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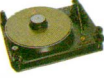
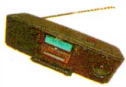

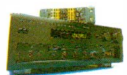
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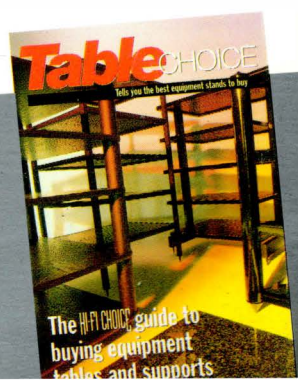
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- | | | | |
|----------------|---|---------------|---|
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PUBLICATION



PRODUCTS AND EDITORIAL SUBMISSIONS

Hi-Fi Choice welcomes all information on new and upgraded products and services, for possible coverage within the news and reviews pages. However, the publisher respectfully points out that the magazine is not obliged to either review or return unsolicited products. The editor is always pleased to receive ideas for articles, preferably sent first in outline form, with details of the author's background, and — where available — samples of previously published work. He cannot, however, accept responsibility for unsolicited copy and would like to point out that it may take time for a reply to be sent.

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THE GET OUT CLAUSE

While every care has been taken in the preparation of this journal, the publishers cannot be held responsible for the accuracy of the information herein, or any consequence arising from it. Readers should note that all judgements have been made in the context of equipment available to *Hi-Fi Choice* at the time of review, and that 'value for money' comments are based on UK prices at the time of review, which are subject to fluctuation and are only applicable to the UK market.

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It's sound that counts

It's another *Choice* exclusive. Starting on page 52, we bring you the best hi-fi in Europe as voted by the European Imaging and Sound Association (EISA) Audio Awards Panel.

The EISA Awards are the result of long and careful deliberation among the review staff of ten of the finest audio magazine's in Europe. *Hi-Fi Choice* was the sole UK representative, and we were delighted to find that our views were largely in accord with our opposite numbers in the rest of Europe, most of whom adopt a similar test methodology to our own with both a technical and subjective bias.

The judges each held their own particular views on what makes a good product, and clearly different markets place a slightly different emphasis on the relative importance of features, style and finish. However, when it came to the all-important question of sound quality, there was a remarkable degree of consensus among the assembled experts.

You can read about the best products in Europe in our awards feature, but the key point here is that consensus of opinion over what constitutes a good sound. This flies in the face of the popular argument that people in different countries around the world like different sounds. This would mean that hi-fi should be tailored for specific markets.

I even attended a technical seminar in Europe some years ago where a Japanese manufacturer actually brought along four different versions of a new speaker, each designed for a different country. Its engineers had produced a version for America, Japan, North Europe and a one-off for the UK. Amusingly, all the assembled European hacks preferred — you've guessed it — the design intended for the Japanese home market.

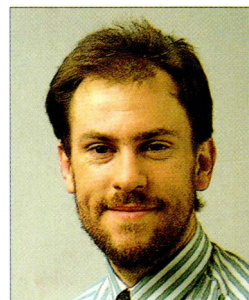
The moral of all this is that a

good sound is a good sound, period. This is not only borne out by the findings of the European Audio Awards Panel, it is also figuring prominently in the thinking of specialist manufacturers as they address wider world markets and begin to develop products for a growing number of audio visual enthusiasts.

Bob Stuart of Meridian, for example, has not only been busy on his latest range of hi-fi separates reported on page 4, he has also been addressing the new set of problems posed by audio visual systems in the home. As he points out, many of the AV surround sound systems that have hit the market so far have concentrated on facilities, ease of use and the simple thrill factor of reproducing cinema sounds in the front room.

Bob, on the other hand, is of the opinion that the route to AV happiness lies in getting the sound right first, and then adding the bells and whistles. This, he maintains, will enable the AV set-up to function as a superior hi-fi system as well as peeling the wallpaper away as you watch the afterburners cut in on *Top Gun*.

The findings of the European Awards Panel seem to bear out what he is saying. As more hi-fi specialists turn their attention to the AV market, they would do well to remember that ultimate sound quality still appears to be the great leveller — no matter the area of specialisation, no matter the market place.



No dissention; Simon Davies reveals what unites the four corners of the globe.

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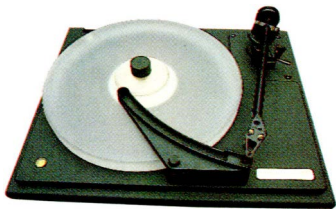
HI-FI CHOICE



The Front End

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Update

CHOICE NEWS FROM AROUND THE WORLD

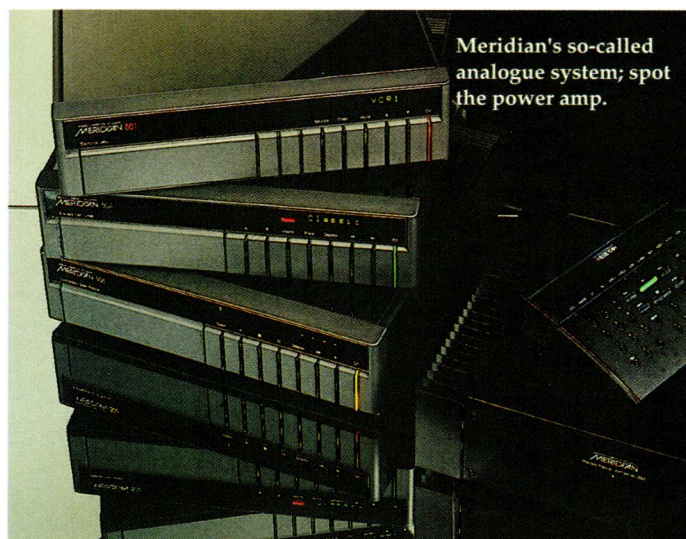
New Meridian range looks to the future

Meridian has launched a new range of products, the **500 Series**, that combine to form complete analogue, digital or AV music systems.

Eleven models are included in the new line-up. The £975 **500 CD transport** uses an advanced CD servo on a four-layer aero-space standard PCB. It can be used with digital speakers or the new £695 **563 digital to analogue converter**. The latter boasts Meridian's dual differential **Delta Sigma** chip-set, accurate to 19 bits and balanced class A output amplifiers.

Much of this technology is also found in the **508 Super CD player** (£1,350), which uses the transport mechanism from the **500**. The cheaper **506 CD player**, at £795, uses an 18-bit version of the **Delta Sigma D/A** converter.

Full remote facilities are provided via the new **Meridian System Remote** (£50) which can be used to map and label sources with **500 Series** components, and is switchable



Meridian's so-called analogue system; spot the power amp.

for use with Meridian **200** and **600 Series** models.

The **501** analogue preamplifier (£595) features six analogue inputs, optional phono modules and twin outputs for bi-amping. The **501V** is the same preamplifier with a built-in video board at £745, offering extensive video and S-video handling facilities.

Other models include the £595 **504 FM tuner** and the 65 watts per channel **555 stereo power amplifier** at £595. The **562** and **562V digital control units**, £625 and £825 respectively, feature Meridian's own A/D converter circuitry to process analogue sources such as tuners and tape decks.

☎ (0480) 434 334

Mordaunt-Short's Music Series

Following the highly successful **3-series**, and somewhat less successful **5-series**, Mordaunt-Short is ditching prefixes altogether for a brand new range of five Music Series models.

The new models are evolutionary, building upon the engineering techniques of their predecessors, fitting into similar size, rear ported enclosures and slotting into slightly higher price points.

The £130 **MS10**, £180 **MS20** and £250 **MS30** are two-way miniature and bookshelf size models of 9, 12.5 and 22 litres internal volume respectively.



The larger £380 **MS40** and £500 **MS50** have extra main drivers (and ports) to augment bass output, and internal volumes of 35 and 52 litres respectively.

The three basic main drivers have improved versions of the moulded integral cone/surround, the **30** and **50** having 200mm cast frames. All the speakers now use Mordaunt-Short's own 25mm metal dome tweeter.

☎ (0705) 407 722

B&W offers Virtual Acoustic Reality, THX style

The Lucasfilm approved and licensed Home THX has definitely stolen the AV high ground beyond mere Dolby Pro-Logic for serious home cinema fans. One of the main reasons is the very demanding loudspeaker engineering requirements, especially in terms of power handling and dispersion control (to minimise room interference), giving you that genuine cinema effect.

B&W is the first UK THX licensee, the company's complete seven speaker system costing over £4,000. Front left, right and centre are handled by identical **FCM8** loudspeakers (£600 each), with twin main drivers spaced either side of a triple tweeter array to avoid floor and ceiling reflections.

Left and right front speakers are each supported on attractively shaped, if rather substantial, subwoofer plinths (**PCS8**, £750 each). The rear signals are handled by compact triangular section speakers (**SCM8**, £550 each) with dipole radiation patterns as prescribed under the terms of the THX licence. ☎ (0903) 820 415

Full-blooded converter from Select Systems

Following the success of the **Francinstien passive CD filter**, the gothic novel fanatics at **Select Systems** are introducing a full outboard digital-to-analogue converter, the £379 **Dacula**.

Based on the increasingly popular and respected **Crystal Delta Sigma** converter chip, **Dacula** has an outboard power supply and five separately regulated supply rails. **Select** has paid particular attention to **RF shielding** and uses digital muting with a relay switched passive de-emphasis network.

☎ 081-893 8662

Flurry of new Denon components

A clutch of new Denon products launched this month are all related but peripheral to the company's popular hi-fi separates.

The £370 DN-720R cassette deck is described as 'a very affordable workhorse', with more rugged build than normal domestic models, better to survive the battering a machine receives in professional use environments like pubs and clubs.

The D110 is a new mini system based on the popular D100 but now also featuring twin cassette mechanisms and an RDS tuner. Price is £870 with loudspeakers or £800 without.

Two new AV surround sound,

Dolby Pro-Logic amplifiers — the 'budget' £480 AVC-1530 and upmarket £1,000 AVC-3530 — build on and reinforce the success

of the current mid-price AVC-3020. There is also an AV receiver in the form of the £520 AVR-1000.

☎ (0753) 888 447



Denon's new top dog AV amp, the AVC-3530, uses a PMI Dolby chip.

New Kentish base for Dutch cable giant vdH

Van den Hul's unique range of cables — including the (mostly) much praised *First* and *Second* interconnects that use metal-free, carbon based conductors — will now be available via the company's new Maidstone based UK subsidiary.

Carbon/metal composite speaker cables called *Revelation* and *Revolution* are also now available, plus a more conventional and inexpensive bi-wire ribbon *Snowtrack* cable. All this in addition to the existing vdH phono cartridges and re-tipping service.

☎ (0622) 721 636

Majik-1, the expanding amplification system

Linn Products will be using *Live '93* to launch its first multi-room product, the as yet unpriced *Majik-1* (which translates into English as magic eye). It's an extraordinary kameleon of a component which not only combines pre- and power amplifiers within the same case, but also incorporates a special computer type port — codenamed *Sneaky* — which offers infinitely more flexibility than any normal integrated amplifier.

What starts out as a mere amplifier can be reconfigured in a variety of ways, with the addition of tuner modules, active filter cards and such like. It can therefore remain the basis of a domestic hi-fi system through a whole succession of upgrades, and changes in lifestyle and personal requirements.

☎ 041-644 5111

Roksan moves on up with Attessa

A compact disc transport and a complete CD player are the two components which introduce Roksan's new Attessa range. Using the same top-loading disc drive and elegant full-width, charcoal grey casework, the £1,295 ATT-DP2 transport and £1,495 ATT-DP2.P player differ only in the inclusion of a Crystal Delta Sigma digital-to-analogue

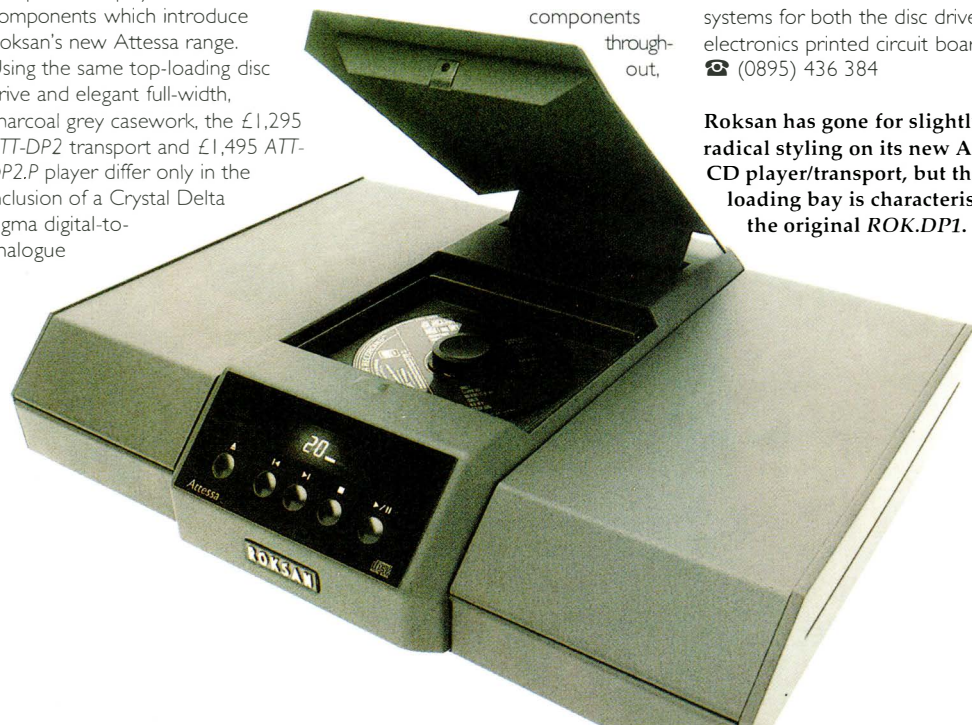
converter in the latter.

Besides careful selection of components through-out,

the player features multiple mechanical isolation and decoupling systems for both the disc drive and electronics printed circuit boards.

☎ (0895) 436 384

Roksan has gone for slightly less radical styling on its new Attessa CD player/transport, but the top loading bay is characteristic of the original *ROK.DP1*.



In Brief

Goodmans has two new CD midi systems, the £200 2850 and £300 6350, plus two personal CD players (£90 GCD-41XP and £120 GCD-81) which may be used with the £35 Active 55 loudspeakers with built-in power amps. ☎ (0705) 673 763

Pioneer is launching four new CD/LaserDisc combination players, priced from £400 up to £700, including two which are NTSC compatible and a third which incorporates a 5-CD carousel mechanism. The £600 VSA-D802S and £400 VSX-452 are new AV Pro-Logic amplifiers and receivers respectively. ☎ (0753) 789 789

Morel is introducing new Neolin loudspeaker main drivers which combine high-flux, compact neodymium based magnets (as used in some advanced tweeters to date) with impedance and distortion linearising technologies. ☎ (0473) 719 212



KEF is adding magnetic shielding to Reference Series 103/4 (£1,249), 102/2 (£799) and a significantly revised £599 101/3 to facilitate use in AV applications. The smaller speakers are voiced to combine with the centre-channel Model 90 unit, the 103/4 with Model 100. ☎ (0622) 672 261

Clarion is adding seven more models to its extensive car hi-fi line-up, including a £290 CRX87R radio cassette head unit with 4x30W power output and RDS with EON on the tuner. It can also control a CD autochanger. ☎ (0793) 870 400



Arcam has picked up yet another US Consumer Electronics Show Innovations award, this time for the very successful Delta 290 integrated amplifier. ☎ (0223) 440 964

Sony's 'world's smallest' WMD-DT1 DAT player, not much larger than a conventional Walkman, is available for £250. ☎ (0784) 467 000

The AudioFile is expanding its Bishops Stortford premises to add three new rooms, primarily to demonstrate Linn Aktiv systems. ☎ (0279) 506 576

The Sound of Silence.



AX-A662BK

Crosstalk, noise interference, signal degradation. All dirty words as far as we're concerned. That's why the JVC AX-A662BK amplifier has no such vices.

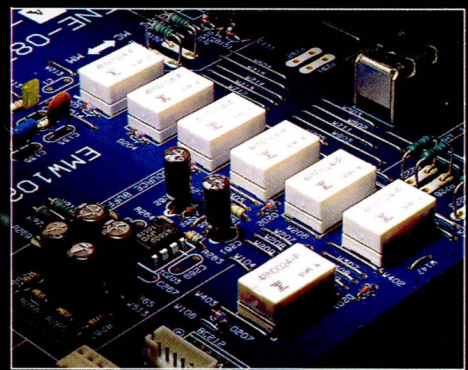
Featuring separate heat sinks and 'Advanced Super A' circuitry for left and right channels coupled with the dramatic reduction of internal wiring, this amplifier is virtually free of such problems.

Designed for the Digital Age.

The benefits? A very special amplifier that delivers a powerful punch, but manages to preserve a certain delicacy and subtlety at low signal levels.

As one Hi-Fi magazine put it - 'The JVC AX-A662BK produces a tidy, neutral, articulate sound with a refined and clean presentation, but is powerful without being unpleasantly assertive'.

Silence is Golden



Obviously.... **JVC**

Rotel discretely improves CD players

The popularity of Rotel's Best Buy £300 RCD-965BX CD player has encouraged the company to introduce two new tweaked variations. These should gain extra enthusiast respect by replacing op-amps with discrete-component circuitry for the audio output stages.

The simple RCD-965BX Discrete offers the first stage of refinement over the standard model for £350, while the £400 Limited Edition Discrete costs just £20 more than the



existing LE model with its slit-foil capacitors and other sonic tweaks.
☎ (0908) 317 707

The latest RCD-965BX bares all. A board full of custom parts for the fashion conscious lurk inside the new Discrete Rotel.

Moth remembers the vinyl Alamo

Moth Group gets to be king of the Wild Frontier with its new Alamo turntable. Following in the footsteps of the record cleaning machine, the Alamo places Moth in the front line for vinyl's last stand.



Supplied complete with a low cost version of the Rega-sourced Moth arm, the turntable itself comes from the same highly respected source, but differs from Rega's own turntables in a great many details, including the use of MDF rather than glass for the platter. Moth's Alamo costs £170.
☎ (0234) 741 152

Tannoy re-defines the bookshelf loudspeaker

Tannoy is introducing a new bookshelf size Definition series loudspeaker. The £650 D100 is a less expensive and space efficient partner for the large floor-standing D700 which was launched a year ago, sharing the same classy real wood finish.

A single 160mm cast-frame dual-concentric driver, ported by a resistive duct, provides the muscle, while the cabinet uses Tannoy's Differential Material techniques to control mechanical energy flow. The hexagonal plan

shape promotes rigidity as well as optimum acoustic performance, inside and out.

☎ (0236) 420 199



Tannoy's D100s are high quality compact monitors with real mahogany veneer.

It's Showtime!

September is the month for the major UK hi-fi shows, and this year sees two London events almost on top of each other.

If you were slow, opening your copy of Choice this month you may have already missed 1993's Hi-Fi Show, September 10-12, held at the same airport hotel as usual, formerly the Heathrow Penta, now renamed the Ramada. This is the traditional event for hi-fi enthusiasts, much of the interest centring around specialist manufacturers.

Some companies will be logging the overtime, but others are giving the Hi-Fi

Show a miss to concentrate on the Live '93 Consumer Electronics Show, to be held at Olympia, September 16-20, where the best of hi-fi, home computers and home entertainment come together under the same roof. Dump the kids off at the Sega or Nintendo stands, and check out the Home Cinema Promenade or the Real Hi-Fi Village.

You can check out the latest in car stereo, watch a live TV broadcast, or even drop in on the Linn Log Cabin (Kabin?). Our sister publication, Home Entertainment, will be at the show as will the Choice team. Tickets cost £7 each, or £16 for a family of two adults and three children. Children under 16 need to be accompanied by an adult.

In Brief

Soundstyle's new £100 per pair speaker stands are available in a range of six bold colours to match the company's Tripod system of equipment supports. ☎ (0284) 701 101



Goldstar is launching two budget price CD mini systems, the £180 FMH 17RA and the £200 F-300, plus an FFH-101L micro system at £280.
☎ (0753) 691 888

BASF Germany is introducing audio cassettes capable of ultimate materials recycling, in line with government environmental initiatives. It has also announced its own MD Maxima recordable mini disc.
☎ (UK) 081-908 3188

BBE Sound Inc of California is replacing the BBE1002 with the Audio Restoration System, an onboard processor which manipulates time and phase alignment with claimed 'dramatic benefits' for sound quality. Home trials and demonstration tapes are available from MAD Ltd. ☎ 081-452 1009

Vivanco is introducing a range of high performance audio leads amounting to more than 160 items. A new SR1000i/iI headphone features an 'In Front Localisation' development claimed to enhance the presentation of spatial information. ☎ (0442) 231 616

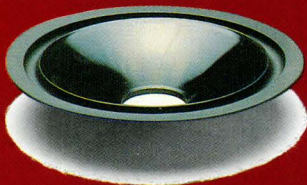


MASTERS OF MUSIC



The new Music Series loudspeakers from Mordaunt-Short *Mastery of Sound*

This mastery of sound is the result of numerous technical innovations unique to Mordaunt-Short.



For instance, MCS technology – an injection moulded cone and surround which ensures a precise cross-section profile for exact bass unit performance.

All crossovers are first order configurations based on minimalistic principles because of the excellent performance of the individual drive units. Result? A simple load and fewer components between the amplifier and the final sound. Bi-wiring is possible too on all speakers except the MS10.

No Phase Cancellations

The conventional mid-bass unit dust cap has been replaced with a phase plug. The path length is calculated to eradicate phase cancellations and give excellent dispersion across the critical middle frequencies.

Low colouration baffles have been a design priority in all Music Series loudspeakers. On the MS10, MS20 and MS30 this has been achieved with mica-filled polypropylene tensioned with steel tie rods.



On the MS40 and MS50, a 30mm dual material composite baffle has produced an extremely rigid structure.

Exclusive

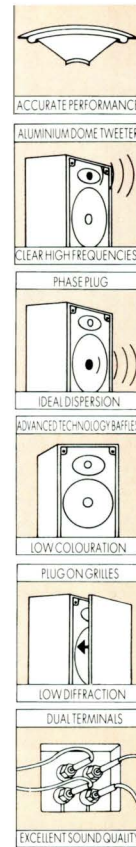
Controlled high frequency performance is achieved thanks to a 25mm aluminium dome tweeter designed and built by Mordaunt-Short.



The ultra thin metal diaphragm and compression moulded rubber surround are mounted on an elliptical low resonance chassis, utilising a high temperature voice coil with liquid cooling and damping.

Making Music

Music first. Music second. Music whichever way you listen to it. With the Music Series, Mordaunt-Short is making music more naturally than ever before. The masters of music are taking their title to heart.



We will be pleased to send you a Music Series brochure on request, together with the address of your nearest dealer.

Mordaunt-Short



Show report

Australian Absolute High End Show

For a first-timer, the organiser of the Absolute High End Show, Surya Moorthy, ran the proceedings at Melbourne's Radisson President Hotel with an experienced air. He even managed to round-up a wide selection of international manufacturers and luminaries, such as Hiroyasu Kondo from Audio Note. The brand has a strong following in Australia, with one of the company's British-built D/A converters, usually fed by a Micromega transport, appearing in almost every room.

Other European manufacturers present included the French Triangle loudspeaker company and the Danish high-end electronics manufacturer LA Audio, as well as Alema, makers of the 300B triode-based *Silver Night* power amplifiers. Marbled blue John Shearne *Phase Two* and the Magnum *IA120* integrated amplifiers were also on the scene.

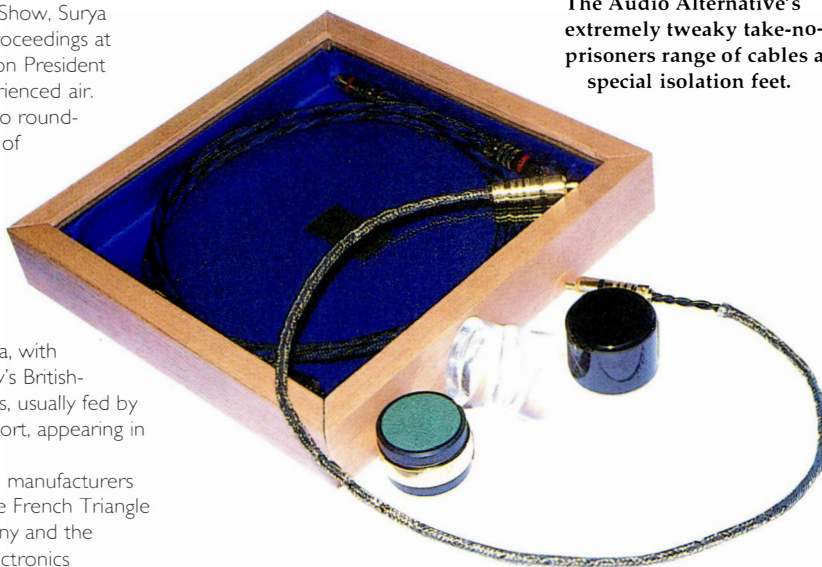
The Australian contingent — rarely seen outside the country — showed great promise. Moritori, for example, is a small indigenous loudspeaker company destined to be successful beyond the antipodes. The company's large Flatline hybrid ribbon/dynamic loudspeaker is manufactured under licence in the US, but the small *Julia* and *Duetta* speakers were stars of the show. These multi-way stand-mounted designs are currently only available in Australia.

The big-is-beautiful market was covered by two New South Wales companies. ME Sound's massive A\$10,000 *1500* stereo amplifier was said to be capable of delivering 1,500W, while Audio Definition's *Statis* loudspeakers stood nearly two metres tall and had a curious star cut-out in front of the tweeter to improve dispersion. At 132kg per speaker, the A\$13,000 *Statis* must

represent one of the front runners in high-mass Australian audio.

Australians take their hi-fi seriously enough to have developed an entire subculture of accessories and 'New Age physics' tweaks, including the Audio Alternative's range of cables and open frame real wood racks, the A\$200 *Edelfüsse*

The Audio Alternative's extremely tweaky take-no-prisoners range of cables and special isolation feet.



Two hemispheres working as one. British John Shearne *Phase Two* amp and Audio Note *DAC 2* with Australian Moritori *Duetta* loudspeakers.

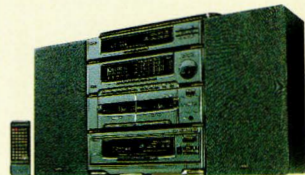
Left; Australian designer Lewis Moritori's *Flatline* hybrid ribbon/dynamic loudspeaker, manufactured under licence in the US.

feet from Brighton Eclipse Audio and the elegant marble sandwich *de Nardis* baseboard.

Although many were cynical of the small *Harmonix* tuning devices including special feet et al, the quality of sound from two treated rooms left people highly impressed. Mr Kiuchi, of the Combak Corporation that manufactures *Harmonix*, was also showing the new *Enacom* devices and reference feet.

In Brief

Sanyo is adding a top-of-the-line £430 *SYS915* midi system to its range, featuring 30W RMS output power per channel and a 4-CD carousel changer. ☎ (0923) 257 130



Boston Acoustics' revised £210 *360 II* in-wall loudspeaker is now weather-proofed to withstand boat and caravan installations. ☎ (0494) 890 277

Minicraft's Engraver and Security Kit (£25) provides a simple means of adding personal security post code identification to valuable items such as hi-fi equipment. ☎ (0388) 420 535

Aiwa is offering a complete 'personal' home cinema package based on a 14inch Trinitron TV/video combo (*VX-S140* at £600) and £650 *NSX-D909* Dolby Surround CD mini system — perfect for converting the cupboard under the stairs into a groovy AV den. ☎ 081-897 7000

Celef has carried out extensive revisions to two of its ProAc loudspeaker models, now known as the *Tablette III* (£480) and *Studio 100* (£700). ☎ 081-207 1150

Lift (UK) has a new range of *Liftboy* and *Jumbo* CD storage systems, the former handling 30-60 discs at £20-£30, the latter 75-120 discs at £40-60. ☎ (0296) 615 151

BADA, the British Audio Dealers Association, has added eight new shops, but has also fallen out with Midlands-based Active Audio.

Kodak has introduced a £400 *PCD885* portable player, bringing go-anywhere flexibility to the Photo CD format, while also handling replay of conventional CDs. ☎ (0442) 61122

Sansui is moving from Leicester to Bolton and introducing two new home cinema components. The £900 *AV-9000DSP* AV amplifier replaces the existing 7000 model, while a new £500 *RZ-7900AV* receiver upgrades the performance available from integral tuner models. ☎ (0204) 700 139

Merlin Audio is running the first Budapest High End show between November 5 and 7 at the Hyatt Atrium Hotel. The show promises state-of-the-art goodies from home and abroad. ☎ (010 361) 215 2612

HOW TO HEAR



WITHOUT GIVIN



Why choose between the future and the past, when Philips Digital Compact Cassette (DCC) lets you have it all. DCC plays music with crystal-clear CD quality. Zero noise, zero hiss. Even better, it lets you

record your music with the same digital sound quality. Already, there are literally hundreds of DCC titles, from major artists. Rock, rap, jazz, classical, country, swing. And there are more coming every day. But what about all those

hundreds of cassettes you've already collected? Play on. They'll sound as good as ever on a Philips DCC machine. (Proof that rock and roll will never die.) Naturally, when you're playing DCCs, you'll have all the benefits of digital



THE FUTURE



GUPTHEPAST

technology. You can directly access your favourite songs, track by track. However, DCC has other features even your CD can't match. Beyond track number and elapsed time,



DCC displays the song title, album title, even the artist's name. That's true whether you're listening on the home unit available today or the DCC portable and car players coming later

this year. If you'd like to leap to the musical future without throwing away the past, there's really only one choice; Philips DCC. For further information on where to find DCC, call 0800 212 643. **Your music will never be the same.**

PHILIPS

Don't miss next month's bigger than ever issue of

HI-FI CHOICE

Pre/power amps

We push six well-known pre/power amp combinations to the limit. Are they better than integrated amplifiers? Full tests on models from Adcom, Alchemist, Arcam, DPA, NAD and Quad.

