally	Dolby B/C/HX Pro, variable bias, track search	R	69
Sony TC-FX110B £90	Poor+ Poor+	Woolly bass and scrappy treble combine to make a meal of many music types, despite accurate response shapes with most types of tape. Prerecorded material sounds dull	Dolby B/C		75
Sony TC-TX55 £150	Average Average+	The sound quality ranking is a good one for an auto reverse machine at this price level. Clean, sharp sound, only slightly let down in the deep bass.	Auto reverse, Dolby B, C & HX Pro	R	75
Sony (WMD6C) ProWalkman £249	Good+ Very Good	"One of the finest sounding cassette decks on the market today. A mandatory Best Buy, which also fits in your pocket"	Dolby B, & C	BB	60
Sony TC-RX60ES £250	Average Average	For once a stable sounding auto-reverse deck but sound quality is rather 'dirty' and compressed, especially with Dolby C	Auto-reverse, Dolby B/C/HX Pro, auto-tape recognition		63
Sony TC-RX80ES £350	Average+ Good	Clean, powerful and detailed sound, especially without Dolby C. Stable pitch – but prerecorded cassettes sounded disappointing	Auto reverse, Dolby B/C/HX Pro, bias/level adjust	R	63
Teac V-250 £89	Average Average	Ultra-basic design which works quite well. Lack of pitch integrity is the main shortcoming, but it wasn't always noticeable	Dolby B	R	63
Teac V-270C £109	Average- Average-	Not quite cheap enough to compete solely on price, the V-270C is a rather messy and unstable sounding deck	Dolby B & C, bias adjust		63
Teac V-285CHX £115	Average- Poor	Poor, threadbare sound quality under most conditions of use. Cheap, but not a real bargain because it doesn't really work	Dolby B & C, fine bias adjust		75
Teac W-355 £119	Poor Average+	A better than expected performer. Often a little ragged, even unsteady, the design is nevertheless quite lively and engaging. A viable basic twin deck machine	One record, one play transport, Dolby B		75
Teac V-480 £129	Average Average+	A rather utilitarian model, the V-480 just makes it on to our recommended list by virtue of a clean, open sound that to an extent transcends the measurements	Dolby B/C/HX Pro, fine bias	R	75
Teac W-450R £159	Poor Average+	This model does a great deal for the money. It has severe measured shortcomings, but sound quality that is almost good enough. Interesting, but not quite obvious material for commendation	Twin auto-reverse, one records, Dolby B/C/HX Pro		75
Teac W-470 £179	Average- Average	A low grade transport is allied to respectable electronics to give sound quality ranging between acceptable and good. Prerecorded tapes sound bright	Twin deck, one records, Dolby B/C, intro-search		75
Teac V-870 £399	Good+ Good	Cut-down V-970X for the proletariat. Expensive and carefully engineered with mostly very good but slightly cold sound quality	Dolby B, C, HX Pro, 3 Head, manual tape calibration	R	63
Teac V-970X £499	Very Good Very Good	An excellent sounding deck with useful features (tape calibration etc) that fully justifies the price	Real-time counter, track search, Dolby B/C/dbx & Dolby HX Pro, bias adjust, remote control, 3 Head	R	57
Teac W-990RX £499	Good Good	A mess with dbx, but taut and articulate otherwise. The 990, though expensive, has a powerful range of features, making it one of the few really ambitious decks to successfully straddle both sets of requirements	Dolby B/C & dbx, dual auto-reverse/record, parallel & sequential recording, remote	R	69
Teac R-919X £599	Very Good Average	Superbly equipped, yet usable – and well built too. But sound quality is something of a disappointment at this price level, being appropriate for a model about half the price	3-head auto-reverse, tape calibration, Dolby B/C/HX Pro/dbx		75
Technics RS-B355 £140	Good Good	Good sound let down by inadequate meters and poor prerecorded replay only sound quality	Dolby B, C, microphone inputs, cue and review	R	63

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THE DIRECTORY

CASSETTE DECKS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Technics RS-B505 £160	Average+ Average+	Neatly made recorder with Dolby HX Pro that sounds precise and stable, though sometimes a little processed and grainy too	Track search, Dolby B/C/HX Pro		57
Technics RS-TR255 £160	Average Average	Neat, sensibly designed middle of the road dual transport recorder, suitable where the ability to dub tapes is a particular priority	Twin transports, one records and auto-reverse, Dolby B/C	R	75
Technics RS-B605 £180	Good Average+	Mixed but generally good sound. Weakest points are dbx and prerecorded sound, best are Type IV (metal) recordings which sound sharp and precise	Track search, Dolby B/C/HX Pro & dbx		57
Technics RS-TR355 £200	Average Average	Serviceable middle market dual deck without serious fault but with some annoying inadequacies, notably an inability to play side A and B and then stop	Twin auto-reverse, one records, Dolby B/C/HX Pro		75
Technics RS-B705 £250	Average Average-	3 heads for the price of two, but not the sound quality to go with them	Track search, Dolby B, C, HX Pro, bias adjust, 3 Head		52
Technics RS-B905 £350	Good Good	Good, well set up cassette deck with a clean, accurate sound but some compression. dbx circuit sounds poor	Dolby B, C, HX Pro, dbx, bias adjust, 3 Head		57
Technics RS-T80R £400	Poor Poor	Flexible and pleasant to use but poor transports led to poor sound on our latest sample	Dual deck, auto reverse, track search, Dolby B, C, dbx		52
Yamaha KX-230 £140	Average+ Average+	A strong near-budget performer, the strengths include good overall sound, excellent search aids. Weaknesses: ergonomics, soggy bass with prerecorded material	Dolby B/C/HX Pro, variable bias	R	75
Yamaha KX-300 £160	Average+ Average-	Uncommonly well equipped and adequately made and presented, this model turned out to be a disappointingly uncertain proposition on audition	Track search, Dolby B, C, HX Pro with 'play trim', bias adjust, remote control		57
Yamaha KX-400 £200	Good Good+	A highly commercial package with every widget under the sun. Happily it sounds good too.	Auto reverse, track search, Dolby B, C, HX Pro, remote control	R	52
Yamaha KX-500 £210	Very Good Very Good	An accomplished performer, strongest in the areas of pitch and spatial stability, but slightly rough around the edges	Real-time counter, track search, Dolby B/C/HX Pro with play trim, bias adjust, remote control	R	57
Yamaha KX-800 £330	Good Average	The present Yamaha range seems oddly inconsistent. This sophisticated model sounds fine (almost) but came a clear second best to the KX-500	Real-time counter, track search, Dolby B, C, HX Pro with play trim, bias adjust, 3 Head		57
Yamaha KX-1200 £500	Excellent Average+	A veritable rats' nest of buttons and dials, albeit well laid-out. This is nearly a great recorder, but lacks simplicity of sound	Real-time counter, track search, Dolby B, C, dbx, HX Pro, bias adjust, remote control		52

DAT RECORDERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa Excelia XD-001 £1300	Very Good Very Good	Clear and very listenable recorder roughly comparable to but slightly sweeter sounding than the Sony DCT-1000ES - but with an inferior front panel design	Track ID and search, remote	R	63
Grundig Fine Arts DAT-9000 n/a (system component)	Good Good	Conventional DAT recorder offering standard facilities. The deck is well made and equipped, and is engineered to a satisfactory quality standard. It performs to an acceptable standard, though it is not state of the art	2/4 hour recording, mic inputs, digital in/out		69
Luxman KD-117 £1499	Good Good	Slightly soggy, earth-bound sound quality, this model trails the other DAT decks tested so far	Two analogue inputs, remote twin address		63
Sony DTC-M100 £799	Very Good Very Good	Clean, clear sounding 2nd generation model with most of the features and sound of the DTC-1000ES	Mid-width, alpha-numeric display, remote, optical interfaces	R	63
Sony DTC-1000ES £1299	Very Good Very Good	Fine, consistent performer with accomplished tape handling and good build quality	Standard track ID and search, remote	R	63

CD PLAYERS

This all-digital music source is well established, despite still high disc prices and the opposition of many hi-fi enthusiasts. Compact Disc's strengths over conventional vinyl are complete freedom from surface noise with automatic and programmable play, plus track skip and fast music scan - frequently under full remote control. However, many vinyl enthusiasts find CDs sound less involving than

top quality vinyl replay.

Introduced five years ago at around £500, CD players now average less than half that price, and for the main offer improved performance besides. Even cheaper players may have the latest decoding chips and the most useful play features; extra money can buy remote control, remote volume control, audio 'tweaks', plus improved build and component

quality control.

Compared with many hi-fi components, CD players give impressive lab performance, though there are differences between players nonetheless. **Sound quality** variations are even more marked, particularly in a good quality system. As it behaves very like a preamp, there are no problems connecting a player to a normal amplifier.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
ADC CD 2000E £330	Good+ Fair+	One of the slimmest players in the business but nothing special inside. Nice ergonomics but overpriced	Remote, timeshared 16 bit		64
Aiwa DX-M45 £149	Fair Fair	Cutdown Philips technology, but results are quite good for this British made machine	Manual	R	64
Aiwa XC-005 £280	Average Average+	Very comprehensively equipped including double digital and audio outputs. The average performance was still sufficient for recommendation at this price	Power vol, edit-dubbing, shuffle 2 digital op	R	76
Aiwa CD-001 £300	Good Good	Pretty close to Recommendation, delivering a respectable sound quality and lab performance from an ergonomically attractive package, but ultimately failed to excel in any particular respect.	Track entry/volume remote, direct recorder connection etc.		58
Aiwa XC-007 £499	Very Good Good	Creditable sound despite inverted output, high tech engineering with very good lab performance. A worthy contender but not cheap	Remote, keypad, timer, digital output, pseudo 20 bit, dual DAC		64
Akai CD-52 £249	Good Good	A nice surprise from Akai, genuinely good sound from this mid-priced model. Better linearity will help further	Remote, digital output, headphone socket	BB	64
Akai CD-62 £330	Fair Very Good	Looks, build quality and the technical specification are right up to date. As it stands it sounds very good but if the indifferent lab performance could be improved, it would probably sound even better.	Remote, programme, hdph, comprehensive display etc	BB	70
Akai CD-73 £450	Good Average	A little uneven musically, the Akai tends to smother fine detail, but has first class dynamics and stereo imagery. Worth auditioning	Track entry keypad remote, menu display (switchable)		62
Akai CD93 £700	Good Very Good	Undoubtedly a CD player of real class in build, presentation, lab performance and sound quality, but also a shade expensive for formal Recommendation - though that's not to dissuade lovers of black lacquer wood finish.	Track entry remote, menu display etc.		58

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THE GREAT sound advice NOT CLOSING DOWN SALE

A UNIQUE OPPORTUNITY TO PURCHASE QUALITY HI-FI AT UNREPEATABLE PRICES
CHOOSE FROM A SELECTION OF NEW, USED AND EX-DEMONSTRATION BARGAINS

LOUGHBOROUGH, The Sound Factory, Duke Street.					LOUGHBOROUGH (continued)				
	MAKE/MODEL	RETAIL PRICE	SALE PRICE	SAVE		MAKE/MODEL	RETAIL PRICE	SALE PRICE	SAVE
1	Roksan Xerxes/Rega RB300/Linn K9	£845	£ 595	£250	1	Mordaunt Short MS10 S2 (B) (Ex-demo)	£89	£59	£30
1	Roksan Xerxes/Artemiz/Linn K9	£1180	£980	£200	2	Mordaunt Short MS10 S2 (New, Boxed)	£89	£75	£14
1	Roksan Xerxes/Artemiz/Shiraz	£1594	£1354	£240	1	Heybrook Point 5 (B) (Ex-demo)	£139	£109	£30
1	Roksan Xerxes/Mission Mechanic/Koetsu Blk	£2154	£1500	£654	1	Cornflake Shop Table (for Midgets!)	£50	£20	£30
Few	Linn LVX/Basik Plus arms (Ex-demo, S/Hand)		Offers		1	Roksan Turntable Table (Triangular, Med)	£119	£59	£60
1	Syrinx PU2 Gold (Remember?)	£295	£75	£220	1	Roksan Turntable Table (Triangular, Tall)	£149	£79	£70
1	Syrinx PU2 Silver (Remember?)	£275	£60	£125	1	Roksan Table (Rectangular, Tall)	£169	£109	£60
10	ADC Phase 4 Cartridges	£45	£15	£30	Roksan at "Rock Bottom" prices (all items are new, boxed, with guarantee)				
1	Cambridge Audio CD 2 CD Player	£649	£400	£249	1	Roksan Xerxes (Black)	£655	£589	10%
1	Arcam T21 Tuner (Teak)	£219	£129	£90	1	Roksan Xerxes (Rosewood)	£735	£661	10%
1	Arcam T21 Tuner (Teak) (S/H, 6 Years Old)		£60		1	Roksan Xerxes (Walnut)	£685	£616	10%
1	Yamaha KX200 Cassette deck (Old Model)	£130	£99	£30	1	Roksan Xerxes (Black)	£655	£589	10%
1	Creek 4040 Amplifier (Series 1)	£169	£119	£50	1	Roksan Xerxes (Dark Oak)	£705	£635	10%
1	Mission Cyrus Two/PSX (S/H)	£498	£300	£198	1	Roksan Artemiz Tonearm	£450	£405	10%
1	Incatech Claymore	£365	£245	£120	1	Roksan Artemiz Tonearm	£450	£405	10%
1	Lentek Integrated Amp. (Remember?)	£450	£175	£275	1	Roksan Rectangular Table (Tall)	£149	£119	10%
1	Naim Audio Nait 1 Integrated	£259	£150	£108	We have numerous Xerxes spares, please telephone for further details (Loughborough)				
1	Mission Cyrus Two	£299	£159	£140					
	Mission PSX (sold as pair)	£199	£100	£99					
1	Mission Cyrus Two/PSX (Old Style)	£498	£300	£198					
1	Exposure 7/8 (Pre/Power, Ex-demo)	£680	£350	£330	BIRMINGHAM, 162 Alcester Road, Moseley.				
1	Rotel RA 820 BX3	£180	£129	£51					
1	Naim Audio Naxo 2 (Old Case)	£250	£100	£150					
1	Naim Audio Naxo 2 (Old Case)	£250	£100	£150					
1	Bryston 12B Pre-Amp	£995	£695	£300					
	Bryston 4B Power Amp (sold as pair)	£1595	£1295	£300					
1	Exposure 7 (Dual)/9/4 (Dual)	£2079	£1500	£579	1	Rega Planar 3/RB300/K9 (Ex-demo)	£282	£175	£107
1	Exposure 6/7/8	£897	£627	£270	1	Roksan Xerxes/Artemiz/K9 (Ex-demo) (B)	£1180	£950	£230
1	Exposure 7/8 (S/H)	£678	£375	£303	1	Linn Axis/LVX/K9 (Ex-demo)	£382	£312	£70
1	Exposure 8 Super (Pwr. Amp., New, Boxed)	£379	£275	£104	1	Linn Axis/Basik Plus/AT93 (New, Boxed)	£327	£279	£48
1	Exposure 4 (with Pre P.S.U.)	£599	£429	£170	1	Linn Basik Plus Tonearms (New)	£149	£75	£74
1	Rotel RA 820 BX3 (New, Boxed)	£180	£139	£41	1	Cambridge Audio CD2 (Ex-demo)	£649	£400	£249
1	Mission 70 Mk2 (B)	£109	£75	£34	1	Rotel RCD 820 BX2 (New, Boxed)	£249	£209	£40
1	KEF C40 (W)	£199	£99	£100	1	Yamaha CDX 510 (Ex-demo)	£199	£135	£64
1	Gale 301 (B)	£259	£175	£84	1	Arcam Delta 70 Cd (Ex-demo)	£499	£395	£104
1	Roksan Darius (B)	£1265	£895	£370	1	Arcam A60 amp (Ex-demo)		£75	
	Latest Crossovers & Stands (sold as pair)	£1610	£1120	£490	1	Mission Cyrus One (Ex-demo)	£179	£149	£30
1	Linn Kans (B) Active Versions	£299	£125	£174	1	Mission Cyrus Two (Ex-demo)	£299	£249	£50
1	Gale 210 (B)	£139	£99	£40	1	Mission Cyrus PSX (Ex-demo)	£229	£189	£40
1	Mission 70 Mk2 (B) (New, Boxed)	£109	£80	£29	1	Naim Audio NAP 135 (Ex-demo, Pair)	£2196	£1450	£746
1	Tangent RS4 (T) (Remember?)	£250	£50	£200	1	Naim Audio Nait 2 (Old Style, New)	£325	£295	£30
1	Heybrook HB2 R (W)	£200	£125	£75	1	Naim Audio NAP90 (Old Style, New)	£289	£269	£20
1	Linn Nexus (B) & Stands (Grey)	£448	£325	£123	1	Linn Sara (Walnut) & Stands (Ex-demo)	£743	£450	£293
1	Linn Helix (B) & Stands (Black)	£348	£259	£89	1	Heybrook HB1 (Walnut) (Ex-demo)	£189	£135	£54
1	Roksan Hotcakes (Piano Black)	£139	£109	£30	1	Heybrook Point 5 (Ex-demo)	£139	£109	£30
1	Roksan Hotcakes (Piano Black, Ex-demo)	£139	£99	£40	1	Linn Kans (B)	£299	£200	£99
					1	Mordaunt Short MS10 S2 (Ex-demo)	£89	£59	£30
					1	Mordaunt Short MS10 S2 (New, Boxed)	£89	£75	£14

sound advice

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THE DIRECTORY

CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Arcam Delta Black Box £250	n/a Very Good	This rich, powerful and articulate sounding DAC transforms the majority of medium price CD players	Needs D-out CD players	R	60
Arcam Black Box II £299	Very Good Very Good	An addition to the BB I, it also offers improved sound and more inputs	Optical and wired input digital decoder	BB	76
Arcam Delta 70 II £550	Very Good Good	Now in Mk II form a further improvement is seen in features, performance and sound quality. Solidly built and British	Now adds simple remote vol + std features; also display off	R	76
Arcam Delta 170 Transport £599	Very Good Very Good	While no bargain, this is a well made metal boxed transport providing clean digital data for outboard decoder/processors	Transport only, display off, usual programming	R	76
Cambridge Audio CD2 £650	Fair Very Good	The finest midrange in digital audio is sufficient grounds for Recommendation, though there remains a tinge of disappointment that the CD2 didn't get closer to big brother elsewhere, notably in the bass.	16x oversampling, remote control	R	58
Carver TL 3100 £340	Average Average—	The sound quality did not live up to the excellent fascia. Carver's DTL did not aid the indifferent sound	DTL sound shaping, usual facilities, remote, memory		76
conrad johnson DFI £1,995	Average— Good+	Setting a decent standard and including an FET line preamplifier, the unusual DFI is worth investigating	Line preamp built-in, simple remote facilities		76
dbx DX5 £640	Good Poor	Sound quality proved a single disappointment, though it's refreshingly unique in providing semi-pro post-production facilities that some users will undoubtedly relish.	Track entry/volume remote, compression, impact recovery, ambience etc.		58
Denon DCD 610 £200	Good+ Fair+	Lots of Denon player for the money, well equipped with good all round performance	Remote, versatile programming 2x 0/S	BB	64
Denon DCD820 £249	Average+ Average—	A powerful combination of features and build for the money ensures recommendation. The sound is just good enough	Well equipped, power vol, edit etc, digital out	R	76
Denon DCD 810 £250	Very Good Fair+	A good value allrounder bettered on sheet value by the 610 and 910; power volume could sound better	Remote, 4x oversampling, programming	R	64
Denon DCD 910 £300	Very Good Fair+	A well equipped deck of impressive appearance and solid sonic and lab performance	Remote volume, programming, 8x 0/S digital output	BB	64
Denon DCD1420 £400	Very Good Average	Superbly equipped with a fine lab performance, this modern player needs a touch more sonic spice to get recommended	20-bit, very comprehensive, remote, power volume etc		76
Denon DCD-1500II £500	Very Good Very Good	The extra build quality over cheaper Denons is justified in terms of sound quality and lab performance, while the feature list is comprehensive and quite nicely presented.	Track entry/volume remote, menu display etc.	R	60
Denon DCD-1520 £500	Very Good Very Good	High tech, high profile, high gadget content, good sounding player at an almost affordable price.	Programme, hdp socket, remote, track entry, optical digital output	R	70
Denon DCD 1700 £650	Good+ Very Good	The overall sound was strong and coherent approaching reference standards. Fine build quality and facilities make this a firm contender	Remote, skip, scan, headphone socket, programmable	R	58
Denon DCD 3520 £1000	Very Good Good+	Built like a battleship this new model takes its place at the top of the Denon range with a smooth and powerful sound, quite free of graininess	Composite 20-bit DACs, full programming features	R	72
Denon DCD-3300 £1200	Good++ Very Good	Sounding tight and coherent though not significantly better than the cheaper 1700. Very well built and comprehensively equipped	Remote control, with volume, keypad programme, scan, search, headphone		51
Dual CD 1030 RC £170	Fair Fair	An up and down performance on test but it is hard to deny the overall value for a machine that includes remote control at this price	Remote, headphone socket, 2x 0/S, timeshared 16 bit	R	64
Ferguson CD007 £130	Good Fair	The cheapest recommendation in the test group; don't expect the earth but the value is good	Manual, digital output, headphone socket	R	64
Ferguson CD008 £150	Fair Fair	Not as strong as its relatives, sample fault perhaps? Though performance is fair enough overall	Remote, midi digital output, 2x 0/S, timeshare 16 bit		64
Goodmans GCD300 £129	Average Average	It may be adequately made, but with cheap good sounding players available this particular Goodmans isn't quite good enough	Programmable, skip, search, repeat		70
Goodmans GCD550 £199	Average+ Fair+	A slow autochanger with a weakish lab performance but the sound is fair enough, the features good and the price is low	Remote, 6 disc autochanger, 2x 0/S	BB	64
Goodmans GCD555 £219	Average Average—	Scores approval on grounds of low price. You must pay more for better sound and a faster mechanism	6 disc changer, 32 track memory, remote etc	R	76
Grundig CD9000 £1000	Good Good	Aimed at a market which puts external styling above sound quality. Although this player is of slightly above average competence in most departments it is expensive	Remote, programme, hdp socket, calendar display etc		70
JVC XL-Z1010 £499	Good Average—	Despite some high tech design and a good lab result this model did not deliver good sound quality	32 track prog., disp off, auto fade, 2 digital		76
Kenwood DP-8010 £449	Good Fair	Top build quality and novel technological features seem to achieve little success here. While the technical performance is fine, the sound quality doesn't match its competitors	Track entry remote, memory display, sprung feet, optical digital output etc		70
Luxman D-90 £300	Fair Good	Despite technical ingredients that do not seem particularly inspiring, this is a nicely judged package that is ergonomically neater than most, with decent sound quality for the price and distinctive finish and presentation.	Track entry remote, programming etc.	R	58
Marantz CD583 £169	Very Good Good	Devoid of all but the CD essentials it makes up for in sound quality what it lacks elsewhere	Memory, track skip, search, etc	BB	70
Marantz CD85 £500	Very Good Very Good	This player may just miss a top sonic rating but it's well made and has plenty of features befitting a Marantz heavyweight	FTS, key pad remote, comprehensive display, programming, optical output etc	R	70
Marantz CD94/CDA94 £1600	Very Good Very Good+	This two-box combination delivers reference standard lab and listening test results, albeit at a price which seems a little steep. Very refined	Favourite track selection, remote, balanced output etc	R	60
Marantz CD12LE £2800	Very Good Excellent	This top of the range two-box player may be very expensive but it is very well made. Technical performance is very good and the sound is the best from Marantz yet	Two box, digital processor, FTS, optical connection, hdp socket, comprehensive display, balanced output etc	R	70
Meridian CD207 £1050	Very Good Excellent	The 207 matures with age and in its present form it offers one of the best sounds around plus great packaging and versatility through its preamp options	On-board preamp, options, two box, coax digital output, remote	R	72
Micromega CDF1 Classic £1400	n/a Very Good	A very well made and stylish player from France, the CDF1 is a CD player for analogue lovers or as close as we've come across	Basic remote, digital output, suspended chassis	R	72
Micro Seiki CDM100 £3850	Very Good Good	One of the hernia inducing bricks of hi-fi, the Micro is extravagantly styled, finished and built. The good lab performance led to an 'only good' sonic display when the price demanded excellent	Balanced output, remote, display blanking		72
Mission PCM2 £500	Good+ Good	A matured design with good features it is the best sounding power volume player available, it even tests well. It accepts the £200 PSX power supply option	Remote volume, display and phase invert	R	64
NAD 5320 £169	Average— Average—	A low cost player devoid of features but at this low price it should still offer better sound	Budget facilities, 20 track program		76
NAD 5220 £230	Average— Poor	Conforms sonically to a stereotype of the medium that most players have grown out of. Hard, thin and raw sound with poor stereo and resolution.	Time/track display, memory		62
Nakamichi OMS-1E £395	Good Good	This neat enough player doesn't really follow the Nakamichi tradition of providing exceptional sound quality while at the same time perpetuates that of selling at an above average price	Simple remote etc.		58