CD showdown

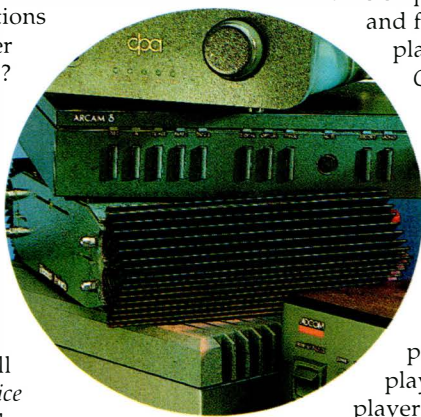
Full measurements and blind listening tests on 20 of the latest CD players, all competing for a *Hi-Fi Choice* Swing Tag and a place of honour in the *Choice* Directory. Our line-up includes the newest models from Arcam, Denon, Quad and Rotel.

Win Mordaunt-Short speakers worth over £2,500

Your chance to win one of Mordaunt-Short's fabulous new Music Series loudspeakers, in a great competition you can enter for the price of a stamp.

SCOOP! Counterpoint Model 8 D/A Converters

Pick your technology! The new *Model 8* DAC from Counterpoint features interchangeable chips, to fine tune your system and future-proof your CD player. We subject it to the full *Choice* laboratory tests!



MiniDisc — now smaller than ever!

We look at the new Sharp portable *MD-D10* MiniDisc player — the smallest, lightest player yet available. How does it size up to the competition?

FREE! A CD table-top storage rack from On

Next month, *Hi-Fi Choice* is giving away a unique compact disc storage rack from accessory maker On.

Designed to rest on a shelf or table, the rack holds 12 CDs and allows you to browse by flipping through the discs. The popular On rack will

not only be yours free with the November issue of *Hi-Fi Choice*, it will also sport the *Hi-Fi Choice* logo.

Reserve your copy now. The exclusive On racks are sure to become real collectors items in no time at all.



It's all in the November issue of *Hi-Fi Choice*, on sale Tuesday, October 12, 1993.

(All contents subject to change due to circumstances beyond our control)

YOUR REFERENCE POINTS FOR THE BEST HI-FI

Reference Point is a sound partnership between Pioneer and a nationwide network of specialist hi-fi dealers, selected because they're the most reputable independent experts. Visit any Pioneer Reference Point dealer for the best advice and service.

AVON		GLOUCESTERSHIRE		MIDDLESEX		WILTSHIRE	
Paul Roberts, Bristol	0272 429370	Hutchinsons, Cheltenham	0242 573012	Musical Images, Edgware	081-952 5535	P R Sounds, Melksham	0225 708045
Paul Roberts, Bristol	0272 250760	Robbs, Gloucester	0452 419777	Musical Images, Hounslow	081-569 5802	P R Sounds, Trowbridge	0225 777799
Paul Roberts, Weston-Super-Mare	0934 414423	GREATER MANCHESTER		T.A.S., Eastcote	081-866 4911		
Radford Hi-Fi, Bristol	0272 428248	Bill Hutchinson, Manchester	061-839 8800	T.A.S., Ruislip Manor	0895 632217		
BEDFORDSHIRE		Clearstone Hi-Fi, Manchester	061-835 1156	NORFOLK		WORCESTERSHIRE	
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Richards Audio Visual, Bedford	0234 365165	Ashton-u-Lyne	061-343 5127	Martins Hi-Fi, King's Lynn	0553 761683	Worcester	0905 27551
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B & B Hi-Fi, Bracknell	0344 424556	HAMPSHIRE		NORTHAMPTONSHIRE		YORKSHIRE WEST	
B & B Hi-Fi, Maidenhead	0628 73420	Bryants Hi-Fi, Aldershot	0252 20728	H.G. Rapkin, Northampton	0604 37515	Maxwells, Northalerton	0609 773535
B & B Hi-Fi, Newbury	0635 32474	Cristavision, Fareham	0329 288660	NOTTINGHAMSHIRE		Scarborough Hi-Fi Centre,	
B & B Hi-Fi, Reading	0734 583730	Now That's Hi-Fi, Portsmouth	0705 811230	F.L. Smith Electrical, Mansfield	0623 655684	Scarborough	0723 374547
Frasers Hi-Fi & Video, Slough	0753 520244	Sinclair Youngs, Basingstoke	0256 28623	F.L. Smith Electrical, Worksop	0909 479770	Vickers Hi-Fi, York	0904 629659
Frasers Hi-Fi & Video, Wokingham	0734 794998	Southampton Hi-Fi Centre,	0256 21307	Forum Hi-Fi, Nottingham	0602 622150	YORKSHIRE SOUTH	
BUCKINGHAMSHIRE		Southampton	0703 228434	Superfi, Nottingham	0602 412137	Superfi, Sheffield	0742 723768
B & B Hi-Fi, High Wycombe	0494 535910	HERTFORDSHIRE		OXFORDSHIRE		YORKSHIRE WEST	
CAMBRIDGESHIRE		Chew & Osborne, Bishop's Stortford	0279 656401	Sound 'n' Vision, Bicester	0869 246491	Amrik Electronics, Bradford	0274 722530
Cambridge Hi-Fi, Cambridge	0223 67773	David Orton Ltd, Hitchin	0462 452248	Winley Audio Centre, Witney	0993 702414	Amrik Electronics, Leeds	0532 752285
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Hamlets Audio Visual, Stockport	061-428 6367	ISLE OF WIGHT		Paul Roberts, Taunton	0823 270000	CD. DOWN	
Tomorrow Studios, Warrington	061-476 3500	Russells, Newport	0983 523864	STAFFORDSHIRE		Hi-Fi Experience, Belfast	0232 249117
CORNWALL		KENT		Purkiss Hi-Fi, Hanley	0782 265010	LRG Sound & Vision, Belfast	0232 732452
ETS Electriceutres, Helston	0326 573285	Hoves of Southborough,	0892 528682	Universal Electronics, Cannock	0543 502118	CD. ANTRIM	
ETS Electriceutres, Penzance	0736 64274	Tunbridge Wells	0892 537288	SUFFOLK		LRG Sound & Vision, Larne	0574 272757
H.B.H. Woolacotts, Bude	0288 352269	Kimberley Hi-Fi, Bexleyheath	081-304 3272	Peter Watts, Bury St Edmunds	0284 703045	Nicholl Bros, Ballymena	0266 49616
Truro Hi-Fi, Truro	0872 79809	Whitstable Tele-Radio, Whitstable	0227 272028	System Sound, Sudbury	0787 72348	SCOTLAND	
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Stuart Westmoreland, Derby	0332 367546	Norman Audio, Preston	0772 53057	Tru-Fi, Redhill	0737 766128	Bill Hutchinson, Glasgow	041-248 2857
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Upton Electronics, Paignton	0803 551329	LINCOLNSHIRE		SUSSEX WEST		Quinns Audio Visual Systems,	
DORSET		Superfi, Lincoln	0522 520265	Cristavision, Chichester	0243 775444	Swansea	0792 773644
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Movement Audio, Poole	0202 730865	Babber Electronics, W13	081-579 6315	TYNE & WEAR		Hi-Fi Western, Newport	0633 262790
ESSEX		Brians Hi-Fi, W1	071-631 1109	Bill Hutchinson, Newcastle-u-Tyne	091-230 3600	GWYNEDD	
Chew & Osborne, Epping	0992 574242	Covent Garden Records, WC2	071-379 7427	WARWICKSHIRE		Owens, Bangor	0248 362951
Chew & Osborne, Saffron Walden	0799 523728	Hi-Spek Electronics, N3	081-349 1166	Carvels of Rugby, Rugby	0788 541341	WILTSHIRE	
Classic Sound & Vision,	0702 461634	Hi-Way Hi-Fi, W2	071-402 2441	The Hi-Fi Company, Leamington Spa	0926 888644	WORCESTERSHIRE	
Southend-on-Sea	0702 600130	Kamla Electronics, W1	081-323 2747	WEST MIDLANDS		YORKSHIRE NORTH	
Hi-Spek Electronics, Brentwood	0277 226303	Light & Sound, E6	081-472 1373	Bridge Hi-Fi, Walsall	0922 640456	YORKSHIRE SOUTH	
Peter Foulkes, Colchester	0206 767428	Myers Audio, E17	081-520 7277	Coventry Hi-Fi, Coventry	0203 440529	YORKSHIRE WEST	
Peter Foulkes, Maldon	0621 853148	Spatial Audio, W1	071-637 8702	Naam Hi-Fi Vision, Birmingham	021-633 4944	YORKSHIRE WEST	
Twenty 20 Audio Visual,		Stereo Regent Street, W1	071-287 2458	Naam Hi-Fi Vision, Coventry	0203 632086	YORKSHIRE WEST	
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Choice Sessions

The latest products, the best recordings and our own points of view on the most interesting developments to hit the hi-fi scene. Concise reports by the Choice team.

CD PORTABLE

Sanyo CDP-55A

The difference between a portable player and a personal player is often not all that great. The £169.99 CDP-55A is not just a jogger's toy — it's an affordable portable CD player, with added extras that mean you get an extremely versatile machine for your money.

This slightly plasticky player is equipped with 'Fast read Multi-trace Anti-Shock System', which is Sanyo-speak for jog-proofing. It uses Sony's ATRAC data compression system, culled from MiniDisc technology. The CDP-55A stores the compressed datastream in a three-second buffer memory. Only a major jolt will upset the player for longer than its memory capacity, which is shown by a three-stage LCD indicator.

It's supplied with in-ear phones that have a tendency to drop out of the ear and get tangled in knots, though they are good at containing the sound. Leads are supplied for connecting the CDP-55A to a domestic system, as well as a rechargeable nickel-cadmium battery and a mains adaptor.

For in-car use, the 55A comes with a cigarette lighter power connector and a cassette adapter that links it with the car hi-fi — a fine test for any CD player's



Sanyo's CDP-55A shock-proof boogie machine chills out in a bed of its favourite compact discs.

jogability. Unless you plan to take the 55A rally driving, it will survive all but the bumpiest of roads without difficulty.

Played through a modest in-car system, music was purer than the usual cassettes and went much louder without distortion. It certainly passed the sing-a-long test, even though I got strange looks at traffic lights.

The Sanyo CDP-55A's versatility and ease of use are attractive qualities. Listening to Crowded House as I write, I find myself distracted by the player's constant invitation to sing-a-long — so I'm still searching for those elusive harmonies.

Lisa Nickson

Sanyo UK Sales Ltd, Sanyo House, Otterspool Way, Watford, Herts WD2 8JX. ☎ (0923) 246 363

DISTRIBUTION BLOCK

Rata Distribution Powerkord

If you're not au fait with the effects of mains supply quality on audio components, this review may come as some surprise. However, just as different audio cables sound different, so do mains cables, and there is enough of an AC cable subculture to suggest that this isn't just a matter of hype.

With a Rata Distribution Powerkord you can add six or eight sockets to your existing

Rata's Distribution Powerkord is a chunky alternative to the usual fare, and sounds a lot better as a result.



array. The RDP is made up of a high quality Olson distribution block, Kimber 8TCM Powerkord cable, an Mk Toughplug and a Rata Superclamp.

The price varies according to how much cable and how many sockets you need; it starts at £134.19 for a horizontal six way block with a three foot lead. According to its maker, Kimber Powerkord's woven construction has a filtering effect on mains borne RFI (radio frequency interference) and the longer the cable, the more effective the filtration.

When I first saw the RDP, and heard how much it cost, I was skeptical, but not unwilling to compare it with a semi-tweaked Duraplug four way that circumstances were forcing me to use.

Timing, was the area the RDP made its presence felt the most. I was impressed with the improvement that it brought about in various CD players and the system as a whole. Timing is one of the key areas where CD has plenty of ground to make up, so anything that improves it significantly has to be a bonus. The RDP does, and more so if there's a Powerkord between it and the CD player.

Jason Kennedy

Rata Ltd, Edge Bank House, Skelsmergh, Kendal, Westmorland, LA8 9AS. ☎ (0539) 823 247

VERDICT

Sanyo CDP-55A

▲ **PROS:** Jog-proof; affordable; adaptable.

▼ **CONS:** Looks a little cheap; no carrying case.

▶ **£169.99**

SOUND QUALITY



VALUE FOR MONEY



VERDICT

Rata Distribution Powerkord

▲ **PROS:** Improves timing, especially with CD players.

▼ **CONS:** You'll want Powerkords all round.

▶ **£134.19**

SOUND QUALITY



VALUE FOR MONEY



AMPLIFIER

Pioneer A-400X

The original Pioneer *A-400* has almost become a legend since its introduction in 1990. With most Japanese audio products having a commercial lifespan of 12 to 18 months before being superseded, the *A-400*'s longevity speaks for itself. Not that it's perfect; there are several areas of performance that could usefully be improved.

But would Pioneer have the nerve to update it? Would they risk killing off their star attraction? Faced with an impossible choice, they've elected to keep the old *A-400*, introducing the slightly more expensive *A-400X* as an alternative.

Although visually similar, the £300 *A-400X* is actually very different internally. The main circuit is completely updated. An improved phono stage is provided, and out go things like the choke in the output stage. You lose the headphone socket (for a more direct speaker signal path), but gain another set of unswitched speaker terminals for bi-wired operation.

The original *A-400* was gutsy, dynamic, and musically very involving. It had pace and excitement in spades, with lots of rhythmic verve and bite. Against this was a certain lack of smoothness and refinement. Also, the bass 'spread' slightly, making the sound a little soft.

The new *A-400X* certainly improves on these weak areas. It sounds much cleaner and tidier, achieving a smoothness and refinement the original *A-400* lacked. If you like clear, civilised musical presentation, the *A-400X* is definitely a better bet than the *A-400*.

Alas, these gains haven't

been won without losses elsewhere. In a nutshell, the new *A-400X* lacks the brilliance and vitality that made the *A-400* so exciting and involving. In hi-fi terms, the new amp marks a definite advance on the old, but its matter-of-fact coolness makes it musically less engaging.

With the *A-400* remaining in production, you should be able to audition it against the new *A-400X*. Both amps are going to have their adherents, and the new version will doubtless appeal to those who never liked the original and thought it overrated. I like the *A-400X* a lot, but if the choice were mine, I'd go for an *A-400*.

Jimmy Hughes

Pioneer High Fidelity (GB) Ltd,
Pioneer House, Hollybush Hill,
Stoke Poges, Slough SL2 4QP.
☎ (0753) 789 500

VERDICT

Pioneer A-400X

▲ **PROS:** Smooth refined sound; clean and civilised.

▼ **CONS:** Lacks the *A-400*'s drive; slightly bland

▶ **£300.00**

SOUND QUALITY



VALUE FOR MONEY



CARTRIDGE

Goldring Elektra

Given the vast number of low-price turntables sold over the past twenty or more years, there must be quite a few in need of a new stylus. But what do you do if your deck is, say, ten or more years old and a replacement stylus is no longer made? Replace the whole cartridge of course; in price terms there may actually be little extra to pay by doing so.

Goldring's *Elektra* is a budget-priced medium compliance magnetic cartridge intended to fit most reasonably good tonearms.

I tried the *Elektra* in an early Eighties Technics belt-drive deck which still had its original cartridge — a basic Japanese moving magnet design. Listening to the original Technics cartridge and then going over to the Goldring showed the latter to have a bigger, fuller sound. Bass was deeper and more powerful, and the overall sound was clearer. Instruments and voices sounded sharper and better separated.

Treble harshness is often a problem at this price level, and Goldring have wisely rolled off the *Elektra*'s extreme top-end. It sounds quite crisp and detailed, but the high frequencies are a little soft by comparison with more ambitious cartridges.

Obviously, at this price, one shouldn't expect too much. Nevertheless, the *Elektra* gives a very respectable account of itself, and will comfortably better most inexpensive cartridges supplied with budget turntables. It is robust and straightforward to fit (get your dealer to do this if you're inexperienced), and thoroughly deserves every recommendation.

Jimmy Hughes

Goldring Products Ltd, 8 Greyfriars Rd, Bury St Edmunds, Suffolk, IP32 7DX. ☎ (0284) 701 101

VERDICT

Goldring Elektra

▲ **PROS:** Full, solid sound quality.

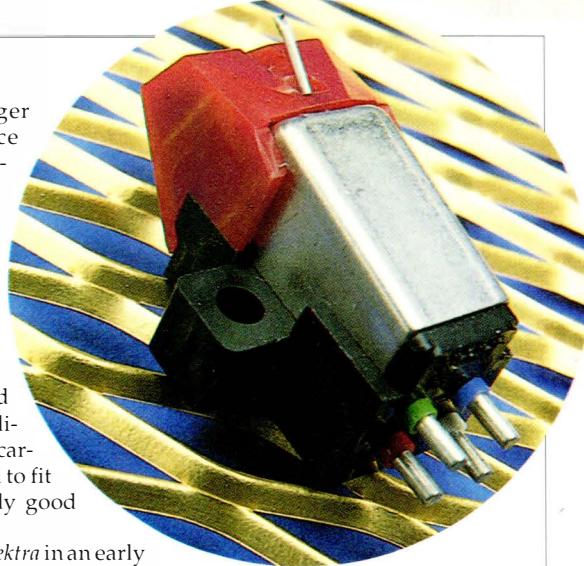
▼ **CONS:** Lacks fine detail and subtlety.

▶ **£24.95**

SOUND QUALITY



VALUE FOR MONEY



The Goldring *Elektra* is just the cartridge to revitalise your old turntable and open up the record collection again.

LOUDSPEAKERS

B&W Solid Team

When opening the *Solid Team* box, the first accessories that come tumbling out of the box are a pair of small metal grilles. Apparently, these fit into the speaker ports when the *Teams* are used outdoors, to stop creepy crawlies making a home in your speaker. Naturally enough, they're called Bug Plugs.

Versatility is the watchword of the £129.95 *Team* speakers. They come complete with a mounting bracket, to fix to walls or ceilings. And they have shielded magnets, for use in an AV system. There is an optional *Team Bass* subwoofer to add more grunt, but the *Team* on its own is claimed to reach down to 55Hz up against a wall.

At a suggested sensitivity of 87dB, the *Team* will work with most amplifiers between 20 and 75watts, while a protection circuit prevents the death metal enthusiast in all of us from blowing the speakers apart by playing music too loud.

It's well protected against the elements, although the *Team* is more likely to survive as an in-patio speaker than by a swimming pool of chlorinated water. At the rear of the speaker are a pair of nickel plated 4mm cable connectors; Although these sit in a recessed panel, they are still comparatively exposed and are likely to be first to suffer from corrosion in an unfriendly environment.

The sound quality of the *Teams* is pretty impressive,

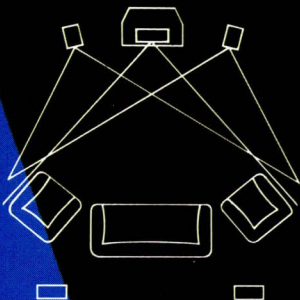


Following in the footsteps of a giant killer; the headphone socket-less *A-400X*.

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MAKE THE MOVE - IF YOU DARE - FROM OBSERVATION TO PARTICIPATION, WITH KEF'S REFERENCE SERIES MODEL 90 AND 100 CENTRE CHANNEL SPEAKERS IN YOUR HOME THEATRE SET-UP. FEATURING THE BREAKTHROUGH KEF UNI-Q® DRIVER, THEIR HIGH OUTPUT AND LOW DISTORTION ENABLE THEM TO DELIVER VIDEO SOUND FAITHFUL TO THE ORIGINAL PERFORMANCE, WHILST MAGNETIC SHIELDING ASSURES FREEDOM FROM PICTURE DISTORTION.... FOR NO OTHER HOME VIEWING EXPERIENCE QUITE LIKE IT.

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With conventional speakers, when you move off-axis, the tonal balance changes. If you do the same thing with Uni-Q speakers, the tonal balance remains unchanged. This consistent tonal quality is vital for accurate dialogue reproduction in home theatre sound.

What Video Magazine (Aug '93) awarded both the Reference Series Model 90 and Model 100 speakers 10 out of 10 for performance, dialogue clarity and looks.

Alvin Gold, in Audiophile Magazine (May '93) writes "Quite simply the KEF 100... is easily the best dialogue speaker I've used to date."



The experience of sound

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Choice Sessions

HEADPHONES

Sony MDR-CD450

The £45 MDR-CD450 is third down from the top of the eight strong Sony *Digital Reference* headphone range. In common with its alleged progenitor, the fabulous and now sadly deceased £2,500k MDR-R1, it is a sealed-back model designed to provide the listener with a degree of isolation from the outside world.

I can't say what kind of technology devolved down from the R1 to the more relevant machinery we're looking at here, but I can tell you that the transplant didn't take. The MDR-R1's capsule structure was an exotic hardwood, chosen in part for its lack of microphony. Sony has handicapped the MDR-CD450 with a vaguely similar shaped earpiece shell which turns out to be one of the most microphonic I have encountered, though the headband and cable are much better.

The microphony can be detected as a layer of coloration over the mild mannered, and inoffensive but extraordinarily dull and lifeless, output from the headphones themselves.

I was astonished to find that I simply couldn't hear great rafts of musical information. On one occasion, testing the Sony with a Nicam TV broadcast, I found it all but impossible to follow speech at all. I could hear the voices, but was completely unable to follow what was being said unless the volume was turned uncomfortably high. My reference headphones, AKG K-400s, which admittedly cost a lot more, were as clear as a bell, even with the volume turned

given the size and price of the speaker. The phased guitar sound at the beginning of Prince's *Purple Rain* sounded very good — too good, in fact, highlighting the jangly nature of the treble and the artificially overblown bass.

Moving to a pair of JBL *Control 1s* showed that, although they have a greater sense of space and air than the *Teams*, the two stood toe to toe in many respects, and the cheaper *Teams* had the greater weight.

Although the *Solid Team* is not hi-fi as such, its distinctive style, robust build and half-way decent sound makes it a fine choice for music while you barbecue.

Alan Sircom

B&W Loudspeakers Ltd,
Marlborough Road, Churchill Ind.
Estate, Lancing, West Sussex.
☎ (0903) 750 750

VERDICT

B&W Solid Team

▲ **PROS:** Very versatile; solidly made; good sound.

▼ **CONS:** Not hi-fi quality; lacks transparency.

▶ **£129.95**

SOUND QUALITY



VALUE FOR MONEY



AMPLIFIER

Magnum Quartet-A

Strictly-controlled blind listening tests are a unique feature of *Hi-Fi Choice*, lending the group reviews a consistency and reliability that simply could not be achieved by conventional one-off listening. Then again, there are times when this rigorous straightjacket prevents us from being entirely sympathetic towards that rare product that dares to buck convention.

So it was with Magnum's *Quartet-A* in issue 121. It's a very slim black box that plays host to some four separate amplifiers. Two of these amplifiers cover the entire audio band while the other pair are tailored to handle mid-to-high frequency sounds only. Not only are the bass/



The cute little *Solid Team* speakers can be connected base to base to make a neat centre channel for AV systems.

treble earth paths separated (as they are during bi-wiring) but bi-amping allows each amp to exercise a tighter grip over a single drive unit and a limited bandwidth.

Although it can be used as a stereo amplifier to feed a pair of single-wired speakers (as we tested it in issue 121), the *Quartet-A* really comes into its own when used in bi-amped form. We criticised the *Quartet-A* two months ago for its sandy treble and rather grey balance, an observation now addressed by increasing the loading of its CD input from 9.7kohm to a more compatible 18kohm.

Bringing those extra treble amplifiers into play certainly lifted the performance of our Audio Note AN/JJ speakers. Bi-amped they sounded sweeter still: the decay of percussion, the thrill of massed strings and cry of brassy sax were joined by a sense of atmosphere and occasion that was missing before.

Inevitably, the effect of bi-amping will vary from speaker

to speaker but in this instance it paints a mellow and more enticing tonal picture, and its soundstaging grows bolder, while also drawing different groups of instruments into sharper focus. The end result is simply more comfortable, detailed and, above all, entertaining.

Paul Miller

Hailey Audio, 328 Ware Road,
Hailey, Hertfordshire SG13 7PG.
☎ (0992) 714 811

VERDICT

Magnum Quartet-A

▲ **PROS:** Flexible design, capable of fine results.

▼ **CONS:** Results will vary from speaker to speaker.

▶ **£330.00**

SOUND QUALITY



VALUE FOR MONEY



Magnum's *Quartet-A* earned itself a reprieve courtesy of an extra two channels of amplification.

The truth,
the whole truth,
and nothing but the truth . . .



. . . so help me DPA!

It is a truth universally acknowledged, that clarity of sound allows true involvement with music.

Recognised Hi-Fi critics throughout the world have consistently praised DPA's products for their unrivalled clarity and transparency of sound reproduction. This inevitably leads to more profound musical experiences.

After years of development, the 200S pre and power amplifiers have been perfected. The amplifiers share the technology that has so inspired reviewer's praise in the past. The 200S combination at £1,250 gives state of the art performance at a reasonable price.

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dpa

DPA Digital Ltd., Unit 7, Willowbrook Tech. Units, Crickhowell Rd., St. Mellons, Cardiff CF3 0EI Tel (0222) 795621 Fax (0222) 794267

Choice Sessions

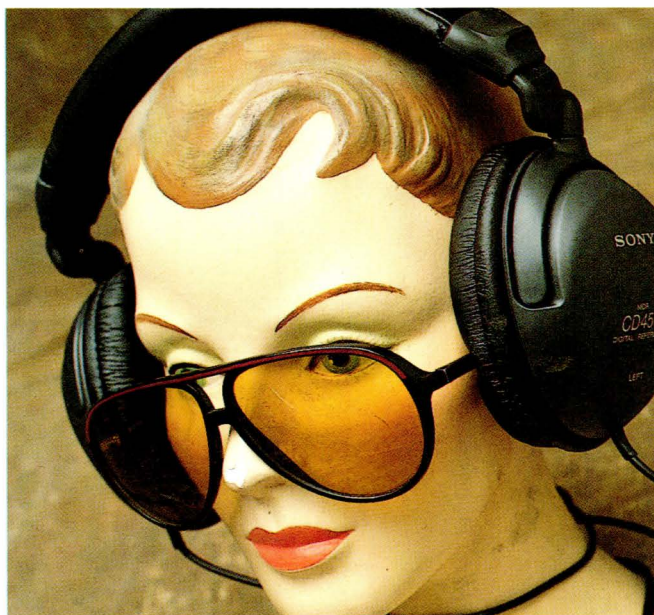
down way below a natural level.

The Sony does have certain qualities in its favour. It's smart and comfortable, thanks to warm and cossetting earpads which are however, too small to operate as circumaural pads, and limit the isolation provided.

They're extremely sensitive, making them usable with almost any kind of equipment, battery or mains powered, and the 6.3mm plug fitting is a screw on adapter which, when removed, reveals a 3.5mm plug. The Sony will plug into almost anything. Plus, of course, there may be those who like the warm, woolly but cuddly sound of the MDR-CD450. There is, as they say, no accounting for taste.

Alvin Gold

Sony UK Ltd, Sony House, South Street, Staines, Middlesex TW18 4PF. ☎ (0784) 461 688



There's no accounting for headphones: the delightful Dolores models the Sony MDR-CD450s.

that has shown any significant interest in Tannoy. However, the British drum company Premier is looking at using them for bass drums, so what started out as a speaker cone could yet end up as a drum skin.

It would be a great pity not to take advantage of an invention that offers more bass at a louder volume. After all bass is a dimension that's missing from too many systems.

Jason Kennedy

SPC Design, Newlands, Littlethorpe Lane, Ripon, Yorks HG4 1UB. ☎ (0765) 604 288

PREAMPLIFIER

Audio Research LS3B

The transition of Audio Research from valve amplifier manufacturer to manufacturer of solid state amplifiers with broadly valve like attributes continues apace with the LS3B, a line level audiophile preamplifier selling at what, by US standards, is middle price territory. This rather understates the position in the UK, but it does provide a new entry level to Audio Research, one of the most celebrated of all high end marques.

As far as styling and engineering are concerned, there is an element of Mercedes-Benz about ARC equipment, all of which is styled similarly, and built in much the same painstaking way. The LS3B uses ancient looking toggle switches to select power on/off, muting, tape monitor and 'direct' — an input that bypasses all other circuitry. Standard ARC style rotaries take care of volume, balance, mono/stereo switching and source selection, which here means five line level

The shape of cones to come? Spiral tube reinforced Helicones and a guinea pig Tannoy 615.

VERDICT

Sony MDR-CD450

▲ **PROS:** Easy on eye and ear; good sensitivity.

▼ **CONS:** Lacking in analysis; soggy sound balance.

▶ **£44.99**

SOUND QUALITY

■ ■ ■ ■ ■

VALUE FOR MONEY

■ ■ ■ ■ ■

CONE TECHNOLOGY

Helicones

Simon Carrington typifies that uniquely British class of inventor which the corporate Japanese seem to have great difficulty in producing. He's recently been applying lateral thought to the improvement of loudspeaker cone design.

What he has invented is a cone made up of a helical tube that ports into the cabinet at the centre, and into the atmosphere on its circumference. Designed for use with infinite baffle designs, the Helicone, as it has been dubbed, effectively gives portless loudspeakers a degree of reflexivity, and significantly increases both surface area and rigidity. The sonic effect is to

increase power handling and bass output below 50Hz — a bass output increase of 9dB at 30Hz has been measured in anechoic conditions. Using a Helicone allows you to decrease cabinet volume by a third and maintain the same bass extension. The rigidity also extends high frequency output as it is far less prone to break up than a conventional cone.

Simon has stuck Helicones to both sides of conventional and perforated plastic cones, and formed flat ABR drivers, ending up with a varying degree of low frequency boost.

He used Tannoy 615s for most of the work. The 615s, effectively donated by Tannoy, proved very suitable; leaving the coaxial mid/high frequency driver alone, Helicones were attached to the bass driver and ABR. Simon demonstrated these to great effect. Unfortunately, I've not heard standard 615s

played in anger but doubt that they are ordinarily as substantial as the Heliconed version. It is probably enough to say that the physiological impact of Metallica's *Enter Sandman* (a seminal high mass recording) was not left in any doubt.

What we have here is a design looking for a manufacturer. So far, the only hi-fi company

VERDICT

Helicones

▲ **PROS:** Allows more bass from small boxes.

▼ **CONS:** Not as yet in production.

▶ **£N/A**



The highest fidelity. Naturally.

HD 580

Top of the range dynamic headphone using new duofoil diaphragm which virtually eliminates sound colouration.



HD 320

Part of the new generation of dynamic hi-fi stereo headphones, the HD 320 has ergonomic styling with a sound quality that is designed to optimise transparency and clarity, whilst ensuring a strong bass definition.



HD 560 II

"A detailed and open headphone with the ability to recreate the power and depth in a piece of music."

Hi-Fi Choice
Oct 91.



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It's no coincidence that Sennheiser headphones are acclaimed again and again in the hi-fi press.

We set new standards of sound reproduction and quality at the leading edge of acoustic technology. Supremely comfortable and near-unbreakable, the headphones are specially designed for easy replacement of parts.

With accurate, detailed response and rich pure tone, recreate the eloquence of the instruments, the vitality of the vocals. Whatever your taste in music you'll appreciate the transparent natural sound quality, balanced by a wide dynamic range.

Now prove it. Try out our headphones for yourself. You'll be convinced. Naturally.



HD 340

A headphone which produces a roomy and detailed sound whilst incorporating high quality in its design making it lightweight and comfortable to wear.

 **SENNHEISER**

Sennheiser UK Ltd, Freepost, Loudwater, High Wycombe, Buckinghamshire, HP10 8BR. Telephone 0628 850811. Fax 0628 850958

inputs in addition to tape and direct.

The rear panel is populated with high quality gold plated phono sockets, including outputs for two power amps, and a pair of balanced XLR sockets—an increasingly common inclusion with high end electronics. The mains lead is captive, and construction internally and externally, is to the expected high standard.

Truly good preamplifiers are thin on the ground, but (given a long running in period) I can think of fewer adverse comments to make about the LS3B than any other preamp I remember. It simply didn't betray itself in any way. It favoured no frequency area, type of music or volume setting. It simply sounded utterly neutral yet vivid, lively and incredibly informative in the sense of being responsive to the smallest details, and the slightest expressive or dynamic changes.

However, the direct input was discernibly more refined and outgoing still, and the use of the balanced option, while not transforming the sound, gave it a new sense of energy and purpose.

Used for this test with ancillaries from Wadia, Theta, Martin-Logan and others, the Audio Research LS3B sets new standards at the price, and receives the highest possible endorsement - five stars for value as well as performance.

Alvin Gold

Absolute Sounds, 58 Durham Road, London SW20 0DE.

☎ 081-947 5047

VERDICT

Audio Research LS3B

▲ **PROS:** Performs well under nearly all circumstances.

▼ **CONS:** No balanced input is provided.

▶ **£2,149.00**

SOUND QUALITY



VALUE FOR MONEY



The classic lines of an Audio Research LS3B preamp hint at nestling state-of-the-art electronics inside.

TURNTABLE

Townshend MkIII Rock

Backed by the success of the *Seismic Sink* baseboard, and fuelled by the critical acclaim of the huge *Sir Galahad* loudspeakers, Townshend Audio has returned to making turntables, after a break of several years.

Based as ever on the concepts developed in the late Seventies at the Cranfield Institute of Technology, the new £799 *Mk III Rock* adds Nineties materials, science and production engineering to the original design.

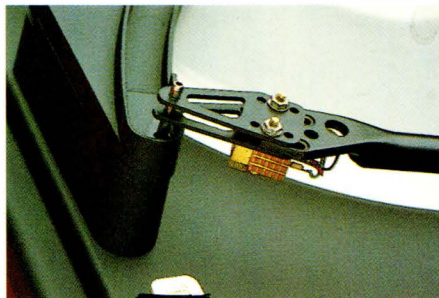
Pivotal to the *Rock* ethos is cartridge damping, using an outrigger fitted to the headshell of the tonearm, which sits in a silicone-fluid filled trough at the front of the turntable. It's a little disconcerting at first, swinging a gloop-filled arm over your precious vinyl, but as the fluid is so viscous, you soon overcome any apprehensions.

It does not have any form of suspension, although the entire deck is set into a modified

Seismic Sink. A further *Seismic Sink* is virtually mandatory, as it adds extra control and weight to the bottom end. In the near future, a *Merlin* power supply for the *Mk III Rock* will be fitted into a *Sink* body, which would be an ideal upgrade. The entire package, with an clear acrylic platter atop the dark grey powder-coated table, looks stylish and elegant.

Making music is where the *Mk III Rock* really shines through. Suitably troughed and *Sinked*, it makes almost all of the turntables currently available sound virtually chaotic in the bass. Other top-flight turntables may sound more mellow and expansive, but none have the *Rock's* confident, CD-like stability of image and focus, com-

The latest incarnation of the Townshend *Rock* is a slick looking beast, complete with special *RB300* outrigger.



combined with a massive reduction of surface noise. It also seems to make the sweet-spot appear unimportant, projecting sounds throughout the room.

This all combines to give an up-beat attack to Neneh Cherry's *Buffalo Stance*, for example. This track typified all that's good about the *Rock*; playing it on my *PT Anniversary*, it sounded rhythmically loose and unfocussed by comparison. In all, this simply makes you more interested in your records, and when you first get a *Rock*, sleepless nights of record playing are almost guaranteed. Just as rock 'n' roll will never die, nor will the *Rock*.

Alan Sircom

Townshend Audio, Tim's Boat Yard, Timsway, Staines, Middlesex, TW18 3JY. ☎ (0784) 455 866

VERDICT

Townshend MkIII Rock

▲ **PROS:** Superlative sound; excellent bass.

▼ **CONS:** Needs an extra *Sink* for best results.

▶ **£799.00**

SOUND QUALITY



VALUE FOR MONEY



D/A CONVERTER

Audio Note DAC 3

Audio Note has resisted the rising tide of digiphilia for longer than most so-called bastions of the analogue faith, but in the end circumstances have prevailed and a range of three DACs has appeared.

At £1,650, the Audio Note DAC 3 is top of the range and uses a pair of 6922 triode valves for its output stage. At its heart lies a PCM63P Burr-Brown 20-bit converter chip which, in this Bitstream era, is unusual but not half-way as novel as the matching transformers that sit between it and the analogue filters.

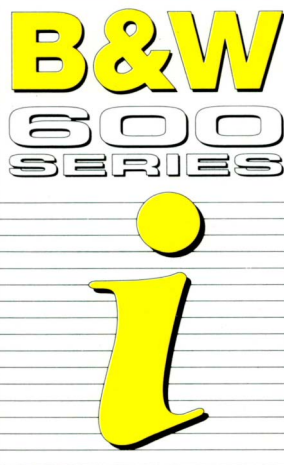
These passive devices are much like the transformers used in moving coil step-ups, as they match the output impedance of



Talking Speakers

At B&W we believe in evolution. For almost thirty years we have been making some of the world's finest domestic and professional monitors, developing our skills and products to meet the needs of the most discerning listener. You.

To achieve such a high standard of reproduction, our designers spend a lot of time listening to feedback. Not from our loudspeakers, but from our professional clients, reviewers and, most importantly, our customers. The result is that we don't release a new range every year or so, but incorporate improved features as the public demands and our



world-renowned R&D department allows.

The 600 series has evolved significantly over the past three years (although considering the reviews on their release, it seemed hardly possible at the time). All of the new series have improved crossovers and ferro-fluid cooled tweeters (metal domed, of course), and the larger models now have one piece moulded bass drivers. The only thing that we haven't been able to improve upon is the classic modern styling by Kenneth Grange.

We'd go so far as to say that the 600 series has evolved to the point where it can speak for itself.



Inside this unexciting Audio Note case lies the technology to turn your CDs into living, breathing, butt kicking music makers.

the source to the input impedance of the filter. The idea is that you give both an easier life.

On the facilities front, the DAC 3 is a bit unusual as well. Alongside optical and electrical inputs (the latter in both BNC and phono varieties) are two pairs of output sockets, one marked 'demp' and the other 'direct'. This is for the small proportion of discs which have pre-emphasis on them. All the other CD players and DACs I have come across adjust for this automatically but, being an esoteric outfit, Audio Note took a, well, fresh approach to the matter.

I used the DAC 3 with Meridian 200 and 602 transports. I had hoped to use a Marantz CD-11 as well, but the Audio Note wouldn't lock onto its electrical output for some reason.

The DAC 3 has many of the strengths that one might expect of a tube component. It's dynamic and has an open, detailed character that is difficult to differentiate from the discs being played. Variations in the sound of software weren't subtle, each example displaying the character of the techniques and environments used to make it.

The DAC 3 revelled in the improvements wrought by the dearer transport, and the 602 added an extra dimension of substance and energy to discs. Yello's rampant *Baby* sounded astonishingly powerful and expansive. It brought out the pres-

ence of live recordings well. The energy and atmosphere of Zappa's *Ring of Fire* was convincingly produced, the DAC revelling in low level detail and unearthing more intonation and nuance than usual. It also has a fine sense of timing, despite the fundamentally relaxed presentation, that drives the music along without resorting to force.

The big Audio Note is a subtle and effective converter. It allows CDs to sound as dynamic, fast and substantial as the transport will let them, and therefore deserves the best you can get. The DAC 3 is a ruthless and powerful device that reveals some surprising strengths in the medium. Lend it an ear.

Jason Kennedy

Audio Note UK, Unit 1, Block C, Hove Business centre, Fonthill Rd, Brighton BN3 6HA.

☎ (0273) 220 511

VERDICT

Audio Note DAC 3

▲ **PROS:** High resolution DAC with excellent dynamics.

▼ **CONS:** Manual de-emphasis; needs serious transport.

▶ **£1650.00**

SOUND QUALITY



VALUE FOR MONEY



RECORDING

Hammersmith

Music for brass and winds; Dallas Wind Symphony/ Howard Dunn Reference recordings CD/LP RR-39.

The late Seventies saw a fundamental change in the way music signals were stored; digital recording had arrived. Initially, the prospects were enticing. Digitally-recorded LPs promised enhanced frequency range and wider dynamics, plus an absence of traditional nasties like print-through and wow.

One of the first digital recordings, Telarc's LP of Holst, Handel, and Bach featuring the Cleveland Symphonic Winds under Frederick Fennell, was issued in the UK in 1979.

Yet the sound of this early Soundstream LP wasn't quite right. The bass was fantastic, but the top sounded frayed and brittle, giving a slight edge so that heavy transients tended to spit. Instruments like the side drum had a roughness, which made it hard to hear each stroke separately.

Memories from 1979 came flooding back as I sat listening to Reference Recording's CD of Holst's *Suites*

1 and 2. The sound is big and impressive, yet with greater focus and an extra clarity missing with the old Telarc. I still have the latter on LP and CD and it sounds good, albeit slightly fuzzy at the extreme top-end, no matter what it's played on.

Holst's *Suites* for military band contain some marvellous music — accessible, tuneful, atmospheric, touching, stirring — and the Dallas Wind Symphony under Howard Dunn play with plenty of enthusiasm. On the whole, he adopts fairly fast tempi (for example, the second movement of the first *Suite*), and keeps the music moving.

Dunn retains Holst's original instrumentation, rather than adding extra parts, creating light textures. Certainly, the old

Fennell performances on Telarc were denser, heavier, and more symphonic in terms of scale

To complete this all-Holst programme, Dunn adds the *Hammersmith Prelude and Fugue*, plus *A Moorside Suite* — the latter given in its original brass version.

The LP, taken from analogue tapes, is crisp and detailed. Cut at a good high level, with plenty of bass weight and transient impact, it sounds sharp and forward. However, there is a tendency for the high treble to protrude slightly, almost as though the mics had a rising top-end response, giving the brass a sizzly quality during climaxes.

The CD, from digital masters, is very good too. Resolution seems a tad lower, and the instruments have less body and vibrancy. But it's still very good sounding, and the most extreme treble is less exposed.

Going back to the old Telarc LP, its crowning glory was a quite fantastically

tight powerful bass drum, the like of which had never been heard before on commercial vinyl. I have memories of the 1980 Audio Show, and punters pinned to the wall in the Audio Pro sub-woofer room as the finale of Holst's first suite thundered out! Doubtless, some of you were there too and are still having nightmares...

The RR disc (LP or CD) isn't quite as awesome in terms of bass as the old Telarc, largely, I suspect, because the bass drum isn't actually being hit quite as hard. It's a softer, rounder sound, deeper in pitch, but with less transient attack. This ties in with Dunn's lighter, faster, performances conceived with the purist very much in mind.

Jimmy Hughes





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Technics
For music lovers.

Paul Messenger assesses a Nordic hi-end tuner that's been around for a few years, costs a tidy sum, is all knobs and dials, but proves a radio enthusiast's delight.

Tandberg 3001A

When the call came I didn't even know that Tandberg hi-fi equipment was still available in the UK — or that it was still manufactured at all — let alone that there was this £2,300 3001A tuner with an international audiophile reputation. That very day I'd just finished work on the tuner group test (issue 120) which had included at least three exciting models, so the prospect of trying something even more extravagant was doubly inviting.

Tandberg has been Norway's main contribution to world hi-fi for a great deal longer than even I can remember. The firm's main UK reputation was built on reel-to-reel tape recorders back in the Sixties. The *Huldra* series tuners, from the same era, were also held in the highest esteem by radio enthusiasts.

Though the hi-fi side of Tandberg shrank in the Seventies, it still produces its own designs — the relative maturity of which can be seen as an advantage in these retro-conscious times.

The 3001A actually dates back

to the early Eighties, and the importer's sample we borrowed was itself a few years old — both factors which are reflected in the review findings. One crucial distinction between this Tandberg and the vast majority of the tuners on the market is that to all intents and purposes it's an analogue device — which has both positive and negative implications.

It doesn't look in any way dated at first glance — in fact, the beautifully finished titanium/gun-metal casework has a timeless, classic quality, besides one or two rather sharp corners. Switch on, however, and the resultant light show does rather give the game away — they

don't make them like this any more (outside Norway that is). There are lots of buttons, many with LED tell-tales, but pride of place goes to a brightly illuminated (if rather deep set) genuine pointer-and-dial analogue tuning display, backed up by two swinging needle indicators for the centre-tune and signal strength.

The one thing

Air check

This Tandberg comfortably established the new air-check performance benchmark. Tune most tuners to 103.2MHz at this low level Brighton site and all you will normally find is noise and interference; tune the Tandberg in and you hear *Power FM*. Not very well, admittedly, but that's because the signal is hemmed in and barely above the noise. To get anything at all on this splatter-ridden channel has defeated all comers until now.

The Tandberg also increased by a clear grade the reception rating of all the difficult London stations — from 'fair' to 'good' or from 'good' to 'excellent' — compared to the modestly priced but eminently airworthy Denon *TU-580RD* reference. The cleansing effect of the tight 'narrow' selectivity proved almost equivalent to doubling aerial capability. For the first time it was possible to listen for long periods to *Kiss*, *Jazz FM*, *Capital* and *LBC* with a modest aerial, without constant reminder that the signal had travelled some 50 miles.



that's missing is the now virtually obligatory digital frequency readout. I don't expect that analogue displays will ever make a comeback but they're friendly enough things nonetheless, and no handicap, especially when coupled to a nicely weighted and damped flywheel action rotary knob.

One major reason tuners went digital was to facilitate features like presets and remote control. You won't find any form of remote operation here, but there is a collection of eight presets, which should be enough to store your favourite stations. A neat ergonomic trick is the way the preset and flywheel have been integrated, so that as soon as you touch the main tuning knob this mode immediately takes over from whatever preset might have been selected at the time.

Some £2,300 is a lot of money to pay for any hi-fi component, and much more than the hundred or two most people allocate for tuning into the radio. But this is such an impressive piece of engineering in so many ways that the price doesn't seem unreasonable, and the internal com-



Friendly analogue displays feature on the 3001A which has a 'classic quality' — a dream tuner with careful system matching.

ponent count provides further justification. Being a 'serious' tuner, it is FM only, yet it also has a variety of front panel features that few rivals provide, which will gladden the radio enthusiast's heart.

Which brings me to the crunch. The serious hi-fi tuner is sitting on the horns of a dilemma, required to satisfy two different and essentially contradictory criteria. As a hi-fi component its prime purpose must be to maximise sound quality, however nebulous such a definition must be. As a radio it should also arguably have the ability to seek out distant and partly obscured stations, cope well with very strong signals and generally make the best of whatever's available across the FM band of the RF spectrum.

The upmarket British tuners all make sound quality their first priority in their various ways: the intention is, first and foremost, to attract the serious hi-fi enthusiast whose main concern is to get the

very best out of just a handful of easy-to-receive stations. The Tandberg is clearly trying to satisfy both camps, with variable selectivity and a much greater range of options which will delight the radio

Looking under the lid

The eight-gang varicap front end has no fewer than six RF tuned circuits before the mixer — two or three is the norm, four a luxury, and six probably a record. Two BF900 dual-gate MOSFETs act as RF amplifiers and a third as mixer, giving an exceptionally sensitive front end with good avoidance of wide-spaced intermodulation, but susceptibility to close, strong signals above 70dB.

Selectivity is provided by two six and two four-pole 10.7MHz linear phase LC modules, plus two SPE MJ-A ceramics for 'narrow' mode. A TDA1047 chip undertakes limiting, feeding a ratio detector, which is sweet and kind to weak and fading signals.

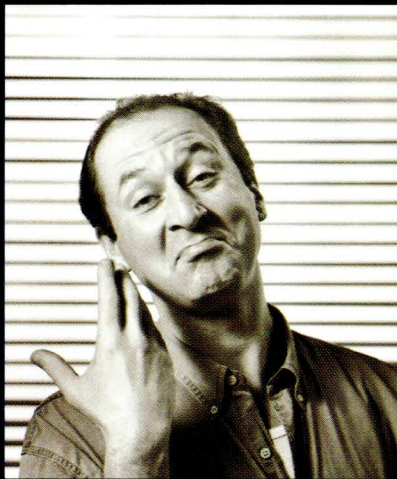
The semi-discrete decoder is a switching type design with very sophisticated pilot extraction and locking circuitry. Rear sockets can be connected to an external oscilloscope to assist aerial alignment for multipath reduction.

buff, but which also conspires to make it a more complex device. And complexity a natural enemy of sound quality, at least according to some schools of thought.

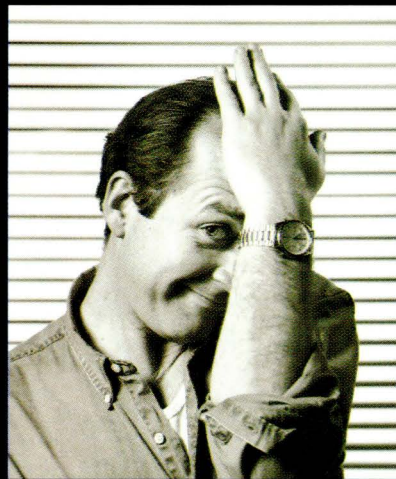
Three different degrees of selectivity give very narrow, medium or very wide settings, the slight offset between the optimum tuning point between 'narrow' and 'normal' being a reminder that this is an analogue device which has not seen factory alignment in several years. If not the last word in accuracy, the analogue meters are practically informative and have a very wide range. It's gratifying to be able to set the inter-station noise muting to a calibrated level when trawling the band, while the action of the AFC servo is also very well behaved.

A radio enthusiast's tuner

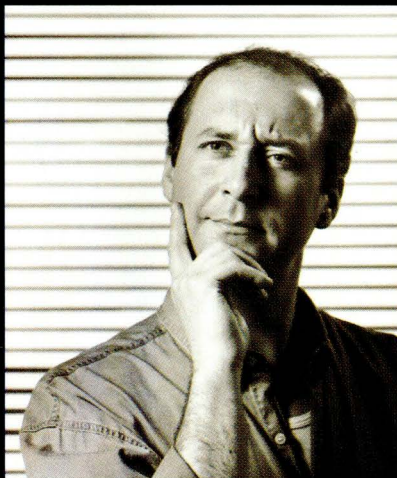
Auditioned purely on strong signals in an audiophile system context, the sound quality was initially a little disappointing. At the agent's suggestion, a very classy (and, at £250, expensive) Siltech MC4/56 interconnect was obtained from Connexions, and this brought a consider-



"I've got a pretty good hi-fi system"



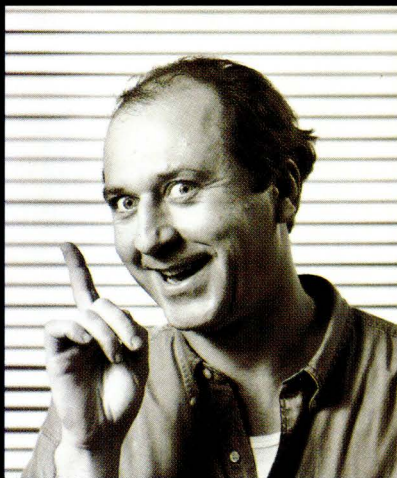
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able improvement.

The Tandberg's main strength is an exceptionally sweet and very open treble, and some careful system and component matching is needed to preserve this delicacy. Its limitations, on the other hand, seem to lie more at lower frequencies, where some lack of drive and urgency is also apparent.

The net result in audiophile terms is a

tuner which will work beautifully in the right context but might disappoint in another. I wouldn't regard the 3001A as a likely candidate for inclusion in a Linn or Naim system, but suspect it will work exceedingly well in combination with panel speakers and valve amplifiers.

From a radio enthusiast's point of view, this Tandberg tuner is an absolute delight, setting new standards for diffi-

cult station reception through some serious radio engineering. The audiophile case is a little less cogent, but for high-end hi-fi careful system matching is always essential, and excellent results should be achieved in the right context.

Tandberg, Esoteric Audio Imports, 6 Castleman Road, Chichester, West Sussex PO19 4TL. ☎ (0243) 533 030

JBL Ti2000

Alvin Gold makes space in his listening room for distinctive looking

loudspeakers that produce sound which can be felt as well as heard.

Everyone knows that JBLs go loud, but loud and dirty rather than loud and clean. JBL is for heavy metal freaks, for disco freaks — for freaks full-stop. A couple of years ago, JBL attempted a break for the high ground with a sophisticated purist hi-fi design. The market collectively yawned, turned over and went back to sleep.

In the *Ti2000*, JBL finally has a product worth waking up for. I've been using them for several months as front loudspeakers in a neo-THX system (sounding brilliant, though their dispersion characteristics are completely wrong for the job), and in various stereo hi-fi systems when testing amplifiers, CD players — or just listening.

The *Ti2000's* odd shape is strictly functional. Its base is made wide to accommodate a decent 210mm pulp cone bass driver, and narrow towards the top to reduce the frontal area near the 25mm titanium dome tweeter. The latter should help to promote sharper imagery. In the middle sits a dedicated midrange driver, a 130mm polypropylene cone unit with crossover points at 300Hz and 5kHz. This unit handles almost all the formative musical information, especially in the area of the ear's greatest sensitivity.

The slightly tilted front baffle means that the tweeter points at the ear when used on standard lowish stands (Audio Note for this test). Its asymmetry in all planes helps disperse internal resonances, which translates into reduced levels of coloration. Each pair is built in mirror image symmetry to optimise stereo imaging.

The *Ti2000* is also notable for its unusual weight (22kg, nearly 50lb) due to its double enclosure structure, one inside the other Russian doll style, with an intermediate rubberised damping layer.

The *2000* won't work in every system. Not only is the price beyond most people's reach, the speaker also demands a genuinely powerful and 'grippy' amplifier to make it sing. The better US super amps are a good match, but it can also be teamed with amplifiers such as the top Musical Fidelity models. Either way, it prefers open, colourful designs.

All the efforts put into achieving exemplary stereo imagery have paid only limited dividends. The system does image well, but in a laid back way that proves to be a hallmark of the system.

I found the *Ti2000* to be more understated than JBLs of the past, but don't mistake that simple observation for any lack of ability in areas where previous JBLs have done well. When the chips are down, bass delivery is simply prodigious. The organ in the *Pini Della Via Appia* movement of Respighi's *Pines of Rome* (Dutoit et al/Decca) sent the floorboards of my listening room into a slow, sustained waving motion. There's never any hint of excess, but given a suitable excuse this is bass that can be felt as well as heard in a big room. Thereally

gratifying feature, however, is that it knows when to stop. With small scale and acoustic material, the bass stays quiescent; it doesn't drone along.

For a speaker with such tremendous low frequency potential, speech quality off radio was surprisingly free of the chestiness that even the best trained BBC inspired designs from the *LS3/5a* seem unable to sidestep. The other end of the audio frequency band was equally impressive. Although early versions of the JBL titanium dome were coarse and aggressive, the current version is as sweet and as smooth as they come. Even the frazzled opening of *Pines* didn't faze the JBL tweeter.

It is the midband, however, that is the *Ti2000's* secret weapon. Speech quality benefited from the almost total absence of box-like resonance effects, and music generally was free of woody vocal colorations and the attractive but unnatural halo that you often hear surrounding orchestral strings. This is a truthful, accurate midband that neither conceals nor sanitises. Most remarkable of all is the speaker's extraordinary dynamic ability which allows it to drag

itself from music that's scarcely audible at all to a point which would annoy the neighbours, without even touching the volume control. The *Ti2000* is a star.

Harman Audio, Unit 2, Boreham Wood Industrial Park, Rowley Lane, Boreham Wood Herts WD6 5PZ. ☎ 081-207 5050

The designer was perfectly sober; the asymmetry of the *Ti2000* helps reduce coloration and aids stereo imaging.