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MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Nakamichi CDP-2E £495	Very Good Good	It's ergonomically superior and has above average sound, but it isn't cheap. The standard of build quality and finish is first class which isn't quite matched by the sound quality	Programming, hdph, remote track entry, digital output		70
Nakamichi OMS-4E £1200	Very Good Very Good	Solidly controlled and comparatively simple this clearly represents one of the major benchmarks for CD sound quality, though the midrange sounded a touch thin	Skip and scan, headphone socket		51
Nakamichi OMS-5EII £1500	Good+ Very Good	"... delivers near state of the art performance and build quality in a deliberately starkly functional package, but at a very high price..."	Skip and scan, simple track programming, manual control		51
Nakamichi OMS-7EII £2000	Good+ Good	The only serious criticism here is of the price. And in our not always humble opinion you can get better sound quality for less elsewhere in Nakamichi's range	10 digit track entry keypad programming, headphones		51
Onkyo DX-1500 £170	Average Fair	Ruled out on the grounds of its poor DAC filter, but it's not so bad really given the price	Manual, 2x 0/S, timeshared 16 bit		64
Onkyo DX-3500 £250	Very Good Fair	It offers a lot of facilities and fine build quality for the money. Lab performance is very good but the sound quality doesn't inspire	Key pad remote, memory, hdph socket, comprehensive display etc		70
Onkyo DX-7500 £450	Good Very Good	This comes close to the state of the art performance in many areas. It has lots of facilities and is well made too.	Key pad remote, memory, hdph, very comprehensive display, optical digital output etc	R	70
Philips CD610 £160	Average+ Average	Built down to the price the sound is OK while the package performance and features constitute fine value	Remote, hdph, programming etc	BB	76
Philips CDC875 £300	Average+ Average-	The changer works well and this machine is very well equipped. The sound quality is below par but may not matter too much in its likely 'muzak' application	6 disc changer/dig op remote, hdph, memory, shuffle		76
Philips CDV185 £350	Average+ Average	Hard to value with the video singles facility but it all works well enough for a recommendation	Video singles + CD start + digital out etc	R	76
Philips CD880 £500	Very Good Very Good	The '880 is an impressive blend of luxury build quality and features at a far from extravagant price, and also delivers the subjective goods.	Volume remote, FTS, menu display etc.	R	60
Pioneer PDM710 £350	Good Average	A fine multi-changer with excellent memory programming; fully featured, sounds fine but no digital output	6 disc changer, 40 track memory + multi memory full remote, hdph, etc	R	76
Pioneer PD9300 £450	Excellent Average	A mid price flagship of excellent build and lab performance but only average sound - interesting though	Remote, 24 track programming, 2 digital op		76
Pioneer PD-91 £800	Excellent Very Good+	Close to state of the art in nearly all areas - soundstaging, clarity and simple lack of artificiality. A well made and sophisticated player	Track entry remote, calendar display, index search, etc.	R	64
Proton AC-120 £180	Average Average-	Fine styling, low price but barely average performance	15 track memory, simple design, remote, hdph		76
Revox B126 £649	Very Good Good	Made in Switzerland so the build quality and technical performance is high but then so is the price and the sound quality is only good	Programming, Revox remote system compatible		70
Revox B226S £840	Good Average	Top quality build and finish for the Revox system enthusiast. For high value sound look elsewhere	Remote vol, hdph, 19 track memory, digital op		76
Rotel RCD820B £210	Good+ Fair+	A budget Philips based player of dependable sound quality and offering very good value. Build is a touch lightweight	Remote, basic facilities	BB	64
Rotel RCD820BX2 £250	Good Very Good	Start with a good base and then make it sound better, the '820BX2 CD player maintains the reputation established by its namesakes, and comfortably deserves Recommendation.	Direct track entry remote etc.	R	58
Rotel RCD855 £250	Good Good+	Stripped for action this well built Philips technology player delivers fine performance and sound. First rate value	Remote, 20 track prog, 1 audio op, 1 digital op	BB	76
SAE D102 £700	Good Good	Considering the high price of this player, most of the innards seem fairly prosaic. Sound quality and lab performance are both respectable enough, but hardly justify the price premium involved, though styling is unusual.	Remote (inc volume), skip, scan etc.		58
Sharp DX150 £129	Fair Fair	This is a none oversampled player which is rather outclassed for technical and sonic merit by the vast majority of the competition. Pretty enough but would you want to put discs in it?	Programmable, skip, search, repeat		70
Sharp DX750 £179	Fair Fair	It has a remote control but it's too like the 150 which is rather outclassed for technical and sonic merit by the vast majority of the competition	Remote, programmable, skip, search, repeat		70
Shure Ultra D6000 £495	Average+ Fair	Ergonomically well thought out with full function remote control, but not really scoring sonically considering its price	Remote control (full function inc volume)		51
Sonographe SD1 (by CJ) £799	Good- Very Good	Distinctive with oak end-cheeks, using Philips based 14 bit x 4 oversampling, Conrad Johnson electronics make this a musically rewarding player	Full search programme and timing	R	51/Coll
Sony CDP-M55 £190	Fair Fair	£20 buys a remote control handset to operate your M35. Sony call it an M55 (see CDP-M35 review).	Simple remote, skip, scan, programming etc.	R	58
Sony CDP-M75 £230	Good Good	This midi version of the '750 saves £20 on the price (see CDP-750 review).	Track entry remote, menu display ect.	BB	58
Sony CDP-C50M £250	Fair Fair	The Sony concept of an autochanger is interesting and executed with characteristic thoroughness. The lab and sound test results reveal it to be of only average quality	Carousel autochanger, remote, multi disc programming, variable hdph socket		70
Sony CDP-M95 £280	Very Good Fair+	Very well equipped mid sized player fine build and finish, incorporating Sony's custom file disc labelling	Remote, programmable, variable hdph output	R	64
Sony CDP-228ESD £400	Very Good Average+	Good value, this is Sony's best mid price design and comes superbly equipped	hdph, remote, rem vol, custom file	R	76
Sony CDP-338ESD £550	Excellent Good	Only a bit better than the 228 the 338 is a good machine, but not quite good enough for formal recommendation at the price	Custom file, remote, rem vol, hdph, shuffle etc, 2 digital op		76
Sony 557ESD £1000	Excellent Good+	Superbly built flagship model that produced excellent lab results and very good sound. Many luxury features though not that good value	Full remote, disc directory, digital output, power volume, 8x 0/S, 18 bit		64
Sony CDP-X7ESD £1300	Good+ Average	A Sony flagship, build and finish is exemplary, styling is unusual but the sound is just average	Custom file, remote, 2 digital op, balanced audio + phonos		76
Sony CDP-R1/DAS-R1 £5000	Very Good Excellent	Sony has aimed high with the R1 and in some ways has created the reference player. Build quality is amazing and it offers a high level of facilities. One or two faults were revealed in both the lab and the listening, but it's generally excellent	Two box, dual optical connection, digital processor, FTS, remote		72
Stax Quattro £2995	Very Good Very Good	Now in mill guise this substantial player recreated exceptionally strong and convincing bass lines together with a beguilingly musical midband	18-bit DACs, 20-track memory, full IR remote, variable o/p	R	72
Teac PD470LE £279	Average Average	With the LE upgrade the 470 has improved to a just average position	Remote, hdph, 20 track prog		76
Teac ZD880 £450	Good Fair	Decent enough in most respects with a very good build and finish. Its sound isn't competitive enough to inspire any real enthusiasm	Remote, track key access, auto space, comprehensive display, hdph socket etc		70
Technics SLP202 £160	Very Good Average-	A competent budget player; no frills but a good value performance and build quality. Buy the similar SLP227 if you want remote control	Simple facilities, 20 track program, no rem	BB	76

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CD PLAYERS

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Technics SLP-333 £270	Good+ Average	A decent enough player lacking that final edge necessary for review distinction	Dubbing edit, hdph, digital out, rem vol remote, 20 track prog	R	76
Technics SLP-555 £320	Very Good Average	A well balanced, well made player delivered at a very fair price. Good facilities for cassette dubbing	Peak level detection, remote, rem vol, hdph digital op	R	76
Technics SLP777 £380	Very Good Average	A higher quality version of the 555, it may impress with its extra facilities. Performance is similar to 555	Display off, full remote, audio level meter, 32 track prog, hdph digital op	R	76

CD MIDI SYSTEMS

So you want a hi-fi, but you don't want to make a fuss about it. A pre-packaged system with everything matching up and no aggravation may not rank with carefully chosen separates on **sound quality**, but there's no denying the attractiveness or popularity of this approach – the market for pre-packaged component hi-fi systems is at least as big as that for separate items, even ignoring the vast numbers of low-cost single unit stacker systems.

The arrival of compact disc led to a new fashion for shelf-standing compact systems, or 'midis' as

they are known in the trade, as a replacement for earlier floor-standing rack systems (themselves the upmarket development from music centres). Only some 330mm wide, midis can more or less match full-size (430mm) rack components for performance, and are certainly cheaper to make, ship, sell and buy.

Whereas specialist hi-fi is moving steadily towards ultra-simple 'no frills' components, midi systems tend to be sold on a feature count at a price point, usually with little opportunity for

demonstration and comparison. Our test programme includes extensive auditioning and lab testing, while making allowance for the different aspirations of designers and expectations of users. Key features valued highly by customers include system remote control, automatic switching, double 'dubbing' cassette decks, and elaborate equaliser tone controls. And the top end of the market is developing with surround sound audio/video-ready packages.

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa X-D80K £550	Poor Poor	Congested and harsh sound quality, the cassette deck, amp and loudspeakers being well below par. The built-in timer adds some operational flexibility	Auto-reverse, CD synchro record, remote, timer	R	77
Aiwa X-D100 £1000	Average— Fair	Very fully equipped with wide ranging in and outputs but poor upgradeability. Sound quality is reasonable on the whole	Digital & optical in/outputs, dual auto reverse, disc file CD etc	R	77
Akai M.50CD £550	Poor Poor	Cassette lacks Type II compatibility, general sonics mediocre or less	Devolved from M.80 but simplified, part remote	R	65
Akai M.80CD £800	Good Good	Good all rounder with minor ergonomic shortcomings but generally practical layout	Separates based, twin auto-reverse cassette	R	65
Ferguson HFD28 £300	Poor Poor	Similar to Goodmans 5000 system but with greater power and marginally superior sound	One-piece, semi-remote	R	77
Goodmans 5500 £320	Poor Poor	It offers the basic features (but no Dolby or magnetic cartridge) and rough and ready sound	One-piece, remote	R	77
Goodmans 5300CDM £400	Average— Average+	Crisply styled system with gutsy amplifier and sophisticated speakers. CD player works well, other sources are variously mediocre	Combined cassette/tuner/amp, plus T/T and CD with remote	R	65
Goodmans Maxim-Midi System £520	Average Average+	De-luxe version of 5200 system – very good value for money and readily upgradeable. Sonics rough but OK and speakers good; CD crude	All separates with twin cassette	R	54
Grundig Studio Line 1 £330	Poor Average+/ Poor	Intriguing package with warm, woolly but attractive sound let down by poor attention to detail and suspect cassette deck. Amplifier appears to be inadequately protected	CD/cassette tuner plus preset equaliser	R	77
Hinari DK200 Disc Deck £300	Poor— Poor—	Confused user interface is matched to inadequate electronics. Poor – and poor value	Single unit, two cassettes, CD, tuner, remote	R	77
JVC Midi-W900CD £1000	Good Good+	A competent allrounder, with important convenience related features, and powerful linked recording facilities. Less strident speakers would be appreciated	Separates system, equaliser, auto-reverse cassette	R	65
JVC Midi-W91CDM £1111	Good— Average	Very well equipped (viz. multi-disc player, powerful tape related features) with acceptable but rather nondescript sound	Multi-disc player, twin auto-reverse cassette, equaliser	R	77
Marantz MX493AVCD £549 with LD20 speakers, £449 without	Average Mixed	Good source components (ex cassette) let down by poor amplifier. Flexibility is strong point, and the system may prove attractive where the A/V possibilities can be fully utilised	Twin auto reverse, opt speakers, surround processor etc	R (with LD20)	77
Marantz MX583 £750	Average— Poor	The system has potential in an A/V context, but is patently lacking in a purely audio one. Only the CD excels	Component system with A/V amp, no speakers	R	65
Marantz MX673CD System £900	Average+ Average	Tremendously flexible audio/visual system. Sound quality is satisfactory at best and ergonomics a mess	Various A/V inputs, remote, speakers optional	R	54
Pioneer S-11 £510	Average— Average—	Fine lower middle market system, with one useful extra – the built in timer. Only the record deck is disappointing	Twin auto reverse cassette, built in timers, one piece amp/cassette	R	77
Pioneer S-3300 £1080	Very Good Very Good	High standard of reproduction on all sources, though mistracking with Dolby C was a limitation. There are few gimmicks and plenty of fine engineering	Dolby C/HX Pro, multi-disc, amp with DAC etc	R	77
Proton AI-3000 £550	Good Good	There are a host of minor problems, including no LW, but the unit is attractively packaged and can be made to sound very good despite a woolly sounding amplifier	One piece CD, cassette, tuner and amp, remote	R	65
Sanyo 39CD £260	Poor Average—	Acceptably compromised basic low end system, offers broadly respectable if unambitious music making for those on a tight budget	One piece + CD, non-remote, manual tuner	R	77
Sanyo 49CD £300	Poor Average—	Similar to 39CD, but with Dolby B, preset tuning, remote control and more power. Audio wise, it's more of the same, but there's greater stature when loud and cassettes are helped by Dolby B	One piece + CD, partial remote control, digital tuner	R	77
Sanyo 59CD £380	Average— Average—	Adequate performance overall, though endemic lack of pitch integrity takes edge from tape and records. Some inconsistencies in control system too	As 49CD, + full remote, auto source select, separate turntable	R	77
Sharp CD-X17E £550	Average Average+	Highly specified miniature with detachable speakers. AC mains power only. Good sound let down by crude upper midband and treble. Expensive for what it is	CD luggage with dual cassette & tuner, detachable speakers	R	77
Sharp SA-CD800H £700	Average Average—	A superficially high grade, high spec system, the SA-CD800H actually sounds clean but a little 'synthetic'	One-piece, 6-disc CD, no T/T	R	54
Sony Compact 301CD £400	Average— Average	Mainly crisp, articulate sound and excellent ergonomics offset by modest FM results and lack of pitch integrity on cassette	Twin unidirectional cassette, equaliser, 30 preset tuner etc	R	77
Sony 501CD £500	Average Average	Fair all round performance except noisy FM. Ergonomics and visuals good, but no auto source select, tuner stereo defeat	Twin auto-reverse, 3-band tuner, equaliser etc	R	77
Sony Compact 500CD £550	Average+ Average+	Impressive visuals are matched to electronics which in audio terms lack inspiration. The speakers are particularly poor	Combined amp/cassette, 36 preset tuner, T/T component CD	R	65
Sony Compact 700CD £700	Average+ Good	Loudspeakers and (to a lesser extent) turntable spoil a fine sounding and stylish – if rather costly – package	Separates system, auto reverse cassette, 36 preset tuner	R	65

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NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Sony Compact 701C0/711C0 £700/£800	Average+ Good	Sound quality good all round, though cassette pitch accuracy is below par. Features average but system control is weak	Twin auto-reverse, graphic equaliser (711 only), 30 preset tuner	R (701C0)	77
Sony Series 1000CD £1500	Very Good Excellent	Very sharp, articulate sounding system from CD and FM. Cassette deck good and flexible, turntable as usual is not in keeping	Separates system, twin auto-reverse cassette, amp with DAC	R	65
Technics X900CD £470	Average Average-	Good build and mostly good sound is offset by mediocre amplifier and loudspeaker and some operational oddities	Main cassette/tuner/amp, separate T/T and CD		65
Technics X1 £500	Good Good	Superb value for money from a system with solid straightforward engineering at an attractively low price	Auto-reverse record transport, auto-disc/tape editing, surround sound, remote	BB	77
Technics X5D £800	Very Good Very Good	A mainstream system offering considerable flexibility and power in a traditional suit of clothes, and embodying values that place music first	Twin auto-reverse, tuner/timer, auto record deck, digital amp	R	77
Yamaha AST-C10 £600	Average+ Very Good	Brilliant if flawed luggable with weighty, powerful bass, and a rare combination of expressiveness and clarity unprecedented from such a small package. Good features.	Mains portable twin cassette/CD/radio system detachable speakers, remote	R	77

TUNERS

The radio medium operates at a much lower profile than TV, but in areas outside pop music the BBC service is the envy of the world. Live Prom concerts can rival all other sources from a hi-fi perspective. Only the FM (VHF) bands give stereo hi-fi sound, though AM (MW & LW) are useful for receiving certain transmissions in the UK.

Something of a hi-fi afterthought, tuners are often selected merely to match a chosen amplifier

cosmetically. However, the task they carry out is far from simple (or cheap), combining the skills of RF (reception) and audio (signal processing) engineering. The importance of the former will depend on local reception conditions, but money invested in a high quality outside aerial system is well spent.

Tuners come in two basic types. Analogue models tune gradually (and usually manually) across

the bands, and can have analogue or digital displays; they are often preferred for sound quality, and are certainly best for AM bands. Digital tuners offer convenient automatic tune facilities and hold many station positions in pre-set memories.

(The Lab and Sound results for models tested in issue No. 65 refer to FM only. For AM results see under Comments.)

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai AT-52L £150	Very Good Very Good	Holds its own on FM against many much more expensive tuners, but AM is very poor	All bands	BB	65
Akai AT-93L £250	Good+ Good+	By AM standards presentable (good) while FM delivers the goods	All bands, aerial switch	R	65
Arcam Alpha £149	Good Average++	Attractively classic British analogue tuner with sound quality comfortably better than most	FM/AM Analogue	BB*	50
Arcam Delta £270	Very Good Very Good	Hi-fi sound on FM, good on AM, a dependable British all-rounder	6AM, 6FM presets, FM/MW, LW display manual tune	BB	55
Denon TU 450L £130	Average+ Average+	Poor AM sound quality may be a deterrent but the FM performance fully merits recommendation	FM/AM Digital MW/LW	R	50
Harman Kardon TU920 £299	Good Average	Rather weak sound quality for the price despite good lab test results	16 presets, AM/FM, digital auto scan, active tracking		55
Harman Kardon Citation 23 £559	Good Very Good	Fine performance, interesting features and ease of use are this tuner's forte, and the sound quality is top notch	FM/AM seek/manual adjustment muting 16 presets remote control	R	60
Kenwood KT-660L £130	Fairly Good Fairly Good	You get your money's worth of gadgets and the radio's basically sound although programming is complicated. AM - fairly good	Timer, clock, all bands	R	65
Kenwood KT-1100D £300	Good+ Good+	Behind a gaudy and rather useless display the radio is much better than you might first think. AM - good	Firework display. FM/MW bands only	R	65
Linx Theta £400	Good Very Good	A Magnum Dynalab on the cheap with the hallmark styling of this small British newcomer. Some of the best midrange from any tuner	Manual analogue tuning, no presets, signal strength meter	R	72
Magnum Dynalab FT101 £599	Good Very Good	Although expensive for its fairly minimum set of facilities its excellent sound makes up for what it lacks elsewhere	Analogue manual tuning, no presets, signal strength meter	R	72
Marantz ST35L £125	Good+ Average-	It works well enough but the sound could be better for the money	16 presets, AM/FM, digital auto scan, active tracking		55
Meridian 204 £525	Good+ Good	Pleasant sounding with a fine finish but does not make the grade at this price	FM only, auto scan, digital, remote, clock timer		55
Musical Fidelity TI £300	Good+ Very Good	Top class FM stereo sound on good signal strengths from this audiophile model. Watch out for local CB!	FM only, analogue box dial, manual tune, signal meter	R	55
NAD 4020 £139	Good Average+	Not the quietest or most sensitive tuner tested, it still provided good sound for the money, being "musical and ambient"	Analogue FM/AM	BB	50
Naim NAT 01 £1098	Very Good Very Good	There may be better sounding tuners in the world, but we have yet to hear one	No presets. Two box, flywheel tuning FM only, Analogue	R	50
Nakamichi ST-7E £750	Good+ Good+	Exceptionally good for weak-signal areas, and good all round	16 AM/FM presets, Schotz enhanced sensitivity, auto time digital		55
Onkyo T9090 II £590	Very Good Very Good	It has most of the facilities you could possibly want and more beside. Lab performance and sound quality are both good enough to ensure recommendation even at this price	FM only, digital, 20 presets, auto scan etc.	R	72
Pioneer F91 £350	Excellent Good++	Easy to use, this model has excellent RF performance and scored very high ratings on the listening tests	FM/AM 24 presets	R	60

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TUNERS

NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Proton AT-300 £199	Good Good	The AT-300 is pretty on the outside, orthodox on the inside and rather dear. AM – poor	FM/MW only	R	65
Quad FM4 £289	Very Good Good+	Fine sound, excellent ease of use, good build and finish and a more than satisfactory technical performance	7 presets. Digital	R	50
Revox B260 £918	Excellent Very Good	Sophisticated and expensive, the B260 is ideally suited to the rest of the Revox range and should also work well in other systems	FM – virtually everything	R	60
Rotel RT-830AL £110	Good+ Good	Fine sounding budget audiophile material, no frills, no fuss	Manual dial analogue, FM, MW, LW	BB	55
Rotel RT-850AL £160	Good+ Good+	Scoring well on listening tests and one of the best sounding tuners at its price level, it was a bit let down on AM but RF performance was good	FM/AM, digital	BB	50
SAE T-102 £449	Good+ Good+	Expensive for all the radio you get, but sounds interesting. AM – Poor	FM/MW only	R	65
Sony ST-S300L/ ST-S100L £140/£100	Good Good	A reasonable entry point, not for difficult areas. AM – Poor	All bands	R	65
Sony ST 500ES £200	Good+ + Average—	Disappointing sound quality but good lab performance. (Includes long wave)	10 AM/FM presets, auto scan digital		55
Sony ST-S 700ES £299	Very Good Very Good	First class in every respect including FM sound quality. Even AM was well above average	FM/AM, 10 presets, digital scan	BB	60
Yamaha TX-L400 £130	Good+ + Good+	Good FM sound, let down by poor AM but otherwise good value	16 presets, auto scan, digital, FM, MW, LW	BB	55
Yamaha TX-500 £150	Average+ Average	Under a gaudy coat, this sensitive tuner gave reasonable stereo results. However, the AM had again been thrown down a well	20 presets (10 buttons) digital		50

Rating refers to original, tested model

HEADPHONES

There are a variety of different approaches to headphone design, and examples of each turn up in this group. Amongst the more expensive esoteric models, electrostatic drivers are used in square open-backed phones such as the Jecklin and Stax models. The majority of these come with some form of transformer which takes the signal initially from the speaker terminals on the amplifier. The actual speaker cables then travel from this unit via a

bypass switch to the loudspeakers.

The more down to earth models feature dynamic drivers in circular open-backed designs. The advantage of open backs seems to be a correspondingly open sound and a less claustrophobic feel to the music. One can also of course hear external noises and irritate people on public transport.

The third category are closed-back designs,

which are useful in situations where it is necessary to block out background noise.

Another means of distinguishing different types is the way they sit on your head or ears. There are three styles: circumaural models enclose the ear and rest on the side of the head; supra-aural designs press on the outer ear (pinna); and intra-aural types rest inside the ear and are popular amongst users of personal stereos.