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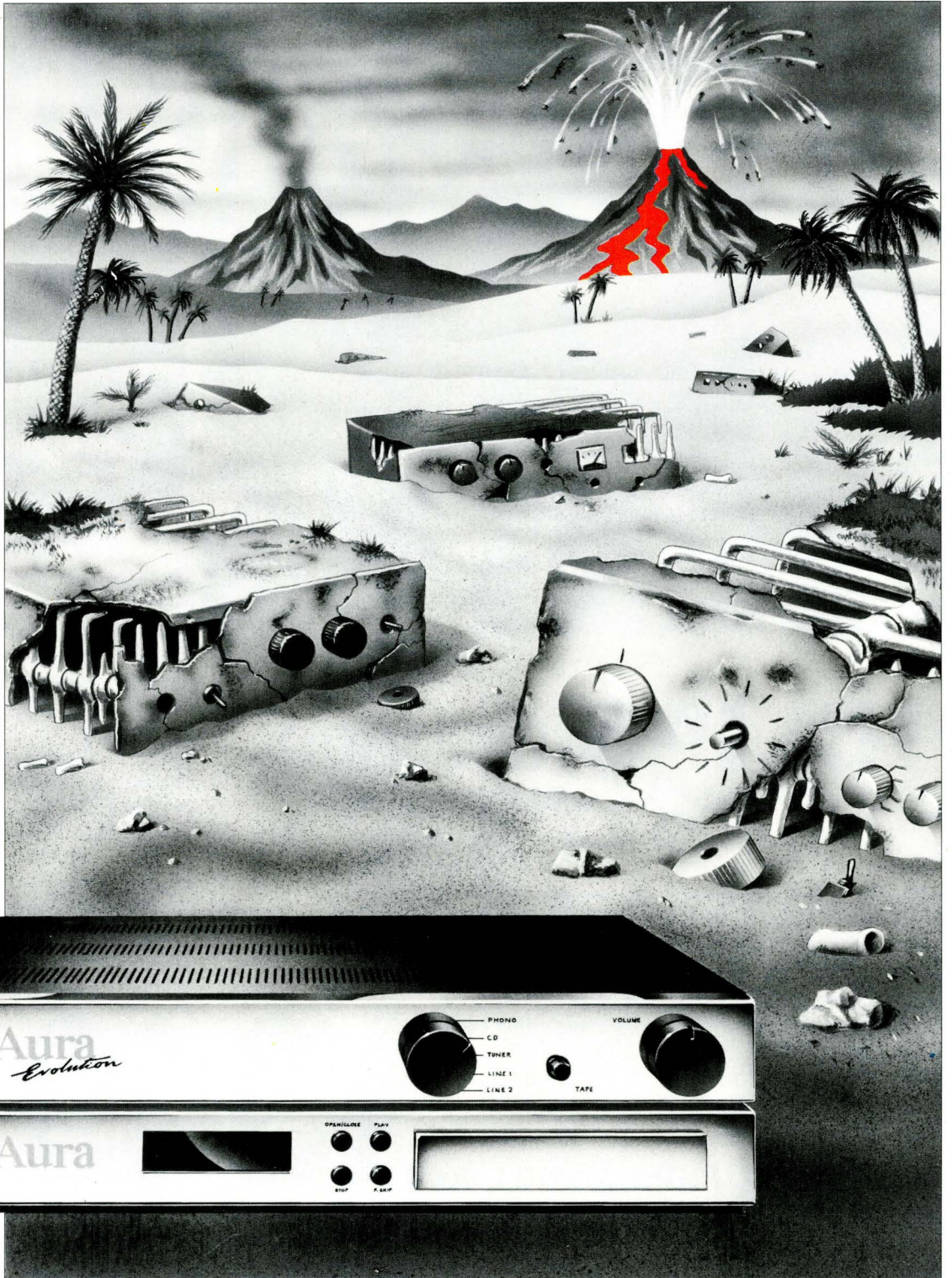
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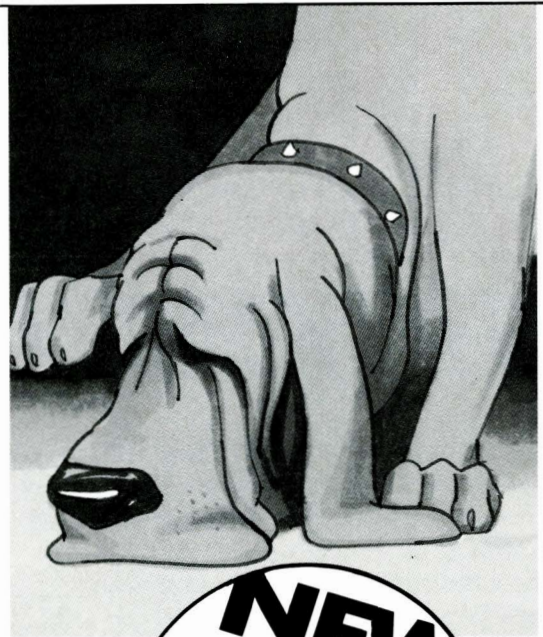
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Two grand amps

Q I am presently building up a good quality vinyl-based hi-fi system but I cannot decide on the best amplifier and speaker combination for the job.

I currently own a Pink Triangle *Anniversary* turntable, SME V tonearm with Denon DL-304 cartridge, Revox B77 open reel recorder, Nakamichi *Cassette Deck 2* and a Marantz CD-52II compact disc player.

My musical tastes are extremely wide, encompassing electronic dance, rock, reggae, piano and orchestral. I would like solid, well-formed bass that will not swamp the upper ranges. To keep within my budget, I am considering the Rega ELA or Mission 753 loudspeakers, which leaves me around £2,000 for amplification (I may upgrade the speakers again at a later stage).

As I live in Norway, I am considering an Electrocompaniet EC-3/100DMB pre/power combo. However, due to logistics, I am unable to audition this amplifier with either of the speaker systems mentioned above.

From your experience, which of the two combinations would be most suitable for use with the Pink Triangle — or do you have any alternative proposals?

William Bailey
Trondheim, Norway.

A It's not easy, finding an amp and speaker combination as good as the front end you are using. We have not heard the current range from Electrocompaniet, but our spies tell us it's a good one.

The Naim NAC72/HI-CAP/NAP140 trio is a decent alternative, as would be the



YBA 3 pre/power combo. It is also worth investigating the Iso/Argo/Alecto amplifier combination from John Michell. One other newcomer that you might like to audition is the Arcam Delta 110/120.2 pre/power amp. Watch out for a full review in next month's issue.

Below: a hard turntable to do full justice to, the Pink Triangle Anniversary, here with SME IV.

Query of the month

The meek shall inherit the bass

Q My system consists of a Pioneer PD-S801 CD player, Pioneer A-400 integrated amplifier and Mission 753 loudspeakers, connected with Audioquest Quartz interconnect and Linn K400 speaker cable.

I listen to various kinds of music, but have a slight bias towards female vocals and soul. Even though my system has given me much listening pleasure, the meek bass of the PD-S801 has to make way for something more solid, though not necessarily wall-shaking. I am also looking for more warmth, yet I would like the system to be at least as detailed.

Although I understand the laws of diminishing returns in the world of hi-fi, would £1,000 bring significant improvements compared to what I have at the moment? My dilemma is whether to spend my whole budget on a CD player to partner my A-400, or to get both a new CD player and integrated amplifier. Would my A-400 be

up to the task if I partner it with a top flight CD player? I would like to retain my Mission 753 speakers to partner the new equipment.

Fra Ismail
Clifton, Bristol.

A It's rare for a set-up like yours to have 'meek' bass, which leads us to believe that the system needs a few minor adjustments to get it to sing. It would be better to get what you already have really working properly, before changing a component.

You make no mention of either the size of the room, or the position of the speakers within. Hopefully, the 753s are in a room large enough to let them breathe, but even if this is not the case, place the speakers about 0.75m to 1m from the rear wall. This should fill in the bottom end, overcoming much of the 'meekness' you describe. Secondly, replace the interconnect

cables with van den Hul's The First metal free cables, and the speaker cables with bi-wired sets of either Mission or DNM solid-core. This will add space and air to the upper registers and should unveil the richness of the PD-S801 CD player.

Both Pioneer products respond very positively to the use of the Townshend Seismic Sink isolation platform, in this case better even than a Mana table. Adding a Sink under each component will round off the system's low end solidity. Finally, although not recommended by Pioneer, the Tom Evans/Trichord modifications to both CD player and A-400 would further improve the resolution of the system, especially in the lower registers. The total cost of all these modifications should be less than £1,000.



Third time lucky

Q I am about to purchase my third system of hi-fi separates, and I would very much appreciate your help in avoiding a problem which I have experienced with previous systems: excessive sibilance. I want to avoid the same problem again at all costs. My last system comprised a Sony CDP 491 CD player, Sony TCK 570 cassette deck, Pioneer A-400 amplifier and Tannoy M15 speakers.

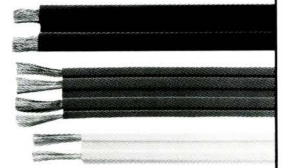
I have approximately £900 to spend on a new CD player, cassette deck, amp and speakers. In the past, I have searched for a very clear, detailed sound, but perhaps I would be better served by a more laid-back approach? Finally, should I invest in good quality cables?

R Ide
St. Albans, Herts.

A We are concerned that you are chopping and changing systems without success, especially as the previous system had the potential to be rather special. It is unclear in your letter as to whether you still have that system; if you have, hang on to the cassette deck and amplifier, and spend the £900 on a well-matched, smooth sounding CD source (like the Pioneer PD-S902), a pair of JPW AP3 loudspeakers with heavyweight stands, and plenty of decent speaker cable and interconnects.

If the entire system has gone, try doing without the tape deck at first, concentrating on putting together a better CD-based system. To eliminate sibilance from a CD system is not cheap. However, a set-up consisting of an Arcam Alpha 5 CD player and amplifier, a pair of Rogers LS2a/2 or Rega Kyte speakers on Foundation Sir FRED stands, plus a set of top notch cables, should be able to

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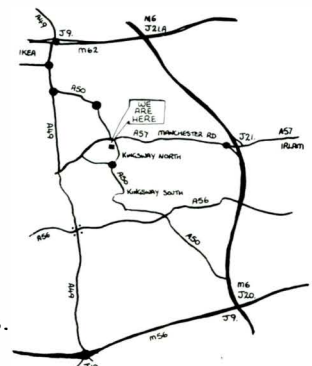
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HELP!

deliver the sound you are looking for.

More importantly, arrange some demonstrations with local dealers and listen out for a combination that sounds really sweet to you. There are good dealers with fine demonstration rooms in Watford, Harpenden and Radlett, as well as St Albans. One of these specialists will be able to put together a system that suits your ears, and your budget.

Graphic equaliser?

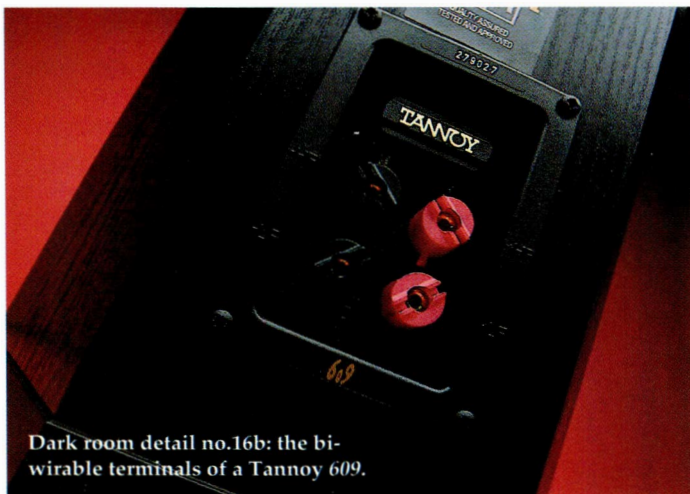
Q I am getting into the idea of buying hi-fi separates and wonder if you have some sound advice for me. I have been for a demonstration at my local separates dealer, looking for a system with a budget of £1,100.

At present, I am looking at buying an Arcam Alpha CD player, Audiolab 8000A amplifier and Tannoy 609 speakers. I have an old graphic equaliser but was recommended to exclude it from my system. Could you please tell me if my system will combine well and if I should take the dealer's advice and exclude my equaliser?

Stephen Brand
Aberdeen, Scotland.

A The system the dealer has put together for you should work well, and if you are happy with the sound it made in the dem room, the chances are you'll like it just as much at home.

The dealer is also correct about the equaliser. It is well nigh impossible to improve the sound of a system with a graphic equaliser. You would be much better off bi-wiring the Tannoy speakers. Just connect two cables on each terminal of the amp to the individual bass and treble sockets on the speaker.



Dark room detail no.16b: the bi-wiring terminals of a Tannoy 609.



Mission's beer budget British CD player, the shapely DAD 5.

True blue

Q I am looking to buy my first 'real' hi-fi and I have between £700 and £800 to spend on a CD player, amplifier and loudspeakers. I plan to add a tape deck and turntable at a later date.

My room measures 5m x 3m and I usually play a mixture of blues, rock and pop. Could you point me in the right direction as to a good system, preferably British made, with the emphasis on quality rather than looks?

James Wright
Rochdale, Lancs.

A Finding a good British CD player that will not absorb well over half your budget is not an easy task. The least expensive true blue British player is the Mission DAD 5, but if you want one with a recommended tag hanging from it, the Arcam Alpha is a strong contender. Arcam is in the process of phasing in its replacement, the Alpha 5, which looks set to be every bit as successful, but is as yet an unknown quantity.

Low cost British amplifiers with a price-tag below £250 are also few and far between. Currently, only the Aura

VA-50 and Creek CAS 4040 S3 fit the bill, although once again the new Arcam range offers a possible contender in the form of the Alpha 5. The Sugden A25B, made in Yorkshire, no less, is another possibility.

Which doesn't leave much for the speakers. Fortunately, speakers like the little Celestion 1, JPW Sonata and P1 Vinyl, and Wharfedale CRS3 all produce excellent sounds without breaking the budget (much).

Once you have built the backbone of the system, improve it with a Sound Organisation ZO38 table, Atacama speaker stands, Sonic Link Violet or DNM interconnects, and Mission Stranded or DNM Rainbow speaker cable. Then you can boast that you have an all-British hi-fi system.

Searching for a little more oomph

Q Although the combination of my Rega Planar 3 turntable (with Rega RB300 tonearm and Audio-Technica AT110E cartridge), NAD 3020i amplifier, NAD 5420 CD player and Mission 760 loudspeakers works relatively well, I still feel I could achieve better results with another amplifier.

I find the sound I'm getting is rather shallow and a bit tinny. It lacks detail and a little oomph. I have around £300 to spend on a new amplifier. I listen to all sorts of music, but mostly blues oriented and mainstream rock.

M G Gatzford
Lund, Sweden.

A The 3020i was a great little amp, but the design is now a little long in the tooth and can be readily improved upon by one of today's low-cost superstars, like the new Arcam Alpha 5. Rather than devote the entire budget to a new amplifier, however, don't you try some other

subtle modifications to the system.

In addition to the Arcam, change the cartridge over for the bright red Rega Super Bias, a perfect match for the Planar 3. The next step is to get some decent supports for the equipment (see this month's supplement), together with a set of Atacama SE24 speaker stands filled with silver sand for the Missions. Finally, adding a set of DNM, Linn or van den Hul interconnect and speaker cables will round off the system nicely, leaving the loudspeaker and CD player ripe for upgrading at a later date.



Rega's classic Planar 3 turntable deserves a first class cartridge.

Punch, energy and definition por favor

Q My current system comprises a Philips CD-850 CD player acting as a transport for a Micro-mega Duo BSII converter. This is fed into a passive preamp and then to a McCormack DNA-1 power amp, which powers a pair of KEF 105/3 loudspeakers.

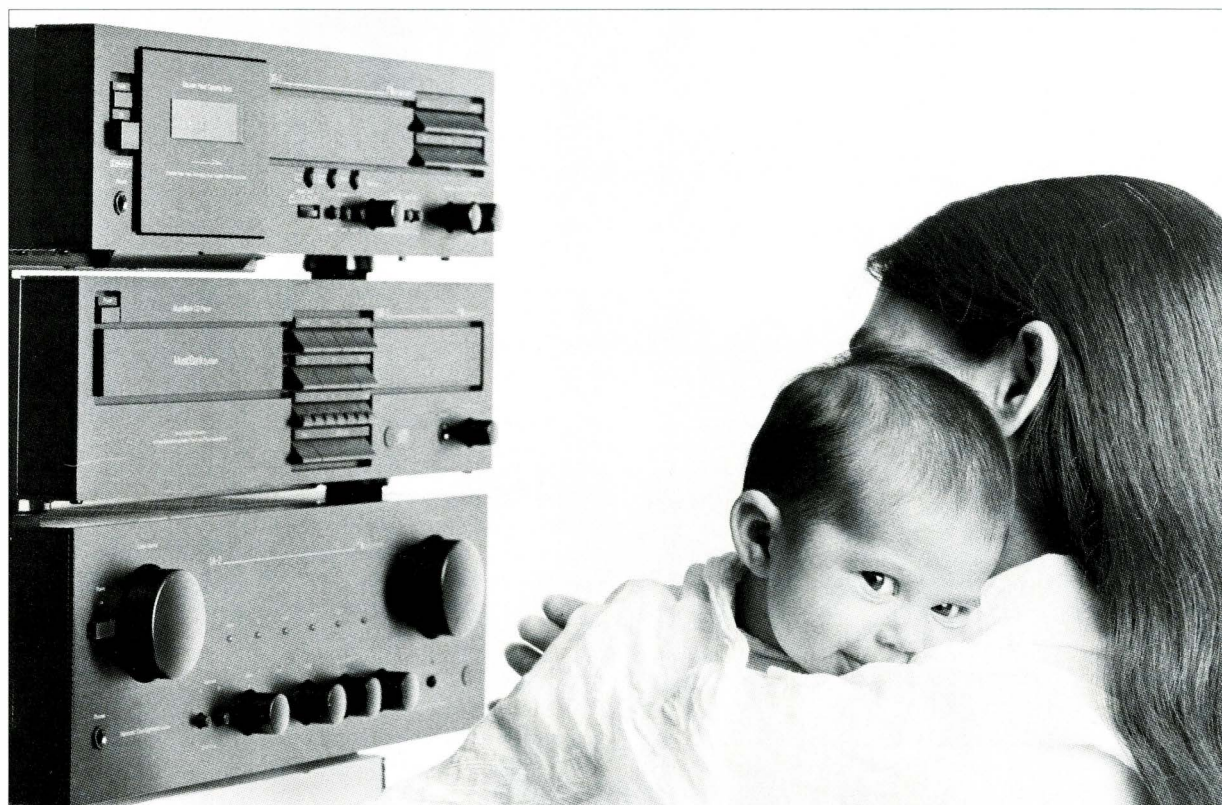
My room is about 3.5m x 5m and my musical tastes are wide, including rock, classical and jazz. In the last few months, I have tried a variety of amplifiers without success. No matter what I try, the sound is disappointing; the system lacks bass definition and control. It's slow and lacks punch.

I have read about amplifiers for the 105/3, but I'm a little confused. Some recommend big, solid state amplifiers, while others suggest low-powered tube amplifiers. Can you help? My budget is about £1,500.

Juan Gerda Piza
Mallorca, Spain.

A The only reviewer we know of who routinely uses 105/3s does so with the very expensive Jadis JA30 valve power amp, allied to a Peter Sanhen SP 1.5 or Michell Argo preamplifier, but he has also had great success with the Pioneer A-400. In your price category, the Art Audio Quintet or Naim 72/140 combination should be a good match for the KEF. Two other options are the Audio Innovations Series 700 or Audio Note OTOSE integrated amplifiers.

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HELP!

However, the outright quality of the front end you are using is of some concern. Although the Micromega Duo BSII is a fine DAC, using it into a CD-850 may not be letting it give all its got.

While this is unlikely to be the root cause of the problem, it is possibly a contributing factor in your system's shortcomings. Aim for a matching Micromega Duo transport, to balance things out sonically.

In the final analysis, though, you may be better off swapping the KEFs for an alternative pair of speakers rather than trying to make them perform solidly in the bass — routinely the downfall of many a fine KEF.

A decent pair of horns, such as Castle Winchesters, or the untested Impulse H2 or Horning Agathon loudspeakers, should overcome all the bass problems of definition and control that you describe.

Moderate volume

Q I have upgraded my front end to a Pink Triangle LPT turntable, with a Rega RB300 arm and an Ortofon MC15 cartridge, and I've added a Technics SL-PG520A CD player. These feed my Technics SU-V8 amplifier and AR 92 speakers.

Am I losing much by retaining this speaker and amplifier combination? If so, what amp/speaker upgrade would you suggest with a budget of £1,200? The speakers should be floorstanding and capable of being placed near a wall. The system will be used to play pop/rock/light classical music at relatively moderate volumes.

Paul Sneddon
Mobberley, Cheshire.

A The amp/speaker combination that you have is perfectly adequate, but it could easily be bettered by today's finest. However, a £1,200 amp/speaker combination may show up the shortcomings in your CD player. As long as you accept that the CD player will be next on the list to be changed, a decent amp and speaker is the right move.

A good system with floorstanding speakers at the price may well consist of an Arcam Delta 290 amplifier, allied to a pair of Linn Keilidh or Castle Chester speakers. Such a system will fully reveal the strengths of your front end.



Arcam's Delta 290 will take you towards the possibly perfect sound.

Inspired choice

Q I am looking for an amplifier, costing between £400 and £500, to complement my Rotel RCD-965BX CD player and Tannoy 611 speakers. These are connected with QED 79 Strand speaker cable. All the components will be changed in due course; the CD player possibly with an Arcam Alpha, and the speakers with either Linn Keilidhs or Monitor Audio MA14 Golds.

Clarity is the main objective, and floorstanding speakers are a must. I would be most grateful for your expert advice. I read your magazine regularly, and it is your reviews that have inspired me to buy a hi-fi system in the quest for the ultimate sound.

D A Hodges
Sawbridgeworth,
Herts.

A It is difficult to recommend an amplifier to match a speaker which you have not yet decided upon, especially when it is using a CD source which is also a future purchase. Our recommendations can only be guidelines.

Assuming that you settle on the Alpha CD player, the Arcam Delta 290 amplifier seems a logical choice, and one that is well suited to the Linn speakers you mention. If you opt for the MA14s, you may find that the Audiolab 8000A is a better choice. In this system, you may even find that the Rotel CD player has a more acceptable tonal balance than the Alpha.

Whichever system you opt for, try changing up from the QED cable you are currently using, to bi-wired speaker cable and serious interconnects. The Linn cable range would lend itself naturally to the Arcam/Linn system, while the Audiolab/Monitor Audio system is better suited to van den Hul cables.

Planning the room to suit the system

Q I am currently involved in designing a house and am auditioning speakers, stands and cable to go in it. They need to match my system, which comprises a Systemdek IIX turntable with a Grado Signature 8M cartridge, Rotel RCD-965BX LE CD player and a Cambridge Audio C75/A100 pre/power amplifier combination. This is connected, via Monster cables throughout, to a pair of Morel MP-202 speakers that have done a sterling job in a cramped apartment for the better part of a decade now.

My planned listening room will be 5m x 4.5m, straight-walled and carpeted with wood paneling, with a couch directly facing the speakers. My projected budget will be somewhere in the £700 to £1,500 range for speakers, with an additional £350 or so ear-marked for speaker cables and interconnects. My musical tastes vary greatly, from Telemann to Diamond Head, rollicking jazz and sultry blues.

David A Derrick
Pennsylvania, USA.

A Our reaction would be to aim for the Epos ES14 loudspeaker, with its own dedicated stand. This comes in at the lower end of your budget, but should suit your system without being too revealing of components before the speaker cables. Moving into more expensive territory may not be such a good idea just yet. It could show up other system failings.

If your heart is set on spending big money, try the Audio Note AN-E with filled stands, or the floor-standing Castle Chester.

Take your partner

Q My current system comprises a Marantz CD-52 Mk 1 CD player, Kenwood KA-3020 amplifier and a pair of fairly new Cyrus 780 speakers, using Audioquest Turquoise interconnect and a single run of Linn K20 speaker cable.

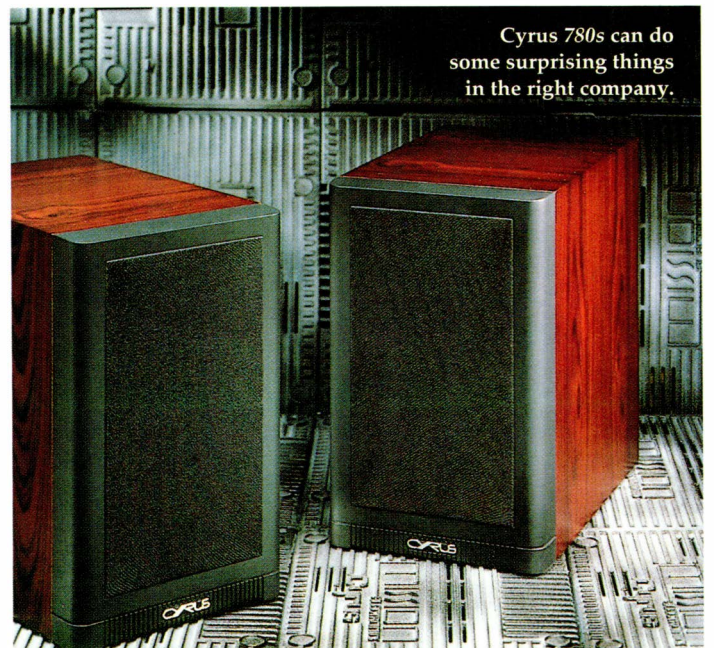
I want to upgrade this set-up by changing the CD player, and possibly the amplifier. Which models should I audition that will match the Cyrus 780s?

James Brown
Croydon, Surrey

A An obvious partner for the Cyrus 780s is the Pioneer A-400 amplifier, as the two go together beautifully. Otherwise, the soon to be discontinued Cyrus One amp would suit, as would the new Arcam Alpha 5. The new Arcam Alpha 5 CD player is as yet untested, but if it is anything like its predecessor, it'll be well worth a listen.

One of the Legato Link Pioneer CD players would also be worth investigating, particularly if you opt for the A-400 amplifier.

Cyrus 780s can do some surprising things in the right company.



close your eyes and see



the new Arcam Alpha 5 system

Close your eyes and see the difference between Arcam's all new Alpha 5 system of hi-fi components and anything else in its price range.

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Next, try the Alpha 5 tuner. Again, don't let its surprising

affordability seduce you. Instead, listen to broadcast sound that is natural, clear and dynamic, without annoying sibilance or harshness.

Finally, feast your ears on the Alpha 5 CD player - quite simply, the best value high performance CD player ever produced by a UK manufacturer. And, September's What Hi-Fi? agreed, calling it "the player to beat" and giving it a class leading 5 star rating. They concluded, "it's one remarkably transparent player, seeming to be at home with all genres of music, and equally enjoyable with all."

Just listen. Close your eyes, open your mind, and see the light.

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Wot, no grunge rock?

Something I find frustrating in *Choice* is the selection of listening material. Not being a classical music fan, I cannot comment on the classical selection. However, I do feel that the choice of rock music is generally too limited, covering female vocals and folk rather than mainstream rock, such as U2 and Led Zeppelin.

In many reviews, it is stated that a product is 'at it's best with simple, well-recorded material'. Aren't all components at their best with such music? When was the last time a *Choice* panel evaluated a product by listening to a demanding rock track?

Using simple well-recorded albums for evaluation is fine while listening to REM's *Automatic for the People*. However, I buy albums for the music, and the sound quality is incidental.

For listening tests to have any real meaning, imperfect recordings must be used alongside reference recordings. That way music fans can listen to The Rolling Stones' *Exile On Main Street* without being constantly reminded that it was recorded with a mobile recording studio in a kitchen.

Paul Butt
South Woodham Ferrers,
Essex.

Sorry to contradict you, but the material used on the last blind test of loudspeakers included The KLF's It's Grim Up North — and you can't get more 'difficult' than that. Other artists used in panel assessments, as well as Sessions and Statements tests, have ranged from Aerosmith and AC/DC to Frank Zappa and Zodiac Mindwarp. The Choice office in particular is constantly awash with music from the Black Crowes, Led Zep, Nirvana and the Spin Doctors.
Alan Sircom, Reviews Editor.

Letter of the month

Books for beginners

I have been interested in hi-fi for about a year and I subscribe to *Hi-Fi Choice*. I find the information useful but sometimes very technical. Do you know of any books that explain the basic concepts and terms behind hi-fi?



If not, then can I suggest that Paul Miller writes one for *Hi-Fi Choice* readers. I am sure that many readers would like to get more from the test results you publish.

Hendrik Buist
Malaysia.

It's as if we'd read your thoughts! We have an audio glossary planned for the near future, translating the technical terms used in Hi-Fi Choice Laboratory Reports into clear understandable English for the layman.

In the meantime, there are several books which help unravel the mysteries of hi-fi. Newnes' Audio and Hi-Fi Engineer's Pocket Book, written by Vivian Capel, is a small but surprisingly useful data guide that is detailed without being bogged down in jargon. For the very technically minded, books like John Watkinson's Art of Digital Audio and Martin Colloms' High Performance Loudspeakers fit the bill, but be warned that these are not books for the beginner.

To explain the language of subjective reviews, J Gordon Holt's Audio Glossary deserves a mention, as does Laura Dearborn's Good Sound. Last, but by no means least, is Bluff Your Way in Hi-Fi, written by Sue Hudson and John Crabbe. Although in need of a revision, this small, light-hearted read still contains enough information to sound thoroughly informed, outsmarting all but the most hard-core hi-fi buffs.

Alan Sircom, Reviews Editor.

What's so good about the best speaker?

While I enjoy the *Choice* reviews, I question the wisdom of calling a budget speaker like the Wharfedale CRS3 'One of the best speakers we've ever heard', *Choice*, issue 122.

Surely such an accolade should be reserved for a more expensive design, one that needs the ultimate in partnering equipment?

A Mayfair
Newcastle-upon-Tyne.

Wharfedale's CRS3 — is it still one of the best ever on a budget?



The budget loudspeaker market is one of the most fiercely competitive areas in hi-fi, and the Wharfedale CRS3 is one of the best speakers we've ever heard at the price. As such, we would confidently expect many budget systems of the mid-Nineties to use CRS3s. Hopefully, the owners of these systems will also feel that it is the best speaker they could get at the price — solidly made, widely compatible and with a great sound.

Naturally, we don't expect the Wharfedale to outperform a speaker like the expensive Audio Note AN-E, or even the mid-price Epos ES11, but for many people these speakers are way out of reach. If nothing else, we have found that budget systems can be fun too! Ed.

Blind fury II

Congratulations for having the balls to print my letter (Blind Fury, August *Write On!*) and a half-decent reply. However you may have slightly missed my point.

I am not against blind listening tests; on the contrary, they are essential. However, I seriously doubt if you can be sure that all individual equipment is tested under the very best possible conditions (especially with a near infinite number of combinations available).

I think that you should devote much more time to testing systems. That way, we could be reasonably sure that any differences were due to personal preferences rather than system mismatching.

David Kelly
St Ives, Cambridgeshire.