NAME PRICE	COMFORT SOUND	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Aiwa HP-X30 £30	Good Good—	A flashy personal stereo phone which alternatively could be used at home. A slight LF tonal preference slightly colours the response, but it ain't a bad can	Supra-aural, closed-back, dynamic		75
Aiwa HP-V99 £50	Good— Average+	Horn loaded in-ear miniatures with plenty of guts but not enough transparency or bass to compete with the headbanded competition	Intra-aural, closed-back, dynamic		75
Aiwa HP-X80 £50	Good Good	A headphone that's highly suited to non acoustic music and portable sources, nicely made and slickly finished. Sound quality doesn't quite match the price	Supra-aural, closed-back, dynamic		75
Aiwa HPEX-200 £90	Good Good	Modern looking and well finished the Excelsias, as they are dubbed, had meaty bass and sounded reasonably open for the type	Circumaural, closed-back, dynamic		63
AKG K135 £35	Poor Fair	Despite a very appealing design the K135s don't live up to the usual AKG standards, though they do have the ability to reproduce rhythm well	Supra-aural, semi-open, dynamic		63
AKG K145/S £58	Good+ Good+	Electrostatic tweeters combine with a dynamic mid/bass unit to create very confident sounds in a comfortable headphone. Balance is on the bright side	Supra-aural, semi-open, electrostatic/ dynamic	R	75
AKG K240 Monitor £60	Very Good Good	Something of a classic these AKGs are very user friendly in all respects; sonically on the warm side of neutral	Circumaural, semi-open, dynamic	R	63
AKG K280 Parabolic £110	Good Very Good	A very revealing and unusual twin driver design that uses the same principle as a satellite dish to beam sound into the ear	Circumaural, open-backed, dynamic	R	63
AKG K340 £136	Good Excellent	Heavyweight cans in most respects, the K340 with its electrostatic tweeter is a very revealing headphone. Gives the total electrostatics a good run for their money	Circumaural, closed-back, electrostatic/dynamic	R	75
Audio Technica ATH 909 £55	Average Average	Quite impressive in the treble though a bit bass shy, the 909s worked well at highish levels	Circumaural, semi-open, dynamic		55
Audio Technica ATH 910 £65	Average Good	The closed-back 910s are an improvement on the 909s with a nice rhythmic quality rarely found with headphones	Circumaural, closed-back, dynamic	R	55
Audio Technica ATH-911 £75	Very Good Very Good	Nicely finished dynamic headphones with all the trimmings, plus a very clean and subtle sound	Circumaural, open-backed, dynamic	R	63
Beyer DT 325 £30	Very Good Fair	Lightweight in more ways than one, the 325s may be a little bright for some systems and tastes but will suit duller sources	Supra-aural, open-back, dynamic	R	63
Beyer DT330 Mk II £45	Good Poor	Not the most revealing 'phones encountered, the 330s were nevertheless enjoyable and rarely offended	Circumaural, semi-open, dynamic		55
Beyer DT550 £69	Good Good	On their own the 550s sound articulate with a slightly 'gritty' treble and 'keen' midrange; not suitable for headbangers!	Circumaural, semi-open, dynamic		55
Beyer DT880 £90	Good Good	Well made cans with a warmish sound but fairly solid midrange, though they're not that informative for the price	Circumaural, semi-open, dynamic		63
Beyer DT990 £119	Very Good Very Good	The 990s are definitely a significant pair of dynamic headphones; they have a smooth and yet revealing, neutral sound that is hard to criticise.	Circumaural, open-back, dynamic	R	55
Beyer IRS690 £200	Good+ Very Good	High quality infra-red headphones with soft comfy earpads and mellow but informative sound quality which is hard to dislike	Circumaural, open-back, dynamic	R	75
Jecklin Float Model One £79	Good Very Good	Whilst very unusual in appearance the Floats give remarkable sound quality and openness at a reasonable price	Circumaural-ish, open-back, dynamic	BB	55
Jecklin Float Model Two £99	Good Very Good	Helmet shaped and pretty unflattering but open sounding and comfortable in the long term. Note lack of adjustment means you should try before you buy	Circumaural-ish, open-backed, dynamic	R	63
Jecklin Float Electrostatic £399	Good Excellent	One version of the state-of-the-art, these electrostatics have an openness of sound rarely found in the breed, with good dynamic range to boot	Circumaural-ish, open-back, electrostatic	R	55
JVC HA-D990 £65	Good+ Good+	Good looking well made cans that offer good sound quality for the money. Sonic nature is of the easy-going, laid-back variety	Supra-aural, closed-back, dynamic	R	75

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

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Bartletts money saving recommended systems

Turntable	Amps	Speakers								
		Wharfedale Delta 30	LPW Sonata AR Red Box	Celestion 3	Mission 761 Heybrook Point 5 Tannoy E11 AR 112	Celestion DL 411	AR 122 B & W DM550 Gale GS210 Celestion DL6 II Allison AL105	Tannoy M15 Mission 762 Infinity RS2001	Heybrook HB1 Celestion DL 811 AR 132 Allison AL110 MF Reference 2	Tannoy M20
CS430	AR A03	279.95	297.95	306.95	314.95	331.95	339.95	356.95	382.95	407.95
CS430	AR A05	314.95	332.95	341.95	348.95	365.95	373.95	390.95	416.95	441.95
CS430	ARCAM Alpha II	297.95	314.95	323.95	331.95	348.95	357.95	373.95	399.95	424.95
CS430	Denon PMA 250	249.95	267.95	276.95	284.95	301.95	314.95	335.95	352.95	377.95
CS430	Marantz PM 35	271.95	289.95	298.95	305.95	322.95	331.95	357.95	373.95	398.95
CS430	Marantz PM 45	314.95	332.95	341.95	348.95	365.95	373.95	390.95	416.95	441.95
CS430	NAD 3020E	254.95	272.95	281.95	289.95	307.95	314.95	335.95	352.95	377.95
CS430	NAD 3130	288.95	306.95	315.95	322.95	339.95	348.95	364.95	389.95	414.94
CS430	NAD 3240PE	365.95	383.95	392.95	399.95	416.95	424.95	441.95	467.95	492.95
CS430	NAD 3225PE	271.95	289.95	298.95	305.95	322.95	331.95	357.95	373.95	398.95
CS430	Rotel RA810A	238.95	246.95	255.95	272.95	289.95	297.95	314.95	340.95	365.95
CS430	Rotel RA820AX	272.95	290.95	299.95	306.95	323.95	332.95	348.95	374.95	398.95
CS430	Rotel RA820BX4	306.95	324.95	333.95	340.95	357.95	366.95	373.95	399.95	467.95
CS430	Rotel RA840BX4	348.95	366.95	375.95	382.95	403.95	408.95	424.95	448.95	510.95
CS430	Rotel RA870BX	434.95	452.95	461.95	479.95	496.95	504.95	521.95	547.95	592.95
CS430	Yamaha AX330E	254.95	272.95	281.95	289.95	307.95	314.95	335.95	352.95	377.95
CS430	MF B1	344.95	361.95	369.95	378.95	394.95	411.95	429.95	446.95	472.95

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Revolver extra £116.00 Rotel RP855 extra £77.00

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AR CD06 extra £179.00 Denon DCD 520 extra £68.00

Denon DCD 620 extra £103.00 Denon DCD 820 extra £146.00

Denon DCD 920 extra £189.00 Denon DCD 1420 extra £274.00

Denon DCD 1520 extra £400.00

Marantz CD 40 extra £103.00 Marantz CD 50 extra £146.00

Marantz CD 50 SE extra £189.00 Marantz CD 60 extra £189.00

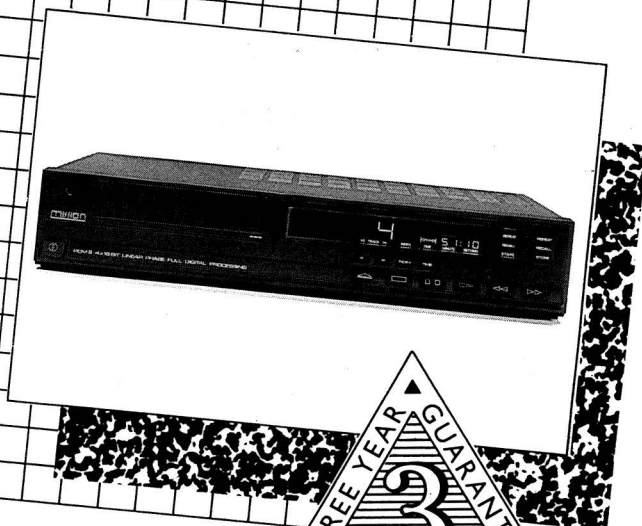
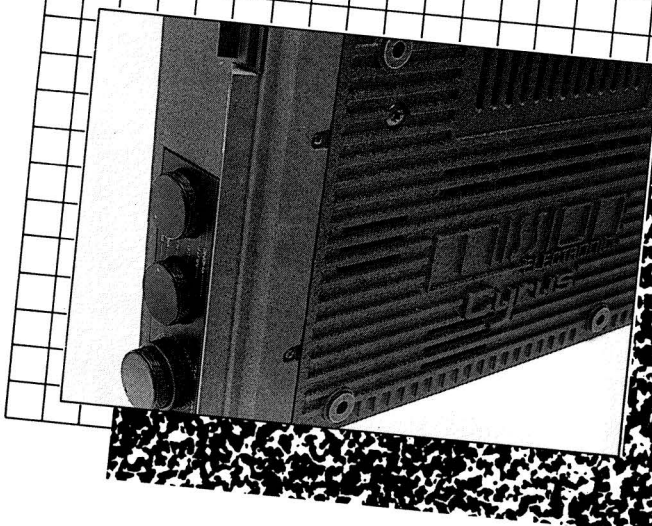
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THE DIRECTORY

HEADPHONES

NAME PRICE	COMFORT SOUND	COMMENTS	TYPE	VALUE	BACK ISSUE FULL REVIEW
Koss TD/60 £20	Good Average	Although they're devoid of channel identification and have a decidedly Stateside approach to sound, these are very listenable phones for the price	Supra-aural, closed-back, dynamic		75
Koss K/6X Plus £30	Fair Poor	'Sixties-style' phones from the good ole US of A, their sonic style is unique and can make a system sound quite different	Supra-aural, closed-backed, dynamic		63
Pioneer SE-72 £30	Good+ Average—	Neat, nicely made personal stereo oriented phones along the lines of Sony V3s. Sound is on the veiled side, good for aggressive sources	Supra-aural, closed-back, dynamic		75
Quart Phone 30 £40	Good Fair	Whilst not as seductive as their PMB25 predecessor the 30s are reasonably neutral and do improve on some of the competition — though not stunning	Circumaural, semi-open, dynamic		63
Quart PMB 25II £40	Good Good	Despite a somewhat unconventional suspension system the 25s put in a convincing and enjoyable performance with warm, lively balance	Circumaural, open-back, dynamic	BB	55
Quart Phone 70 £70	Good Good	Competent performers that were hard to criticise but lacked the life and sparkle of which some of the competition are capable	Circumaural, closed-back, dynamic		63
Quart PMB 65 £70	Good Good	Quite revealing and neutral albeit with the usual closed back sound, this competes well with more established models	Circumaural, closed-back, dynamic	R	55
Quart PMB 85 £90	Fair Very Good	These more expensive Quarts bear a striking resemblance to the Jecklin Float models and use two drivers per ear. Sound is a bit bass heavy but not bad overall	Circumaural, open-backed, dynamic		63
Realistic Pro-X £25	Poor Average—	Robust, unanimously uncomfortable and heavily veiled in sonic terms — not a great success	Supra-aural, closed-back, dynamic		75
Ross RE2530 CD £20	Average Average	Rather an 'average' £20 phone that some found uncomfortable due to high pressure on the ears. Sonic balance is on the bright side	Supra-aural, closed-back, dynamic		75
Ross RE2560 CD £25	Good Average+	If you're not too fussy about quality of finish and don't have an elfin head then these British phones warrant attention. Sound could be smoother	Supra-aural, semi-open, dynamic		75
Ross RE-2760 £35	Poor Fair	Stylish white cans from the only British firm in the business. Unfortunately sound quality is not up to par in this price range	Supra-aural, closed-back, dynamic		63
Sennheiser HD30 £13.50	Good Poor	Built specifically for the personal stereo market these small and light Sennheisers have a slightly synthetic sound, but are an upgrade on the average Walkphones	Supra-aural, semi-open back, dynamic		55
Sennheiser HD40 £18	Very Good Good—	Very light and comfortable headphones with an even sonic balance that will suit most sources, but jack is 6.3mm and not suited to personals	Supra-aural, semi-open, dynamic	BB	75
Sennheiser HD450 £27	Good Fair	Modern, simple and lightweight phones that are remarkably robust and which turned in a relaxed if weighty performance that was at worst pleasant	Supra-aural, semi-open, dynamic	R	63
Sennheiser HD480 £37	Good Fair	Using the same shell as the 450s, the 480s were a little softened and unrevealing by comparison with their competitors	Supra-aural, semi-open, dynamic		63
Sennheiser HD420SL £47	Good Good	The 420s gave a full and tangible quality to instruments and voices; whilst not the most revealing headphones around they would suit slightly brash sources	Supra-aural, open-back, dynamic		55
Sennheiser HD520 £60	Good+ Good+	A very comfortable and musically capable headphone. If you've got this sort of bread to blow on cans, give 'em a blast	Circumaural, semi-open, dynamic	R	75
Sennheiser HD530 £70	Very Good Good+	One of the better dynamics in its group, the 530s create a sense of space that eludes most sub £100 cans, and they're dead comfy to boot	Circumaural, semi-open, dynamic	R	75
Sennheiser HD540 Ref Gold £160	Good Very Good	The 540 Golds prove that dynamic headphones can be subtle, informative and capable of creating a remarkable sense of space	Circumaural, open-back, dynamic	R	55
Sony A21L £20	Good— Good—	Forward facing in-ear drivers on a folding plastic band provide exceptional clarity for such an inexpensive phone. However, no bass, and fit isn't to everyone's taste.	Intra-aural, semi-open, dynamic	BB	75
Sony MDR V3 £30	Fair Good	Portable stereo oriented phones that are very nicely made and combine clarity with a pleasant lack of distortion	Supra-aural, closed-back, dynamic	BB	63
Sony MDR-V5 £50	Very Good Average+	A nicely made comfortable headphone let down by a limited ability to reproduce music in a natural fashion	Supra-aural, semi-open, dynamic		75
Sony MDR V7 £70	Very Good Very Good	Classy sounding cans that are very slick and work well with all types of music, setting the standard in their price range	Circumaural, closed-back, dynamic	R	63
Sony MDR-CD999 £120	Good+ Very Good	A very nice headphone in all respects, the 999s are worthy of the best headphone outputs and high quality sources	Supra-aural, semi-open, dynamic	R	75
Sony MDR-R10 £2500	Excellent Very Good+	Costly state of the art sealed moving coil design built to the highest standards using the finest materials. Sound quality reflects this care, being clear, sweet and refined	Circumaural, closed-back, dynamic	R	72
Stax SR34 £140	Fair Very Good	The least expensive Stax headphones around, the SR34s are lively and rhythmic with good tight bass and a sweet midrange	Supra-aural, open-back, electret		55
Stax SR84 £210	Very Good Very Good	The stepping stone between dynamics and full electrostatics, these electret phones are revealing, open and highly enjoyable	Supra-aural, open-backed, electret	R	63
Stax Gamma pro/SRD-X pro £296/£230	Very Good Excellent	The Gamma pros are like a stethoscope for your hi-fi, revealing subtleties that many loudspeakers fail to resolve	Circumaural, open-backed, electrostatic	R	63
Stax SR Gamma £299 (inc. SRD-6 Adaptor at £100)	Very Good Very Good	The next model down the Stax range from the Lambda, the Gamma is an excellent headphone with little to criticise but the price.	Circumaural, open-back, electrostatic	R	55
Stax SR Lambda Pro £545 (inc. SRD-7SB Mk 2 Adaptor at £185)	Very Good Very Good	A bit of an industry reference the Pros are frighteningly revealing, bringing across more information than loudspeakers costing twice as much	Circumaural, open-back, electrostatic	R	55
Stax SR Lambda Pro £360/ SRM-1 energiser £635	Very Good Excellent	This combination extracts layers of information that other headphones only hint at. The SRM-1 has more edge than the SRM-T1, but it's good	Circumaural, open-back, electrostatic	R	75
Stax Lambda Signature/SRM-T1 £470/£895	Very Good Excellent	The Signature when combined with the SRM-T1 valve driver must be the most transparent headphone available	Circumaural, open-backed, electrostatic	R	72
Yamaha YHL-006 £30	Average Average	Unusual personal stereo oriented phones that curl up when not in use. Earphones are like golf balls and balance is well suited to Walkmans	Supra-aural, open-back, dynamic		75

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"Hi-Fi '90 should not be missed"

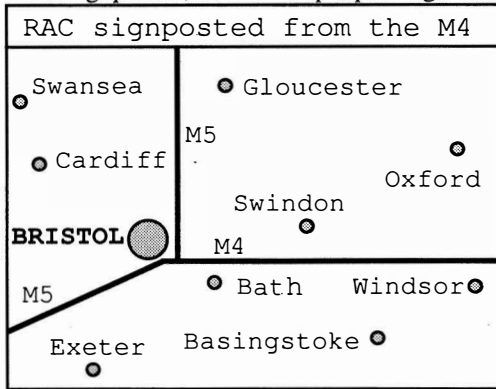
The stage is set to make the Hi-Fi' 90 exhibition an event not to be missed by 'experts, enthusiasts, and anyone who has an interest in music'.

The Hi-Fi exhibition at the holiday Inn Bristol, has established itself as the 'most important opening event of the U.K. hi-fi calender', in the opinion of Gramophone magazine.

This remarkable achievement has been made in just four years, through commitment from the major manufacturers, the enthusiasm of the organisers, and the choice of a superb location, to produce an exhibition of enviable quality and organisation. Because the exhibition is organised so superbly, it leaves the public free to enjoy visiting the many stands, and appreciate the audio visual technology on offer

Easy access will make Hi-Fi' 90 a national success

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Most of the products from the major companies showing at Hi-Fi' 90, at the Holiday Inn Bristol, will be offered at 10% off the normal selling price. The discounts will help attract people from all over the country.

Many of the show's visitors are expected to take advantage of the discounts on offer, as they make a great deal of difference to the final price of a complete system.

Enthusiasts have said that this helps to provide a good atmosphere at

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| Acoustic Research | Celestion | JPW | Nagaoka | Snell |
| Air Tight | Chord | KEF | Naim | Sony ES |
| Aiwa | Creek | Kenwood | New Musical | Sony Tape |
| Akai | Cyrus | Koss | -Express | Stax |
| AKG | DCM | Lexicon | On | Tannoy |
| Allison | Denon | Linn | Onkyo | Target |
| Allsop | Discwasher | Loewe | Panasonic | TDK |
| Alphason | Dorex | Lumley | Philips | Technics |
| Apollo | Dual | Madrigal | Pink Triangle | Thats |
| Aragon | Epos | Marantz | Pioneer | Wharfedale |
| Audio Innovations | Goldring | Mark Levinson | Posso | What Hi-Fi |
| Audio Note | Haffler | Maxell | Procead | Wheaton Music |
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THE DIRECTORY

PERSONAL STEREOs

Whilst not exactly hi-fi components, personal stereos probably play more music to more ears than all manner of domestic systems and as such demand some attention. Now that personal CD players have joined the ubiquitous Walkman in the market, the variety and standard of sound quality is huge, with obscurely named cassette players practically falling out of your cornflakes packet and Discmen going for £300.

Despite their diminutive size personals attempt to incorporate as many gimmicks and features as

possible, cassette players often incorporating tuners, graphic equalisers and Dolby noise reduction. CD players are still relatively expensive and don't tend to vary that much on the features front, rather the amount and quality of accessories differs. Most models come with a mains adaptor and some include remote control.

Sound quality on the cassette front seems to have a proportional relationship to price and integrity of construction – wow and flutter being quite obvious on the cheaper models. CD players

become less noisy as they get dearer and also reduce in size; one drawback of the latter seems to be that immunity to shock suffers as a consequence. Cassette players do, on the whole, seem better suited to the outdoor life than their digital counterparts, as does the software. Bear in mind that the sound and lab ratings given below cannot realistically be compared to those in other categories or between cassette and CD personals.

PERSONAL CASSETTES

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa HS-PL300 £110	N/A Average	Good looking, simply laid out player with a sensible selection of features and reasonable sound quality for a small player of this price	Dolby NR, chrome/metal eq, remote		78
Aiwa HS-PX303 £150	N/A Good	Chunky and macho styling combines with comprehensive features and a half decent transport to make a powerful personal	Dolby B & C, chrome/metal eq, remote	R	78
Panasonic RQ-P505 £100	N/A Poor	Very attractive and neat little player with nicely designed controls and XBS bass boost, but sonically it's limited by distinct wow and flutter	Dolby, chrome/metal eq, remote		78
Panasonic RQ-P525 £120	N/A Average+	Fitted with what is effectively a bass only tone control and harbouring all the necessary features the 525 also has a knack with tape replay	Dolby B & C, chrome/metal eq, remote	R	78
Philips D6658 £30	Very Poor Poor	The low price limits sound quality, and this is not a spectacular machine, but it does a reasonable job nonetheless	Graphic EQ, AM/FM		56
Saisho PS90R £40	Poor Poor	A bit of a jumble of features and gadgets, the PS90R has on-board speakers, an extending aerial and even records, but sound quality is dubious	Graphic EQ, types I, II & IV, AM/FM, recorder		56
Sharp JC-270E £130	N/A Average-	Slightly old fashioned design combines with a basic feature count and mediocre sound quality to make an apparently uncompetitive player	Dolby, chrome/metal eq, remote		78
Sony WM-BF65 £90	N/A Average+	Regular size radio/clock/cassette player with a bright even open balance and Sony's forward facing phones. Not as glamorous as slightly more expensive models but sonically not bad	Dolby, chrome/metal eq, radio, alarm clock	R	78
Sony WM-701C £150	N/A Good-	Beautiful little machine with all the necessary buttons'n' switches and a fundamentally exceptional sound quality, marred unfortunately by wow and flutter	Dolby B & C, chrome/metal eq, remote, folding phones		78
Sony Walkman Pro £249-£289	Good+ Very Good	One of the finest sounding cassette decks on the market today. A mandatory Best Buy, it takes other personals to the cleaners (except on weight and power consumption)	Dolby B, C, types I, II & IV, record, line BB in/out, varispeed		52/56
Toshiba KT-4549 £80	N/A Poor	Fully equipped with 10 preset radio and alarm clock the KT-4549 is a bit aggressive on the sonic side and the bass boost system lacks balls	Dolby, chrome/metal eq, radio, alarm clock		78

PERSONAL CDs

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Goodmans GCD-10 £120	Average- Poor	Cheap, flashy and not short on accessories the GCD-10 is a rather noisy player that left a lot to be desired on the sound quality front	13.5 x 3.7 x 18cm, 478g, mains adaptor		66
Kenwood DPC-77 £270	Good+ Very Good	Very chunky and well made, the DPC-77 is the only player to include a digital output and sounds very good through its analogue output – a suitable domestic alternative	12.8 x 3.5 x 14.5cm, 750g, digital output, mains & in-car adaptors	R	66
Philips D6800 £130	Average Average-	A competitively priced and reasonably attractive looking player whose sonic performance is somewhat marred by a rather grainy top end	13 x 4 x 17.5cm, 516g, 3" ready, twin hdph sockets		66
Sanyo CP-12 £260	Fair Good+	Sonically amongst the more enjoyable personal CD players and capable of revealing the musical aspects of a disc in an interesting and entertaining fashion	12.5 x 2 x 12.7cm, 380g, wired remote, mains adaptor	R	66
Sony D-20 £150	Average+ Fair	Not bad for a machine at this price, it's nicely designed and reasonably robust, with reasonable sound quality	13.8 x 3.8 x 15cm, 450g, mains adaptor	R	66
Sony D-88 £300	Average- Fair+	A stylish and 'cultish' object, the D-88 is very small and has an adjustable disc drive for three and five inch discs. Sound quality doesn't quite match appearance	9.4 x 3 x 9.8cm, 300g, 3" ready, mains adaptor, no line out		66
Sony D-150 £300	Fair+ Very Good	One of the most enjoyable machines encountered, sounding informative and sweet and looking very tasty to boot. Comes complete with a tough carrying case	12.6 x 2.1 x 13.5cm, 420g, 3" ready, R mains adaptor	R	66
Xenon CDP-03 £180	Average- Fair+	A well made and competitively priced machine that is ergonomically spoiled by flat slightly unresponsive buttons. Sound quality ain't too bad but a trifle boring	12.6 x 2.7 x 12.6cm, 560g, high frequency filter, key lock		66

CD PORTABLES

CD Portables or Yuppie Blasters as we classified them are basically portable stereos gone digital, ie a compact disc player is included alongside the usual AM/FM radio and single or double cassette deck. Compact disc is a novelty that seems to add a fairly hefty premium onto the price of the standard ghetto blaster, but the improved sound quality over standard cassettes may justify this for some.

In virtually every case a CD output socket is

fitted which means that it's possible to play silver discs through a domestic amplifier and loudspeakers, thus they are some sort of substitute for standalone mains machines (as are the personal CD players). One drawback with having a CD player on board is that batteries are gobbled up even quicker than usual, up to ten batteries being required in some cases. Neither are the units particularly light, the heaviest weighing eight kilos!

However they do all run off the mains too, and come with an appropriate lead for this purpose. Other useful features common to most are spare input sockets to record from an external line source such as a preamplified vinyl disc signal, and microphone sockets for recording live events (although the usual lack of record level adjustment is a nuisance).

MODEL PRICE	SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Aiwa CSD-XL25 £150	Poor	It's cheap, cheerful and not too low on features but sound quality from disc is frankly uninspiring	Twin headphone sockets		73
Bose Acoustic Wave £750	Very Good	Not exactly a CD portable as it doesn't play discs, but a highly versatile and stylish radio cassette player that has bass	Input sockets, Dolby NR, PA capable etc	R	73
Grundig RR9000CD £300	Average	Relatively slick machine with full CD function and volume remote control, low on features for price and unspectacular sounding	Remote, motorised volume pot, condenser mic		73
Philips AZ8394 £200	Average-	Stylish in a wasp-like fashion, unfortunately the disc playing lets it down somewhat but otherwise it's OK	Twin decks, graphic eq., bass boost, condenser mic		73
Sharp QT-CD43 £280	Average	Quite a beefy box that comes complete with remote control for volume and CD functions. It even has a surround sound option which enhances imaging	Clock, speaker outputs, powered volume pot		73

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THE DIRECTORY

CD PORTABLES

MODEL PRICE	SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Sony CFD-D73 £280	Good	The model we received was intended for the Japanese market and thus may not be entirely representative but it made reasonable sounds and has novel features	UHF bandwidth, input sockets, graphic eq., Megabass	R	73
Sony CFD-DW83 £300	Average	A macho looking beast capable of highish levels, but unimpressive sound for the price. Nice styling and good for scratching	Clock, timer, balance, input sockets, graphic eq.		73
Toshiba RT-8089 £200	Poor+	Square and long but rather drab on the sound quality front, as well equipped as most but rather tinny in many respects	Clock, twin decks		73

STANDS AND SUPPORTS

It's becoming more and more apparent that all the components in a hi-fi system benefit from being placed on the right kind of support. It is already acknowledged that performance of electro-mechanical transducers, such as turntables and loudspeakers, can be greatly improved by using highly rigid supports. This notion has been expanded to include electronics such as amplifiers and compact disc players, and inevitably a broad range of stands and supports have been produced to cater for this requirement.

With loudspeaker stands there seems to be two

broad schools of design. The most common is the open frame type which uses square section steel tubing (usually less than an inch square) made up to form a tripod or quadropod stand usually fitted with spikes top and bottom to ensure good coupling to both floor and cabinet. However, for reasons of domestic harmony this latter option is often not pursued as eagerly as perhaps it should be. The alternative approach is to use mass. Larger section (approximately 3 inch x 2 inch) tubing is welded between square top and bottom plates and filled with sand and/or lead shot. Again, this type uses

spikes at the base but Blu-tack or the like for coupling with the speaker cabinet.

Equipment supports generally place isolation quite high on the list of priorities and usually use a lightweight steel frame to support an MDF platform. Once again spikes are used to minimise contact with the platform and ensure good coupling to the floor. Minimising weight without compromising rigidity seems to be the aim with turntable supports but those designed for electronics often employ some form of damping to kill vibration, sometimes in the form of mass.