We are continually investigating components in and out of the context of a wide range of systems. However, we could easily devote an entire magazine to the testing of one component in various systems, so vast are the permutations. This may receive full marks for thoroughness, but would not make for a readable magazine.

Producing a successful sounding system at any price point takes a considerable amount of behind-the-scenes time and effort. While we do intend to include more system tests (watch out for our December issue), the bulk of the research needed to make coherent group tests will continue to be carried out in the run-out to the listening tests proper. Ed.

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COMPETITION

This month, you've a chance to win a complete Adcom/Celestion system, or one of eight pairs of Celestion 5 Mk II speakers in our great competition — all for the price of a stamp!



Answer just five easy questions and you could win one of the nine superb Adcom/Celestion prizes pictured here.

The first lucky winner will receive a complete system worth £1,270 comprising the new Adcom *GCD 600* five-disc multiplay CD player, the Adcom *GCA 510* 80 watt line level integrated amplifier and a pair of the new Celestion *7 Mk II* loudspeakers. The latter can handle any amplifier rated at ten to 120 watts and the 27 litre cabinet allows bass extension down to 57Hz. In addition, eight runners-up will each receive a pair of the new Celestion *5 Mk II* loudspeakers, pictured above, worth £169 a pair.

Questions

1. How many watts does the Adcom *GCA 510* amplifier deliver?
a) 80 b) 40 c) 100 d) 25
2. What nickname did *Choice* give to the Celestion *6000's* styling?
a) Star Trek b) Rococo
c) Star Wars d) Dark Star
3. How many drive units are there in each Celestion *5 Mk II* loudspeaker?
a) three b) one c) two
d) four
4. What is the internal volume of the Celestion *7 Mk II* loudspeaker?
a) 30 litres b) 92dB c) 89dB
d) 27 litres
5. Is the Adcom *GCD 600* CD player...
a) single play b) multiplay
c) twin reverb d) dual capstan

How to enter

Write your answers to the five questions, along with your name and address, on the back of a postcard or sealed-down envelope. Please do not seal the answers within the envelope, however, as the entry will be automatically void.

Send your completed entries to Adcom/Celestion Competition (HFC/1093), *Hi-Fi Choice*, Computer Mailing Services, PO Box 249, London WC2H 0HS. Entries must be received by first post on Tuesday, 19th October, 1993.

Competition rules

The Editor's decision is final and no correspondence will be entered into. Winners will be notified by post. The competition is not open to employees of Dennis Publishing Ltd, Celestion, their suppliers, agents or associates. The competition is open to UK residents only. No cash alternative will be offered. Submission of entry will be taken as meaning acceptance of the rules. Proof of posting cannot be accepted as proof of receipt. Please notify us if you do not wish to be informed of any special offers or promotions.

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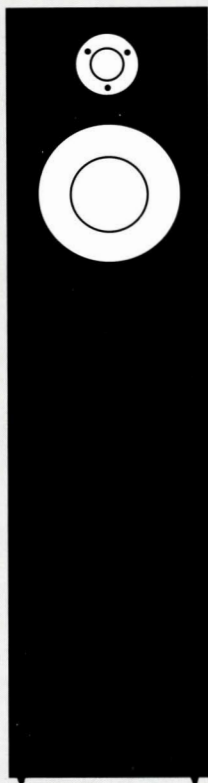
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It's as clear as carbon cables

Recently received a press release from van den Hul. Now, after nearly twenty years of research and selling metal cables, this Dutch company has concluded that metal wires, however pure, limit sound quality. The electrical signal is somehow degraded when it passes from one metal crystal to the next. So van den Hul is selling short lengths of cable that are made of pure carbon fibres. They connect a record player or CD player to an amplifier. Banishing metal, the company pledges, "brings about quite remarkable sonic benefits". There is none of the, "varying colorations and midband harshness associated with all the different metals commonly used in audio cables".



Barry Fox muses on the possibility of a non metal hi-fi and sticks his neck out to predict the future of DCC worldwide.

Doubtless anyone who pays the £180 for the one metre connectors will hear the difference. The power of auto-suggestion is very strong. So is the fear of telling your wife that you have spent £180 on replacing a couple of leads that worked perfectly well before.

But hang on. There is an awful lot of metal inside the hi-fi units which the cables connect. How can adding an external carbon cable repair the "colorations" and "harshness" this internal metal creates? Are we in for a new craze, with hi-fi buffs tearing apart their amplifiers, to replace all those nasty metal wires, circuit

board tracks and components with charcoal and soot?

But all is not lost. Even if nutters try this and end up with a hi-fi system that produces no distortion at all because it produces no sound at all, the £180 has not been wasted. van den Hul says the new cables are "strong enough to pull a car". So they can be used as a tow rope. A bit short, maybe, but blooming strong.

DCC looks to Europe

When companies issue their financial results I usually yawn, because a good accountant can hide most things of relevance in a lot of gabble about debentures, and asset management.

The latest (half yearly) figures from Philips, for instance, showed that the company's sales went down by two per cent, but it still pulled in five times more money than last

year. Why? Philips raised a lorry load of cash from selling its share in the long-standing joint venture in Japan with Matsushita (Panasonic/Technics). Philips also made money out of software through Polygram. And pulling out of the personal computer business and shutting down magnetic tape production at the PD Magnetics plant had a, "positive effect on income".

Put another way, if you sell off the family silver and cut back on manufacturing, the books will look better, at least for the time being. Like most companies, Philips does not break its figures down, country by country or product by product, so there is no way of knowing how well DCC is doing in different countries.

So far most of us hacks have played safe and dodged any prediction of how DCC will fare against MiniDisc in the long term. Well, I am now ready to put my head on the block and predict that DCC will fail in Japan and North America, but may succeed in Europe.

The North American Philips operation just does not have its heart in DCC, and does not have the clout and competence to win over Sony. The only real support for DCC in the USA comes from Panasonic, and by ditching CD-i in favour of the rival 3DO interactive system, Panasonic has shown its true colours. Do not discount the significance of the break-up of that joint venture company in Japan. It has loosened the bond worldwide.

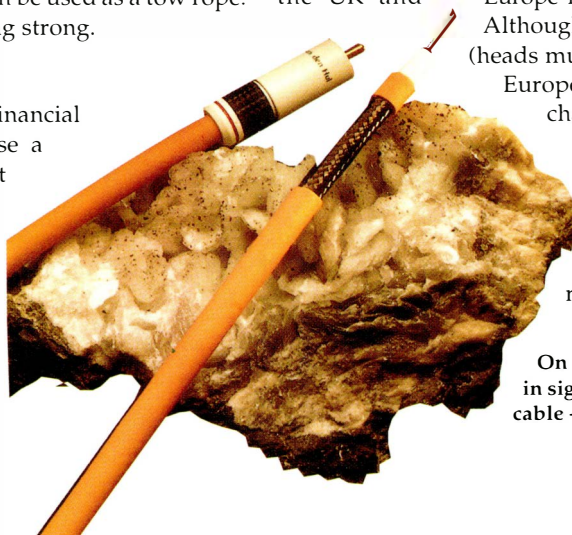
In Japan, MiniDisc has always looked likely to win over DCC, and the future use of MiniDisc as a data and video store just strengthens the odds. The fact that Philips has shifted its audio division to Singapore, to be closer to the Far East, can do nothing to reverse this trend. Philips and Marantz just don't have the clout to run with DCC alone. The moment Panasonic/Technics shows any signs of wavering, DCC will be dead in the water in Japan.

Philips engineers in Europe did a remarkable job on developing DCC, but the audio management in Eindhoven fumbled the marketing. Philips has now re-shuffled the management of its audio division but this comes two years too late, and has created a vacuum of indecision. It is hard to see how shifting the HQ from Eindhoven to Singapore can possibly help DCCs in Europe.

Luckily for Philips, Sony's clumsy handling of MD in the UK and

Europe has given DCC some space. Although this can't last much longer (heads must roll inside Sony UK and Europe, too), DCC still has a good chance of success. But only if Philips can drop the price of DCC decks so far and so fast that people are tempted to buy backwards-compatible digital, rather than analogue, decks.

On the rocks with no heavy metal in sight; van den Hul's carbon fibre cable — strong, if not very long.



The Pioneer D-07 'super' DAT samples analogue inputs at 96kHz, adding an extra octave to the frequency response.



DAT's better

With the D-07 'super' DAT machine, Pioneer pushes DAT back into contention in the digital recording battle. Richard Black tries it out and Paul Miller takes its vital statistics.

Since the introduction of CD, the state-of-the-digital-art has not really advanced very substantially. Yes, we now have massive oversampling and bitstream, and systems claimed to transcend in various ways some of the limitations of the CD format, but basically we continue to use the original format of 16 bits with 44,100 samples per second. DAT, of course, uses the

marginally sampling rate of 48,000 samples per second, but essentially it is the same format as CD.

At least, it has been the same format until now. For Pioneer has taken the plunge and produced the first wholesale upgrade to hit domestic digital audio since 1980. The £1,100 D-07 is a DAT recorder with all the features one expects — 48kHz or 32kHz sampling of analogue inputs

and 44.1kHz digital copying (with SCMS) of digital sources — but with the added capability of sampling analogue inputs at 96kHz, thus adding a whole extra octave to the frequency response.

As one who has never been happy with standard digital technology, I was delighted to be asked to try out this new machine, encouraged also by reports from users of the professional Mitsubishi

recorder too but, unlike DAT, these can be noisy and require remote siting which was unfortunately not convenient this time round.

Listening to the replay from both DAT decks on my EAR/ATC hi-fi system, and on the enormous Townshend loudspeakers owned by Pioneer's John Bamford, left no doubt as to the relative merits of standard and super DAT. Basically, the *D-07* sounds less digital. The sound is clearer, more open and more detailed, with better imaging and a considerably more visible acoustic, even monitoring on a pair of £20 headphones. Naturally though, it does share the undisputed digital trait of an audibly flat and uncoloured frequency response with normal DAT.

The differences between the decks are perhaps most obvious with vocal recordings, as the voice has a wide frequency range and is notoriously difficult to record. Not only do vowel sounds have quite a high content of harmonics above 5kHz (these determine the timbre of the voice) but the consonants, which as any singer or stage actor will tell you carry most of the intelligibility, are by their nature very high frequency sounds and place heavy demands on the quality of recording and replay equipment.

With this in mind, it is perhaps not surprising that on the 96kHz sampled

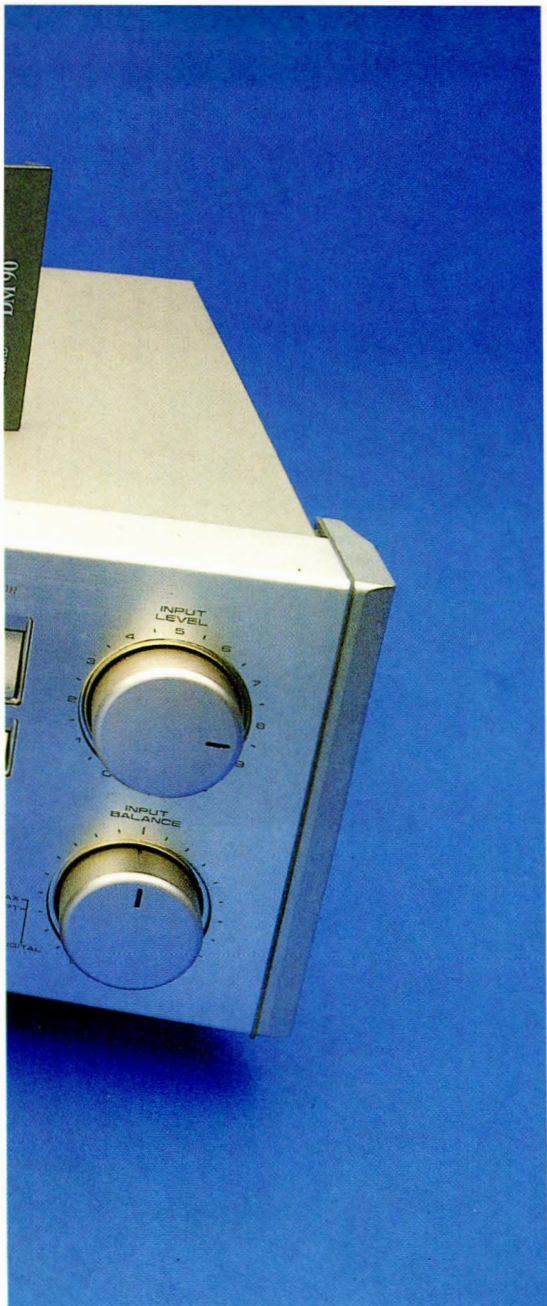
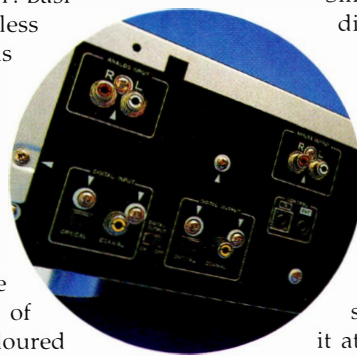
tape, the words are clearer and the text less tiring to follow. Also, the normal DAT sounds slightly grainy and harsh; these are qualities which I don't associate with Moira's voice (one I have heard extensively, in every sort of acoustic, over the last year or so) which is notable for its smoothness and evenness — bright sometimes, but never harsh.

Similarly, the flute sounds less distorted on the super DAT recording, the tonal quality closer to what I associate with Julie, who again is a performer I've known for several years. The basic sound of the flute is actually lacking in very high harmonics, but the breath sound which accompanies it at a low level is, like sung

consonants, a high frequency and is also very distinctive. Comparing the two sampling rates, 48kHz made this sound slightly dirty, and in an odd way, even coloured, almost like electronic noise. At 96kHz, it was more natural.

As for the piano, it too sounds more lifelike at 96kHz. It also shows up the lack of detailed church acoustic information that is conveyed on the 48kHz tape, as the piano sounds shut-in and physically (though not dynamically) compressed.

It must be said that the advent of 96kHz sampling proves everything that many people have long suspected about current digital technology and its limita-



recorders which have been available for some years with 96kHz sampling.

An ideal opportunity arose in July, at a concert of Scottish music I was giving with soprano Moira Harris and flautist Julie Duncan, in a church in the city of London. This church has wonderful acoustics, an ideal woodblock-over-stone floor, low background noise and a rather good, if small, piano, making it a favoured venue for concerts and demo recordings.

Apart from the *D-07*, we ran for comparison my own Sony *DTC-750* conventional DAT recorder (see *Choice* issue 105) and the intriguing new Pioneer *CT-95* cassette deck (to be reviewed by Alvin Goldin the November issue of *Choice*). Microphones were two Br  el and Kjaer type 4003 line level omnidirectional, which I regard as the finest microphone in current commercial production. My own design of power supply and amplifier replaced B&K's 2812, a disappointing partner to the mics. Cables were by Bespoke Audio. It would have been interesting to run a good open reel analogue

Using the super DAT player

Operation of the *D-07* is straightforward, at least as regards simple recording and playback which is basically just like cassette. However, DAT also allows the use of various subcodes on the tape to make track start and skip points and also some further information for track titles and timing.

The *D-07* allows entry of alphanumeric titles, but it's such a hassle that I can't imagine anyone ever bothering. I would far rather have Sony's feature on the *DTC-750* of real-

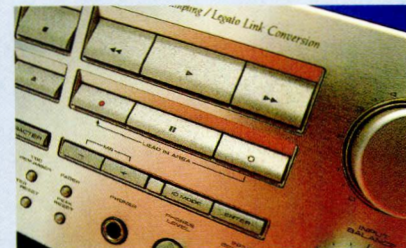
time date and time recording.

Entry and erasure of start and skip codes is much less convenient on the Pioneer deck. It involves scrolling through various ID write and erase modes, the Pioneer lacking Sony's feature of rehearsal and adjustment of ID positions. There is a numeric keypad for track access, but unfortunately this is only on the remote control.

I would rather see more keys on the front panel. I'll grant you it looks messier but it's certainly a damn sight easier to use.



Real-time date and time recording on the Sony *DTC-750* is a real boon.



The *D-07* does not have a numeric key pad for track access on the fascia, just the remote.



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tions. One can only hope that it shows the true way forward, if sidelines like DCC and MiniDisc are not allowed to muddy the waters of hi-fi advancement too much.

So what's wrong with DAT?

A substantial body of informed hi-fi opinion considers 48kHz to be a woefully inadequate sampling rate, and doubling it should certainly improve matters greatly. Even if very few people can hear above 20kHz (21kHz is the highest I have ever known anyone hear with certainty), the fact that music consists largely of transients, with a frequency range which is theoretically infinite, makes consideration of the response of both our ears and hi-fi equipment a complex matter.

It is true that experiments have proved that a 20kHz bandwidth is adequate, but unfortunately history has shown that listening tests can prove practically anything, including such a thoroughly debunked hypothesis as speech recorded on 78s and played back on a good 1930s gramophone sounds indistinguishable from the original. I rest my case.

From DAT to super DAT

Doubling the sampling rate is not really too complicated. In fact, the analogue-digital converter (ADC) in the *D-07*, a multi-bit chip made by Burr-Brown, samples at 192kHz when either 48 or 96kHz recording is selected, giving an oversampling ratio of four or two respectively, with 16-bit resolution. The tape simply runs at double speed in 96kHz mode and the rotating head drum also rotates at double speed, so the whole system is just 48kHz speeded up. The clever part is making record and playback heads with twice the frequency response of normal heads, since the data rate is doubled.

However, head technology is advancing fast and it had to come sooner or later. Amusingly, a tape recorded on the *D-07* at 96kHz sampling and played back on a standard DAT machine will work, but at half speed and an octave lower in pitch.

For the rest, the *D-07* contains much the same electronics as any other DAT deck — a pair of Pioneer's own PulseFlow DAC chips, an assortment of not very audiophile op-amps and lots of capacitors wrapped in copper foil. I know all the reasons why Pioneer didn't make one, but I would still love to hear an audiophile version of the deck . . .

Pioneer (GB) Ltd, Pioneer House, Hollybush Hill, Stoke Poges, Slough SL2 4QP.
☎ (0753) 789 789

Laboratory report

First things first. What theoretical improvements might we expect by increasing from a 48kHz to a 96kHz sampling rate? For a start, we would not necessarily forecast any significant increase in resolution, signal to noise ratio or reduction in distortion as these are all linked to quantisation accuracy rather than sampling. Furthermore, the DAT word length is fixed at 16-bits, regardless of what the sampling rate is.

This is borne out in practice, with the *D-07* offering a fairly consistent 0.0018-0.009 per cent distortion at 0dB, a 91-92dB signal to noise ratio and maximum errors in resolution of +0.5dB (48kHz) and +1.35dB (96kHz). By the way, total harmonic distortion will inevitably fall at high frequencies in 48kHz mode because the signal is filtered above 24kHz (the 2nd harmonic of 20kHz lies at 40kHz and so on).

Other variations in performance are caused by the different oversampling filters, PulseFlow DACs and analogue filter stages that encompass the 48kHz and 96kHz stages. In effect, the *D-07* is rather like two DAT players in a single case, so any differences in sound quality may just as easily be attributed to the different digital electronics as any variation in the sample rate.

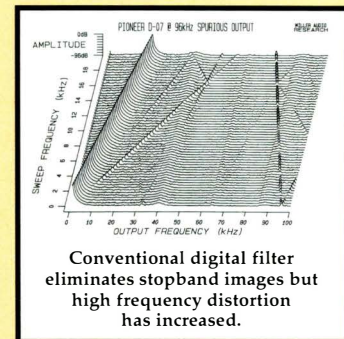
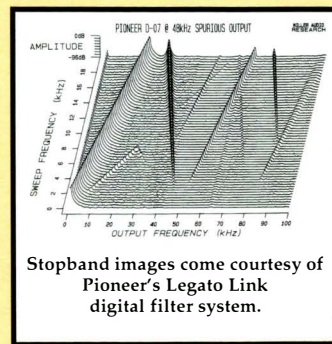
Meanwhile, doubling the rate at which audio signals are sampled allows twice the bandwidth to be accommodated. So a full 0-48kHz range can be accommodated using a 96kHz sampling frequency — more than sufficient to capture all those ultrasonic nuances. A brief look at the frequency response plot highlights the advantage of recording at 96kHz (red trace). Do note,

however, that the abrupt 48kHz cut-off acts in concert with a gentle high frequency roll-off which finds the 'audio response' reduced by 2.5dB between 10kHz and 45kHz.

But look a little closer and you'll see the slope of the curves are very different. This is because the normal 48kHz response (black) is complicated by the inclusion of Pioneer's Legato Link digital filter. This merges unwanted stopband noise with genuine audio data to give the impression of a more extended response. The effect is very clear from the 48kHz 3D plot which highlights the thick stopband images avoided by the alternative eight times, 20-bit digital filter used during 96kHz playback.

Once again, are we listening to differences in frequency response or differences in stopband noise between the various 48kHz and 96kHz modes? Either way, the final plot, an accumulation of Richard's piano recital, still shows that more original 'high frequency ambience' is captured in 96kHz mode.

Remember that this 'wide' 96kHz sample rate is only available via Pioneer's analogue inputs and that playing back a 96kHz tape on any other DAT machine will result in half-speed music. Furthermore, in its wide setting, Pioneer's digital output deviates from the IEC958 standard to provide a 96kHz datastream. No conventional domestic gear (including outboard DACs and other DAT players) will lock onto this non-standard digital signal, though the ability to dub from one *D-07* to another at the 96kHz rate is still promised.

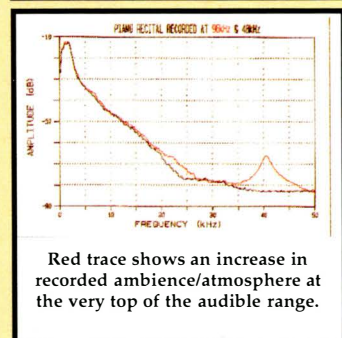
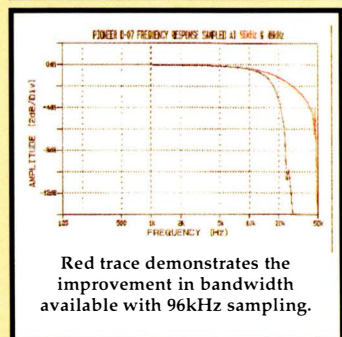


DAT player: Pioneer *D-07* (via analogue inputs, 48kHz/96kHz)

	20kHz	1kHz	20kHz
Channel Balance	0.13dB	0.13dB	0.23dB
Channel Separation	117.2dB	97.1dB	62.5dB
THD vs Level, 0dB	-94/-95dB	-89/-92dB	-89/-81dB
-30dB	-77/-79dB	-63/-62dB	-71/-68dB
-60dB	-42/-44dB	-42/-38dB	-46/-35dB
-80dB	-39/-43dB	-27/-24dB	-24/-22dB
Dithered, -90dB	-30/-30dB	-18/-16dB	-13/-13dB
Dithered, -100dB		-10/-7dB	
Resolution @ -60dB		+0.12/-0.20dB	+0.12/+0.20dB
-80dB		+0.25/+0.40dB	+0.20/+0.35dB
-90dB		+0.50/+0.75dB	+0.35/+0.90dB
-100dB		+0.80/+1.10dB	+0.50/+1.35dB
Input Sensitivity (for 0dB)			290mV
Peak Output Level, L			2.160V/2.134V
R			2.176V/2.150V
Relative Output Level			+0.70dB/+0.60dB
Output Impedance			961ohm
CCIR IMD, 0dB			-95dB/-90dB
Suppression of stopband IMD			11.8dB/70.3dB
S/N Ratio (A-wtd, re 500mV)			91.9dB/90.6dB
Digital Output		Coax and Opt @ 48kHz/96kHz	
Crystal Clock Accuracy			0.00ppm/0.00ppm
Serial Number			MJ1000051

Typical selling price

£1,100.00





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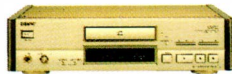
THE EISA

EUROPE'S TOP

The 1993-94 EISA



Compact System
JVC MX-G7



CD Player
Sony CDP-X707ES



Audio Recorder
Philips DCC600



Loudspeaker
Mission 753



Home Theatre
Yamaha
DSP-A2070

At last! The wraps are off. After months of careful deliberation, the best hi-fi in Europe was revealed to a packed audience at a special reception held on August 29, 1993, at the end of the Berlin Audio Fair.

Awards for the best audio, video and photographic products were presented by the European Imaging and Sound Association, EISA. Every year, EISA's European Awards Panel, comprising staff members from specialist photo, video and audio magazines from 13 European countries, gathers to select the best new photo, audio and video products on the market. These awards are well known as European Camera, Camcorder or Audio Product of the year.

This year, for the first time, *Hi-Fi Choice* was asked to represent the UK specialist hi-fi press on the European Audio Panel. The unique *Choice* combination of product evaluation — comprising technical and subjective assessment, plus the views of an independent blind listening panel — marked the magazine out for inclusion on the Audio Awards Panel.

The selection process has been refined over many years, and is both rigorous and thorough. There are ten product categories; Compact System, CD Player,

*Hi-Fi Choice proudly presents the
ten brightest stars in European hi-fi
this year — only the best can
become winners of the 1993-94
European Imaging and Sound
Association Awards.*

Audio Recorder, Loudspeaker, Home Theatre, Amplifier, Car Audio, High-End Audio, Design and Innovation. Only one system, component or innovation will be given the award title, and there is no grading of the other nominations in that category.

The awards recognise excellence in audio products or systems, taking into account the use of advanced technology, useful features, elegant design, ease of use, value for money and, above all, sound quality. All formats using recorded material — vinyl, CD, cassette, DCC, MiniDisc and so on — are eligible for selection.

Audio systems, speakers, hi-fi components and car audio equipment must be in production in order to be considered.

The qualifying period runs from July to July in each year, and equipment must have been made available to the majority of the jury for detailed evaluation.

All components and systems must also be on sale by July 1, 1993. This means that prices and orders by distributors and dealers must have been accepted by this date. For a model already available before the start of the qualifying period to be included, it must have received significant modification during that period to be eligible again.

The guidelines for the innovations category are slightly different. Products to be included must be announced to the European market within the qualifying period, but do not have to be in production. The magazines making up the Audio Awards Panel should have been able to judge just how innovative new products are within the qualifying period.

Each of the magazines that go to make up the Awards Panel produce their own initial shortlist of products for consideration by all the Panel members. This choice is made by the magazine's Editor and review staff, and reflects the results of tests carried out by the publication within the qualifying period.

These initial selections are then sent to

AWARDS '93

HI-FI AWARDS

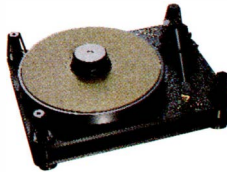
Award Winners



Amplifier
NAD 302



Car Audio
Blaupunkt
Stockholm RCR 42



High-End Audio
SME Model 20



Design
Revox Evolution



Innovation
Sony MiniDisc

the headquarters of the European Awards Panel two weeks before the final selection meeting in June. One week later all members receive a final nomination list for a last detailed study. The next step is a formal meeting of the judging panel, which all magazines' spokesmen attend in person, to discuss and finally thrash out the winners in each category.

This meeting of technical experts from throughout Europe produced a lively and heated debate, and serves to ensure that the EISA Awards truly reflect the best hi-fi in Europe. The products mentioned in the following pages are not the only components worth considering, but they do represent the true elite within their own categories.

Quite a few of the products are already *Hi-Fi Choice* Best Buys or Recommendeds, and the further endorsement by members of the Awards Panel only serves to highlight the consensus that exists within Europe when it comes to singling out the very best sound quality.

Each winning product also carries its own Awards logo that will be used to identify the component in stores and adverts. Be sure to check that the logo is the correct one. Only the Award winner is entitled to carry the EISA badge. The



The meeting of minds. Publishers, editors and technical experts from all over Europe gather together to select the award winners. The Audio Awards Panel included representatives from: *Audio Video Totaal* (Holland), *Audio Review* (Italy), *Audio Video Magazine* (Switzerland), *Audio Video* (Sweden), *Hi-Fi Vision* (Germany), *Audio Video* (Norway), *Hobby & Elektronik* (Austria), *Elektro Verkoop* (Belgium), *Hi-Fi & Elektronik* (Denmark) and, of course, *Hi-Fi Choice*.

Award cannot be applied to every product in the manufacturer's range.

Finally, although it is tempting to look at the Awards and put together a system of separates based purely on the Award winners, be aware that this is not such a good idea. Some of the products will be exceptional budget designs, chosen for their excellence at the price, while others will be truly esoteric pieces of kit that demand the very best partnering equipment money can afford. Be sure that you match the Award winners listed in the following pages with appropriate partnering equipment to get the best sound from Europe's finest hi-fi.