LOUDSPEAKER STANDS

MODEL PRICE	TYPE FINISH	COMMENTS	TOP PLATE SIZE HEIGHT	VALUE	BACK ISSUE FULL REVIEW
Appolo A820 £40	4 leg Fair	A light open-framed budget design slightly lacking in rigidity and subjectively superceded by other stands costing £10 more.	19 x 19cm 53cm		58
Appolo A10 £47.25	4 leg Fair	A robust and lightweight model, it would make an ideal upgrade for those still happy with the big boxes of old.	19 x 19cm 44cm	R	58
Foundation Fred £65	2 leg Average	With sand filling the Freds made speakers sound tight and coherent with a more even balance.	19 x 19cm 36/43/59cm		58
Foundation Maggi £159	Pair Very Good	Made for Magneplanar and other similar panel speakers they seem to have a healthy effect on the sound quality thereof.	50 x 2cm 2cm	R	58
Foundation Pi £250	2 leg Very Good	Overpriced in material terms the Pi nevertheless has a very positive effect on the low frequency performance of conventional speakers.	20 x 20cm 25/38/46/53cm	R	58
Heybrook Point 5 £50	3 leg Very Good	An unusual triangulated open frame stand that can help certain speakers sound more transparent and fluent - a good value stand	23 x 21.5cm 47cm	BB	58
Heybrook HBS1 £75	4 leg Very Good	With its new aluminium base frame the HBS1 fared very well in the listening tests. It allowed much of the speakers own 'sound' to remain intact.	23 x 21cm 47cm	R	58
Linn Kan II £79	4 leg Very Good	Built to support Linn's Kan speaker this stand is well suited to the task, but is less successful with other loudspeakers.	19 x 16cm 59cm		58
Linn Sara £85	4 leg Very Good	The Sara exhibits some odd properties so its use other than with the Sara loudspeaker should be viewed with caution.	25 x 21cm 53cm		58
Monotrak Engineering M1 £58	1 leg Good	The M1 gave the mid and treble a commendably smooth and detailed presentation but bass sounded rather lacklustre and muddy.	19 x 18.5cm 48cm		58
Monotrak Engineering M4 £58	4 leg Very Good	Begging comparison with Heybrook's HBS1 the M4 maintained much of the openness and forthright detail of that model.	23 x 21.5cm 53cm	R	58
Monotrak Engineering M4S £58	4 leg Very Good	Its stature and stability would seem to mark it out as most suitable for smaller, lighter cabinets. The M4S possessed an open midband and clear treble.	20 x 17.5cm 53cm		58
Mordaunt-Short IS1 II £45	3 leg Good	Suited to low mass speakers, preferably using spikes to effect coupling, they sounded slightly 'jazzed up' but the overall sound was quite unclouded.	18 x 15cm 56cm	R	58
Origin Live £117	3 leg Good	An unusual tripod stand devoid of top plate and taking up more floor space than normal, subjective and technical performance was exemplary.	(support area) 22 x 17.5cm 52cm	R	58
Partington PP4 £50	1 leg Good	The PP4 offers a rather mixed performance, though when damped with sand infill it was less ready to embellish the overall sound and low frequencies became tauter and quicker.	18 x 16.5cm 48cm		58
Partington Dreadnought II £120 (filled)	1 leg Very Good	Ideal for systems on the light/bright side of neutral, the Dreadnought IIs nevertheless still need some careful re-examination by Partington.	17.5 x 16.5cm 63cm		58
QED TS22 Tristand £50	3 leg Very Good	Most tracks sounded uplifted or buoyant, never thick nor coloured. It worked well with most of the speakers tried and encouraged a fluid and revealing midband.	19 x 17cm 45/50/58cm	BB	58
RATA Torlyte £190	2 panel Excellent	Suited to low mass speakers, these unusual stands are hardly discreet but offer transparent and clean sound - much like the Torlyte table!	25 x 21cm 48cm	R	58
Target HS20 £55.75	1 leg Excellent	This monopod stand can be used either filled or unfilled and encourages different characteristics in the sound accordingly.	19 x 16.5cm 53cm		58
Target HJ15/3 £94	3 leg Very Good	Sound quality was basically very good though without the sand infill some loudspeakers may sound a little unbalanced as both bass and treble regions are subjectively exaggerated.	28 x 28cm 40cm	R	58

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HI-FI CHOICE SEE PAGE 16

THE DIRECTORY

EQUIPMENT SUPPORTS

MODEL PRICE	TYPE FINISH	COMMENTS	SIZE (H x W x D)	VALUE	BACK ISSUE FULL REVIEW
Audioquest Sorbothane Feet £10 each	Feet Good	These large gumdrops are very useful for damping vibrations in amplifiers and especially CD players.	6.5 x 2.5cm (circular)	R	57
Cornflake TCS5 £50	Table Very Good	A little too close to the ground for comfort, perhaps, but this novel and stylish little table is certainly worth seeking out.	29 x 43 x 33cm	R	57
Cornflake TCS6 £50	Shelf Good	A squat and rigid frame supports a Medite top board with four adjustable spikes, better suited to suspended sub-chassis turntables.	43 x 23 x 33cm		57
Deltec Isolation Base £135	Platform Good	Designed for all CD players, amplifiers and separates, but not suspended sub-chassis turntables, the isolation is second to none.	50.5 x 40cm	R	57
RATA Model A £125	Table Very Good	A three-legged Torlyte turntable support that has become something of an industry reference.	46 x 46.5 x 38.5cm	R	57
RATA Amplat £40.25	Platform Very Good	A lightweight and rigid Torlyte slat with spikes for floor or shelf mounting, it works well in conjunction with the Target TT2.	4 x 44.5 x 35cm		57
Sound Organisation Table £55	Table Very Good	A deceptively simple structure that just happens to be engineered in a thoughtful, and ultimately successful manner.	37 x 45 x 35cm	BB	57
Sound Organisation Wall Stand £40	Shelf Very Good	The first of its ilk and still amongst the best, this simple framework represents a vast improvement over standard furniture shelves.	27.5 x 43 x 35cm	BB	57
Target TT1 £42.75	Shelf Excellent	This rigidly braced shelf offers both good sound quality and material value for money.	26 x 46.5 x 35.5cm	BB	57
Target TT2 £49.95	Table Very Good	Standing up to the best in most areas, the TT2's only real foible concerns a slight loss of bass 'slam'.	52 x 46.5 x 35.5cm	BB	57
Townshend Suspension Base £145	Platform Fair	Designed to complement the Rock turntable, this platform will bring subjective improvement to a wide range of electronics.	43 x 36cm	R	57

CABLES AND CONNECTIONS

Although cables and connections are sometimes thought to be the least important items in an audio system there has been a growing awareness in recent years that they have a significant effect on sound quality. To this end there is now a vast array of exotic cables and interconnects available to those interested in experimentation. The key observation on cables is that they are much more than mere accessories. Carrying the audio signal, just as any amplifier does, it's really not too surprising that they can influence the quality of that

signal.

The characteristics of any cable are determined by the materials and topologies utilised in its construction. The purity of the conductor, nature of the insulator dielectric, mechanical construction, physical geometry, RF characteristics, efficiency of screening and finally the connectors themselves, all play vital roles in the sonic character. These factors tend to vary more with interconnect cables which are used to carry the signal between active components like pre and power amplifiers. The

interconnects summarised here were tested in 1m terminated lengths and therefore the results and prices relate to that length – some cables may well perform differently when used in longer lengths.

The features column contains information on the material make-up of the different cables with the following abbreviations: OFC – oxygen free copper, OFHC – oxygen free high conductivity (Audionote define the HC as high crystal), PC-OCC – pure copper by ohno continuous casting, LC-OFC – linear crystal oxygen free copper.

INTERCONNECT CABLES

MODEL PRICE (per metre)	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Apature LSD N/A in UK	Poor Fair	Faint resonant boom was audible at very low frequencies, but otherwise this cable sounded remarkably neutral.	Silver plated copper, PTFE dielectric		59
Audioquest Livewire Topaz £35	Good Fair	Sounding 'bigger' and faintly richer than Reference 2, Topaz was also slightly grainy at the top end.	Gold-plated plugs, OFHC copper		59
Audioquest Livewire Ruby £49	Fair Good	Smoother sounding than the Topaz, the extended crystal Ruby is less grainy and coarse, better able to resolve complex passages.	FCL copper twin axial	R	59
Audioquest Livewire Quartz £75	Good Good	Quartz has an ideal, neutral balance that embodies sparkling clarity without the drawbacks of harshness or compression.	3 piece plugs, PTFE dielectric	R	59
Audio Technica AT6115 £50	Very Good Fair	This cable sounds somewhat 'quieter' than the original LC-OFC interconnect, but is also less transparent and three dimensional.	PC-OCC copper coaxial		59
Audionote Copper ANC £35	Fair Good	ANC sounded punchy with a faintly lean but tightly-focused bass character. This crystalline precision waned slightly at higher frequencies.	OFHC copper twin-axial	R	59
Audionote Flexible Silver ANS £85	Fair Very Good	ANS scored a hit with its transparent midband and revealing but quite unforced treble quality. Bass transients were slightly softened.	Silver signal & Copper screen	R	59
Audionote Silver ANV £140	Poor Very Good	Far weightier-sounding than the flexible ANS, ANV interconnect also possesses a fair degree of treble clarity and sparkle.	21 strand silver Litz		59
Aural Symphonics N/A in UK	Poor Good	This cable enjoyed an open and transparent midband and sounded remarkably neutral and faithful to the source.	OF copper PTFE dielectric	R	59

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


THE DIRECTORY

INTERCONNECT CABLES

MODEL PRICE (per metre)	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Budget Patch Cords see text	Fair Poor	As thrown in gratis with cassette decks and the like – frequency extremes were restricted and performances were veiled.	Thin coaxial		59
Budget OFC circa £7	Fair Fair	Subjectively, this cable did lift much of the aural fog experienced with scrawny standard hook-up leads.	OFC		59
Deltec Slink £32	Good Very Good	Ideally used in lengths of under 4 metres, it errs on the lean side of neutral but has an uncommon transparency in the midrange.	4 silver plated OFC strands PTFE dielectric	BB	59
Deltec Black Slink £152	Excellent Excellent	Inherently neutral the cable faithfully reproduced broad and deep stereo soundstages with precise focus and a sense of facility.	8 silver plated OFC strands PTFE dielectric	R	59
Denon LC-OFC N/A separately	Very Good Fair	Supplied with Denon's dearer CD players this cable introduced a peculiar 'twangy' coloration at high frequencies, and a slightly soft bass.	LC-OFC, non-magnetic gold plated plugs		59
DNM Solid-core £15-£25	Fair Good	Transparent in the midband and full of sparkling detail in the treble, low bass was slightly curtailed (unterminated price £2.30 per m.)	Single strand nickel-plated copper. Unshielded	R	59
Kimber Kable PSB £32	Very Good Very Good	An exceedingly transparent midband but slightly 'clanky' treble. It always managed to sound remarkably uncluttered and open.	OFC, PTFE dielectric	BB	59
Kimber Kable KC-1 £47	Very Good Fair	Tonally faintly leaner and brighter than the more open-weave PSB, KC-1's treble detail was just too sharp and grainy.	Multi-gauge PTFE dielectric		59
Kimber Kable KC-AG £375	Good Very Good	Treble detail resolution was perceived in a slightly abrupt if wholly controlled fashion. Depth re-creation and lateral separation were excellent.	Multi-gauge silver, PTFE dielectric	R	59
MDM Interconnect £14.95	Good Fair	The subjective performance of MDM did appear a little imprecise at the frequency extremes, but a worthwhile upgrade on budget interconnect.	Coaxial, solid core, gold plated plugs		59
MIT PC-Squared £75	Fair Good	This multi-gauge cable produced a very open and buoyant midband but sounded slightly 'peculiar' at frequency extremes.	OFC, multi-gauge	R	59
MIT Spectral MI330 £193	Poor Fair	MI330 displays a marvellously open and enticing midband quality, bass is warm and rich but this character has a tendency to dominate.	Multi-gauge balanced bandwidth		59
Monitor PC 0100381 £17	Good Fair	There is more than a hint of instrumental muddling and bass is slightly soft, however, the slightly 'shut-in' sound is par for the course at the price.	OFC, coaxial	R	59
Monster Interlink 400 £30	Good Good	Bass is solid and punchy, counterpointed by a slightly overblown midband which tends to make vocalists sound larger-than-life.	Multi-gauge	R	59
Monster Interlink CD £44	Fair Fair	Low frequency is commendably weighty, but the top-end sounds vague and lacking in image focus. Suited to some systems better than others.	Multi-gauge		59
Monster Interlink Reference £88	Good Fair	Protracted listening indicated a lack of dynamic speed – a subjective sluggishness. It may prove well suited to up-front systems.	Multi-gauge Balanced bandwidth Gold plated plugs		59
Myst Tm £15.60	Fair Good	Fairly neutral with a pleasantly open and transparent midband. Some deep bass detail is lost but treble is sharply focused.	Solid-silver PTFE dielectric	BB	59
Origin Live Soli-Core Super £60	Good Fair	Improves over previous Soli-core samples in stereo depth and bass weight, but a 'loud' treble presentation remains.	Solid-core gold-plated AT plugs		59
QED Incon P1-Gold £14.95	Good Good	A lively open presentation that just borders on the lean side of neutral, the quick and lucid delivery affording considerable musical insight.	OFHC, gold plated Deltron plugs	BB	59
QED Incon Graphite GP1 Gold £18.95	Fair Fair	A shielded version of Incon P1, it sounded thicker at the frequency extremes, the top end being coarser and more out of focus. Good for long runs though.	OFHC Graphite shielding	R	59
Sony RK-C310ES £40	Excellent Good	Possessing deep firm bass and a sparkling top end it offers a balanced perspective with negligible coloration	Coaxial LC-OFC	R	59
Sterling £250	Fair Good	Possessing a neutral if faintly rich overall balance it supplies a pleasantly open and transparent perspective. (Reviewed in pre-production form.)	2 silver strands per conductor		59
Thorens SAC 100 £50	Good Fair	Performance is undermined by a slightly coarse and splashy treble, not necessarily bright, simply rather confused – and fine detail lacks resolution.	Silver-plated OFC, coaxial		59
Van den Hul MC-D300II £59	Poor Good	It tended to highlight some upper mid detail, but a generally open and spacious acoustic proved its saving grace. Slightly soft at LF.	Silver plated single strand VdH plugs	R	59
Van den Hul MC-1021II £69	Good Good	Possessing the same endearing qualities as the D300 it presented open and transparent soundstages and improved timbral resolution	Twin axial silver plated copper	R	59
Van den Hul MC-D502 £77	Fair Fair	The tonal balance was 'tilted' by a strong and authoritative bass line, which had the knock-on effect of muting treble detail. A bit dear.	Twin axial silver plated copper, teflon dielectric		59
Van den Hul Thunderline £147	Good Fair	Thunderline essentially parallels the sonic performance of the cheaper D102. HF is occasionally tainted by a 'tizzy' 'coarseness', bass is tight and dry.	Silver plated 'matched copper'		59
Van den Hul MC-Gold £247	Fair Good	It possesses a rich and beguiling treble balance that matches a weighty, slightly warm bass character. Seductive balance may prove worthwhile in some circumstances.	Silver & gold plated copper		59
Van den Hul MC-Silver £747	Good Good	Although remarkably transparent for an asymmetric design this costly cable was not considered to be of 'state-of-the-art' standard, and is bettered by cheaper models.	19 silver plated copper strands		59
Vecteur 8045 £49	Very Good Good	Sounding solid and forthright it might seem slightly cold in some systems but the treble 'edge' is mercifully clean. Very low frequencies were a little lacking in 'slam'.	LC-OFC signal & screen	R	59

LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Absolute Wire Force 4 £4.50 per metre	Good Fair+	By current standards there was a loss of fine, sharp detail at the frequency extremes, but it has a  and friendly sound	744 OFC strands, PVC dielectric		64
Audionote OR-200 £16 per metre	Fair+ Fair+	Open and detailed throughout the midband but a grainy coloration tended to corrupt subtle timbral information at very high frequencies	200 LC strands, polyurethane and cotton dielectric		64
Audionote AN-SP £100 per metre	Average— Very Good	A clean and open sounding cable that offered a deep and pleasantly detailed perspective. Bass was slightly restricted, but seemed tight and coherent nonetheless	15 silver strands, polyethylene dielectric		64
Audioquest Livewire Black £15 per metre	Good Good	It proved clear and punchy but with some grain across the treble. Nevertheless Black remains an interesting concept and proved better than Livewire Green	OFHC, surface only – foam core construction	R	64
Audio Technica AT6120 £95 – 10m	Fair+ Fair	Compared to earlier LC-OFC cables this PC-OCC derivative sounded smoother and less aggressive	PC-OCC, PVC dielectric		64
Bellwire 12p per metre	Poor Average—	Broadly speaking it delivered a bright and tizzy sounding treble with a fairly open and detailed mid with little or no bass resolution	0.5mm single strand, PVC dielectric		64
Deltec 8S £144 – 5m pair	Good Good+	The unerring transparency and detail resolution of 8S throughout the midband makes it a far cleaner and more spacious sounding cable than others at the price	4 silver plated OF copper strands, PTFE	R	64

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LOUDSPEAKER CABLES

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Deltec Black Sixteen £456 – 4.5m pair	Very Good Excellent	Bass was deep and rhythmically secure, the mid tonally pure and free of additional sibilance while the treble was both relaxed, sweet and highly detailed	16 silver plated OF copper strands, PTFE dielectric	R	64
DNM Solid core £2.30 per metre	Average Fair	A good general-purpose solid-core, though too bandwidth limited for high-end applications. Sounds great in some systems	0.65mm single strand, webbed PVC dielectric	R	64
Exposure £2 per metre	Good Good	It could sound a trifle matter of fact but this emotive flattening was also somewhat dependent on the music program. It is also highly suited to long runs	56 OFC strands, webbed PVC dielectric	R	64
Kimber Kable 4PR £49.45 – 5m pair	Fair Fair+	This directionally marked cable benefitted from an open and airy treble quality but seemed notably leaner than 4TC. Bass was well round and satisfyingly taut	4 x 7 copper strands per conductor, PVC dielectric		64
Kimber Kable 4TC £16 per metre	Good Good+	4TC made a great impression in the listening tests with an open midband, a smooth and unfatiguing treble with slightly rich but suitably weighty bass	OF copper, PTFE dielectric	R	64
Linn K20 £2.20 per metre	Good Fair	Subjectively it erred on the forward and bright side of neutral but enjoyed an essentially clear and punchy delivery	56 OFC strands, webbed PVC dielectric		64
Marantz ML-55S £24.90 – 10m	Fair Fair	Subjectively this cable offered a loose and splashy treble which, though not overtly bright, did compromise both tonal and timbral accuracy	30 OFC strands, 3 conductors PVC dielectric		64
Mission Cyrus £2.50 per metre	Average+ Good	Because of its impedance characteristic this cable will deliver a smooth and unfatiguing treble balance with loudspeakers offering an easy load	0.8mm single strand, PVC dielectric	BB	64
Monitor PC Silverline PC4 £5.75 per metre	Good Average	Sonically it laboured under a heavy and claustrophobic balance, lacking the see through transparency and lucidity of the better solid core cables	2072 x 0.07mm silver plated copper strands		64
Monster Superflex £2.50 per metre	Fair+ Fair+	Treble detail was both reserved and confused though there was little in the way of harshness and grain. Deep bass notes were also found to be lacking	OFC, multistrand, Duraflex dielectric		64
Monster Original £4 per metre	Good Fair+	Original sounded relatively congested and murky at higher frequencies but possessed weight and conviction in the bass	Multistrand		64
Monster Powerline 2 £12 per metre	Good Good-	Powerline stamped its own hallmark on the sound with a strong taut bass and an essentially clear midband giving tactile stereo images	Multistrand, helical construction		64
Musical Fidelity Lifeline £11.50 per metre	Fair Good-	Lifeline did demonstrate a strong directional inclination, affording a laid back but fairly neutral balance when correctly oriented	4 x 0.8mm PC-OCC strands	R	64
Naim NAC-A4 £2.25 per metre	Good Fair+	Tinged with brightness while the deep bass response seemed both over heavy and poorly integrated compared to the immediate competition	Multistrand, webbed PVC dielectric		64
NVA £6 per metre	Average+ Good	A light and breezy sounding cable best suited to short lengths, NVA benefitted from a clear and transparent outlook	7 x 0.25mm silver alloy strands, PTFE	R	64
Origin Live Soli-Core Ordinary £1.80 per metre	Good Fair+	Subjectively it bettered the performance of the costlier Super version, affording a pleasantly detailed and spacious soundstage with firm bass but slightly coarse treble	1.8mm and 0.5mm single strands	R	64
QED 79-Strand 90p per metre	Good Fair	For much of the last decade QED 79-Strand has been the first port of call for enthusiasts on the upgrading ladder, a tradition that should still hold true today	79 strand, PVC dielectric	R	64
QED Incon Graphite £1.75 per metre	Fair+ Fair+	This graphite version of Incon sounded cruder and generally more heavy handed than the cheaper unshielded type. Overall presentation was mildly restricted and cloaked in a faint aural fog	OFHC, polymeric screen		64
QED Flat 200 £1.95 per metre	Good Good	I detected a degree of confusion at low frequencies but this did not stifle the acoustic atmosphere which remained open and positive	200 strands, flat webbed PVC dielectric	R	64
Rotel Supra 4 £2.49 per metre	Good+ Good	Ideal for both long and short runs, it furnishes a big sound that benefits further from a smooth, unfatiguing treble	1,036 OFC strands, webbed PVC dielectric	R	64
Rotel Supra 10 £6.49 per metre	Good+ Good	Supra 10 provided a very free and open sound that was unhindered by any excess at low frequencies. Worth its weight in scrap copper!	2,562 OFC strands, webbed PVC dielectric	R	64
Sony RK-S5ES £59.95 – 5m	Fair+ Fair+	The sound of this cable was also somewhat controlled and over damped. The treble was relatively free and airy but lower octaves, including the midband, were constrained	350 x 0.08mm OFC strands, heat shrink dielectric		64
Solid core mains cable 36p per metre	Fair+ Good	It enjoys much of the smooth treble and articulate midrange usually associated with the better solid core derivatives. Lean but taut and rhythmically coherent	1.5mm square, 3 cores, PVC dielectric	BB	64
Sterling £499 – 5m pair	Fair Fair	This pre-production sample possessed a strangely muddled and reserved sound quality. It suffered from a progressive instrument modulation that totally confused more complex orchestral passages	Pure Silver, PTFE dielectric		64
Townshend Isolda £400 – 5m pair	Fair+ Good	Isolda possessed a truly dark background out of which rose a very solid and extended bass together with an excellent sense of transparency through the upper octaves	8 coax cables per conductor – very thick	R	64
van den Hul CS-122 £5.50 per metre	Fair+ Good-	Characterised by a driving and powerful bass, CS-122 proved to be a heavy sounding cable. Mid treble detail was refreshingly clear but there was a slightly muted air about the extreme treble	19 x 0.45mm silver plated strands, webbed rubberised dielectric	R	64
van den Hul CS-352 £12.95 per metre	Good Fair+	Subjectively it sounded like CS-122 only more so, the deep rumbling bass tending to overwhelm subtle musical details. It also appeared a trifle peaky in the treble	7 x 0.76mm + 168 x 0.125mm silver plated strands, rubberised dielectric		64
van den Hul SCS-12 £29.95 per linear metre	Good+ Good+	SCS-12 set a high standard with a tight and well focused soundstage populated with tactile stereo images. Bass wasn't as extended or resolved as some other cables	19 silver plated strands of 12 different gauges, PTFE dielectric	R	64
van den Hul SCS-2 £99.95 per linear metre	Good+ Good+	Overall it was commendably neutral and transparent but nothing less would be acceptable bearing in mind the tremendous cost of a stereo pair	665 silver plated matched crystal copper strands, PTFE dielectric	R	64
Vecteur R-CV30 £4.99 per metre	Fair Good	Subjectively the better of Vecteur's three-strong cable line-up offering a neutral overall perspective but with a slight loss of detail resolution at both frequency extremes	4 x 0.8mm LC-OFC PTFE insulated strands	BB	64
Vecteur S-CV90 £199 – 5m pair	Fair+ Fair+	It seemed both less transparent and integrated throughout the midband than R-CV30, though both frequency extremes were spruced with a tighter sharper delivery	6 x 0.7mm LC-OFC strands		64

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IN-CAR ENTERTAINMENT

In-car entertainment is an area not usually associated with the esoteric world of domestic hi-fi. However, it represents a source of musical entertainment that many of us are exposed to every day. The majority of new cars are fitted with some form of radio before they leave the showroom and in many cases this usually very basic player is taken for granted and accepted as representative of in-car audio standards.

For the price of a budget amplifier or more, there is a wide variety of in-car machines to choose from,

including cassette, CD and even DAT players. The majority of sub £300 players are integrated units featuring a cassette player, AM/FM tuner and amplifier, all in one remarkably compact standard sized box. At this price level the cassette players tend to be fairly basic affairs, although autoreverse and noise reduction systems are both fairly common. Tuners are usually of the digital variety with varying degrees of sophistication in signal tuning and presetting, with some machines featuring as many as 18 FM presets. The emphasis is on the frequency

modulated band and AM often suffers as a consequence, but fortunately for radio enthusiasts there are some exceptions.

The amplifier is usually designed to drive two pairs of speakers mounted fore and aft of the vehicle, and a fader is fitted to adjust the balance between the two. The dearer machines feature separate bass and treble controls which can be quite handy given the unusual acoustic of the car environment and the variety in balance and presentation to be had from car speakers.

MODEL PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Alpine 7282L £250	Good Very Good	A very attractive and seductive sounding player. The matt surfaced transparent preset keys are especially sexy	Bass/treble controls, 12 FM 6 AM presets, chrome eq., clock, 8W	R	61
Alpine 7905M/3539 £650/£350	Excellent Excellent	An easy to use and attractive CD/tuner, partnered with a powerful and flexible amplifier to give an effortless source of in-car entertainment	Bass/treble controls, 12 FM, 12 AM presets, slide-out, 150W	R	68
Blaupunkt Windsor SQR 38 £275	Good Average	Not very enthralling sonically, the Windsor is rather low powered but does have a reasonably stable tape transport	5 FM, 10 AM presets, 3.1W		62
Clarion 916HP £160	Good Average	With its rubbery buttons and touches of white this is a modest looking player let down by a weak cassette	Bass/treble controls, 5 FM, 5 AM presets, 9W		61
Clarion 946HP £250	Very Good Very Good	A good FM side let down slightly by AM performance. This Clarion is particularly nice to use with its nifty SAM tuning system	Bass/treble controls, 12 FM/6 AM presets. Slot-in, 15.1W	R	61
Clarion CDC7000/10028HA £650/£250	Very Good Excellent	Despite a slightly off-beat cartridge system the Clarion combo put in a performance that had the sonic edge over other CD/tuners in its test group	Bass/treble controls, 12 FM, 12 AM presets, security code, 80W	R	68
Goodmans GCE229 £150	Fair Average	If knobs, switches and legends are your bag then the GCE229 is the one for you - a lot of gizmos for the price and it even sounds OK	Bass/treble controls, 6 FM/6 AM presets. Chrome eq., clock, MSS, 10.1W	BB	61
Hitachi CSK-402E £250	Good Good	An attractively designed little player that for once doesn't disappoint when it comes to playing music, and it even has a security system	Bass/treble controls, 6 FM, 12 AM presets, Dolby, chrome eq., music search, 7.4W	R	62
Nakamichi TD-400E/PA-300 II £495/£329	Very Good Very Good	If you want your in-car entertainment to compete on sound quality grounds with your domestic system, this combo offers a very strong challenge	Bass/treble controls, 5 FM, 10 AM presets, uni-directional, chrome eq., Dolby B, C, 75W	R	62
Nakamichi TD-700E/PA-300II £874/£329	Very Good Excellent	For those who appreciate the wonders of analogue there are few in-car players to really compete with this superb cassette/radio. You can even adjust azimuth	Bass/treble controls, 6 FM, 6 AM presets, music search, Dolby, 75W	R	68
Panasonic CQ-497 £117	Fair Poor	The CQ-497 has a traditional style analogue tuning system making it easy to use. AM reception was good but the other sources are less encouraging	Bass/treble controls, chrome, NR, 7W		62
Philips DC680 £180	Average Good	A colourful and musically competent player that despite a gammy volume knob is well worth checking out.	8 FM, 4 AM presets 3.5W	R	61
Pioneer DEX-M300/CDX-M100/ GM-3000 £300/£450/£280	n/a Very Good	Separate control unit and boot mounted multi play autochanger make this a bit of a hefty installation but it uses the same magazines as their domestic players and sounds fine	Bass/treble controls, 18 FM, 6 AM presets, 80W, removable fascia		68
Proton 214CD/D275 £300/£175	Very Good Very Good	This Proton cassette/tuner offers good power and a level of fidelity appropriate to its price. Musically it has a Decca-like charm that is very appealing, plus a sensitive radio	Bass/treble controls, 8 FM, 8 AM presets, Dolby B/C NR, chrome eq., 85W	R	68
Sharp RG-F816E £200	Poor Average	Nothing if not novel the 816, with its unusual anti-theft system is custom built for the furry dice brigade, but is sonically a bit lacklustre	Four band graphic, 8 FM, 16 AM presets, ASP, Dolby, MSS, 10.9W		62
Sharp RG-F882E £220	Average Average	Again a glitzy full feature machine with a flip out control panel and plenty of lights. However, sound quality is a bit disappointing	Seven band graphic, 5 FM, 10 AM presets, ASP, chrome eq., Dolby, 8.5W		62

RECEIVERS

Purists will look down their noses at the very idea of combining two functions into one box, and indeed they always have done. But unless we're talking about the exotic elite, the creme de la creme of amplifier and tunerdom, intrinsic technical shortcomings simply aren't an issue.

One obvious reason why you should buy a receiver if you were otherwise considering an amplifier and a tuner is that there are savings, ie of

size. Generally you end up with one box in place of two similarly sized boxes, which has got to be a good idea. Receivers are also simpler to operate, in principle anyway. At the very least you save on one power switch, and typically you are presented with an integrated control system that is bound to oil the wheels of ergonomics.

But there is one important point to watch. Because receivers don't sell in vast quantities in

this country, and because this is one of the very few countries to use Long Wave for public service broadcasting, many - no, most - receivers on sale in this country cover FM and MW only. Remember that LW is the home of Radio 4, where it can be heard on the all too frequent occasions it is not on FM.

MODEL NAME PRICE	LAB SOUND	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Harman Kardon HK330Vi £259	Average Average—	No LW, and FM section best suited to strong, local transmissions. The amplifier is quite powerful but favours the treble. Bass is tuneful but lacks weight	5 inputs (inc 2 tape), FM/MW tuner		70
Harman Kardon HK440Vxi £299	Good Good	Clear, dynamic, slightly bright sounding design, a little grainy in extremis. Mono switching and LW missing from tuner, which otherwise performs well	5 inputs (including 2 tape) with FM/MW tuner	R	70
JVC RX-777VL £500	Good Good	Sharp, lively but euphonious sound quality from line and phono source is matched to a high grade tuner. However, many half-baked facilities blunt value for money	A/V capable with 6 inputs, equaliser, digital ambience, FM, MW/LW		70
JVC RX-1001V £770	Average Poor	Power output is well below spec, and sound quality is cluttered and messy on all inputs	Digital ambience processing, Dolby Surround, 2/4 speaker, 40 FM/MW presets		70
Revox B285 £1782	Average Average—	Sophisticated and capable tuner is married to a muddled, compressed sounding amplifier, which also has low sensitivity preventing the amplifier being driven fully in many situations	70 watts/ch, 4 inputs (inc 2 tape), 29 FM/MW/LW presets		70
Rotel RX-850AL £230	Good Good	Well built and sensibly equipped receiver with outstanding sound quality for the price via the tuner, phono and line sources alike. It majors on subtlety however, and may not impress the heavy metal brigade	4 inputs (inc 1 tape), FM/MW/LW tuner	BB	70
SAE R102 £599	Average— Average	This is an uneven but mostly good performer. It sounds constrained but musical, but the tuner is weak on both wavebands.	4 inputs (inc 2 tape), FM/MW tuner		70

THE WORLD'S NO 1 GUIDE TO BUYING HI-FI

VIDEO RECORDERS

For some time there's been a move to improve both the video and the audio quality of video recorders and TV sets alike as a necessary prelude to a proper integration between the two. Hi-fi video is obviously an important element in the story, and so is Dolby Stereo, the ambient 'surround sound'

system. The weak link of course is on the broadcast side. Although TV sound is well up to normal hi-fi standards, it has always been in mono and unjustly or otherwise has rarely attracted much audiophile interest. But TV sound is – or shortly will be – freed of the shackles of mono by the introduction of NICAM

stereo. NICAM – an acronym for Near Instantaneous Companding and Modulating – is the missing link that will help facilitate the much feted integration of video with audio. And then we have S-VHS, a system which does for picture quality what the other developments promise to do for the sound . . .

NAME PRICE	LAB SOUND & PICTURE	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Akai VS-75EK £550	Average Good	Excellent performance and a slick set of controls make this recorder a pleasure to use. Good price is a bonus	Hi-fi, NICAM, programmable remote	BB	71
Akai VS-77EK £700	Average Good	Another fine and carefully designed model from the impressive Akai video stable. The Dolby installation, whilst flawed, is certain to increase interest in the system	Hi-fi, NICAM, Dolby Surround decoder & stereo amp	R	71
Ferguson FV33H £500	Very Good Below Average	Beer budget NICAM has excellent tape search facilities and an intelligent remote control. Neither picture nor sound quality however are state of the art, and ergonomics are poor	Hi-fi, NICAM, transmitter LCD remote control		71
JVC HR-D750EK £500	Good Average+	Well sorted and relatively affordable NICAM recorder with LP sound only. It is pleasing to use and helpfully equipped, especially when trying to find individual recordings buried in long tapes. Performance is good in relation to price	Hi-fi, NICAM, transmitter LCD remote control	BB	71
JVC HR-S5000EK £1000	Good Very Good	This is the first domestic S-VHS recorder on the market, and it's an unusually well designed one with a wide range of well sorted features and controls. Sound and picture quality are close to state of the art, and miles ahead of any non-S-VHS recorder	S-VHS, Hi-fi, NICAM, LCD remote	R	71
Mitsubishi HS-B70 £1000	Very Good Very Good+	Superb model, and true state of the art picture quality, though you'll need a high grade S-VHS compatible monitor to reap full advantage. The facilities are also wide ranging and generally helpful	S-VHS, Hi-fi, NICAM, LP & SP, programmable remote	R	71
Nordmende V4405K £799	Good Good	Fine basic sound and picture quality, but the RF convertor introduced significant losses. An excellent model, but configured for German home market. VPS compatibility is of no practical use here, and the recorder lacks NICAM	Hi-fi, transmitter handset, digital FX		71
Panasonic NV-FS1 £1000	Poor Good	The control system is poorly organised, with cramped legends and some strange machine logic. Bar code programming is hardly a great achievement either. Picture and sound quality are good, but not state of the art	S-VHS, Hi-fi, NICAM, bar code programming		71
Sanyo VHR-D4710E £900	Very Good Good	Fine colour and moderate detail make for a basically good video section to match a fine sound section. Some of the facilities are a little disappointing however and the deck looks expensive	Hi-fi, NICAM, infra-red headphone remote, digital FX		71

COLOUR TELEVISIONS

The standalone television set is rapidly evolving into a key component in integrated home entertainment systems. NICAM digital stereo sound is now being broadcast for several hours a week from London and Yorkshire transmitters, so stereo CTVs are now becoming available equipped with NICAM decoding and with rather more attention paid to the built-in amplifier and speakers. NICAM is also available on Hi-fi stereo

videorecorders (see above), and this is usually the more practical route for hi-fi system integration, as well as allowing favourite musical events to be saved on tape. To both watch and record with stereo sound will require NICAM on each of course, but the decision to update one or the other first will probably have as much to do with the age of the respective components than the convenience of the interconnections.

The ten CTVs tested so far are all luxury stereo models with 'flatter squarer' 59cms tubes of various kinds. Best suited to a viewing distance of about 7ft, these are one size up from the most popular 51cms size sets and take about 23 per cent of the top 30 per cent of the market. All have remote control, Fasttext (enhanced teletext), and many have on-screen graphics and flexible in/out socketry.

NAME PRICE	SOUND PICTURE	COMMENTS	FEATURES	VALUE	BACK ISSUE FULL REVIEW
Ferguson 59K5Q £599	Average— Good	Attractive and compact design highlights unusual (and rather nice) matt finish Super Planar tube. Picture and ergonomics are pretty good but on-board audio is a bit of an afterthought, lacking sufficient welly for music programming; socketry adequate	59cm SP FST, NICAM, Fasttext, o/s graphics	R	76
Grundig ST-63-460TT £649	Average— Average+	Bulky set's shape resembles a square-rigged sail; screen tilts back slightly, so might suit floor mounting, though beware room reflections. Picture quality is good, if a touch bland, but ergonomics are fairly impenetrable – no on-screen graphics either. Halfway respectable sound quality is over-enriched by cabinet drone.	59cm FST, NICAM, Fasttext		76
Hitachi C25-P759 £699	Average— Average—	Visually very compact and neat, with excellent handset ergonomics and good on-screen graphics and features. Picture quality 'hyped' and compromised by 'peaked' luma response; on-board sound has muscle but not subtlety, and NICAM (SCART) output lacks muting.	59cm FST, NICAM, Fasttext, o/s graphics		76
ITT Nokia £629	Average+ Average—	Bulky square-rigged shape helps deliver a respectable standalone sound quality at a modest enough price. A versatile set with good handset but no on-screen graphics, the picture quality of our sample lacked fine detail resolution, lending a 'soft focus' effect	59cm FST, NICAM, Fasttext		76
JVC AVS250 £550	Average+ Average—	This compact and delightfully versatile non-NICAM set has respectable on-board stereo sound and lovely screen graphics, along with an infernal handset. Our sample suffered a tuner problem which marred a picture quality which was pretty good when monitoring baseband signals off tape.	59cm FST, Fasttext, o/s graphics		76
Mitsubishi CT-2553 STX £649	Average Good	Arguably the best all-rounder in the group, this compact monitor-style set suffers from exasperating ergonomics but the picture is detailed if a shade untidy, the sound lusty if crude. NICAM (SCART) output lacks muting, and colour rendition a shade individual	59cm FST, NICAM, Fasttext, o/s graphics	R	76
Panasonic Prism TK-24 W1 £699	Average+ Average—	Handsome but bulky set delivers serious standalone sound quality. Lovely ergonomics but off-air picture quality marred by tuner section noise on our sample (works fine as picture monitor). Good NICAM (SCART) output.	59cm FST, NICAM, Fasttext, o/s graphics		76
Philips 5574 £599	Average Average+	Neat and compact for a front-speaker set, this competitively priced allrounder lacks on screen graphics and remote white level (contrast) but is otherwise well equipped, if a shade undistinguished and conservative	59cm FST, NICAM, Fasttext	R	76
Sanyo CBP2559 £579	Poor Good+	Lovely subtle and detailed picture quality totally justifies strong recommendation, though handset is obtuse (lacking white level) and on-board sound is dire. NICAM £50 update due early 1990	59cm FST, Fasttext, o/s graphics, picture-in-picture	R	76
Sony D2512U £699	Average+ Average	Beautifully styled around the unique Trinitron tube, the sound benefits substantially from the odd looking detachable loudspeakers. Nice ergonomics with good on-screen graphics, the otherwise detailed picture is a little 'hyped'.	59cm Trinitron, NICAM, Fasttext, o/s graphics	R	76

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PERSONAL MESSAGES

Paul Messenger on Canon's research into Wide Imaging Stereo.

Stereophony is a very tricky topic, and I won't pretend a particular expertise since stereo precision and three-dimensional soundstages have never figured high on my personal list of priorities, and I rarely consciously adopt the 'stereo seat'. To run through the theories even superficially would take pages, but the bottom line is that real precision stereo is only available along the line that represents equidistance from both loudspeakers.

The illusion that encourages the ear/brain to form a properly coherent stereo image relies not only upon the relative loudness of the sounds from each channel, but also the arrival time of the sounds. If you move away from the centre line you can compensate for relative loudness by adjusting the balance control, but there's precious little you can do about the arrival time, given equipment which is currently available (though it's the sort of trick surround sound processors are starting to learn).

But if you use the balance control to compensate for an off-axis listening position, you still end up with a single line along which the stereo is reasonably well formed, only this time it's shifted one or other side of the centre line as well as somewhat

distorted. In a very real sense therefore, loudspeaker stereo is as personal an experience as headphone stereo, unless you plan to seat the family in line astern, or stack them up a stepladder (to quote Ancombe's unforgettable cartoon).

It's hardly surprising that techniques to 'widen' the effective stereo seat have pre-occupied enthusiasts and designers for the past 30 something years, with varying degrees of success. The most promising route has always involved manipulating the directivity characteristics – in the simplest case by siting the loudspeakers so that their axes cross in front of the listeners. Those to the left of the ideal line will be well off-axis from the nearer loudspeaker but almost directly on-axis with the further, right hand speaker whose relative 'beaming' is akin to boosting the output from right relative to left.

There are at least two basic objections to this. The first is that it doesn't work all that well, since directivity/distribution is frequently dependent and usually pretty irregular to boot. The second is that placing speakers around 45-60 per cent off the straight ahead position simply looks downright odd. An approach that avoids these difficulties brings me to the real purpose of this discussion, which is to provide an update on a Japanese research project taking place in a science park adjacent to Surrey University.

Cameras-to-photocopiers giant Canon is backing a senior engineer Hiro Negishi in an investigation into a Wide Imaging Stereo (*WIS*) loudspeaker design technique (described in *Choice July 1988* news pages), whereby drivers fire upwards against large(ish), offset reflective cones.

There's nothing new about acoustic reflectors to be sure, but the technique is rarely found these days, and is interesting for that very reason. The latest prototypes take the sensible step of employing dual-concentric drivers – specifically those made by the small Sussex manufacturer Audio Electronics and in the *TC10 Mk2* (reviewed in *Choice March '89*) – since this enables just a single cone

reflector to be employed.

The accompanying diagram explains the configuration far better than mere words. The DC driver is offset to one side of the baffle that forms the top of a drum-shaped cabinet (built from a section of plastic tubing). The 90 per cent apex of the cone is also offset, so that it sits just above the surround of the driver. The horizontal 'axis' of the system therefore becomes an extension of the line joining the point of the cone and the centre of the driver. The angles and offsets involved ensure that the reflections are concentrated in one direction, but give an unusually smooth loss of mid and high frequency output as one moves off axis, presumably because the reflected sound is axial in origin.

A fundamental difficulty is that the reflector will only work for frequencies of shorter wavelength than its own dimensions. It's therefore only really effective at high frequencies, but should in practice complement the LF-biased side-on direct driver output. The whole thing becomes highly complex and difficult to analyse, but in a published paper, some measurements comparing the Canon *WIS* version with the conventional Audio Electronics *TC10*, are very interesting indeed.

The *WIS* version is significantly smoother and treble output is much better maintained across a horizontal window. No vertical traces were shown, and one might well expect compromise here, though it's a trade-off that is probably worthwhile. Another measurement – new to me – examined the coherence of a stereo pair in-room, and here the 'direct' version showed more obvious patterning than the rather randomised 'reflector'. The implication is that the stereo will be less precisely focused, as part of the price for greater smoothness.

Mr Negishi has attempted to analyse stereo imaging properties across six parameters, placing two *WIS* variations in context with 'direct' and 'omni-directional' characteristics. There isn't space here to discuss this in detail, but I was struck by the concept of an image 'micro

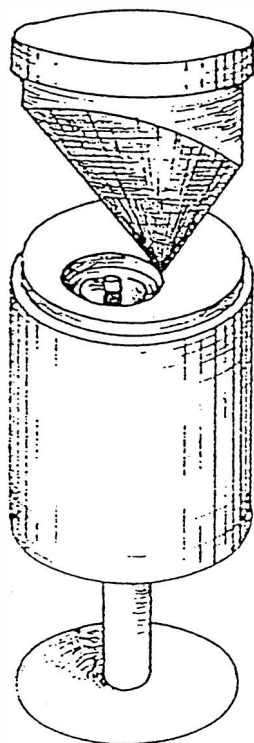
structure', as distinct from 'macro structure'. The former refers to the fine detail of focus and layering and is a natural property of conventional 'direct' loudspeakers, but is comparatively unstable with even small head movements; the latter refers to the broad balance and placement, which less directional speakers can sometimes portray more convincingly.

Listening was strictly under office conditions, but was enough to confirm that the 'stereo area' was indeed very generous – greater in width than the separation of the loudspeakers themselves, while still maintaining a reasonably convincing image, albeit with some 'clumping' distortion. There's some softening of focus and precision which some might find irritating, but to my ears this is accompanied by a refreshing lack of the 'hot spot' beaming effect that characterises many conventional speakers.

Most impressive of all perhaps is the extraordinary degree of variation that could be achieved from the one design. Re-aligning the axes simply by rotating the enclosures introduces one set of adjustments that carry no aesthetic penalty. Another involves placing shaped foam 'bricks' to attenuate output to the rear and side of the enclosure. By reducing the 'omni' component in what is basically a 'semi-omni' design, the stereo image is somewhat sharpened, but the overall spaciousness is reduced – much as one might expect.

It is this flexibility, and the possibilities it opens for endless experimentation that gives the configuration genuine enthusiast-appeal – not to mention the fact that it would be a fairly straightforward yet entertaining DIY project. The *WIS* capability, on the other hand, is an obvious solution to the problem of enabling several members of a family to sit round and enjoy NICAM stereo TV.

In all, reflecting cones have some fascinating possibilities, even without dragging in the vast possibilities that powerful CAD (computer aided design) programs could bring to subtle shaping of the conical lens to compensate for driver characteristics.





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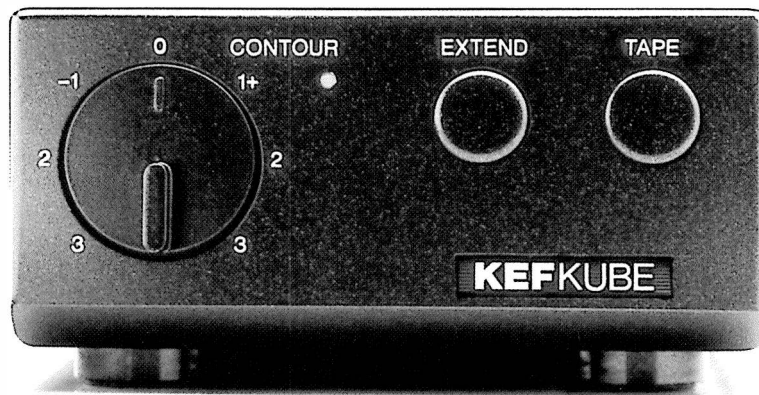
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The Sevenoaks Hi-Fi Magazine



**Nine superb systems reviewed
New products, new technology
Win a £300 Denon CD player!
Special headphones offer
Tips on selecting and
setting-up your system**

OUR SMALLEST REFERENCE SERIES LOUDSPEAKER IS ABOUT THE SAME SIZE AS THIS PAGE.



THIS INCREASES IT MANY TIMES OVER.

It's called KUBE. (KEF User-Variable Bass Equalisation).

This is its actual size.

Quite simply, it makes a small loudspeaker sound like a big one.

As an integral part of the system, it doesn't cost any more.

Model 102, as you can gather, is quite small (a mere 11 litres to be precise).

Everyone knows that small boxes aren't very sensitive and don't have much bass.

Until now.

Model 102 has high sensitivity (92db/2.83v/1M. for the technical), with bass extension to 40 Hz (-6db).

If that sounds impressive, there is more.

KUBE also allows you much greater freedom in loudspeaker positioning by using the Contour control to achieve a natural

balance, compensating for room boundary reinforcement effects.

KEF hybrid technology makes it possible. Here part of the crossover is active minimising sensitivity losses. Dedicated low frequency equalisation extends the bass cut-off frequency lower than it would be with a conventional speaker.

So you don't necessarily need a big amplifier or acres of space.

But then, of course, some people simply prefer small loudspeakers.

For them, there is none capable of out performing the 102.

The proof is waiting at your KEF Reference dealer now.

Ask him for a demonstration and you'll be in for a surprise.

In fact, a much bigger surprise than you'd have thought possible.



The Sevenoaks Hi-Fi Magazine

WORDS AND PICTURES Peter Herring

SYSTEMS REVIEWS Graham S. Mayor

DESIGN Philip Gorton

PRODUCED ON BEHALF OF SEVENOAKS HI-FI

By DIR Publishing Ltd.



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NO BIG DEAL?

Another magazine produced by a hi-fi retailer — so what? The usual quota of equipment listings and self-congratulatory verbiage. True of the majority of such magazines, but not so Sevenoaks Hi-Fi.

The Sevenoaks Hi-Fi Magazine aims to do much more. We want the words to be genuinely informative and helpful, both in choosing hi-fi equipment and using it. Much is the kind of basic, but nonetheless useful information neglected by many of the 'mainstream' hi-fi magazines. If you saw our first magazine, 'Surprising Sevenoaks', we're sure you'll agree. And we hope you'll find this latest effort worth reading and keeping.

As before, there are reviews of recommended systems — no less than nine of them — drawn from Sevenoaks' wide range of equipment. We've been around the Sevenoaks branches to find out which new products have impressed them of late, and asked the resident experts for their 'tuning tips' to get the best

performance from whichever hi-fi system you invest in.

But, as with our first magazine, you'll discover that 'Sevenoaks 2' is worth keeping for more than just its words of wisdom! Look out for another simple-to-enter competition, this time with a highly-desirable Denon CD player as the prize, and why not take advantage of our special offer — a free pair of £40 Sennheiser headphones can be yours.