EISA Camera Awards

Lens	Tamron 3.8-5.6/28-200mm
Colour Print Film	Fujicour Super G 400
Colour Slide Film	Kodak Elite 100
Mono	Ilford Delta 100
Accessory	Metz Mecablitz MZ 40 2
Innovation	Nikon 3D Matrix Flash Metering
Merit	Royal Photographic Society, Bath

EISA Video Awards

High-End Camcorder	Sony CCD-VX1
Family Camcorder	JVC GR-AX55
Mini Camcorder	Canon UC2Hi
Video Recorder	Panasonic NV-SD40
Television	Philips 28 PT 910 A
Innovation	Fujix Simple Hi8 FS-1

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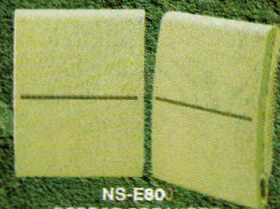
DSP-E1000
DIGITAL SOUND PROCESSING
AMPLIFIER



RX-V470
CINEMA DSP
AM/FM STEREO RECEIVER



DSP-A970
DIGITAL SOUND PROCESSING
AMPLIFIER



NS-E80
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A wide range of components, including the award-winning DSP-A1000 and the budget DSP-E200 digital sound processing amplifiers, plus a range of surround speakers and subwoofers, means you can select the perfect combination to suit your environment. And your pocket.

To find out more about Cinema DSP, contact your Yamaha dealer today - it's where the real action is.

music
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Best Compact System

JVC MX-G7

European Compact System of the Year '93-'94



The JVC MX-G7 combines ease of use with digital sound processing (DSP) features capable of reproducing a range of acoustic effects, including home cinema. The 50 watt MX-G7 — one of JVC's elite *Adagio* range of systems — features a CD player, receiver, twin cassette deck and surround sound processor, divided into four separate boxes.

A novel aspect of the design is the motorised speakers, which can be angled towards the listener, or away facing the walls according to taste. This is combined with the signal processor, making what JVC calls 'Panoramic Surround'.

When the user selects one of the five sound-field modes available, the drive units automatically reposition themselves to best approximate the ambience of a hall, dome, church, cinema or dance club without needing extra speakers.

This spearheads the latest trend in sound processing. Digital signal processing has widely supplanted analogue tone controls

Complete with more gizmos than you can shake a stick at, the JVC MX-G7 is the ultimate midi.

in compact systems, and the success of the MX-G7's dedicated 'Panoramic Surround' DSP/speaker combination is a quantum leap forward for DSP effects.

In addition to the full-range 9cm panorama drive unit, the 16.5cm woofer and 5.5cm tweeter act as a conventional bass reflex loudspeaker, and the speaker units are low magnetic leakage designs. This makes the MX-G7 suitable for audio and video use.

The MX-G7's high technology specification even extends to its operating system. It features the intelligent CSRP (Compu-link Source-Related Presetting) which can memorise levels and DSP modes by time of day and programme source.

JVC UK Ltd, JVC House, JVC Business Park,
Priestley Way, London NW2 7BA.
☎ 081-450 3282



Best CD Player

Sony CDP-X707ES

European CD Player of the Year 93-94



The Sony *CDP-X707ES* uses a truly revolutionary new generation of digital to analogue converters to produce quite remarkable sound quality from compact discs. Built to uncompromising standards of both mechanical and electrical engineering, the *CDP-X707ES* is an outstanding CD player.

European hi-fi enthusiasts, especially in Germany and Denmark, have taken this flagship CD player from Sony very much to heart, thanks to its superb build quality, advanced digital to analogue converters and sophisticated power supply system.

Unfortunately, Sony UK has taken the decision not to import the *X707ES* into this country. According to Sony, this is because CD players costing more than £300 currently account for less than nine per cent of the UK market in volume terms.

Which means that you will not be able to get your hands on the *X707ES* in its present form, though much of the technology that makes the player so special is sure to filter down to new and more affordable models in the Sony line-up in the not too distant future.

In fact, the Score digital filter and Advanced Pulse D/A conversion system found in the *X707ES* has already been seen

Digital audio engineering at its zenith. Sony's *CDP-X707ES* pushes back the frontiers of compact disc sound.

in the £550 Sony *CDP-X303ES* CD player. The difference is, the *X707ES* uses the Advanced Pulse system configured on two separate chips to provide separate D/A conversion for the left and right channels. This is difficult to engineer on lower priced models, due to the amount of space the circuits take up.

Circuit architecture is similar in both models, with the audio and digital circuit boards being kept quite separate, but the *X707ES* scores over its cheaper brother by using high quality, low noise output devices, a superior stable lock CD clamping mechanism and a separate power circuit altogether for the D/A converter.

It all adds up to a formidable package, and one that puts Sony at the forefront of CD player technology at the moment. We're certain that many of its advanced features will be appearing in more affordable models from Sony in the very near future.

Sony Consumer Products Ltd, Sony House, South Street, Staines, Middlesex TW18 4PF.
☎ 081-784 1144



Best Audio Recorder

Philips DCC600

European Audio Recorder of the Year '93-'94



Compatibility with analogue compact cassettes, combined with the higher sound quality of digital recordings, are the main advantages offered by the Digital Compact Cassette system. Utilising Philips' own Precision Adaptive Sub-Band Coding data compression system (PASC), the DCC600 is the company's third player and the first second generation design on the market. It underlines the efforts of the manufacturer to promote the DCC system, offering the advantages of the new technology at a more affordable price.

With its new edge-loading transport mechanism and refined, user-friendly styling, the DCC600 was felt to be more elegant than its forebears by Paul Miller in August's *Choice Sessions*. He also felt that it presented music more comfortably, bobbing happily along and sustaining the major elements of the music. Paul also noted that the combination of Philips' SAA7321 DAC and PASC encoding gave the DCC600 an ordered sound with an economy of tonal colour, and that overall the machine proved the most polished of Philips' latest range.

It has been further tested this month by

The DCC600 is a practical, compact and affordable digital tape recorder with coherent and neutral sound quality.

Alvin Gold (see page 95). Alvin echoes Paul's comments, but adds that the DCC600 is at its best in a fully digital system, when its D/A and A/D converters are by-passed. In this configuration the DCC600 is more coherent and neutral than previous Philips DCC hardware. Combined with an out-board DAC, it is clearly a potent machine, with the attributes of an above average CD player.

As with all DCC players, the DCC600 allows playback of analogue compact cassettes, with an auto-reverse transport and Dolby B and C noise reduction. Used with prerecorded DCC tapes, the DCC600 will display album and track titles, in addition to the conventional DCC time and track number display. It also benefits from DCC's advanced search and programming facilities.

Philips Consumer Electronics Ltd, City House, 420-430 London Road, Croydon, Surrey CR9 3QR. ☎ 081-689 2166

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Best Amplifier

NAD 302

European Amplifier of the Year '93-'94



An amazing design which can bring true hi-fi performance to those unable, or unwilling, to spend a fortune. That was the opinion of the Audio Awards Panel when considering the NAD 302, budget wonder amp which more than lives up to the high standards set by its illustrious predecessors.

Paul Miller and his listening panel reviewed the NAD 302 for *Hi-Fi Choice* in the March 1993 issue, this is what he said about this Best Buy favourite:

"The King is dead, long live the King. From its original launch more than a decade ago, NAD's stalwart 3020 series has held dominion over much of the budget amplifier market, aided by regular revisions. The latest design, the daringly titled 302, lives up to its pedigree.

'It's a real trier', announced the listening panel, 'a loud but very positive sounding amplifier that skips its way through the busiest passages'. This loudness certainly lends the 302 a degree of confidence and poise, leaving vocals sounding clean and clear without straining, and remaining consistent with compact and vinyl recordings.

However, the imaging of the 302 can prove slightly ambiguous. The piano from

Spritely and uplifting; this amplifier impressed the *Choice* listening panel and obviously charmed the EISA selectors.



our Paganini LP, for example, was recessed deep into the soundstage but the lateral position of the violin was insecure, uncertain and lacking in focus. Nevertheless, the scale and sense of anticipation developed by Rachmaninov's *Symphonic Dances* was well sustained by a big, generous and sure-footed sound that belied the little NAD's modest power rating.

Not quite accurate, it was agreed, but the music remained so spritely and uplifting that this really didn't seem to matter."

And so the legend continues. NAD's unassuming little amplifier just happens to sound bigger, classier and certainly more entertaining than many of its rivals. There's no trickery, fancy circuitry or flavour-of-the-month components about this amplifier. Just reliable, solid engineering that delivers the goods.

NAD, NAD Building, 401-405 Nether Street, London N3 1QG. ☎ 081-343 3240



Best Loudspeaker

Mission 753

European Loudspeaker of the Year '93-'94



The Mission 753 loudspeaker wins this award because of its very smooth and warm sound, while retaining both detail and liveliness.

It's an innovative multi-driver, floor standing design that utilises the lower part of the cabinet as a separate reflex loaded bass section to provide a natural and efficient low frequency performance. It is best used bi-wired.

Alvin Gold reported on the Mission 753 in the November 1992 issue, and Paul Messenger Recommended it in his formal

Mission's floorstanding 753 loudspeaker: a modern classic with a beguiling, open sound that will win many friends.

review of the speaker last January.

This is a loudspeaker that is, by any standards, unusually quick and assured, producing something close to the coherent transient quality and natural sense of temporal flow normally associated with the better panel speakers. Yet it has the forcefulness and muscle extending deep into the bass that is the special preserve of good, big, dynamic transducers.

Perhaps surprisingly, at least for those who have not previously encountered a properly optimised boundary design, the 753 also provides exquisitely delineated stereo soundstaging in both planes — soundstaging typically extending both behind and well forward of the plane of the loudspeakers.

There are some mild colorations in the mid and treble, though much depends on the exact orientation of the loudspeakers with respect to the listener. Despite this, the 753 is far from being a 'sweet spot' design, and its wide treble dispersion makes it more than usually capable of providing clean treble and believable stereo.

The 753 did well in two separate unsighted presentations. It was liked for its fine balance and open, lively disposition, with good detail, articulation and expressiveness. However, some care should be taken in matching, as it can lack involvement in the wrong system context.

The initial impression of a lovely open yet warm and rich sound is very seductive. With careful siting the system can deliver superb focus and genuine transparency, while the solid build and four bass drivers allow the generation of loudness levels that are extremely impressive without causing distress.

Central Force Ltd, Mission Group, Stonehill, Huntingdon, Cambridgeshire PE18 6ED.

☎ (0480) 451 777





Best Home Theatre

Yamaha DSP-A2070

European Home Theatre Product of the Year '93-'94



Yamaha's *DSP-A2070* is a landmark product in the rapidly growing home theatre market, combining a fully digital Dolby Pro Logic decoder with a seven-channel, integrated, audio visual amplifier. Its high audio quality, in association with DSP facilities, offers users the opportunity to assemble a true home theatre system at a very reasonable price.

The home cinema market has seen a rapid expansion this year, with many manufacturers introducing audio visual products. Yamaha was one of the first companies in this market, with the innovatory *DSP-1* surround sound processor back in 1986, so it's fitting that they should take this year's prize for best home theatre product with the *DSP-A2070*.

In this amazing box of tricks, Yamaha has managed to multiply the Dolby Pro Logic effect that lies at the heart of current surround sound technology by use of its Digital Sound Field Processing (DSP) system. This creates more natural and

Yamaha's *DSP-A2070* succeeds the popular *DSP-A1000* with the latest in AV technology.

spacious sound fields that are in keeping with the dynamic effects the film director intended. The *DSP-A2070* provides no less than 11 cinema DSP and 12 hi-fi DSP programs for the best possible reproduction of video or audio material.

It's a formidable package that is made even more appealing by the provision of a seven channel amplifier for full surround sound effects.

Power output is quoted at 80 watts for the left front, right front and centre channel speakers, 25 watts for front and rear effects speakers. Comprehensive AV switching is provided, yet clear on-screen displays make using the *A2070* simplicity itself with the sophisticated learning remote control.

Yamaha UK Ltd, Yamaha House, 200 Rickmansworth Road, Watford, Herts WD1 7JS. ☎ (0923) 233 166

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come here because there are not many shops left where you can go in and actually talk to people who are interested in music, rather than equipment.”

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Best Car Audio

Blaupunkt Stockholm RCR 42

European Car Audio of the Year 93- 94



This car audio unit is a milestone on the road to a new generation of car information systems, which not only provide optimum sound quality, but also constantly update traffic announcements, which can be recalled as needed for proper route planning. The concept not only saves time, but also helps to avoid pollution build up in cities.

The Blaupunkt *Stockholm* is undoubtedly a clever little box. Besides being an FM/AM radio cassette player with a 20 watts per channel amplifier on board, it has the very latest in RDS (radio data system) technology. RDS is a system which re-tunes your radio to the strongest transmission automatically as you move between transmitters. Its other bonus is the ability to monitor transmissions for traffic information, cutting into whatever you are listening to with a traffic bulletin if so required. It also

Blaupunkt's *Stockholm* features a virtual traffic avoidance computer, affectionately called TIM.

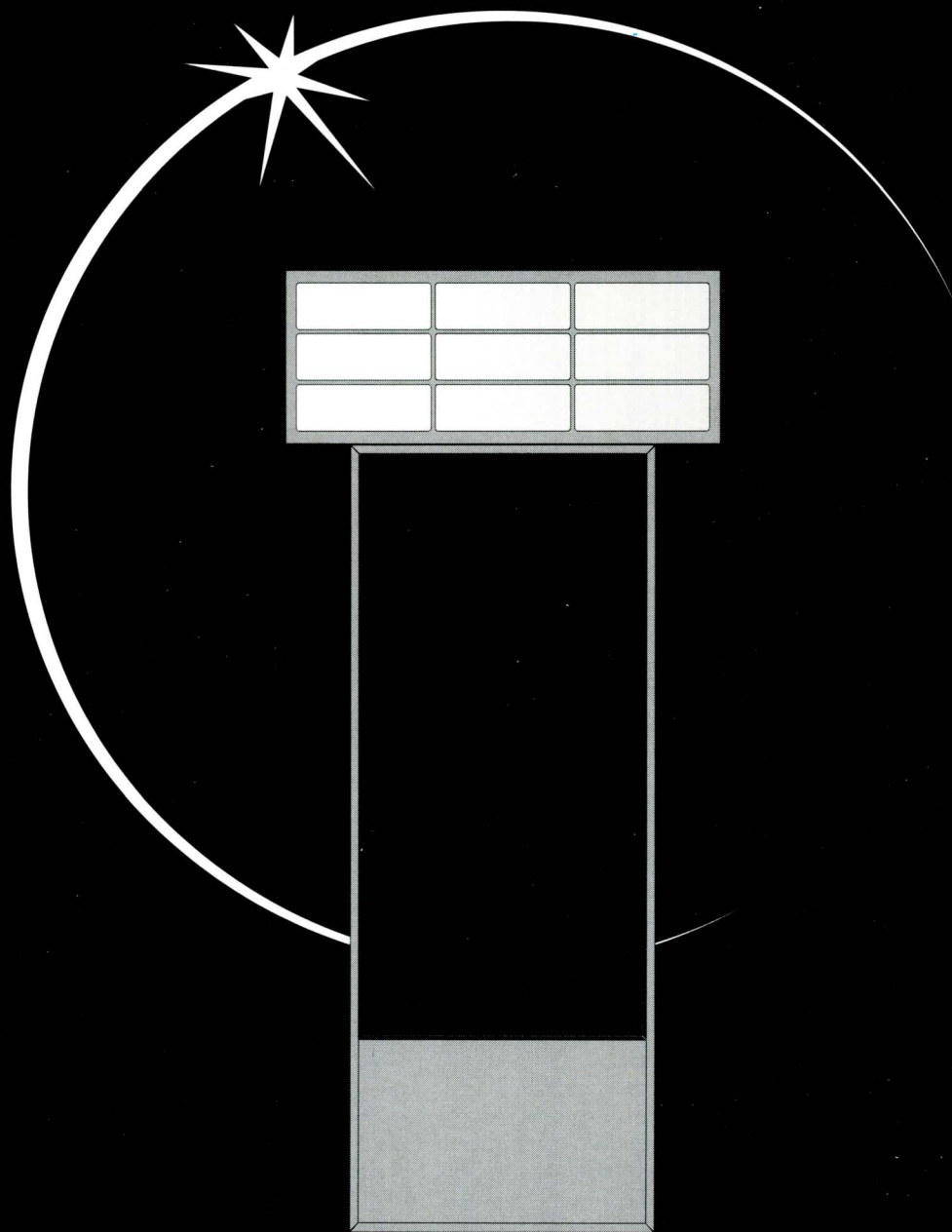
shows you the name of the stations you are listening to.

The *Stockholm* features TIM (traffic memo) which is a system for not only detecting but recording four minutes worth of traffic information broadcasts after you have left the vehicle. For instance, if you want to know what to expect on your morning drive to work, it will listen out for traffic announcements for three hours before you get into the car and play them back at the touch of a button.

As well as being technically advanced the *Stockholm* sounds pretty good too.

Robert Bosch Ltd, PO Box 98, Broadwater Park, North Orbital Road, Denham, Uxbridge, Middlesex UB9 5HJ. ☎ (0895) 834 466

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Best High-End Audio

SME Model 20

European High-End Audio of the Year '93-'94



The SME *Model 20* turntable is an outstanding feat of engineering and one which proves that the vinyl disc is still king of the hill. Excellent sound quality and amazing attention to engineering detail make this the ideal deck for those who want to enjoy their record collections for decades to come.

The provision of a 78rpm speed facility also makes it the ideal device for archiving your precious vinyl.

In our May '93 issue, Andy Benham re-discovered the delights of the LP when he reviewed the SME *Model 20* and Series *V* tonearm. Right from the moment the stylus hit the first groove of the first record, it was obvious that the SME is a rather special turntable.

The bass is remarkably tight, there's oodles of it and, perhaps more importantly, it has the speed to keep up with even the most manic drum or guitar solos, picking out individual notes with ease and separating everything out in an amazingly realistic

Built to last. The SME *Model 20* turntable is the ultimate expression of the audio engineer's art and proves that vinyl is far from dead.

fashion. The bass response is not the whole story. Far from it. The '20 also has a quite remarkably smooth midband. With well recorded female vocals, Michelle Shocked and Tracy Chapman for example, the '20 shows just why so many listeners still prefer vinyl to CD.

Comparing the deck to an expensive twin box CD player showed the '20 quite clearly ahead on points. Percussion was simply more natural and less strident while voices sounded more like voices and less like recordings.

In the right system there's little to touch the *Model 20*. It's quite simply a glorious sounding turntable. Couple that with a degree of engineering overkill and attention to detail which gives a real pride of ownership — and the warm, glowing feeling that however you treat it, the '20 will still be playing your favourite records in 20 years time — and you have a real winner.

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Best Design

Revox Evolution

European Design of the Year 93-94

Homogeneous design combined with modular flexibility is the unique concept behind the Revox *Evolution*. It provides ease of use and style without compromising the excellent sound quality.

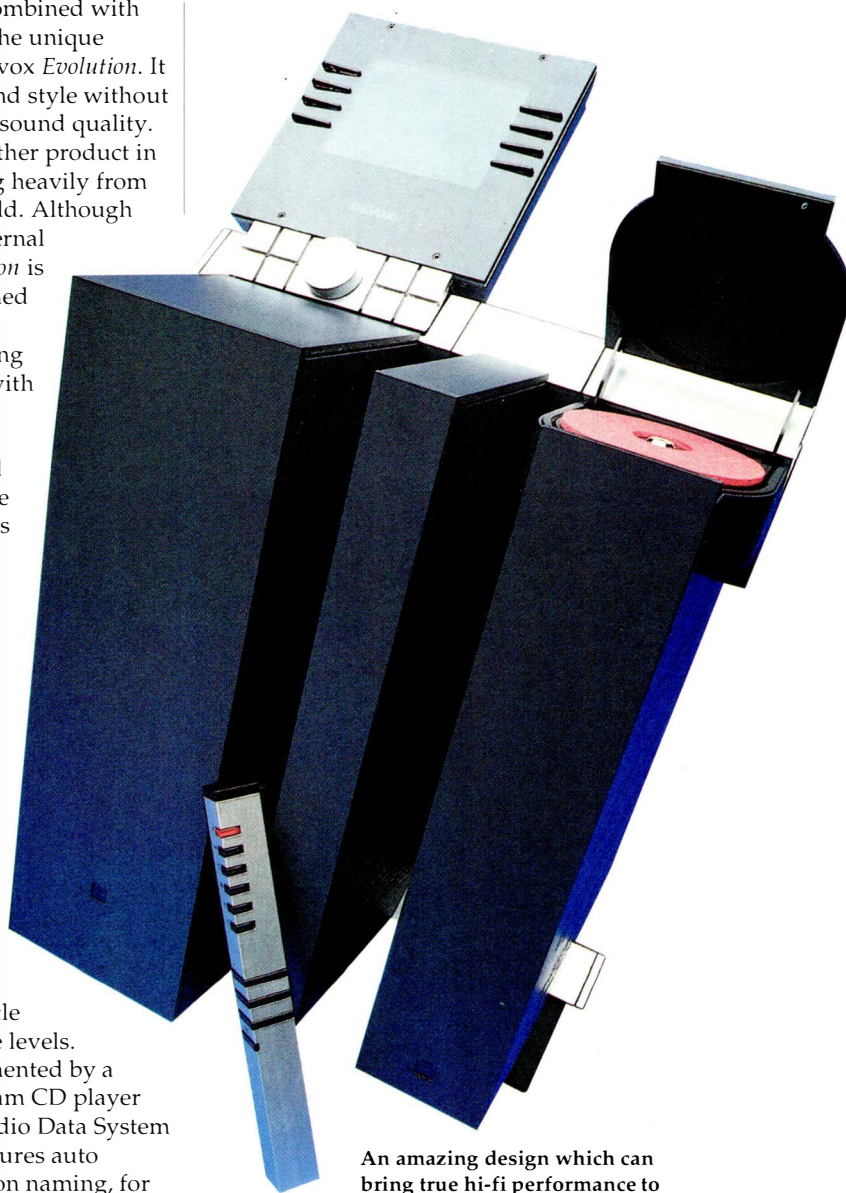
Its styling is unlike any other product in the hi-fi industry, borrowing heavily from the high-tech computer world. Although there is provision for an external line-level source, the *Evolution* is designed to be a self-contained audio centre, without the trailing wires and ill-matching boxes normally associated with serious hi-fi.

The *Evolution* combines separate components, joined together by lengths of square section aluminium tube. This acts as a conduit for audio and control signals as well as power, allowing additional *Evolution* components to be added easily.

All the components are controlled from a custom remote, or the keys beneath a backlit LCD display panel above the 100 watt amplifier section. According to Alvin Gold in the May 1993 issue of *Hi-Fi Choice*, this amp stage is seamless in its tracking of recorded dynamics, with little compression at high volume levels.

The amplifier is complemented by a distinctively-shaped Bitstream CD player and a first-class FM only Radio Data System (RDS) tuner, which also features auto presetting and manual station naming, for transmissions without the RDS code. Currently, Revox offers an analogue cassette deck as an addition to the system, but there are plans to add multi-room capability, and the company is also investigating the inclusion of both an AV aspect and a Digital Compact Cassette recorder.

Although its computer styling puts the *Evolution* in the mould of 'lifestyle'



An amazing design which can bring true hi-fi performance to the high-tech environment.

equipment, the sound quality rises above other design-conscious models while retaining the lifestyle system's flexibility and ease of use.

Revox UK Ltd, 1 Berkshire Business Centre,
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SME MODEL 20



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Most Innovative

Sony MiniDisc

European Innovation of the Year '93-'94



Sony's revolutionary new MiniDisc, seen here as the ZS-M1 Personal MiniDisc System.

MiniDisc is a very compact, digital audio recording system with the benefit of almost instant track access. Superior shock and vibration resistance make it ideally suited to portable systems and car audio equipment.

The MiniDisc system combines advanced magneto-optical technology for home recording with access to easy-to-press pre-recorded music discs.

MiniDisc was developed as a portable brother to compact disc and a replacement for the analogue cassette in personal, portable and in-car applications. Using magneto-optical discs housed in computer diskette size cases, the medium is extremely small, lightweight and durable. MDs come in two forms; magnetic pre-recorded discs and magneto-optical blank discs which can be used to record up to 74 minutes of music.

Apart from disc protection, MD's major advantage over CD in the portable field is the incorporation of a ten second anti-jog buffer. The player uses this buffer like a reservoir, pouring music (in digital bitstream form) in at one end and converting what comes out of

the other end into analogue tunes. If the player is jogged and the laser knocked off track, it has ten seconds to get back into the groove before the music is interrupted.

As if all this weren't enough, MDs also carry information about the music contained on them — album name, track titles, artist and timing are all displayed.

The medium's most impressive technological feat is squeezing so much information onto such a small disc (64mm diameter). For this purpose, Sony developed the ATRAC data compression system, which encodes the audio signal using approximately 20 per cent of the data used by CD. It does this by using the principles of psycho-acoustics, or, more specifically, masking.

MD players have shrunk to tiny proportions and pre-recorded discs multiplied. It can only be a matter of time before MiniDiscs are as commonplace as the ubiquitous cassette tape.

Sony Consumer Products Ltd, Sony House, South Street, Staines, Middlesex TW18 4PF.

☎ 081-784 1144



POWER packed

It's a long stretch between amp tests: four newcomers proved just too tempting for Paul Messenger to keep his hands off. He lines them up here in a power play off.

Four of the latest contenders in the fiercely contested £200 integrated amplifier battleground — the £230 Arcam Alpha 5, £220 Denon PMA-350/II, £200 Marantz PM-44SE and £200 Technics SU-A600 — just missed our last multiple amp test (issue 121). Yet all four are considered to be important new arrivals, and all are expected to sell in healthy numbers during this Autumn's 'season', well before our next major amp project comes around.

They're not, strictly speaking, budget amplifiers. The genuine budget amp got itself irredeemably stuck at £99.99 long ago. A hundred pounds used to buy a decent little amplifier once upon a time — back in 1980 or thereabouts — but the price point remains, with the latest budget models sounding worse with each succeeding year.

Instead, these are budget *hi-fi* amplifiers, capable of doing justice to genuine hi-fi sources and speakers without getting too tangled up in the law of diminishing returns, while at the same time probably representing just about the least one can get away with without ending up with obvious audible limitations.

The modern age of budget amplifier sound quality consciousness actually started with the original and massively

successful NAD 3020, combining European design expertise with Taiwanese low cost manufacturing and launched in 1979 at only £69. The current heirs, the £169 302 and £230 304 (Best Buys in issues 116 and 121 respectively), perfectly delineate this price band where all the action is taking place.

NAD dominated the early Eighties, but the British took back the initiative by the middle of the decade with the highly successful Mission Cyrus One, Arcam Alpha and Creek 4040 models. Then, in 1990, the pendulum swung firmly back towards the Far East when Pioneer introduced the A-400, but this has now crept up to £280 so is no longer part of the budget contest.

The cast list

Arcam Alpha 5	£230
Denon PMA-350/II	£220
Marantz PM-44SE	£200
Technics SU-A600	£200

Evolution

Given that CD players have got steadily cheaper over the past decade, why is it necessary to pay more each year for a partnering amplifier?

Amplifier makers are as adept as anyone at keeping costs under control; the trouble is, an amplifier is a relatively simple device — indeed, usually the simpler the better from a sound quality point of view. And the simpler the amplifier, the more important becomes the inherent quality of the specific components it uses

— and the more expensive too. A decent size power supply is mandatory, and bunging everything possible on a few cheap-to-mass-produce off-the-shelf chips just doesn't work.

The other reason is that we've become much more critical and aware of amplifier sound quality over the past decade. I last carried out an amplifier test for *Choice* some thirteen years ago, and the only

reason I did so then (I was Editor at the time) was simply that I strongly believed that amplifiers did sound significantly different from one another—and most of the industry and reviewers of that time did not.

The debate is still open in some quarters, but the fact that sales in the £150-£250 sector are greater in volume (and greater in value, of course) is proof positive that the market itself has clearly decided it's worth paying a modest premium for something which sounds considerably better than the basic minimum.

The launch pad

Which will be the most popular amplifier of '93/94? The two above mentioned NADs are obvious possibilities, but all of the four new entrants assembled here start out with good credibility ratings.

Weighing up the rival claims, the British entrant from Arcam must start from pole position simply because the *Alpha 3* is already a stonking sales success (despite our on experiences with the amplifier in issue 104). The *Alpha 5* differs quite significantly from the *3* in important details, but is fundamentally a performance along with price upgrade on an already commercially proven theme, and gives Arcam a £230 bite at the market sector cherry.

Although neither can claim the market making strength and longevity of Arcam, both Denon and Marantz also have well established track records in this 'budget audiophile' sector. These new models slot

in the respective ranges as putative replacements for existing successful models (both Recommended, issues 92 and 97 respectively), albeit with some price point juggling. Denon's *MkII* version of the *350* comes in

these four is that the Arcam is much more compact than the others. All sit on a similar full width (430mm) footprint, but the vertically challenged *A5* looks cute in consequence, even though the relative bulk of the other three has its own macho appeal.

Construction is similar throughout, with most of the components, including main PCB, power supplies and heat-sinking, mounted on the base, all wrapped up in a pressed steel case with appropriate ventilation holes. In terms of overall feel, the newly and smoothly styled Arcam leads by a short

head from the beautifully detailed Technics. Rather stern and severe in its bulky simplicity, at least the Marantz has a neat wraparound fascia treatment. Only the Denon has the rather old fashioned sharp edges and corners.