While technologies have moved on, and products changed since our last edition, some things about Sevenoaks Hi-Fi have remained the same. And rightly so. There's still the broad base of equipment stocked (if anything, broader than last year). But it continues to steer clear of the freakily esoteric and certainly stops well short of the 'cheap and nasty'. Each shop retains its separate demonstration area where the emphasis is on relaxed comparisons and un-pressured guidance. You'll find yourself talking to people who know their products and enjoy selling

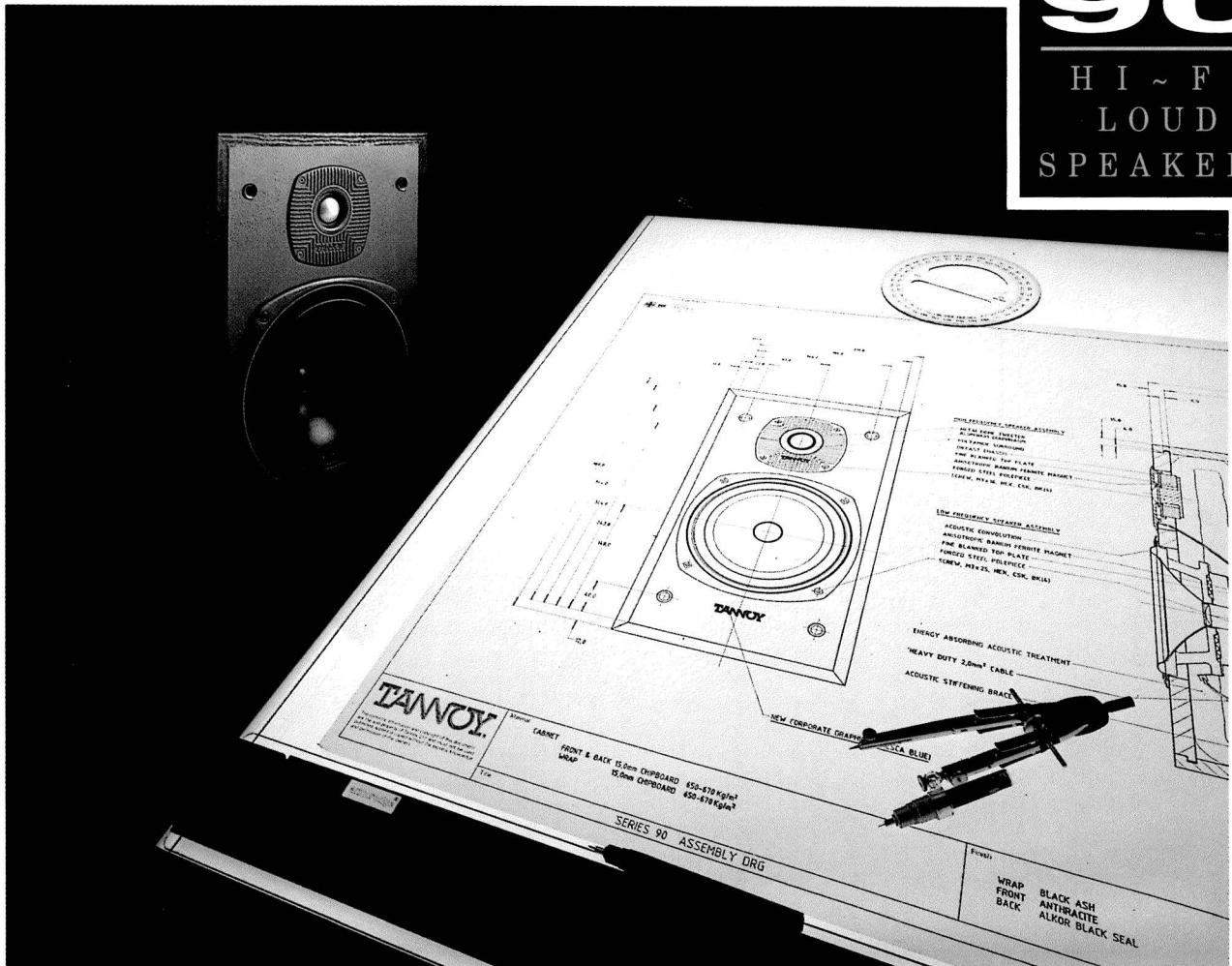
hi-fi because they enjoy listening to good sound themselves. Supplementing the in-shop demonstrations, there's the option of a no-obligation home trial of the equipment you've selected. Moreover, if what you've bought ultimately fails to satisfy, then Sevenoaks are always happy to try to arrange an exchange, subject to the expected conditions.

It sounds as if this kind of service has to come expensive. Not so. Sevenoaks aim to offer the most competitive prices without compromising service or customer protection. That also goes for anyone who uses their mail order service. Anyone, anywhere in Britain can take advantage of Sevenoaks' range and prices. Since all products are conveyed by Securicor and fully insured against loss or damage in transit, mail order customers can buy with confidence.

Though it is able to pass on the commercial advantages gained by being a seven-strong group, such as buying power and an exceptionally wide range, essentially Sevenoaks Hi-Fi remains an individual service: for individuals, and by individuals.

THE STORY SO FAR... **DC1000** "THIS IS ONE OF THE MOST EXCITING, ENGAGING AND REFRESHING DESIGNS I HAVE COME ACROSS IN RECENT TIMES" **HIFI ANSWERS**, MARCH 1989 • **DC2000** "HIGH WONDERFUL AND EXTREMELY RECOMMENDED" **C D REVIEW**, MAY 1989 • "THE TANNOY IS AN EXCEPTIONAL LOUDSPEAKER, ESPECIALLY GIVEN ITS ONE IRREFUTABLE HANDICAP - IT'S SIZE" **WHAT HIFI**, JUNE 1989 • **DC3000** "GO ON, FIND A DEALER AND LISTEN TO WHAT THE DC3000 HAS TO SAY. YOU'LL FIND IT A SEDUCING EXPERIENCE" **HIFI ANSWERS**, AUGUST 1989 • **M15** "I FOUND THE M15'S PRESENTED A WELL DEFINED, WEIGHTY AND - MOST IMPORTANTLY - INFORMATIVE SOUND" **NEW HIFI SOUND**, AUGUST 1989

TANNOY
SERIES
90
 H I ~ F I
 L O U D
 S P E A K E R S



SHOPFLOOR SOUNDINGS

The general agreement among Sevenoak staff and engineers is that good hi-fi equipment has never been better-made or more reliable — and that British equipment is now a match for any in this respect. Nevertheless, a one-year parts-and-labour guarantee comes free with everything you buy from Sevenoaks. There's also the option of a no-quibble extended warranty scheme, with a one-off payment covering repairs for five years.

Currently, but only for a limited period, Sevenoaks Hi-Fi is offering that 5-year warranty *free* to purchasers of selected top-end equipment. Buying products from, among others, the Cambridge Audio, Audiolab, KEF Reference and Roksan ranges will automatically entitle you to five worry-free years of parts and labour servicing. Only CD players and stylii — for understandable reasons — are excluded. Yet it's not a 'breakdown-only' service: repairs are made as soon as performance begins to deteriorate.

This no-quibble guarantee, along with home trials, and exchange-if-not-happy — is a facet of the Sevenoaks service common to all branches. Yet each is encouraged to develop its own distinctive approach.

All shops agree, though, that CD players have displayed a notable improvement in sound quality over the past twelve months, principally through greater understanding of, and consequently better-designed digital-to-analogue converters. In 1989, the same money buys you a better CD player than in 1988, while £250 and above buys a very good one indeed.

With first-class record decks available from the likes of Dual, Roksan and Systemdek, vinyl-based systems retain their popularity. Which is not surprising when you consider the number of records in collections everywhere, but what is perhaps surprising is that people are still keen to upgrade to better turntables such as the Roksan.

continued on page 7

“This no-quibble guarantee, along with home trials and ‘exchange-if-not-happy’ — is a facet of the Sevenoaks service common to all branches.”



Sevenoaks Hi-Fi's Chatham shop during a typically busy lunchtime: plenty of equipment to see and hear, and individual help with your questions.

100001

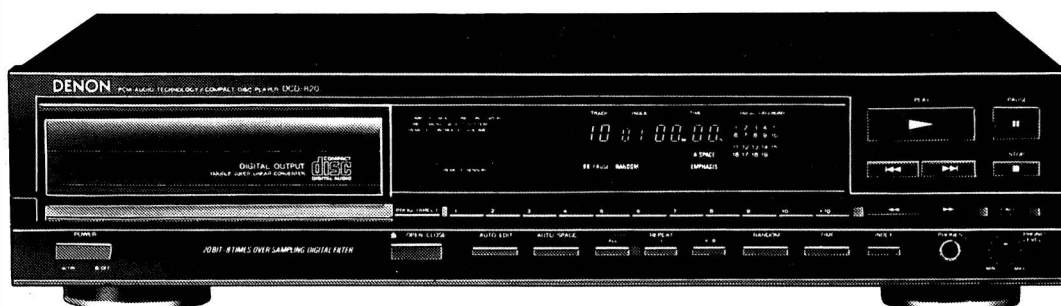
THE 'TWENTY' SERIES CD PLAYERS AT SEVENOAKS HI-FI



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DCD 820

£249.95

· Twin 16 bit DACs · 20 bit Digital Filters · 8 × Oversampling · Twin Power Supplies · Remote Volume · Co-ax Digital Output · Direct Track Selection · 20 Programs · Auto Edit · Index Search · Headphone Volume Control ·



The new 'Twenty' series CD players from Denon, feature the 20 bit "Delta technology" pioneered in our high end 3520/1520 models. The key audible benefit of this advanced circuitry is the improved resolution of low level detail and ambience. All of a sudden recordings sound more real, this multi-bit technology that works! The DCD820 and DCD920 are both outstanding CD players that offer terrific sound quality and a selection of useful features, only you can decide whether to spend that extra £50. Your Denon dealer will help you make the choice.

For full product information write to: Hayden Laboratories Ltd, FREEPOST, Chalfont St Peter, Bucks SL9 9BS

DENON

D E S I G N I N T E G R I T Y

from page 5

In practical terms, Sevenoaks' 'flagship' shop at Sevenoaks itself continues to develop. Despite already having two excellent demonstration rooms, one of them single-speaker, the facilities are set to expand further.

Elsewhere in the Sevenoaks Hi-Fi chain, there have been notable changes in four of the branches over the past year. At Brighton, two new demonstration rooms have been opened on upper floors of the shop, while at Guildford a programme of refurbishment has included new displays which will make it easier to examine equipment. The single-speaker demonstration room at Chatham has become an even more pleasant environment in which to relax, listen and compare, and that can also be said of the first floor on the Tunbridge Wells shop which is now the venue for Sevenoaks Hi-Fi's 'Music Club'. It's taken time to come together, but the club's regular musical evenings are now becoming very popular indeed. Several notable manufacturers have already made 'guest appearances' with many more planned.

Cambridge Audio were the club's first visitors and soon established to an eager audience that the CD3 compact disc player was a worthy successor to the CD2. Demonstrations by Musical Fidelity and Roksan have been equally successful, and proved to all that — given the chance — people do appreciate the differences between products.

As well as manufacturer evenings, it is hoped to arrange question-and-answer sessions with leading experts in digital audio technology, amplifiers and so forth. Look at Sevenoaks Hi-Fi's current hi-fi press advertising for details of the Music Club's activities (although Sevenoaks Hi-Fi customers in the Sevenoaks/Tunbridge Wells area will automatically be notified by letter). The Music Club is open to all, but it is essential to apply in advance for tickets.

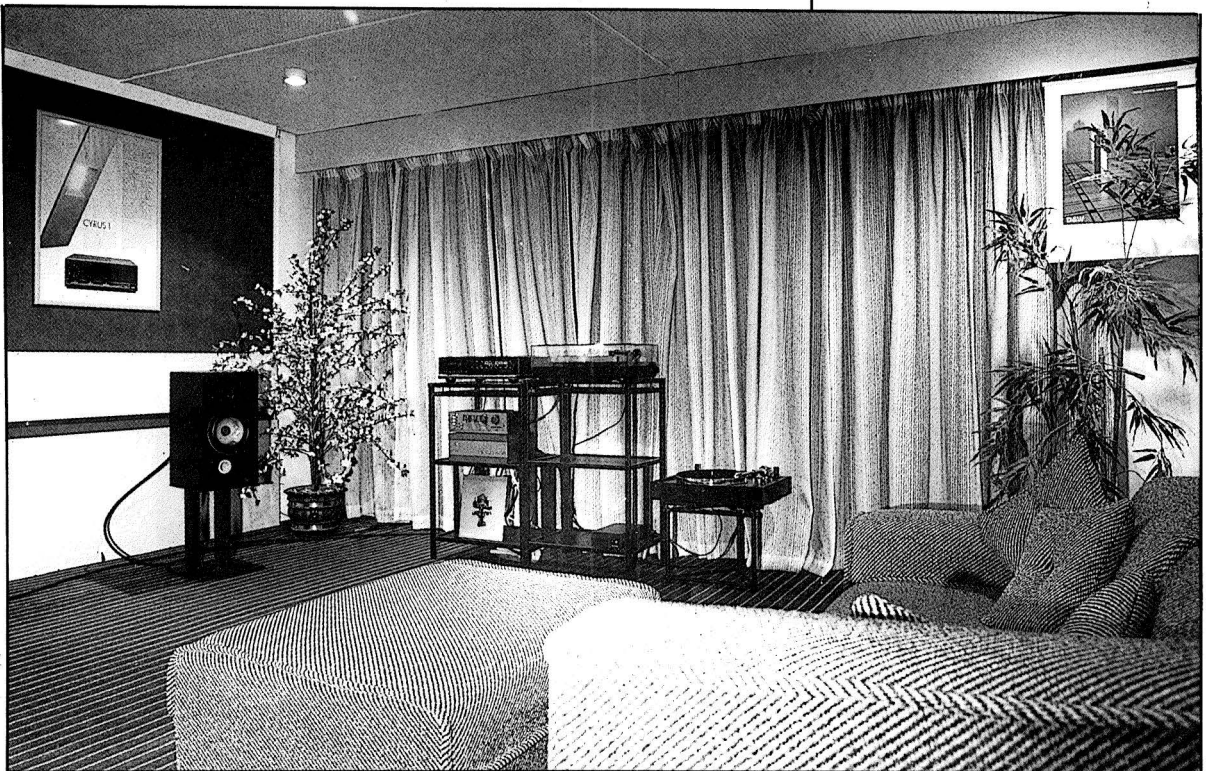
The interest shown at those 'evenings' in quality hi-fi separates has also been noted in Sevenoaks Hi-Fi's branches. It's a trend commented upon by the managers at Beckenham, Chatham and Sevenoaks. Awareness of names as Audiolab, Quad and

Musical Fidelity has grown.

We also asked the managers which products had impressed them during '89. Chris at Beckenham cited NAD's 5320 CD player, Musical Fidelity's B1 amplifier, the Arcam Delta 70.2 CD player and Monitor Audio's MA7 loudspeaker. There were mentions too for Musical Fidelity's MC2 and MC4 speakers ("a nice package") and a general admiration for the Arcam range. As someone keen on outboard digital processors, the Musical Fidelity Digilog has also impressed him.

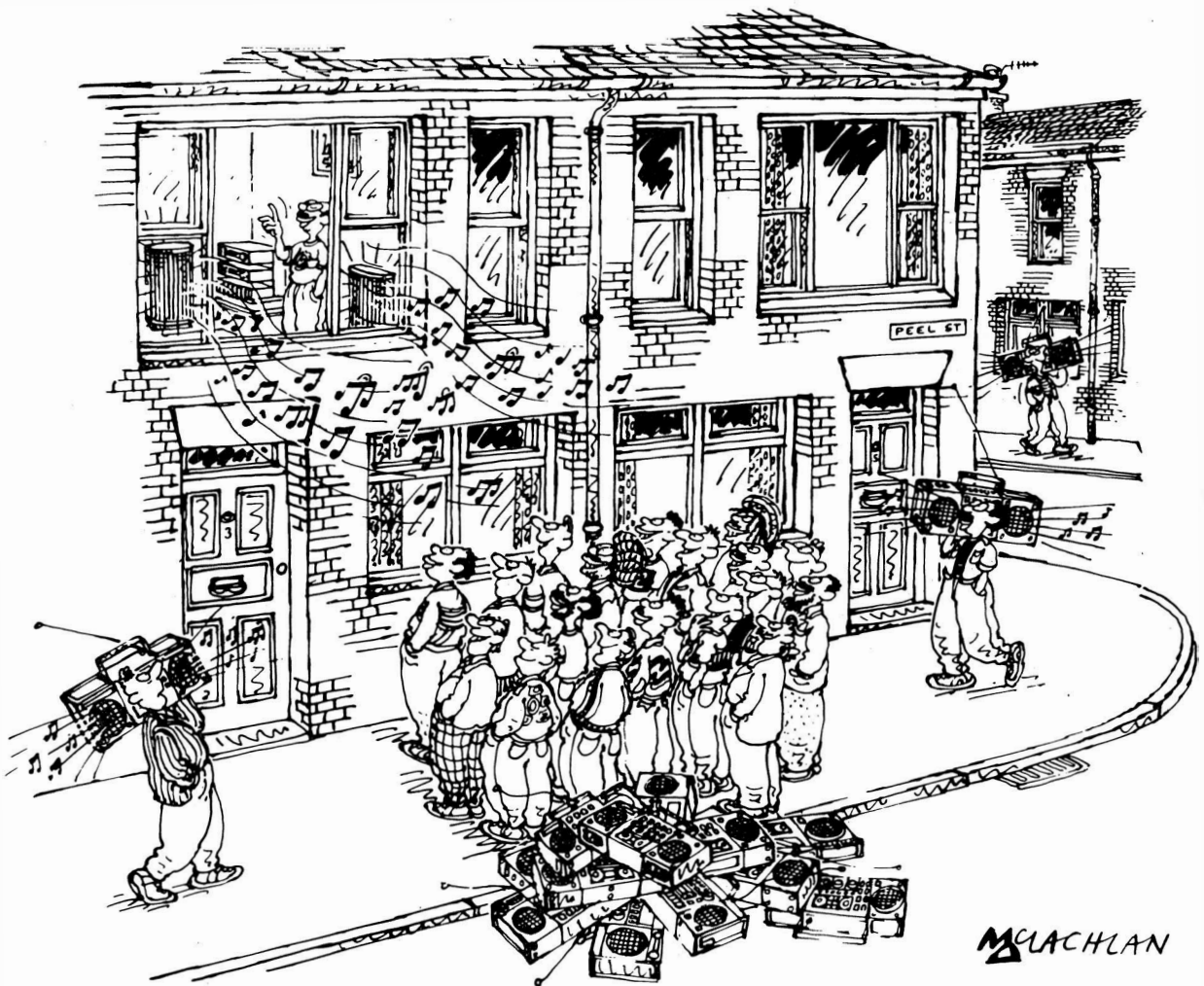
Chatham's Richard echoed some of his colleagues in admiring the Denon range and put in a good word for Castle's loudspeaker series ("a good-sounding product with a fine cabinet finish"). Other speakers to receive plaudits from Ron at Sevenoaks Hi-Fi's Woolwich branch were the Red Box 1 from Acoustic Research, just £99 a pair, and the £200/pair Musical Fidelity Reference 2. Also getting the seal of approval from South-East London were Marantz's CD85 compact disc player, the Revolver Rebel turntable and NAD's 3225PE, a


continued on page 9



Above: The comfortable surroundings of the single-speaker demonstration room at Sevenoaks itself.

When music matters, nothing's quite as good as Quad.




QUAD

For the name and address of your nearest Quad authorised High Fidelity dealer, write to Ross Walker at Quad Electroacoustics Ltd., Huntingdon PE18 7DB. Telephone (0480) 52561

from page 7

£150 integrated amplifier whose 'power envelope' circuitry offers 84watts/channel from a nominally 25watt amplifier. There was also a commendation for Audio-Technica's AT911H headphones.

The success of Marantz's CD65/II and CD65/IISE compact disc players has had the main Sevenoaks branch eagerly anticipating their successors. Manager Stuart is also looking forward to the new Mordaunt-Short range of loudspeakers. He, too, appreciates the dynamic sound of AR's Red Box I, and comments on the success of the similarly-priced model 3 from Celestion. That company's DL4 is also very popular, as is proving Tannoy's E11.

There's another good word for the Denon range from Brighton manager, John, who points out the positive benefits of its two-year parts and labour warranty. Sound-wise, the new Rogers LS4A loudspeakers have impressed, and the established Audiolab 8000A never fails to please. Audiolab was also the first name mentioned by Guildford's Kerry, commenting that it's reliability was now the equal

of Quad's — and they don't come much better than that. He was looking forward to hearing Quad's long-awaited CD player, and to the first generation of CD players using Bitstream.

Although there was little public interest in Bitstream as yet, the verdict from most Sevenoaks branches was that the prospect of NICAM stereo television and stereo video had fired people's imaginations. Ninety-per-cent of VCR sales at the Beckenham shop, for example, are now of NICAM machines, with Akai's VSA75 and VSA77 very popular.

The long-anticipated audio-visual experience is now here, but it does pose some practical problems in installation, yet ones which Sevenoaks Hi-Fi is well-equipped to solve. Matt, assistant manager at the Tunbridge Wells shop comments that people want equipment that's "environmentally friendly" in terms of living space. He gets a lot of enquiries about flush-mounted speakers and concealed wiring, as well as interest in 'lifestyle' audio products. At this branch, multi-room hi-fi installations have become

continued on page 34

THE AUDITIONS CONNECTION

In a move designed to benefit the customers of both, the Auditions chain of hi-fi shops has come under the 'umbrella' of Sevenoaks Hi-Fi. Customers of Auditions can now take advantage of Sevenoaks' expertise in buying and marketing, although the two companies remain independent of each other. In practical terms, that means selected Sevenoaks 'superbuys' will be available through the Auditions branches in London's Chelsea; Orpington, Kent; Walton-on-Thames, Surrey; and Witham, Essex.

These four Auditions stores are renowned for their elegant, comfortable and excellent demonstration facilities. Now, with Sevenoaks 'added value' special system packages on offer in the luxurious Auditions environments, buying hi-fi can remain a pleasure but not an expensive one. The Witham branch of Auditions, shown here, is typical of the high standards maintained by the whole chain.



Above left: One of the two plush demonstration rooms at Auditions, Witham. Both are air-conditioned, and the aim is to create typical, relaxed living room conditions.



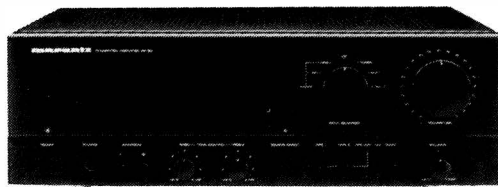
Below left: The spacious showfloor at Auditions, Witham. Separates brands stocked encompass NAD, Rotel, Marantz, Musical Fidelity, Acoustic Research and Exposure. There's also an audio-visual demonstration room.

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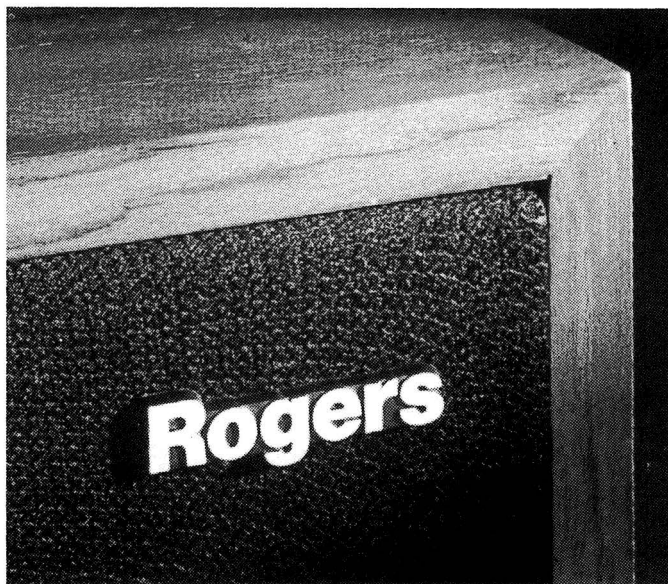
CD-60: 16bit, 4 times oversampling, H.Q. motorised remote volume control, favourite track selection, OPT DIG OUT **£299.99**



SD-60: 3 heads, Dolby B & C HX Pro, variable bias, closed loop dual capstan, record calibration, dual power supply **£349.99**

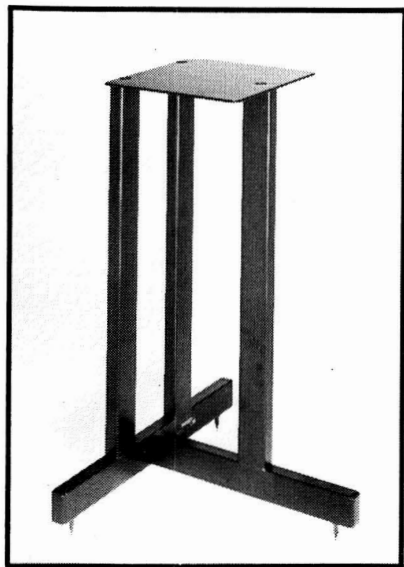
T H E N A T U R A L C H O I C E

Rogers



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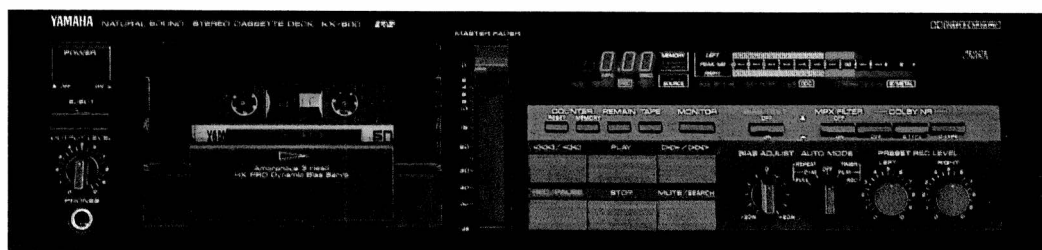
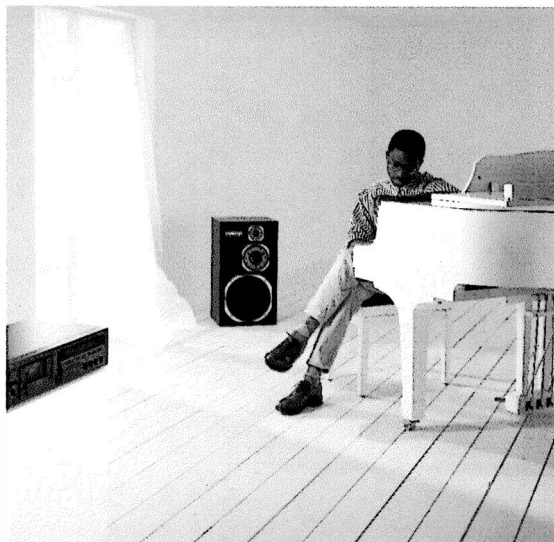
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*Dolby HX Pro is a trademark of Dolby Laboratory Licensing Corporation

Sevenoaks Hi-Fi have, once again, invited me to cast a reviewer's ear over a selection of hi-fi systems, suggested from the countless possible permutations of equipment available, for demonstration or mail order.

All prices correct at the time of going to press

In this competitive age of hi-fi marketing, bad products are very quickly weeded out; and more than ever before, it is possible to mix and match separates with ease; which is not to say that all permutations will perform equally.

We have concentrated our attention to the basic system, using either vinyl or compact disc sources. You could have both if you wish and you may certainly add matching radio tuners and cassette decks.

Graham S. Mayor

SYSTEM 1 — Low Budget System for the Smaller Room

The first systems under consideration fall right at the budget end of the pricing tree.

*Dual CS 503.1 turntable
Rotel RA810 amplifier and
a choice of speakers including:
Celestion 3
JPW Sonata
Royd A7 (See Sevenoaks advertisements for other loudspeaker combinations)*

System price: £264.95

Dual CS503.1

Elegant, simple to set up and use, with semi-automatic operation and fine sound quality, the Dual has been a consistent best-seller.

The deck comes complete with a Dual cartridge, which is actually one of Ortofon's low mass moving magnet devices, ready-fitted to the tone arm. Two-speed operation ensures compatibility with your albums and singles at the flick of a switch. The arm is good enough to handle rather better cartridges than the modest Ortofon, but the package works so well that few will bother to make a change.

Rotel RA810A

The little Rotel amp is a basic, good-sounding amplifier, offering an honest 20 watts per channel.

Standard bass and treble tone controls are provided, but with these systems there should be little call for them to be moved from their centre null position.

Celestion 3

The tiny Celestion 3 has met with much critical acclaim during its short existence. Unusual at the price is the provision of a metal-domed tweeter, which bestows the sound with a delightfully airy high frequency range.

Mounted on Target Audio



stands (at extra cost) and sited with their backs close to the wall, the amount of bass that these little boxes could produce was quite surprising.

Perhaps the system did tend to flatten the dynamics of the music a little, but this is a small price to pay for such a well balanced result. Nice one!

JPW Sonata

Beautifully made, with real wood veneers in place of the usual vinyl finishes, the Sonata can be substituted with no price penalty. Compared with the Celestion, the Sonata has a richer, warmer balance — though not markedly so — and the treble is a little more ragged, but the Sonata has a magic mid-range 'window' that can fully express the dynamic contrasts of the music.

Although most speakers will respond to improvements in the rest of the system, this one will truly rise to impressive standards when asked to work with up-market equipment.

Royd A7

Mid range transparency and a musical presentation are high on Royd's list of priorities. These qualities are much in evidence, but the cost is a particular level of mid-range coloration in the form of a hollow 'boxy' character, that to my ears is rather less

endearing; and the tweeter, similar to that used in the Sonata, sounds a touch more sizzly. Many listeners will accept these compromises for the speaker's excellent dynamic ability and tight, dry bass punch.

CD Source

Having picked your speakers from these, or the other choices available, the first substitution that you might wish to make is the change to a CD source in place of the Dual record deck. In this case Sevenoaks recommended the Philips CD610, which employs the highly-regarded 16 bit digital-to-analogue converters, with 4 times oversampling.

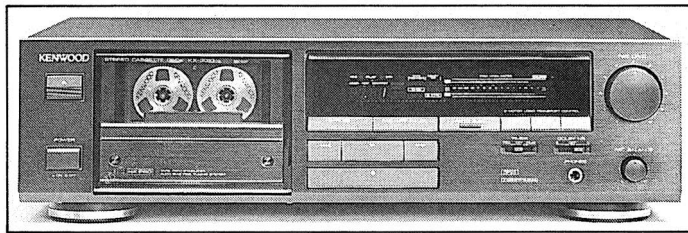
Inclusion of this player, which features remote control operation, in place of the Dual turntable, will add £50.

There is an obvious difference in presentation, whichever of the speakers you select. The CD source makes its impact on the sound, trading some airiness and subtlety for bass power and dynamic scale.

Here, the special qualities of the Celestion tweeter might make the 3 the better choice. Bass quality is lighter and better balanced than that of the Sonata, but both display that same presence and accuracy which appeals in CD based systems.

continued on page 15

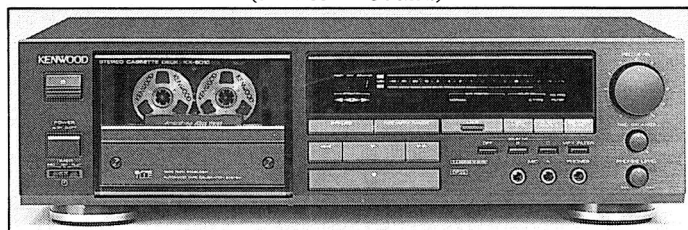
Before choosing your cassette deck, we recommend you get some quotes.



KX-3010:

☞ With enough features to make a CD player feel sick,
this Kenwood cassette deck sets a new standard for value
at its price. ☞

(New Hi-Fi Sound)



KX-5010:

☞ The KX-5010 sets a standard for subtlety and
informativeness ... that is likely to stand for some time, and is
therefore a clear Best Buy. ☞

(Hi-Fi Choice)

Enough features to make a CD player feel like
the proverbial parrot?

Setting standards for value and subtlety that
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of design.

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The Kenwood KX-3010 and KX-5010.

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SYSTEM 2 Something A Bit Bigger!

While the basic systems are ideal for the smaller home, bed-sitter land, and the more affluent teenager's bedroom, the next step up would be to provide a bigger sound more suitable for the average living room.

*Dual CS505.III turntable
NAD 3130 amplifier
with a choice of speakers from:
Mission 762
Tannoy M15
or Wharfedale 505.2*

System price: £385

Matching NAD 5320 CD player (as a replacement for the Dual record deck adds merely £25 to the system price).

Dual CS505.III

Essentially similar in concept to the cheaper 503, the 505 features a sprung chassis, a more substantial plinth, a slightly better cartridge and a richer, more robust sound quality.

NAD 3130

10 watts more power from the NAD amplifier may not seem a lot, but it is half as much again as that provided by the baby Rotel, and sufficient to give the speakers a noticeable lift.

A 'bass eq' network may be switched to add a tailored bass boost suited to small infinite baffle loudspeakers. Of more interest here is a 'soft clipping' feature which will provide greater headroom from the amplifier before the onset of overload distortion from the output stages. It could save your speakers from an early demise at party time. For

modest listening levels, leave it switched out.

Tannoy M15

The M15 is a large speaker, both in sound and stature, and equipped with a new metal domed tweeter, designed by Tannoy for this application. The result is a musically accurate sound in the British tradition.

The latest Tannoy range of loudspeakers is equipped with bi-wirable inputs. What this means is that you can run separate wires from the amplifier to the bass and treble units, each of which is equipped with a set of input terminals (normally bridged with wire links). You could even use separate amplifiers.

Mission 762

The Mission speaker sounds much different from the Tannoy, with a balance and character favouring the mid-range. The bass is just as deep, but tighter than that of the Tannoy, and needs the support of the rear wall to provide the correct amount of emphasis. This speaker is also extremely efficient requiring only half the amplifier power to drive them to the same levels as the Tannoy.

I felt that this speaker sounded better with the CD source than it did with vinyl, whereas the converse was true for the Tannoy.

Wharfedale 505.2

Like the Tannoy, this speaker likes to be located well away from the wall. This speaker is smaller and less physically imposing than the others, and its fine, clear sound suited vinyl and CD sources equally. The bass balance was lighter but not wanting.

The high frequencies were beautifully presented, without splash or sizzle.

SYSTEM 3 Sound for Pound

The next system suggestions are for those people who, less worried about the cosmetics, demand the best sound for money.

Here again we are ringing the changes around the choice of loudspeaker, adding the possibility of improving the turntable.

*Dual CS505.III turntable
Rotel RA870BX amplifier
and a choice of loudspeakers
including:
Monitor Audio R352MD
Tannoy DC2000*

*Alternative sources include the
Rotel RCD855 CD player and the
AR EB101 turntable system.*

System cost: £624.95

**with EB101 in place of Dual
CS505.III: £699.95**

**with RCD855 in place of Dual
CS505.III: £729.95**

The EB101 has a musical sound which is noticeably more precise than that of the Dual in the way it extracts the signal from the groove. There is more detail and more control, and the bass is deeper and punchier, but you lose the semi-automatic convenience of the Dual.

Rotel RA870BX

The 870BX offers plenty of power output (70 Wpc) and a CD direct circuit, with its own separate level control, routes the signal direct from the appropriate input to the power amp stage. It bypasses masses of pre-amp circuitry which may degrade the sound. Either way, the sound is powerful and musical.

Monitor Audio R352MD

Real wood veneer on large boxes adds an air of quality to the big sound these speakers produce. The bass is extended, the balance richer than neutral accuracy. The metal-domed tweeter keeps the top end under control to provide a sound which is relaxing at modest levels, but can kick out plenty of sound when needed.

CD reveals the might and control of the Monitor Audio bass, although again there is the trading of vinyl delicacy for CD power and weight that characterised these more modest systems.

continued on page 19

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CS 503-1

NOW ONLY £114.95

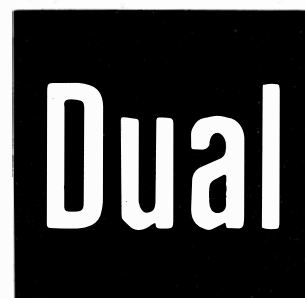
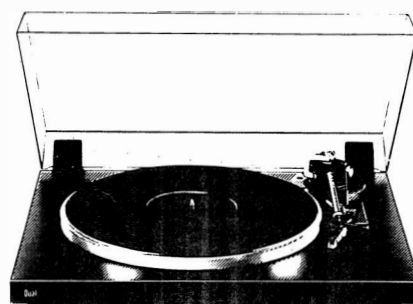


“The Dual CS 503-1 is the most important turntable introduced in the last year”

New HiFiSound, March 1988

“In absolute terms it is a good turntable for the money, with few rivals at the all-in-price.”

Hi Fi News, December 1987



NOW ONLY £139.95

CS 505-3

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“The improved 505-3 sounded impressive too with a deeper fuller bottom end and a greater feeling of authority.”

What Hi Fi, December 1987

“... 505-3 sounded better separated and slightly more vivid.”

What Hi Fi, December 1987



FOR YOUR FREE COLOUR CATALOGUE

Write to: Hayden Laboratories Limited,
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THE SCIENCE OF ART

Celestion have created a new vision in sound for music lovers who regard serious hi-fi as essential to their style of life.

The new range of Celestion 3000, 5000 and 7000 loudspeakers stand a world apart from the ordinary. The secret lies within Acoustic Ribbon Technology—the most advanced form of moving coil driver.

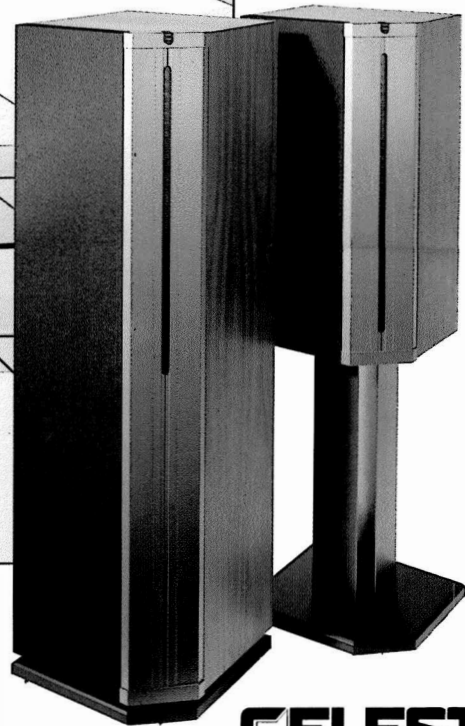
Radical technology matched to a new concept in speaker design, the new Celestion range will shatter all your hi-fi preconceptions into a thousand illusionary fragments.

Celestion. Because sound principles don't change.

Celestion R.S. System — patent applied for.



THE CELESTION 3000 5000 7000 RANGE

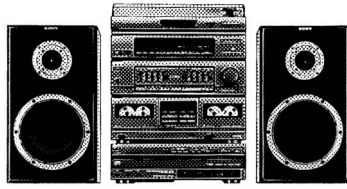


CELESTION

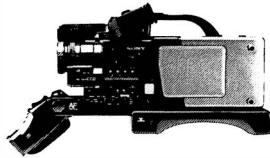


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WHEN YOU HAVE A COMPLETE RANGE



OF SONY MIDI HI-FI SYSTEMS



CAMCORDERS & BLACK TRINITRON



COLOUR TELEVISIONS TO CHOOSE FROM

Why compromise?

SONY®

Tannoy DC2000

In comparison with the others, this is a most unusual speaker, in that it features a version of Tannoy's famous dual concentric driver, which serves the whole frequency range. This is supported at low frequencies by a supplementary bass driver.

Sevenoaks find them extremely popular with rock aficionados, who appreciate their ability to deliver very high sound pressure levels and a huge bass, plus a first-class soundstage.



SYSTEM 4 Systems For The Lower Budget Audiophile

From amongst the products in Sevenoaks suggested systems, we can pick combinations more suited to the serious audiophile. Instead of substituting loudspeakers, here we have rung the changes around three popular British amplifiers.

AR EB101 turntable
Marantz CD50SE compact disc player
Rogers LS4A loudspeakers
and a choice between:
Arcam Alpha II amplifier:
System (vinyl) £520 (CD) £590
Musical Fidelity B1 amplifier:
System (vinyl) £540 (CD) £610
QED A240SA amplifier:
System (vinyl) £560 (CD) £630

For the listening tests, the AR turntable was fitted with a Goldring 1020 moving-magnet type cartridge, which adds another £50 to the system price. It normally comes with a modest cartridge from the Glanz stable, which is accounted for in the system prices quoted above.

The Rogers speakers must be stand-mounted, in a location clear of the walls of the room. It is a beautifully balanced design with low coloration, stunning imagery and a tangible depth.

Arcam Alpha II

The Alpha is a personal favourite of this writer; however, I have no previous experience of either alternative. It is beautifully made.

In the context of this system, and supplied with its signal from a vinyl source, it displays a lively, dynamic sound with an up-front presentation; it lacks the smooth refinement of the Rotel used in

the previous systems — but it is only half the price!

The balance is brighter than strictly correct, but sweetens after a lengthy warm-up period.

A moving-coil option is available for this amplifier, but adds a further £20 to the cost.

With the CD source, the Arcam sound was much closer to that of the B1, to the extent that it was difficult to exercise a real preference. The bass is a bit more full, but also it does not display quite the same level of bass control as the B1 nor its mid-band transparency, yet the differences are small and the Arcam has the price advantage. Of the three, this is probably the best for CD.

Musical Fidelity B1

This brand-new amplifier displayed a slightly sweeter sound than the Arcam, but with a similarly bright balance. Sound stage depth was more convincingly portrayed, and vocal quality was particularly realistic, but the overall effect was impaired by a tendency to sibilant 'splash'.

The B1 was even more impressive from CD than it had been from vinyl. Unlike the QED (below) there are no subtle savings to be made by leaving out bits of the amplifier. It costs more, but to my ears that extra is justified.

The B1 displays a delightful transparency and control from the highest treble to deepest bass, with no evidence of the sibilance that had accosted the vinyl disc sound, and reveals hidden depths of performance in the Rogers speakers.

QED A240SA

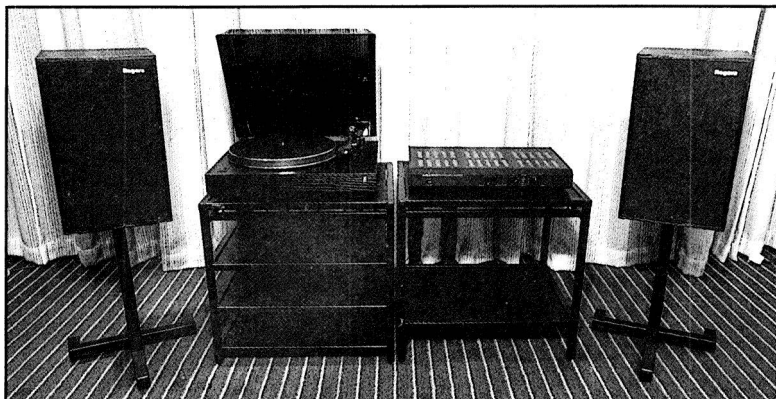
This amplifier produced a softer sound from vinyl than either of the other amplifiers, lacking the B1's sweetness, and its sibilance.

The QED amplifier is available without the high-quality vinyl disc input module as the A240CD amplifier. For the purchaser assembling a CD-based system, this provides a useful saving of £50 on price of the vinyl disc-based amplifier.

In fact, it was with the CD source that this amplifier really came into its own, sharpening the detail resolution and revealing the sound-stage depth that is a characteristic of the Philips circuitry, as employed here in Marantz's latest revamped version of their impeccable and very popular CD65SEII player.

The new CD50SE is a replacement for that highly-praised machine, with an improved presentation and a few extra features. It should prove a killer!

continued on page 21





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ELECTRONICS

because people like music

MISSION-CYRUS GROUP HUNTINGDON PE 18 6ED ENGLAND PHONE (0480)52777 TELEX 32333 FAX (0480)432777

SYSTEMS 5 & 6 Single Manufacturer Systems

*Mission Cyrus 2 amplifier
Mission PCM CD player
Mission 781 loudspeakers
Mission stands and cables*

System price: £950

*Arcam Delta 60 amplifier
Arcam Delta 70.2 CD player
Arcam 2 loudspeakers*

System price: £1,070

Mission

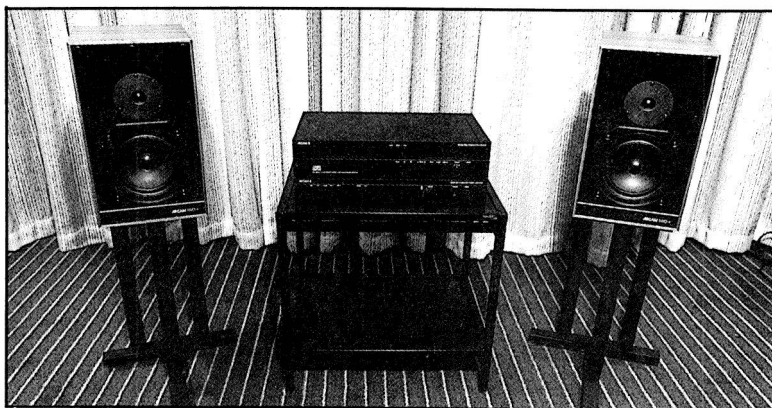
Mission's system concept extends to the use of special flat, solid-core loudspeaker cable and rigid (if rather resonant) stands with three point location for the speaker enclosures and spikes into the floor.

The speakers themselves are finished in real wood veneer and are equipped with two sets of input terminals for bi-wiring.

This is a system that instantly sounds as though it means business. No facet of recorded detail is missed, but at high levels the sound proved rather relentless and fatiguing for my taste — even if my foot never stopped tapping to the music.



Above: The all-Mission system. Below: All the way with Arcam!



Arcam

Like the Cyrus 2, the Arcam Delta 60 is a 'minimalist' design, yet the presentation of the system couldn't be more of a contrast.

Here the sound was hauntingly soft and sweet with three dimensional imaging. Yes wind up the wick and there is sufficient drive to do justice to a Queen mix!

SYSTEM 7 A Serious Component System with the accent on Classical Music

*Quad 34/306 amplifiers
Spendor SP1 loudspeakers
and, in the absence of Quad's
own imminent CD player, we
borrowed the Arcam Delta 70.2
from the previous system*

System price: £1,790

We have moved up-market a step for this system, which is capable of producing a massive sound of remarkable refinement, thanks largely to the sheer excellence of the Spendor speakers.

Quad's timeless styling is considered by many people to embody the epitome of British good taste. Products remain in the company's range for many years, the 34 pre-amp and 306

power amp being amongst the more recent additions.

A new, fully remote controlled, pre-amp (model 66) has already been shown to American buyers and is expected to join the range, along with the Quad CD player, early in 1990.

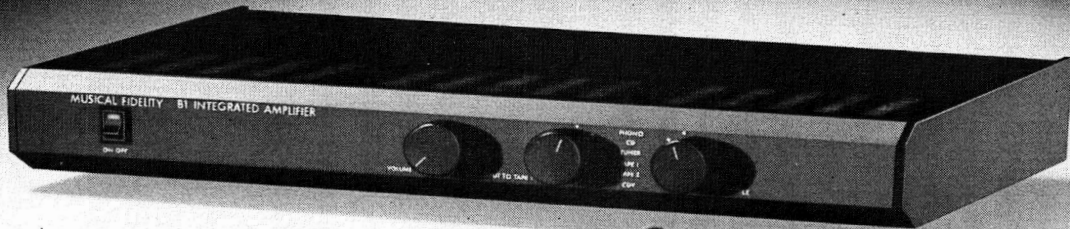
Quad's power amps are capable of an endearing quality that is difficult to escape from once you have experienced it at home. Is it any wonder that senior sales staff from Sevenoaks and myself all use Quad 606 power amps in our own systems?

In the Sevenoaks listening room there was a bass overhang that was well-suited to the realistic reproduction of classical music, but listening to the same speakers with the surprising addition of the stunning Pink Triangle Pip pre-amp (which alone costs £1,000 more than the whole of this system) the remarkable articulation of these loudspeakers was a joy to hear.

No obvious coloration and a system upon which it is possible to build for the future.

continued on page 23





The B1's tonal sophistication, precise imaging and resolution of atmosphere remind me of the A1 at its best. But this amp pulls off the rare trick of sounding detailed and dynamic yet relaxing and listenable at one and the same time.

In the way it delivers power effortlessly, keeps a firm grip on the shape of low frequency notes, and preserves the structure of rhythms and soundstages even when under pressure, it gives a level of performance commensurate with equipment costing a great deal more money.

At £300 to £350 the Musical Fidelity B1 would be a difficult act to follow. At £200 it trounces all the obvious competition...

NEW HI-FI SOUND September 1988

I'm convinced that the B1 is a very important addition to the market; that it deserves to sell in large numbers on the strength of its alluring and involving sound.

NEW HI-FI SOUND September 1988



This £200 integrated amplifier will cause a major shakeup, thanks to its remarkable combination of technical performance, power, build quality and sound...

With good sources it hardly sounds like a budget amplifier at all. A surprise comes in the bass which is pretty tight... The tonal quality through mid and treble is fine, while the clarity is high and the presentation of focus and depth is outrageously good for this class of product... an unusually competitive model.

HI-FI NEWS & RECORD REVIEW September 1988

The B1 produced a truly remarkable sound for a £200 integrated amp. It sounded powerful and explosive, with detailed resolution... This amplifier is out there on pure, exhilarating performance alone - a road-going racer without a doubt.

WHAT HI-FI? October 1988

WHO ARE WE TO ARGUE?

You can hear the B1 at selected hi-fi shops throughout the UK. Better still, for just £199.99, you can own one.

MUSICAL
 FIDELITY

MUSICAL FIDELITY, 15/16 OLYMPIC TRADING ESTATE, FULTON ROAD, WEMBLEY HA9 0TF

SYSTEM 8 More Specialised Component Systems

Roksan turntable £695
equipped with
SME IV arm and £810
Audio Technica ATF5 moving
coil cartridge £100
Audiolab 8000P/C Pre-power
amplifier £325/£495
Monitor Audio Reference 1200
Gold speakers £800
or KEF Reference 102 speakers
£345

This fabulous turntable system will appeal to the engineers amongst you. The turntable has a sense of style lacking in so many hi-fi products, and NO ONE makes tone arms with the constructional quality of an SME.

Put together a first class turntable system and even a relatively modest cartridge, like the Audio Technica, can return an impressive performance.

The Audiolab amplifier is built to similar impressive standards



and produces a self effacing sound quality that will simply pass on the signal at any levels the speakers can reproduce.

The Monitor Audio Reference 1200 Gold is a tall, elegant enclosure with a spiked base, intended for mounting directly on the floor, clear of the walls. At the rear, access is provided to a sealed cavity which may be filled with varying quantities of sand or lead shot to fine-tune the enclosure to the room.

The system produced a robust, powerful sound, with a deep and solid bass. The KEF loudspeakers are tiny by comparison. However,

to attain the same sort of big sound, KEF employ an active equaliser called Kube, which is inserted in the tape loop — or between preamplifier and power amplifier.

Kube has user controls which compensate for the effects of siting the speakers on stands, away from or against the rear wall, and on shelves. Inevitably the sound is a compromise and lacks the spacious, free-hanging qualities evinced by the much more costly Monitor Audio design, but it is difficult to imagine the weight and depth of bass that pops out of these tiny boxes.

SYSTEM 9 A Duo of Modestly- Priced Turntables

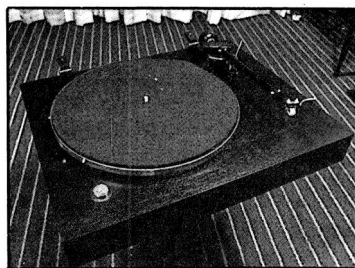
To finish off, we listened to a pair of more modestly-priced turntable systems, each fitted with a sample of the Audio Technica ATF5 moving coil cartridge that we had used in the previous system. For the comparison, we resurrected the excellent Rogers LS4A speakers and Arcam Delta 60 amplifier.

Manticore Mantra turntable with
Musician arm £495
Dunlop Systemdek turntable with
Moth arm £255
(A-T cartridge adds £100)

The Mantra turntable has been around for a while, but the Musician arm was a new one on me. The combination looks well, but there's no pretending it's in the Roksan/SME league.

The sound was crisp, light and bright, revealing plenty of mid-range detail. Despite a lightweight bass character, the sound was solid and suitably expressive.

By comparison, the Systemdek combination offers impressive value for money. The sound was not as explicit as that of the Mantra, but was better balanced,



Top: Manticore's Mantra turntable. Above: Dunlop Systemdek with Moth arm.

and, to my ears, even more musical. This is probably the best I have heard from a vinyl-based system at the price.

Reviewer's Choice

All the foregoing systems were put together to demonstrate a

large proportion of the range of products Sevenoaks have on offer. From those pieces of equipment, I ended up by putting together my own best buy recommendation. The accent is on presentation, reliability and performance without watching the pennies too closely.