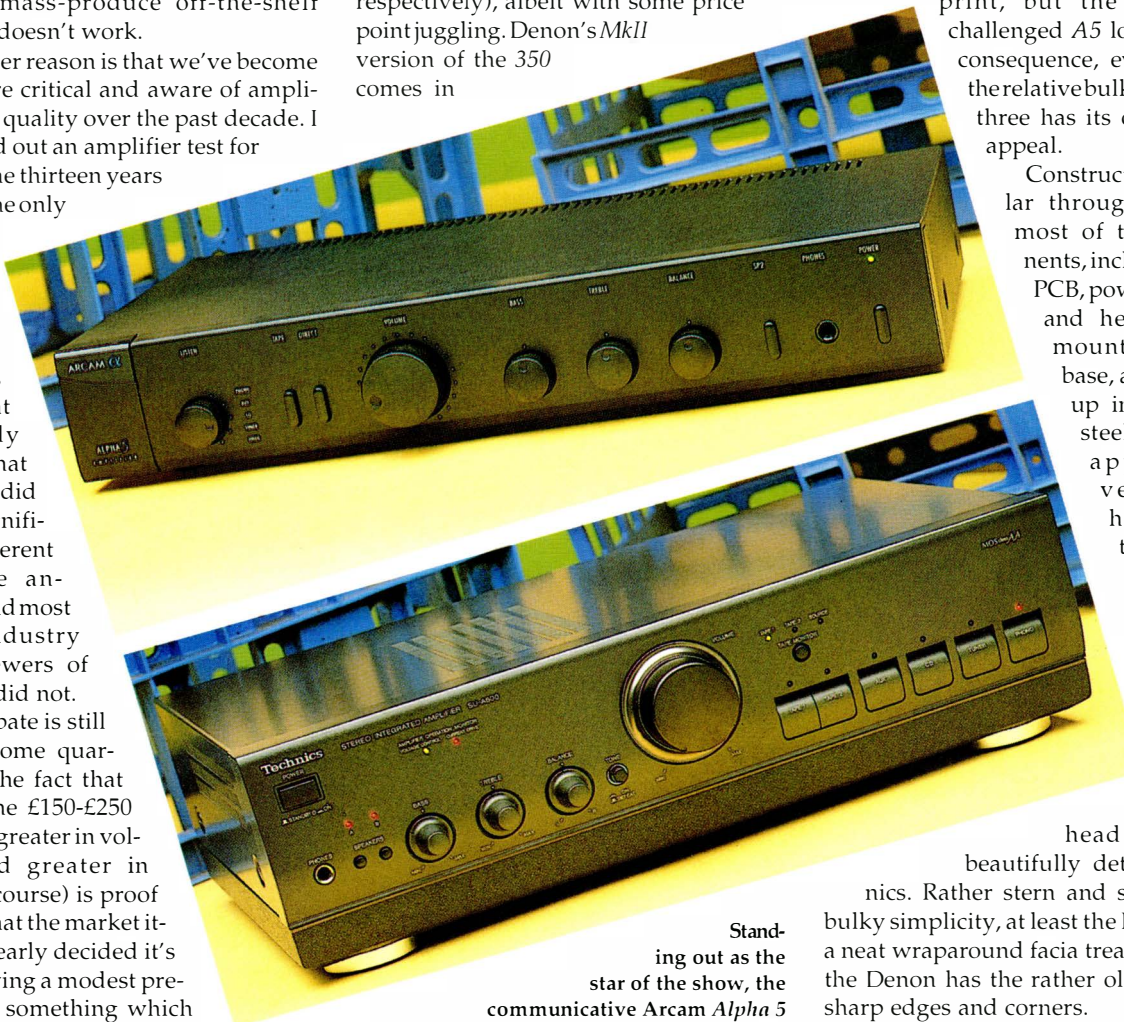
Interestingly, only the multi-board Marantz uses a traditional laminate core (EI) transformer. Both the essentially single-board Denon and Arcam use chunky toroids while Technics has its own unique new low-loss R-core variation. All have taken pains to keep the signal path clean, choosing selected critical components on the basis of sound quality criteria.

Facilities

Arcam	■ ■ ■ ■ □
Denon	■ ■ ■ ■ □
Marantz	■ ■ ■ ■ □
Technics	■ ■ ■ ■ □

There's really not much to choose between these amps in terms of features or specifications. Being audiophile oriented, all retain some vinyl disc compatibility, in each case this is of the high output (moving magnet) variety; all include tone control bypass switching, yet none goes so far as to eliminate tone controls entirely.

Each has five additional line-level inputs, and two line outputs (for feeding to



Standing out as the star of the show, the communicative Arcam *Alpha 5* (top) looks very suave. The beautifully detailed construction of the *SU-A600* (bottom) encases a neutral sounding amp.

at £220 rather than £190, whereas the new Marantz *PM-44SE* is £50 less than its *40SE* predecessor. Given that the latter has recently sold very strongly at a discounted end-of-line £200, Marantz has prepared its launch pad very carefully.

Technics sells lots of amps too, at all different price points above £100, but the £220 *SU-VX600* (Recommended in issue 104) never rose above the also rans in sales terms. Which is why a lot of extra effort has gone into this new £200 *SU-A600*, arguably the most technically radical of the four contenders, though it's from an innately conservative brand.

Construction

Arcam	■ ■ ■ ■ □
Denon	■ ■ ■ ■ □
Marantz	■ ■ ■ ■ □
Technics	■ ■ ■ ■ □

The most obvious difference between

tape recorders), and each can be connected to two sets of speakers and headphones. Both Arcam and Marantz sacrifice switching convenience here in the interests of sound quality. Even the specified power outputs (40W-50W per channel) vary only slightly between the models, depending somewhat on the actual measurement conditions

Sound quality

Arcam	■ ■ ■ ■ □
Denon	■ ■ □ □ □
Marantz	■ ■ ■ ■ □
Technics	■ ■ ■ □ □

How does one assess the sound quality of four near-budget price amps of serious intent? After some thought I elected to use the best possible sources (vinyl and CD) I had to hand, and loudspeakers that ranged from the sublime via the ridiculously difficult to the sensibly priced for a good all round comparison.

What surprised me was how easy it was to hear the obvious differences — much more so than thirteen years ago. I'm sure that this reflects the substantial improvements in source quality throughout the Eighties, and in turn explains the increasing interest shown in amplifier sound quality.

After an overnight warm-up, the Denon took centre stage first, and turned in a decidedly dispiriting performance. I feared we were in for an arduous day's listening. Happily, things improved, but I still find it difficult to say anything positive about the PMA-350/II, despite repeated revisits and several speakers.

Lack of time coherence seems to be the main problem, making the listening experience hard work. The bass has a mechanical quality and some lack of control; the midband has no freedom or leading edge precision, while the treble is detached, hard and tinkly.

The Technics brought things together much better, delivering a good sense of pace and air which encouraged the ad-

vancement of the volume control. Dynamics are natural, while decent timing and rhythm bring an attractive coherence to the whole. Ultimately, the sound is a little constrained, with the treble in particular sounding just a little too well controlled, so that true freedom and transparency is not attained, but at least the sound makes good musical sense and can carry some sense of urgency.

The Marantz sounds quite distinct again, and I suspect may have rather wider appeal than the Technics, though I'd hesitate to state that either one is better than the other. Essentially a romantic, the 44SE majors on fine voice band delicacy and expressiveness which could well appeal to those who wish they could afford a valve amp. The top end verges on untidiness, but still manages to convey a fine

Though on top in the picture below, the Denon PMA 350/II proved itself bottom of the class in this comparative test; by contrast, the Marantz had a sweet and romantic tone.



sense of openness. Although the bass seems better than previous generations of Marantz models, it's still clearly well below the mid on the list of priorities, and is a shade heavy and slowed.

In some ways the Arcam doesn't sound as pretty as the Marantz nor as neutral as

the Technics — but it is significantly more communicative and coherent. One can also criticise the cosmetics of the A5 presentation, which has a character, lacking something in bass drive and speed, and occasionally proving bright and spitty.

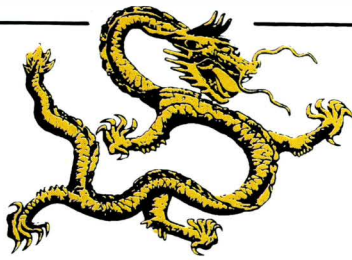
But its superior leading edge definition and coherence across an obviously broader bandwidth results in an experience which delivers a surprisingly good measure of the magic that a true audiophile amplifier can provide. It has altogether more immediacy than the other designs. Having not tried an Alpha in years, and with no preconceptions, I was truly impressed that such a low cost amplifier could turn in such a mature and well balanced performance.

Once the main listening was finished, I carried out a brief 'destruction' test, to discover what might happen if you left the hi-fi system unguarded when throwing a party. Using current-hungry Linn Keilidhs, I whacked up the volume, and with the Denon and Technics my ears gave up long before the amps showed any signs of shutting down, even though the sounds were not all that pleasant. The Marantz politely relay-muted until I settled for a lower level than the others, while the Arcam just stopped completely after twenty seconds of serious abuse, having blown its output fuses.

Verdict

Arcam	■ ■ ■ ■ □
Denon	■ □ □ □ □
Marantz	■ ■ ■ ■ □
Technics	■ ■ ■ □ □

I can't find a great deal positive to say about our sample of the Denon PMA-350/II, but each of the others has its own different strengths. Were this a normal full review, I would award a Best Buy to



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the Arcam and Recommend the Marantz and Technics. I freely admit the *Alpha 5* is my personal clear favourite, well worth the £30 premium for its fundamentally superior communication skills. But other listeners could easily prefer the sweeter and more romantic Marantz, or the more neutral and urgent Technics.

Personal taste and commitment is an inevitable part of the subjective reviewing process, but you shouldn't allow a reviewer's preferences to override your own judgement and taste.

Current capability

Within the innards and connecting cables of a hi-fi system, the stereo sound signal exists as an electrical model, its constant and rapid changes mimicked by electrical voltage changes. This is passed around and processed if necessary, but finally reaches the amplifier, which takes the joint responsibility (along with the loudspeakers) of turning it back into a physical sound signal.

Voltage alone is not enough. Speakers need energy and power to generate sound, and that means supplying not just the modelling voltage, but great gobs of current alongside. The varying source signal and volume control setting determine the actual voltage presented to the speaker, but then the speaker's own complex electromechanical behaviour takes over, making often unpredictable demands for current changes as rapid as the voltage swings of the signal.

Although some describe an ideal amplifier as a 'straight wire with gain', the much more useful analogy is of a infinitely capable (in terms of current delivery and speed of reaction) power supply connected to the loudspeakers, with just a little tap in between which turns on and off according to the changing signal voltage. Irrespective of whether an amp uses solid-state bi-polar or MOSFET devices, or even valves, the quality of the power supply is what really counts.

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Marantz Hi-Fi UK Ltd, Kingsbridge House, Padbury Oaks, 575 Bath Road, Longford, Middlesex UB7 0EH ☎ (0753) 680 868

Arcam Ltd, Pembroke Ave, Denny Industrial Centre, Waterbeach, Cambridge CB5 9PB ☎ (0223) 861 550

Panasonic UK Ltd, Panasonic House, Willoughby Road, Bracknell, Berkshire RG12 8FP ☎ (0344) 853 157

2nd opinion

In the absence of a full blind listening test, three of *Choice's* reviewers conspired together on a rainy Tuesday to assess the four amplifiers. As Paul Messenger states, we listened to the amplifiers on speakers that were both punishing and revealing, in an attempt to unearth the individual characteristics of the amplifiers, and to see how each one performed under stress.

However, as no one would expect to use a £200 amplifier connected to a pair of £5,000 speakers with the sort of load that eats high-end amplifiers for breakfast, the amps were ultimately tested with a pair of 'real-world' £200 Rega KYTE loudspeakers.

Each of us felt that the Denon *PMA-350/II* lagged substantially behind the other three amplifiers in the test. This was the amplifier which most reminded us of the low cost of the equipment being tested. At first, we felt that it lacked definition, but sounded pleasant and friendly. As the test progressed, the friendly sound soon became one that lacked leading edge information and began to sound fatiguing.

The Technics *SU-A600* was comfortably ahead of the Denon *PMA-350/II*. It had a more open, relaxed and dynamic presentation generally, with a reason-

able sense of speed and colour.

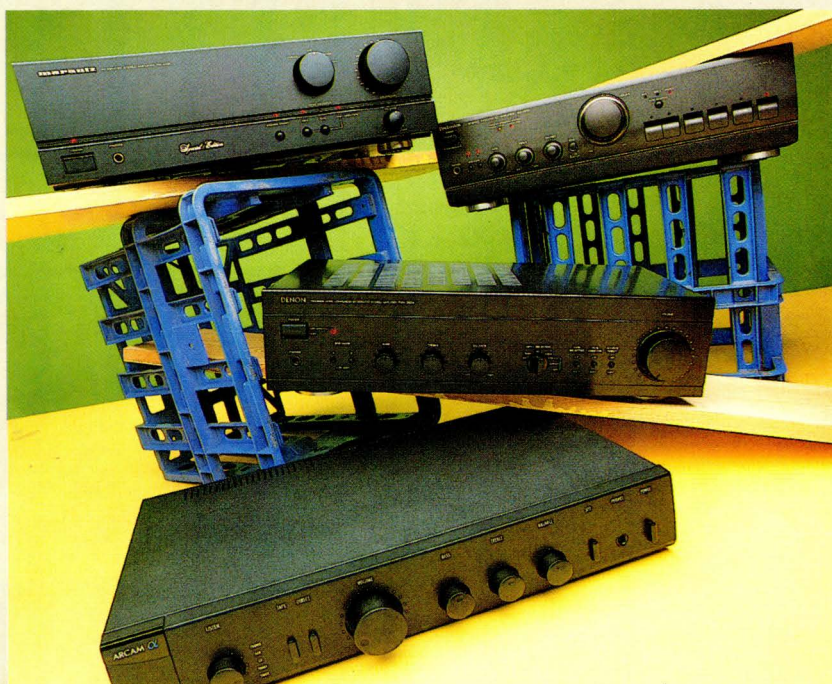
Unfortunately, it also had problems at frequency extremes; it lacked extension and edge in the bass and had a grating quality in the extreme high frequencies. This, combined with the fact that it sounded short of absolute power, weighed against the *A600*.

Although we all placed the Marantz *PM-44SE* in second place, opinions were divided as to its overall worth. One reviewer praised its subtlety and assured, almost tube-like openness and dynamic range. He also conceded that the bass could be a little light and the high frequencies seemed damped.

All three listeners felt that the satin coherence of the Marantz was worthy of note, but ultimately, it was a little too tame, especially when compared to the Arcam *Alpha 5*.

Saving the best for last, the Arcam *Alpha 5* stood clearly above the others. It was more vivid from the moment the stylus and the laser hit their respective discs. While it lacked the smoothness and polish of the Marantz and Technics amps — it was more obviously a transistor amplifier — the Arcam's sound was consummately realistic and won over all who listened to it.

Alan Sircom



On test: cassette decks

The quantity of new cassette decks may have dwindled but the quality has increased. Alvin Gold and

Paul Miller take a look at nine top models plus the latest DCC machine.

Let's face it. The market for home recorders, which on the whole still means cassette decks, has been going through rather a rough patch. First there was the recession which depressed all kinds of buying activity. Then there was the period of hiatus during which Sony and Philips were almost, but not quite, ready to launch their prospective replacements for compact cassettes.

During this period, a percentage of the depleted numbers still interested in hardware purchases put their decisions on hold, waiting to see what would happen, and what it would all cost.

In consequence, the number of new models available has fallen sharply as engineers have been pulled away from cassette deck design work to concentrate on digital projects. The pendulum has probably swung too far, and in the next 12 months we can expect to see an increase in the number of new analogue cassette decks as well as an acceleration in the rate of digital introductions.

Meanwhile, if quantity has been lacking, quality certainly hasn't been. Our group of ten decks has its fair measure of technical innovation and even excellence.

The decks we have selected fall naturally into three groups. Those costing up to

£175 are at the sharp end of the market and make the greatest contribution to sales statistics. The group comprises a twin auto-reverse model with a wide range of special features, including automatic tape alignment, and a single transport model with basic equipment levels but a

Ratings

Excellent	■ ■ ■ ■ ■
Very good	■ ■ ■ ■ □
Good	■ ■ ■ □ □
Average	■ ■ □ □ □
Poor	■ □ □ □ □

These ratings are a simple guide to the sound quality and value for money of each cassette deck.

takes in five quite different models, two twin cassette decks and three single transport machines. Finally, the

real time tape counter which you do not need to zero at the start of a tape. This is a major plus point for a deck costing less than £175.

The next price group runs from £175-£275, and

area above £275 is represented by three designs; one from the name that has become synonymous with high-end cassette deck design, Nakamichi; one from Pioneer, a maker better known for budget designs; and the other a DCC deck, the Philips DCC600, which represents the competition that upmarket analogue decks will face over the months and years ahead.

As I write, the DCC600 is the lowest price dedicated hi-fi component DCC deck available. The only cheaper model is a midi width unit primarily intended for use with packaged systems.

The issue of digital media is obviously hot. As well as DCC, MiniDisc is about to appear as a domestic deck, which will pitch two bright, shiny and apparently very capable new media against what appears to be a has-been — compact cassette.

Without doubt, one or both of these media represent the future of home taping, but it may not happen overnight. As Nakamichi is keen to point out, "... the long history of analogue recording has culminated in products that are technologically mature and offer a very high level of sophistication at a moderate cost... it will be quite some time before [the new digital media] really overtake the analogue cassette."

Understanding cassette tape types

Like noise reduction processes, tapes can also be divided into three groups. They are known by the magnetic materials they use: ferric (iron oxide), chromium dioxide (more likely these days a substitute or pseudo-chrome) and metal (pure iron particles). These types also correspond to IEC Type I, II and IV respectively, designations that appear on the cassette packing.

There is some overlap of prices and characteristics but generally, ferric tapes are cheaper and designed for non-critical use. Chrome bias tapes are inherently quieter and generally give a better, more extended treble, but they cost more, and many portable and some low cost domestic units don't record onto chrome. Best of all are the metals, which though costly, demanding of the cassette deck's performance and a little noisier than chromes, are more consistent and dynamic under pressure, especially when recording closed mic'd, treble rich material at high levels.



Pick a tape, any tape; Alvin explains the differences between the metal, chrome and ferric varieties.



The cast list

Aiwa AD-WX828	£199.99
Goodmans Delta 700W	£139.99
Harman/Kardon TD4200	£249.99
JVC TD-V562	£199.99
Kenwood KX-5050	£229.95
Nakamichi DR-3	£399.99
Philips DCC600	£499.99
Pioneer CT-S520	£279.95
Sansui D-790WR	£199.95
Sherwood DS-5010C	£159.95

What the tests mean

The lab test programme for the cassette decks was undertaken mainly using a Hewlett Packard spectrum analyser and Lindos generator and analyser. Paul Miller did the digital measurements for the Philips DCC600.

The limitations of laboratory tests should be understood, since no measurements can tell us what any tape deck sounds like. But some basic measurements are prerequisites.

Pitch integrity is one of these. A cassette deck that can't keep a steady speed will never sound any good. Low rate pitch variations, with a frequency of several cycles per second, are known as wow, and result in audibly wobbly pitch. Flutter is the word used to describe high rate pitch variations, often caused by unevenness of the diameter of tape driving surfaces. Flutter tends to be heard as roughness and loss of fine detail. Its effects are insidious.

In our tests, we publish composite wow and flutter figures, and a spectrum analysis

with level plotted against frequency. The applied test tone is at 3.15kHz, and before it is recorded onto tape it gives a spectrum which looks like a vertical line perpendicular to the frequency axis. The departure from this is catalogued in the spectrum plots. Any spread in the central peak represents flutter. Energy further away is wow.

Response plots designed to show each deck's replay frequency response when using commercially duplicated tapes (musicassettes) are included, along with graphs depicting the overall frequency responses when recording and playing back on the various types of tape. The responses are plotted with and without Dolby noise reduction for Type II tapes.

Our tests also include measurements of noise (tape hiss and hum) and distortion. The latter is referred to +8dB above 0VU on the meters, by which point most decks will be producing copious levels of distortion, and at -8dB, which shows the inherent distortion level of the medium when not under stress.

A brief history of tape noise reduction systems

The man responsible for exorcising the ghost of tape hiss from compact cassettes, a hiss prone medium, is Dr Ray Dolby. He invented Dolby A, which came to prominence in recording studios, and his company has since released new generations of noise reduction.

The earliest and most successful domestic noise reduction process of all was Dolby B, which although only moderately effective (10dB of effect at high frequencies only) has become the industry standard for prerecorded cassettes. It is widely used when recording.

Dolby C, effectively two Dolby B chips in tandem, followed. This was powerful, but suffered compatibility and alignment problems. These were tackled with Dolby S, the latest system, which is both powerful and backwards compatible. Time will tell if Dolby S can revitalise the market which is presently looking to a digital future.



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Goodmans Delta 700W



One of the cheapest of all twin auto-reverse cassette decks, the compact Delta 700W is surprisingly well endowed in certain areas. Some of the controls have their own LEDs, which act as a guide when entering a sequence of instructions. The Delta 700W also has a one step dubbing key which automates the whole process. Other gadgets include intro scan and track search. Data link type sockets are fitted, allowing single remote control access to system operations for those who want to use the 700W with a full Goodmans component system.

This is no luxury package, and the physical construction is lightweight and rattly. Limitations include the absence of a manual record level control, Dolby HX Pro and Dolby C. The only operational quirk is a control microprocessor that reacts with a snail-like torpidity.

Sound quality

The auto-level control took care of musical dynamics by making sure there weren't any—or many. And so the end result was a weak and flat sounding performance with a loss of stereo integrity as instruments failed to stay locked in position as the music changed.

The lack of low frequency energy also made itself apparent in a number of ways. The most obvious was a loss of tonal depth with many instruments, especially the larger, deeper types. Smaller instruments, whose compass was primarily in the mid and treble, had a grubby and ill-differentiated sound, with some harshness with Type II tapes, a result of underbiasing. What differentiation there was seemed almost random, and partly due to poor head to tape integrity which was clearly audible on headphones.

Poor tape path integrity didn't do a lot of good for prerecorded material either. In one jazz track with a solo alto sax (from a free cassette on a jazz magazine cover), the instrument changed in sound with virtually every note as the tape drifted in and out of contact with the heads. Dubbed tapes were worse still, with the characteristics described further compounded.

Conclusion

This model has only one purpose: to provide the ability to dub tapes cheaply. If price is that important, the Goodmans is worth considering, but performance is little better than that of a decent portable when played through a hi-fi system.

Goodmans Industries Ltd, 2-3 Mitchell Way, Portsmouth, Hants PO3 5PR.
☎ (0705) 673 763

Verdict

- ▲ Compact and easy to use (if slow witted) twin deck.
- ▼ Grubby and bass shy sound, with poor head to tape contact.
- ▶ £139.99 RRP

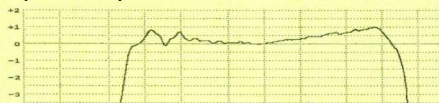
SOUND QUALITY

VALUE FOR MONEY

Laboratory Report

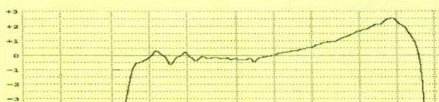
Wow and flutter is extremely high, which is why the spectrum analysis looks like the Himalayas. The subsidiary peaks are caused by capstan wow and other transport components which are either eccentric, resonant or have loose bearings. High levels of medium term speed variation were also evident with a time constant in the order of 6 to 8 seconds.

The Goodmans shows a narrow effective bandwidth. There is little energy below 70Hz or above 10kHz. The noise and distortion results are not to be taken literally as they will be affected by operation of the auto-level control. Even so, the numbers do tell one story all too clearly: metal tapes should be avoided at all costs, and only ferric tapes are truly well suited.



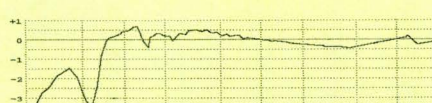
Frequency response — metal tape/Type IV

Accurate response shape, but limited output at frequency extremes.



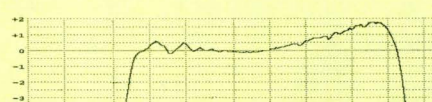
Frequency response — chrome bias tape/Type II

As for the prerecorded cassette with sharp mid treble peak.



Frequency response — prerecorded ferric/Type I

Excellent uniformity of response and good treble extension.

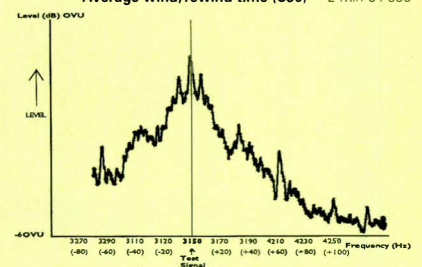


Frequency response — Dolby B chrome bias/Type II

Poor Dolby alignment; treble peak should be greater given non-Dolby response error.

TEST RESULTS

Wow & flutter IEC386 Q-Pk %	0.342%	Mean Wtd	-44.5dB	-37.7dB	-17.1dB
Pk Wtd	0.312%	MOL 3% ref 0dB			
Mean Wtd		1kHz	n/a	n/a	n/a
Crosstalk ref 0dB		Distortion (THD+N) @ +8dB			
100Hz	-29.2dB	100Hz	9.71%	9.50%	18.4%
1kHz	-46.9dB	1kHz	9.01%	10.0%	23.9%
6.3kHz	-31.4dB	6.3kHz	3.22%	3.72%	7.86%
10kHz	-27.1dB	Distortion (THD+N) @ -8dB			
Noise CCIR 468-3 Q-Pk IEC		100Hz	1.75%	1.41%	14.2%
Type I		1kHz	1.79%	1.43%	35.4%
Peak Wtd	-44.3dB	6.3kHz	1.76%	1.49%	7.47%
Type II		Type IV			
Peak Unwtd	-47.0dB	100Hz	-17.0dB		
		6.3kHz	-37.5dB		
		10kHz	-24.8dB		
		Dimensions (wxhxd)			36x13.4x28.6cm
		Tape speed error :			
		record play transport fwd		+0.15%/rev	+0.20%
		play only transport fwd		+0.20%/rev	+0.32%
		Average wind/rewind time (C90)			2 min 54 sec



Wow and flutter spectrum

Prominent capstan wow and other artefacts. can be clearly seen.

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Sherwood DS-5010C



The first thing you should know about Sherwood is that it is a 'tied' brand. It is imported by Hi-Fi Direct, a subsidiary of the Richer Sounds group, and is available only through the Hi-Fi Direct mail order scheme and Richer Sounds stores nationwide. By cutting out one stage in the chain between manufacturer and end user, Sherwood's pricing has always been sharp, and at under £160, the DS-5010C appears to offer a strong deal.

This is a full width, well-finished unit with logic controlled light touch buttons to operate a slightly noisy transport. Basic features of this unidirectional deck include Dolby B and C noise reduction, Dolby HX Pro headroom extension circuitry, a fine bias control and headphone monitoring with a volume control. The latter makes the deck suitable for stand alone use.

The DS-5010C has one neat gizmo: a

real time tape counter that works out the elapsed running time, after the tape length has been programmed. Track and intro search are also provided, and the deck has remote control sockets for system use.

Sound quality

Prerecorded tapes sounded accurate tonally, but had poor differentiation of fine detail and flattened stereo perspectives when compared to the JVC TD-V562 (a reference for all the lower price models tested, albeit at a £40 premium). Overall it sounded acceptable, but don't throw away your CD or record player just yet.

The fine bias control came to the Sherwood's rescue on more than one occasion as the tests progressed, and by the end it proved possible to make variously acceptable recordings on most tapes, though metals conferred no special ad-

vantage, and clearly don't repay the extra investment. In general, it proved worthwhile when recording to slightly underbias the tape to provide a little extra top, which helped reintroduce some clarity lost in the recording process. These losses were at their most obvious with complex material, the standard test disc (choral music from Handel) sounding muddled and sibilant.

Conclusion

The DS-5010C is well priced for the engineering on offer, but it is by no means as exceptional at its price point as some other Sherwood equipment. The slightly scrawny sound lets it down. A reasonable deck then, but not one that passes sustained critical analysis.

Hi-Fi, Richer House, 202 Long Lane, London SE1 4QB. ☎ 071-827 9827

Verdict

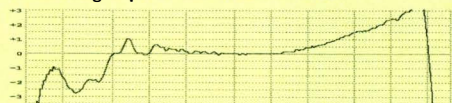
- ▶ **Purposeful; headphone monitoring; real time counter.**
- ▶ **Rather grubby sounding deck lives down to the stereotypes.**
- ▶ **£159.95 RRP**

SOUND QUALITY
 ■ ■ □ □ □
VALUE FOR MONEY
 ■ ■ □ □ □

Laboratory Report

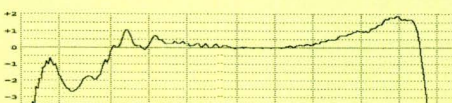
The DS-5010C is not a deck to buy for use with metal tapes, which it under biases fairly severely. This is a parameter that lies well outside the scope of the bias control to apply correction, and is associated with the thin, raw sound noted during the listening tests. The deck is palpably at its best with Type II tapes, and Dolby B. Prerecorded tapes are handled fairly accurately, but the prominent upper midband lends some support to the observation of 'glare'.