Systemdek/Moth/Audio Technica
ATF5 £355
Arcam Delta 70.2 CD player

£550
Arcam Delta 60 amplifier £270
Rogers LS4A loudspeakers and
stands £220

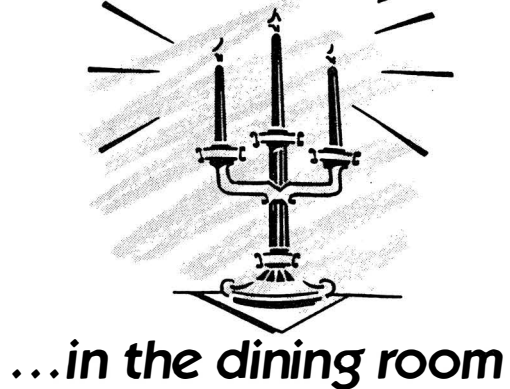
Total £1,395

Accessories

In addition to those products mentioned, Sevenoaks also stock and recommend a wide range of CD players and radio tuners from the Akai GX range, through Aiwa and Denon, again to Yamaha, which may be included to expand the suggested systems, in place of those matching components from the featured manufacturers' ranges. Plus, all those bits and bobs from cartridges to cables that help to make up and refine the system to one's own requirements.



**IF MUSIC
BE THE FOOD OF LOVE,
WHY NOT ENJOY IT...**



...or by the poolside!

With Systemline, you can enjoy real Hi Fi Stereo Sound anywhere you choose. It's a bit like central heating for Hi Fi.

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AR goes beyond the listening experience. Not only are AR products designed for music lovers, they are designed for those music lovers who also demand first rate built quality, attractive appearance and convenience of operation. The Spirit range are high-performance loudspeakers, built both to sound and look good. Behind the attractive frameless grille lies a dual-density baffle which dramatically reduces resonance and improves sound quality. In addition AR's direct driven woofers and minimalist crossovers allow tighter amplifier coupling to reveal more of the spirit of the original performance. Hear it soon at your nearest AR dealer.



The Spirit Captured

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LET US UPDATE YOU

While 1989 hasn't been a vintage year for new products, the choice in certain price brackets has been much enhanced with fresh designs. The highly-competitive £100-a-pair loudspeaker market is a case in point, with the arrival of the highly-praised Celestion 3 and JPW Sonata. Monitor Audio's MA7 has also joined the 'small is beautiful' league. There's an equally fine choice in loudspeakers around £150, evidence of the efforts being put into research and development by companies such as Celestion, Tannoy and Wharfedale. Companies such as these, along with the likes of Quad, Arcam, Spendor and Rogers can always be relied upon to produce a steady flow of fine products.

More specifically, 'vinyl junkies' should be pleasantly surprised by the sound from modestly-priced turntables such as the AR EB101 and the Systemdek. In CD, the Arcam Delta 70.2 is an outstanding product and there have been significant improvements

to Mission's PCM2. If you've an older CD player, then an outboard DAC (digital-to-analogue converter) such as Arcam's Black Box or Musical Fidelity's Digilog can effect a remarkable improvement. Looking ahead, Philips' CD 'clip' player promises to be interesting, along with the generation of full-digital pre-amps expected in 1990.

Also eagerly awaited is Quad's first CD player, and the new pre-amplifier which seems an excellent product, with a remarkably effective remote control.

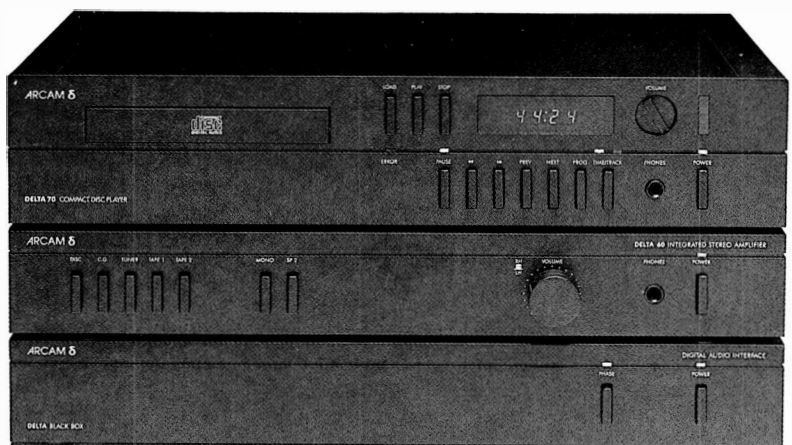
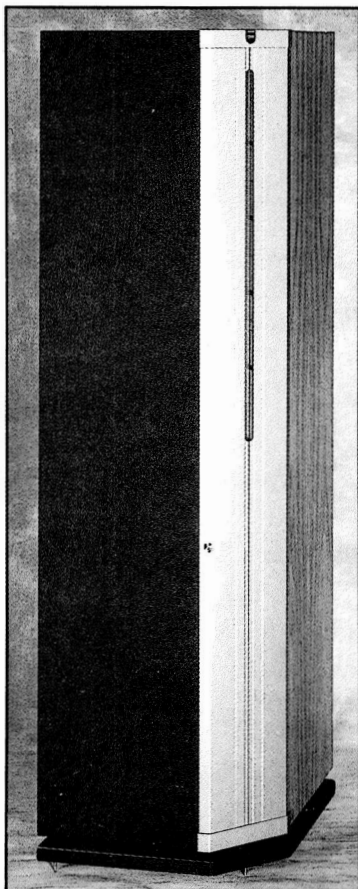
Already here, though, and offering excellent value are integrated amps from Musical Fidelity (the B1) and Rotel (the RA810). Rotel, with the RX850, and NAD, with the 7020, also offer great value in the often-overlooked receiver (tuner-amplifier) area. And, for the ultimate in convenience, consider the Denon receiver which also incorporates remote control for a cassette deck.

The latest speakers to arrive are Celestion's two ribbon designs; there's much interest in

these and in the new range from Cambridge Audio.

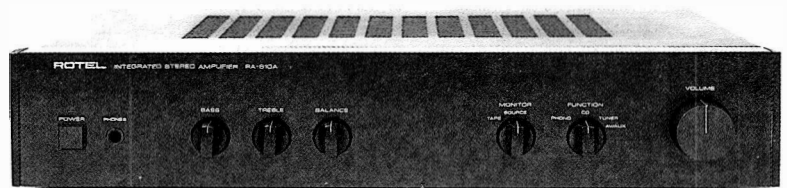
As ever, QED have come up with two truly useful accessories: a headphone amplifier for use with pre-amps sans headphone socket, and a microphone mixer for the number of cassette decks lacking microphone jacks.

Notwithstanding the name, Sevenoaks Hi-Fi is also strongly committed to the expansion in audio-visual entertainment. If you have a good hi-fi system, and are in the market for a video recorder, then a NICAM stereo machine is a must. They now sell for as little as £450. Akai's VSA77 actually incorporates a rear-channel amplifier, which means you don't have to mess around with your hi-fi set up to get surround sound. Top quality hi-fi video recorders are now stocked from JVC, Panasonic, Philips and Sony. Sevenoaks is also involved with the Yamaha DSP 'sound-field processor', and remains behind CD-Video, despite its poor showing in the market so far. Like DAT, its time must surely come.



Left: The Celestion 7000, one of three new loudspeaker designs which utilise 'ribbon' technology: the mid and high frequency driver is composed of a ribbon capable of handling frequencies down to 900Hz. this re-working of a traditional

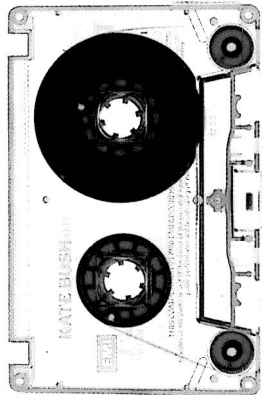
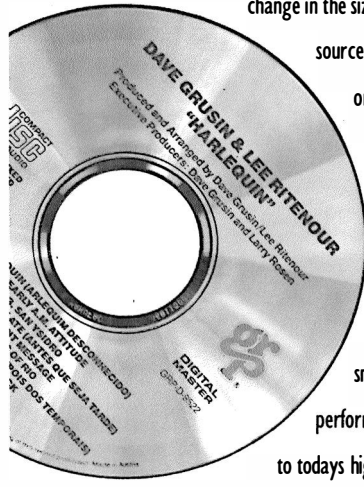
technology has aroused much interest. Above: Matching electronics from Arcam — Delta 70 CD player and Black Box DAC, and Delta 60 amplifier. Below: Rotel's 'budget baby', the RA810 amplifier.





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MAY
CHANGE**

**BUT
A
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As technology produces a constant change in the size and quality of our musical sources it's reassuring to know that one speaker manufacturer has predicted the trend well in advance. Introduced in 1983, the Wharfedale Diamond has broken down the barriers of small speaker design to yield a performance that's perfectly attuned to today's high quality digital and analogue signals in modern space efficient living environments. The latest Diamond III takes

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Questions

1. How many branches of Sevenoaks Hi-Fi are located in the county of Kent?

2. Do we have a fully-equipped central service department with well-trained engineers? YES/NO (please circle your answer).

3. Do we provide an insured mail order service for the UK mainland? YES/NO (please circle your answer).

4. Do we have separate demonstration rooms at all our branches? YES/NO (please circle your answer).

5. Do we sell ALL of the following makes: Quad/Musical Fidelity/Roksan/Audiolab/Pink Triangle? YES/NO (please circle your answer).

Win this Denon DCD 920 compact disc player

With the latest twin 20-bit DAC 8 x oversampling circuitry, plus motorised remote, Denon's DCD 920 will enhance any system. It's well worth winning!

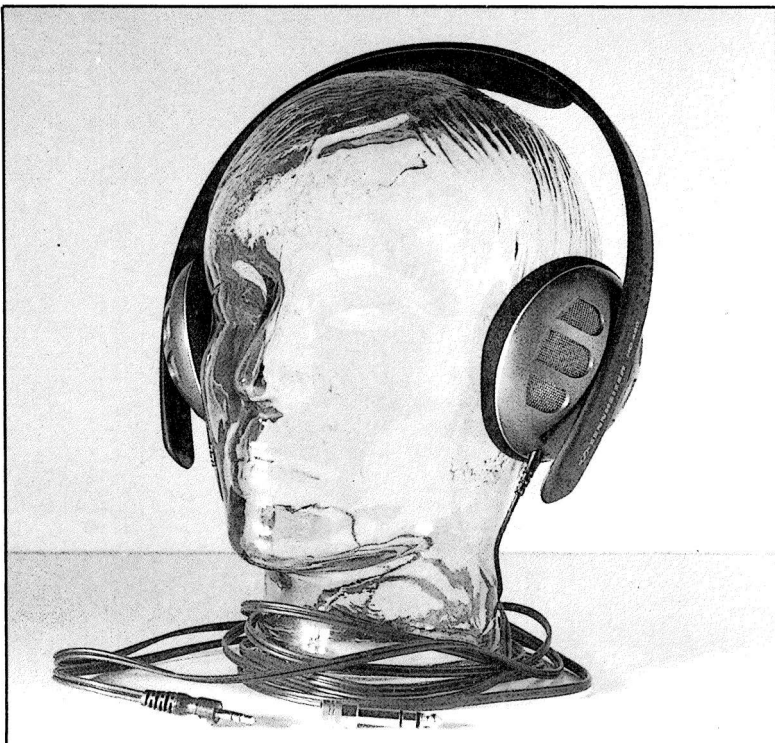
The winner will be the first correct entry pulled out of the editorial 'hat'.

NAME (PLEASE PRINT)	
ADDRESS	
POSTCODE	TELEPHONE

Post your entry to: "Sevenoaks Competition", 111 London Road, Sevenoaks, Kent TN13 1BA. Closing date: February 28th, 1990.

RULES: This competition is open to residents of the United Kingdom and Eire only and not to employees of any company connected with Sevenoaks Hi-Fi. Only one entry may be submitted by any competitor. Altered or illegible entries will be disqualified. Use ball point pen and print clearly in BLOCK CAPITALS please. The Editor's decision is final and no correspondence will be entered into. No cash alternative to the prize.

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don't throw this magazine away!**



**Sennheiser HD480 — worth £40!
"WHAT HI-FI?"
Award Winner**

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Your headphones will be despatched to you by return of post.

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OF MICE AND MEN...

Sevenoaks Hi-Fi is rightly proud of its service department, where a team of six fully-trained engineers undertakes the repair of everything from elderly hi-fi equipment to the latest CD players and video recorders. Assuming spares are available (and computer links with several major manufacturers ensure rapid delivery of components), the aim is to turn round most repairs within a week.

In their time, the Sevenoaks engineers have experienced most of the horrors that can be inflicted on hi-fi and video equipment, but there have been occasions when even they've been amazed. The 'renegade rodent' was one instance. The demise of a top-loading video recorder was discovered to have been caused by a mouse crawling into the open tape compartment and, before expiring, gnawing through as many cables and plastic components that it could find. Indeed, animal life has been responsible for its fair share of damage.

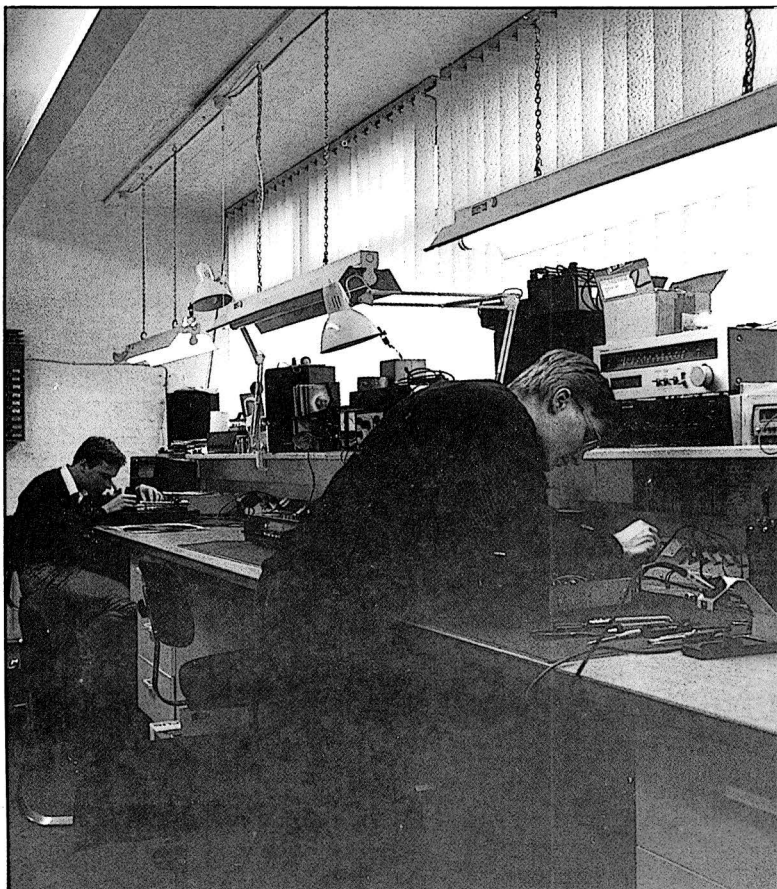
People also do things they'd

rather not talk about! There was the husband who eventually admitted that the hole right through his television was the result of ducking as his dinner was flung through the air upon his late return home one evening. More predictable will be the post-Christmas parade of speakers blown up at parties.

Yet many times, the 'fault' isn't a fault at all. The transit screws will not have been removed from CD players; amplifier balance controls will be turned to either the extreme right or left; tape monitor switches will be left on. In all these cases, just referring to the instruction book would have saved time and money.

They also concur that equipment is now better made than ever before, although simplification in some areas has been offset by the greater complexity of features and facilities. There is still more to proper servicing than simply swapping over circuit boards. And, they add, do mention that rodent-inflicted damage is *not* covered by our guarantee!

"People also do things they'd rather not talk about! There was the husband who eventually admitted that the hole right through his television was the result of ducking as his dinner was flung through the air upon his late return home one evening."

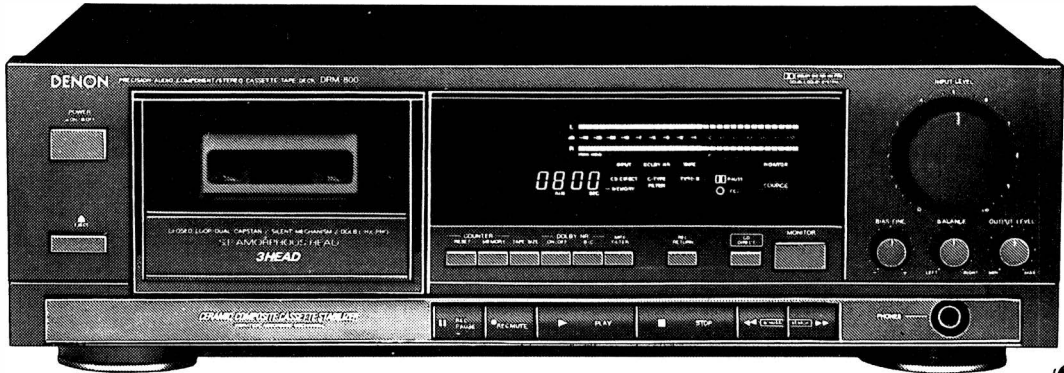


Left: The job may have its amusing side, but Sevenoaks Hi-Fi takes servicing very seriously indeed. Hence the six-strong team of engineers, and a 'spares-sourcing' system that's second-to-none.

10000

NEW THREE HEAD CASSETTE DECKS

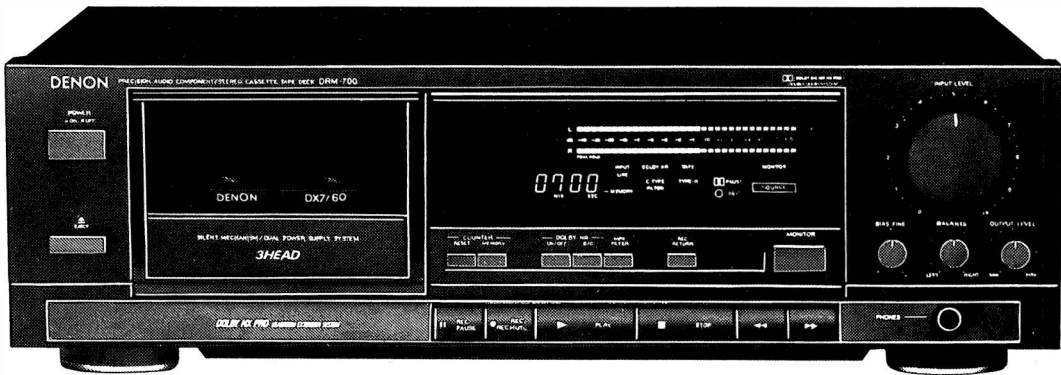
AT SEVENOAKS HI-FI



DRM 800

£299.95

· Three Heads · Three Motor transport · Twin Capstan · Amorphous heads · HX Pro · Dolby B/C · Full logic Silent Mechanism · Rec Return · C.D Direct Input · Ceramic Cassette Stabilizer · Non-slip reel drive · Fine Bias · 50db meter range · Reel time Digital Counter · IS Remote System ·



DRM 700

£239.95

Three Heads · Three Motor transport · HX Pro · Dolby B/C · Full logic Silent Mechanism · Non-Slip reel drive · Rec Return · 50db meter range · Reel time Digital Counter · Fine Bias · IS Remote System ·

With these two new models, Denon once again demonstrate their mastery of the cassette medium. The DRM 700 offers outstanding value for a three head deck and is no mean performer in its own right, the DRM 800 with its amorphous heads and twin capstan transport, goes on to squeeze that extra 'nth' degree of performance from every cassette. The only way to choose between them is to go and see your Denon dealer and take some of your favourite music with you.

For full product information write to: Hayden Laboratories Ltd, FREEPOST, Chalfont St Peter, Bucks SL9 9BS

DENON

D E S I G N I N T E G R I T Y

CHOOSING AND USING

You do not have to be an audio expert to enjoy music, neither is an understanding of how hi-fi works a pre-requisite to judging sound quality. Sevenoaks' sales staff will not try to baffle you with techno-jargon, or expect you to have taken a physics refresher course before arriving for a demonstration. The only information they need from you are some basic facts to determine what range of equipment you'll be choosing from.

Room size is very important, including ceiling height. The construction of the room is also relevant: is it a wooden or concrete floor, what are the walls composed of, where do you intend siting the equipment and the loudspeakers? Positioning is critical to the performance of all loudspeakers, and some people are taken aback to learn that a design they've been considering for bookshelf use is actually intended to work two feet into the room!

You should also decide what programme source (or sources) you want to base the system around: vinyl disc, CD, cassette, radio. And is it to become part of an audio-visual system? It also helps to have some kind of idea of the sound you're seeking; perhaps a clean, forward sound suited to rock music, or something gentler and more spacious that gets the best from classical recordings? And the best way to ensure you attain that sound is to bring along recordings of your own.

Once you've chosen your system, Sevenoaks are happy to arrange for an engineer to install it for you. Alternatively, you may wish to save some money and set it up yourself. It isn't difficult and help is only a phone call away.

Some essentials are common to all systems:

1. With turntables, check the height of the tone arm and obtain the correct tracking angle with an alignment protractor; ensure the pickup cartridge is a tight fit in the headshell; if the deck has a suspended chassis, dress the tone arm cable so that it does not foul the suspension.
2. Use your turntable on a suitable 'sound table' (Sevenoaks stock a wide range of these), or a strong wall-mounted shelf.

3. All connections need to be clean. Since copper oxidises, it's worthwhile cutting back the ends of speaker leads every so often to expose fresh copper. (The same with tuner coaxial leads.)

4. Copper also gradually loosens from a screwed terminal; it's preferable to solder leads on to the standard 'banana'.

5. Position your loudspeakers to avoid feedback (that howling noise!) resulting from interaction with the turntable; also, use recommended stands.

6. The performance of any CD player can also be improved very simply. First, the increased stability given by a Mission Isoplat is worthwhile; and if the player uses a plug-in, figure-of-eight mains lead, try it both ways and hear if the sound changes (a matter of polarisation). CD players generally benefit from the use of a better-quality interconnect than the one supplied.

7. If your wooden floor is uneven, stability can be given to loudspeaker stands by screwing through the stand and into a floorboard. This 'tightening' of the stand to the floor should noticeably clarify 'imaging'.

8. Finally, keep it clean! Use a good stylus cleaner such as Audio Technica's AT607 fluid or their AT637 vibration cleaner. Keep your tape heads oxide-free with a mechanical cleaner such as the Allsop (but Sevenoaks recommend the use of a rubber cleaner specifically for the pinch rollers). And if you feel your CDs are in need of a clean, then the Allsop or Nagaoka cleaners are worth trying — but *do* read the instructions before using them!

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something of a speciality.

Products to have impressed Matt, and manager John at Tunbridge Wells include the new CD3 compact disc player from Cambridge Audio and Roksan's cheaper tone arm. The Roksan Arta Xerxes is also "an interesting development": it fits inside the Roksan turntable to give a line-level output into passive devices such as those from Mod Squad.

Finally, given the number of 'accessories' of dubious worth generated by the hi-fi industry, we asked the Sevenoaks Hi-Fi managers to suggest some which had actually convinced them of their value. Ron at Woolwich immediately cited the Discwasher CD cleaner which, he says, seems to improve the performance of even comparatively clean CDs. And if you have to use an indoor FM radio aerial, then the Cobra with its built-in amplifier, is better than most.

The Hunt P2 record cleaner gets an honourable mention from Stewart at Sevenoaks, who has also noted the performance obtainable from solid-core cables. Like a number of his colleagues, he enthuses about the Mission Isoplat as an anti-vibration support for CD players, adding that it works well with the majority of amplifiers, too.

At Brighton, John encourages the use of speaker stands, however inexpensive the chosen speaker, something that his fellow-managers would endorse. Despite the interest in CD, Matt at Tunbridge Wells still feels there is scope for good turntable accessories and suggests the Hunt EDA Sweep Arm as a prime instance. He also gives a vote to the Milty Workmat: an ideal surface for cleaning records, inexpensive at just £6, and of genuine practical benefit — surely the only criterion by which to judge any accessory.

WHERE TO FIND US...

SEVENOAKS HI-FI

109-113 London Road, **Sevenoaks**, Kent
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MAIL ORDER (Sevenoaks branch only — see above) (0732) 458985
73b North Street, **Guildford**, Surrey
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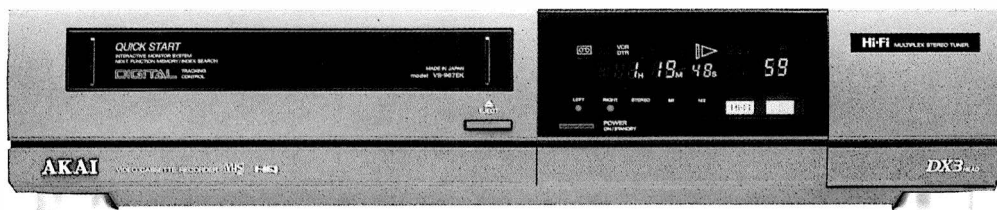
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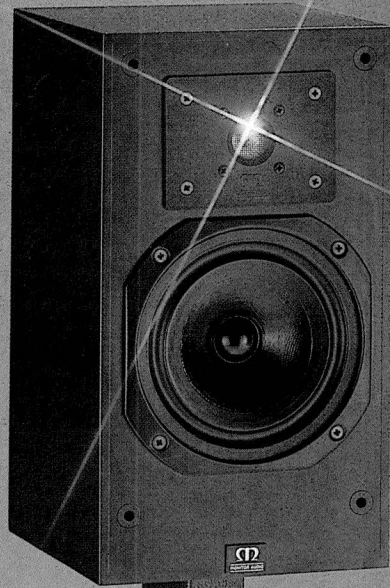
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NICAM broadcast is high quality digital stereo and will be introduced progressively across the ITV stations from this September. However, to receive these broadcasts you will require a special decoder. In preparation for NICAM all Akai's new range of HiFi VCR's have this decoder fitted as standard.

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