The transport gives excellent flutter results, but there are some wow artefacts, most of which are probably attributable to eccentricity of the single capstan. Longer term speed disturbances were also apparent. These could be heard as a gentle meandering of pitch with sustained notes.



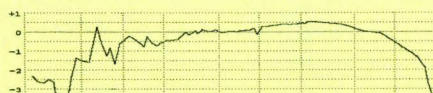
Frequency response — metal tape/Type IV

Type IVs are underbiased by Sherwood, which can't be corrected using the bias knob.



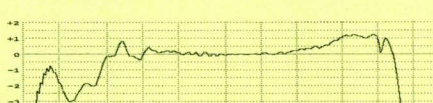
Frequency response — chrome bias tape/Type II

Good performance, but note low frequency loss, and 2dB treble peak.



Frequency response — prerecorded ferric/Type I

Upper midband hump can cause 'glare', this aside prerecorded tapes sound good.

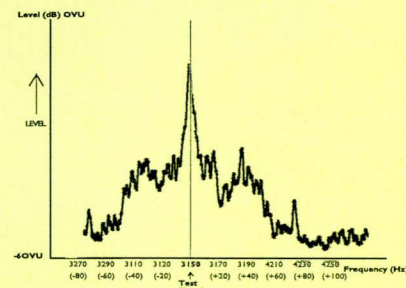


Frequency response — Dolby B chrome bias/Type II

Good performance shows the Sherwood at its best with chrome tapes.

TEST RESULTS

Wow & flutter IEC386 Q-Pk %	0.121%	Mean Wtd	-44.1dB	-47.1dB	-43.8dB
Pk Wtd	0.102%	MOL 3% ref 0dB			
Mean Wtd		1kHz	-3.8dB	-3.1dB	-4.3dB
Crosstalk ref 0dB		Distortion (THD+N) @ +8dB			
100Hz	-40.1dB	100Hz	16.9%	19.3%	17.0%
1kHz	-42.7dB	1kHz	13.2%	13.3%	13.3%
6.3kHz	-37.7dB	6.3kHz	3.05%	3.51%	3.10%
10kHz	-34.2dB	Distortion (THD+N) @ -8dB			
Noise CCIR 468-3 Q-Pk IEC		100Hz	1.06%	1.35%	1.03%
Type I	-43.9dB	Type IV			
Type II	-46.9dB	1kHz	0.78%	0.97%	0.834%
Peak Wtd	-43.6dB	6.3kHz	2.61%	2.72%	2.60%
Peak Unwtd	-46.7dB	-45.9dB			
		Dimensions (wxhxd)	44x12.5x24.5cm		
		Tape speed error	+0.01%		
		Average wind/rewind time (C90)	2 min 36 sec		



Wow and flutter spectrum

Accurate central peak indicates stable pitch; sidebands show wow energy.

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Tony Kleiser
Uxbridge Audio
109 Chiswick High Road
Chiswick
London W4 2ED

22nd June 1993

Dear Sir,

I am writing to you, to inform you that I have recently purchased several items from your Chiswick shop.

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Your staff are all friendly and very helpful. One person in particular has put himself out to help me non stop. That person is Gordon, it is because of his help, that you can be assured of seeing me in your Chiswick shop very soon, ready to sit, listen and purchase any new items I may like the sound of.

I would also like to thank you for giving me the chance to improve my system without having to feel as though I'm being forced to buy because it's there.

Thank you once again for your help and staff. I would appreciate it if you showed Gordon this letter, as I'm looking forward to my next listening session and cup of coffee.

Yours gratefully,

Nigel Harradine

Nigel Harradine

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Aiwa AD-WX828



About a year ago, we tested a twin cassette deck from Aiwa, the AD-WX929, that was so fully equipped I concluded that it hardly seemed fair to ask what it sounded like. The same strategic price slot is now occupied by a pared down model, the AD-WX828, the 929 having moved up to £250.

The new model lacks some key features, including the ability to record on both transports, the quick optically triggered end of side auto-reverse change-over, play trim and remote control. It is a measure of Aiwa's continuing competitiveness, however, that even in its reduced circumstances, Aiwa's £200 offering remains better equipped than most.

This is a dual auto-reverse Dolby B/C/HX Pro deck, with one recording mechanism, which has a proprietary tape alignment circuit adjusting record bias and

sensitivity in 15 steps. A range of powerful search, recording and tape dubbing modes are available, and the whole package is supported by an excellent display. Although button bound, the control system is attractive and modern, and operational feel and tape handling are way above expectations at this price level.

Sound quality

The Aiwa is a crisp, clean and tidy performer, with a lightweight but agile and tuneful bass and plenty of detail. This occasionally deteriorated into a jangled edginess with complex music, but mostly gave the lie to the Aiwa's modest pricing.

There was little if anything to be gained from using metal tapes, but it made good recordings on ferric tapes and a good Type II chrome bias tape, TDK SA, proved to be an optimum qualitative match. There

was some roughness on strongly percussive sounds, but little identifiable pitch instability, even with long, sustained notes.

Prerecorded tapes proved open and clean in the midband, though acoustic bass lines sounded leaden, especially when used on the replay deck. This was exaggerated when tapes were dubbed at high speed.

Conclusion

It's not quite as good as the AD-WX929, but the WX828 still sets the standards below £200. Although it's bass lacks pitch resolution, the mid and top are at times startlingly vivid and with music of moderate complexity, it performs remarkably well. A clear, unequivocal Best Buy.

Aiwa (UK) Ltd, Unit 5, Heathrow Summit Centre, Skypoint Drive, West Drayton, Middlesex UB7 0LY. ☎ 081-897 7000

Verdict

- ▲ High value twin deck with many features and crisp sound.
- ▼ Bass can sound woolly; treble tends towards coarseness.
- ▶ £199.99 RRP

SOUND QUALITY



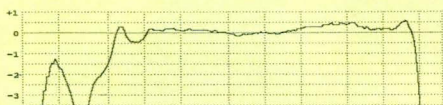
VALUE FOR MONEY



Laboratory Report

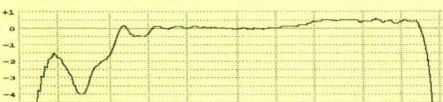
Wow and flutter figures are disappointingly high. The spectrum analysis displays a fine central peak indicating a good basic performance, spoiled by capstan wow, visible as the broad shoulders in the peak. There are also some sharp flutter peaks close to the central one. Medium to long term speed integrity is very good, however.

The signal to noise figures are fine, but the deck is not capable of extracting any extra dynamic range with high energy tapes. The various response shapes are very accurate, apart from a minor treble loss with the Dolby circuits engaged by operation of the auto level control. Even so, the numbers do tell one story all too clearly: metal tapes should be avoided at all costs, and only ferric tapes are truly well suited.



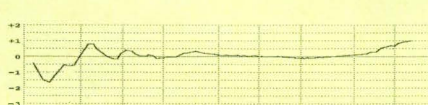
Frequency response — metal tape/Type IV

Accurate response shape, but metal tapes do not yield any extra dynamic range.



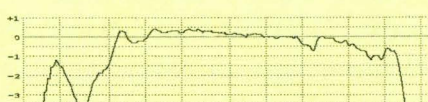
Frequency response — chrome bias tape/Type II

Very accurate mid and top highlights good qualitative match with some chrome tapes.



Frequency response — prerecorded ferric/Type I

A fine result indicates excellent compatibility with prerecorded tapes.



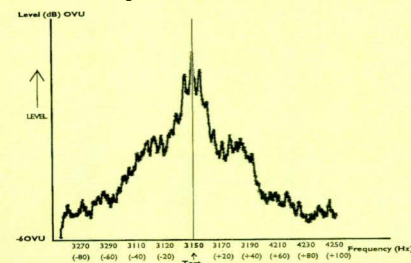
Frequency response — Dolby B chrome bias/Type II

Minor treble loss when Dolby circuits engaged by operation of auto level control.

TEST RESULTS

Wow & flutter IEC386 Q-Pk %	0.225%	Mean Wtd	-44.1dB	-47.7dB	-46.7dB
Pk Wtd	0.185%	MOL 3% ref 0dB	-0.3dB	-2.9dB	n/a
Mean Wtd		Distortion (THD+N) @ +8dB			
Crosstalk ref 0dB		1kHz	20.7%	18.9%	21.5%
100Hz	-35.8dB	1kHz	8.37%	15.1%	17.4%
1kHz	-50.2dB	6.3kHz	4.49%	3.97%	7.19%
6.3kHz	-47.3dB	Distortion (THD+N) @ -8dB			
10kHz	-43.1dB	100Hz	1.17%	0.583%	0.867%
Noise CCIR 468-3 Q-Pk IEC		1kHz	1.32%	0.827%	0.891%
Type I		6.3kHz	1.60%	1.79%	2.05%
Peak Wtd	-49.3dB	Type IV			
Peak Unwtd	-47.3dB	1kHz	-46.4dB		
		6.3kHz	-49.6dB		

Tape speed error:
 Rec/play transport fwd 0.02%/rev -0.03%
 Play only transport fwd -0.25%/rev 0%
 Average wind/rewind time (C90) 2 min 52 sec



Wow and flutter spectrum

Basically good result spoiled by capstan wow and discrete flutter artefacts.



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Harman/Kardon TD4200



If you want to know where the inspiration for this two head deck comes from, a quick read of the promotional literature tells all. On frequency responses, 'only Nakamichi offers a comparable performance.' So why not buy a Nakamichi? One clue can be found in the price — the TD4200 costs £259.

The TD4200 is a simple but painstakingly designed deck in a market too heavily populated by routine 'me too' machines, often using off the shelf components. H/K points to its use of such attributes (not features) as discrete components, where others use high feedback circuits and low cost ICs instead.

This is a two-head deck with fine bias adjust control. It is well laid out and very easy to use, almost granny-proof, with pleasingly individual aesthetics. This is a deck you might choose for its engineering

integrity and (hopefully) it's music making abilities, because you certainly wouldn't buy it for its range of features.

Sound quality

Looking at the ten decks on test in ascending order of cost, the Kenwood was the first to offer something approaching a transparent electronics chain. The Harman/Kardon has the same quality, but takes it further by adding an altogether more ambitious set of virtues to this fundamental quality. The HK4200 is not just transparent; it also has weight, substance and power.

More solidly screwed together than many of its contemporaries, the TD4200 also has a solid and physical sound. The midband has a real sense of purpose and analysis. Only the treble can sound a little raw on occasions. The combination of

metal tapes with Dolby B produced recordings with strong dynamics and a detailed, if rough sounding, treble. Pre-recorded material sounded satisfactory, but more earthbound than native recordings.

Conclusion

The comparison that H/K seeks to make with Nakamichi is true not only of its operating bandwidth, but also in the singular lack of bells and whistles. You don't even get a headphone socket. But this minimalist approach results in a deck at a reasonable price with genuine audiophile sensibilities, which despite its simplicity can make recordings that transcend the usual stereotypes. A clear Best Buy.

Harman UK Unit 2, Borehamwood Industrial Park, Rowley Lane, Borehamwood WD6 5PZ. ☎ 081-207 5050

Verdict

- ▲ Features have been sacrificed to improve sound quality.
- ▼ Same as above; better sound means fewer features.
- ▶ £249.99 RRP

SOUND QUALITY
 ■■■■■□
VALUE FOR MONEY
 ■■■■■□

Laboratory Report

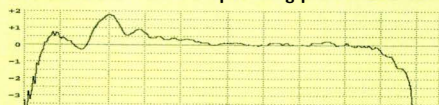
The Harman/Kardon is endowed with a first class transport which yields impressive wow and flutter numbers and also shows a clean spectrum. Medium to long term speed drift was also checked, and found to be essentially unmeasurable.

The TD4200 lived up to expectations with good distortion behaviour at high levels, and a creditably wide bandwidth to match. The record amplifier and head design allows metal tapes to be pushed hard.

The quid quo pro is an extra dB or so of background hiss with all three tape groups. This is probably not the best choice of deck for non-Dolby recordings, and in practice only the Dolby B circuit sounded genuinely transparent. The other significant finding was the limited treble output using prerecorded material.

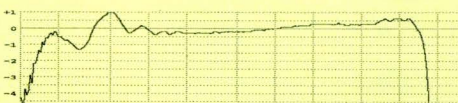
TEST RESULTS

Wow & flutter IEC386 Q-Pk %	0.0689%	Mean Wtd MCL 3% ref 0dB	-39.8dB	-45.6dB	-43.4dB
Pk Wtd	0.0525%	1kHz	+3.8dB	+0.3dB	+1.0dB
Mean Wtd		Distortion (THD+N) @ +8dB			
Crosstalk ref 0dB		100Hz	5.52%	12.6%	8.85%
100Hz		1kHz	4.04%	11.9%	7.43%
1kHz		6.3kHz	3.08%	2.21%	2.84%
6.3kHz		Distortion (THD+N) @ -8dB			
10kHz		100Hz	1.00%	0.718%	0.686%
Noise CCIR 468-3 Q-Pk IEC		1kHz	1.11%	0.659%	0.798%
Type I		6.3kHz	1.24%	1.02%	1.88%
Peak Wtd	-39.6dB	Dimensions (wxhxd)	44.2x12.6x32cm		
Type II	-45.5dB	Tape speed error	+0.05%		
Peak Unwtd	-44.3dB	Average wind/rewind time (C90)	1 min 59 sec		
Type IV	-46.5dB				



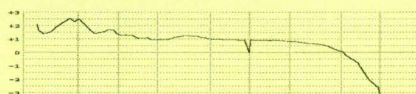
Frequency response — metal tape/Type IV

Accurate response; note -3dB point at 18kHz, very close to the specified 19kHz.



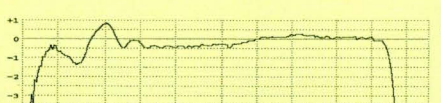
Frequency response — chrome bias tape/Type II

Plenty of treble extension but probably not the best deck for non Dolby use.



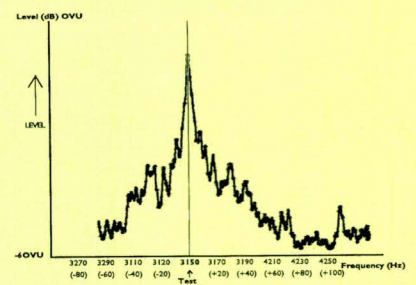
Frequency response — prerecorded ferric/Type I

Premature treble roll-off (-3dB is at 10kHz) is a disappointing result.



Frequency response — Dolby B chrome bias/Type II

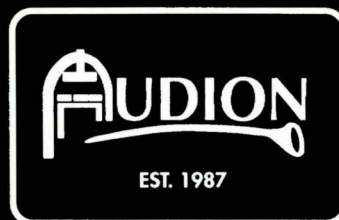
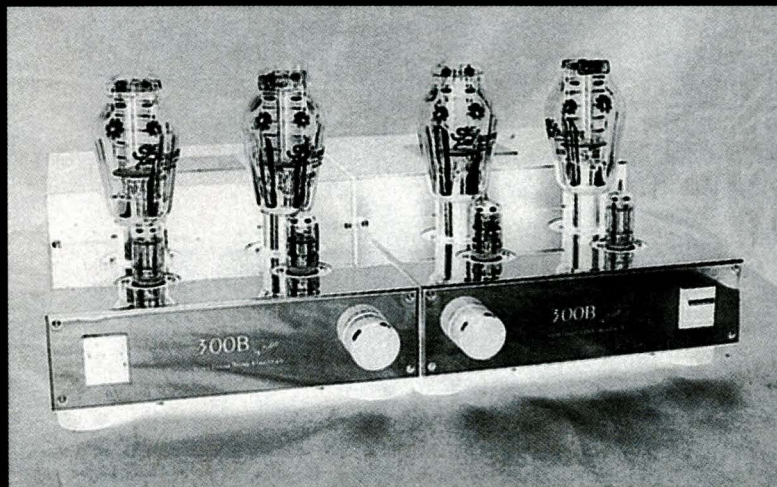
Good Dolby line-up gives accurate result and can sound genuinely transparent.



Wow and flutter spectrum

Sidebands are at low level, and sharp central peak indicates stable pitch.

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JVC TD-V562



Despite very attractive pricing, this deck has some surprisingly exotic qualities. The centre loading mechanism is equipped with a closed loop, dual capstan transport, the capstans driven by a direct drive motor, an unusual choice at this price level. Although not a genuine heavyweight, the JVC boasts vibration absorbing feet and an aluminium fascia.

The cassette loading door is powered, and fitted with a cassette shell stabiliser. The deck changes transport modes with uncanny decorum. None of these points is unique at the price, but in combination they make an impressive package with a pronounced enthusiast's bent.

What you get is a three-head deck with real-time off-tape monitoring, manually adjustable bias, Dolby HX Pro, plus B and C type noise reduction and a tape counter with rolling number and time

modes. System remote control links are fitted, and headphones can be connected, though no level control is provided.

Sound quality

The sound of this deck is an odd mixture of excellence and opacity. With such a sophisticated transport, the deck sounds as solid as a rock, and given the right material is capable of presenting a stable, coherent and believable soundfield.

Solid as it was, the JVC never sounded completely transparent. The sound it produced had a slightly heightened quality at times, yet the midband tended to reproduce with a deadness which detracted from the vivacity of some recordings.

Generally, the sound held together well with complex, densely scored material. However, with solo and small group music, that puts a premium on the ability

to 'hear through' a sound to the acoustic behind the notes. Here, the JVC was shown at its most synthetic and transitory.

Prerecorded music cassettes were successfully reproduced by this deck; which kept a grip on some of the more exuberant bass lines in a number of jazz titles, and generally gave tapes a feeling of stability and poise. Again though, that slight feeling of artificiality would not go away.

Conclusion

The JVC is an interesting mixture > It's powerfully endowed under the skin, but the audio electronics don't quite match the performance of that remarkable transport. This is why it rates as Recommended and not a Best Buy.

JVC (UK) Ltd, JVC Business Park, Priestley Way, London NW2 7BA. ☎ 081-450 3282

Verdict

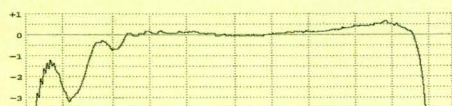
- ▲ Brilliant transport; solid sound for the price.
- ▼ Dolby switching sound marred by slight transitory edge.
- ▶ £199.99 RRP

SOUND QUALITY
 ■■■□□
VALUE FOR MONEY
 ■■■□□

Laboratory Report

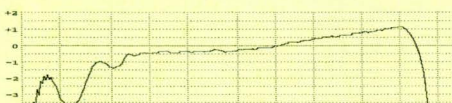
The dual capstan mechanism and direct drive power plant are not just for show, and on the test bench at least the deck fully lives up to its promise. The transport offers first rate stability. The flutter sidebands are at a very low level, and are essentially innocuous. Modulation noise appears to be low.

The frequency responses are almost universally impressive. The prerecorded plot could have been drawn with a ruler, and extends flat to the limits of measurement in the treble. The JVC is one of the least costly decks to make good use of metal (Type IV) tapes, which can be peaked to +4dB or so without obvious compression problems. Signal to noise figures are also impressive.



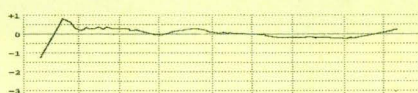
Frequency response — metal tape/Type IV

Absolutely accurate response with metal tape; the HF bandwidth extends flat to 18kHz.



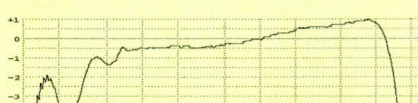
Frequency response — chrome bias tape/Type II

Slightly rising response trend can be clearly seen, especially above 1kHz.



Frequency response — prerecorded ferric/Type I

Accurate alignment implies unusually neutral sound with prerecorded material.

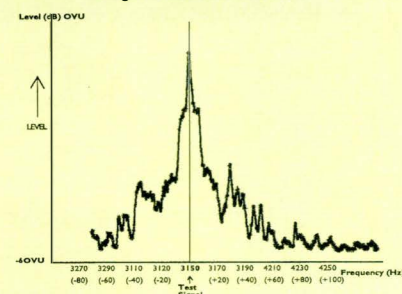


Frequency response — Dolby B chrome bias/Type II

Shape of response suggests a particularly good Dolby B set-up.

TEST RESULTS

Wow & flutter IEC386 Q-Pk %	0.0686%	Mean Wtd	-43.5dB	-47.9dB	-47.7dB
Pk Wtd	0.0538%	1kHz	+0.8dB	-1.9dB	+1.1dB
Mean Wtd		100Hz	17.7%	17.1%	10.5%
Crosstalk ref 0dB		1kHz	10.3%	13.1%	7.89%
100Hz	-46.8dB	6.3kHz	1.53%	3.05%	3.41%
1kHz	-43.6dB	Distortion (THD+N) @ -8dB			
6.3kHz	-32.6dB	100Hz	0.656%	0.683%	0.691%
10kHz	-32.5dB	1kHz	0.875%	0.597%	0.572%
Noise CCIR468-3 Q-Pk IEC		6.3kHz	1.32%	1.66%	1.99%
Type I		Dimensions	43.5x13.1x32.5cm		
Peak Wtd	-43.4dB	Tape speed error	-0.05%		
Peak Unwtd	-47.9dB	Average wind/rewind time (C90)	2 min 20 sec		
Type II					
Type IV					



Wow and flutter spectrum

First class spectrum — thanks to dual capstan drive and direct drive motor.

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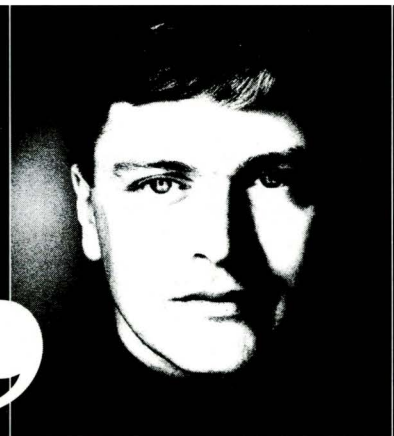


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Kenwood KX-5050



The sweeping curves of the front panel mark the KX-5050 out as a Kenwood even before you get to the name on the badge, but there is little else to distinguish this neatly executed but anonymous package.

The basic roll-call includes Dolby B, C and HX Pro, intro scan and CD peak search — a socket for which is included on the back. The deck is unidirectional and has two heads and three motors, giving rapid tape winding speeds. Special search and play modes include a track search capable of looking up to 16 tracks in either direction, and various repeat modes including an A-B repeat mode.

An auto-bias circuit sets an appropriate bias level for the current tape, which can be assigned to memory if required. The circuit is effective, but not very quick at just under 40 seconds a pass. Finally, the

fussy display can be turned down so that just the counter display remains lit, or it can be turned off altogether.

Sound quality

The KX-5050 is one of the lowest priced models on test to sustain close and repeated analysis. It doesn't sound like a bag of transistors, but breathes air and space and even a whiff of depth into the stereo component of the music. The sound of instruments is no more accurate than with a number of the cheaper models, and there was some thickening of textures, with consequent loss of fine detail. But the Kenwood remains smooth and attractive, and above all transparent.

Its contribution could often be ignored when used for replay instead of the original source, a CD player. In particular, it handled complex choral music without

any obvious strain or loss of clarity.

The Kenwood's problems, such as they were, amounted to matters of omission. The bass in particular had a slightly thin, wooden quality. Dolby B noise reduction was a successful adjunct to this deck. For most purposes, the extra hiss reducing power of Dolby C will be outweighed by the slightly unnatural decay sounds as notes die away.

Conclusion

Ultimately, the KX-5050 lacks star quality. Nevertheless, it has fine audio manners, and is a good choice for those who put audio criteria above gadgetry. The Recommended tag is warmly deserved.

Trio Kenwood (UK) Ltd, Kenwood House, Dwight Road, Watford, Herts WD1 8EB.
☎ (0923) 816 444



Verdict

▲ Fine, explicit sound with good stereo and delivery.

▼ Some loss of fine detail; bass rather thin and mechanical.

▶ £229.95 RRP

SOUND QUALITY

■■■■■□

VALUE FOR MONEY

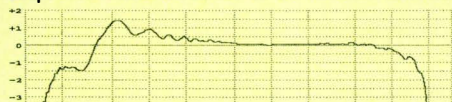
■■■■■□

Laboratory Report

Comparison of this model and the £30 cheaper JVC TD-V562 proved instructive. The two track each other very closely, but in almost every case the Kenwood lags a little. Its responses are a little less accurate, its noise distortion figures are a tad higher, and its effective dynamic range is just slightly lower.

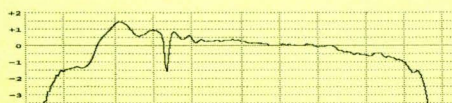
They both yield clean spectrum analyses of wow and flutter, but again the figures favour the JVC. The Kenwood plot, although free of dominant sidebands, has just a little more spread than its opposite number from JVC.

However, the Kenwood's three-motor construction gives much quicker track access times. It should also yield improved long term reliability. More significantly, tape output levels measure better on the Kenwood than on any of the decks tried.



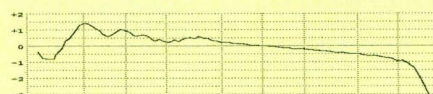
Frequency response — metal tape/Type IV

Accurately aligned metal response run shows limitations in 19kHz (-3dB) bandwidth.



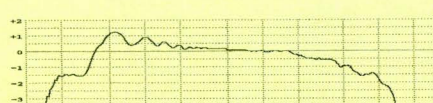
Frequency response — chrome bias tape/Type II

Good result with chrome tapes, and all other tape types.



Frequency response — prerecorded ferric/Type I

Output tilts slowly downwards by 2dB between 50Hz and 10kHz.

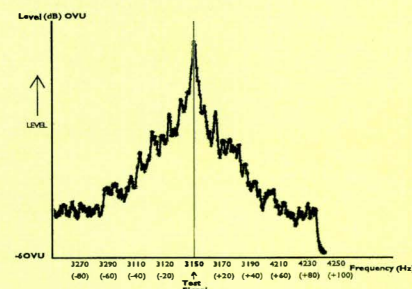


Frequency response — Dolby B chrome bias/Type II

Well aligned Dolby B circuit means less side effects.

TEST RESULTS

Wow & flutter IEC386 Q-Pk %	0.119%		
Pk Wtd	0.0892%		
Mean Wtd		-43.3dB	-46.5dB
Crosstalk ref 0dB		+3.2dB	+2.3dB
100Hz			+2.1dB
1kHz	-36.8dB		
6.3kHz	-49.4dB		
10kHz	-40.9dB		
Type I			
Type II			
Noise CCIR 468-3 Q-Pk IEC			
Peak Wtd	-43.6dB	-46.3dB	
Peak Unwtd	-46.8dB	-48.6dB	
Type IV			
Mean Wtd			
MOL 3% ref 0dB			
1kHz			
Distortion (THD+N) @ +8dB			
100Hz	13.9%	13.9%	15.1%
1kHz	10.1%	10.4%	13.2%
6.3kHz	2.44%	2.08%	3.82%
Distortion (THD+N) @ -8dB			
100Hz	0.993%	0.587%	0.784%
1kHz	0.983%	0.603%	0.709%
6.3kHz	1.08%	0.785%	0.976%
Dimensions (wxhxd)		44x12.7x	27.7cm
Tape speed error			-0.1%
Average wind/rewind time (C90)			1 min 50 sec



Wow and flutter spectrum

Medium-to-low wow and flutter with no dominant sidebands.

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Sansui D-790WR



The D-790WR is a straightforward twin cassette deck, distinguished only by the fact that the non-recording transport lacks auto-reverse. The deck also lacks Dolby C and Dolby HX Pro. The former may not be all that important: the Dolby C circuits of cassettes often lack definition, and the simpler Dolby B usually gives superior results. But the loss of Dolby HX Pro means that low bias tapes, the kind often used with less costly decks, probably won't give of their best.

The Sansui offers normal and high speed dubbing, and a special 'edit' mode. The only remaining controls are the transport keys, Dolby B switching and input level control. The display is crude, with low resolution metering, but the deck is otherwise extremely straightforward and a pleasure to use. Data sockets on the back are available for system control.

Sound quality

Cosmetically attractive recordings can be produced that pass muster if not examined too minutely. Do so and demons are revealed: the ever present tape hiss, the subtle loss of detail, the not so subtle loss of dynamics. The latter arose from the remixing of the original sound due to the frequency response errors when using metal tapes (which were broadly acceptable) and chrome bias tapes (which were not as they resulted in audible Dolby mistracking and excessive brightness).

From any distance the bass wasn't quite right. It wasn't simply a lack of bass weight. The upper bass took on a boomy quality that slurred tempi with some jazz recordings (Ry Cooder's *Big Bad Bill Is Sweet William Now*, a Bix Beiderbecke composition). Even with TDK AR, a ferric tape which is as close to neutral as you will

find for this deck, the sound was thin and edgy, and showed a clear preference for the leading voice or instrument at any given point in time.

This patently unstable mix was upset further by audible loss of pitch with sustained piano notes and the like.

Conclusion

In its favour, the D-790WR is not expensive and it comes from a good home, the house of Sansui, which provides some reassurance in the event of servicing requirements. The other side of the argument is that, though simple to operate, the Sansui is less than adequate musically. This is a deck which sounds unbalanced and sometimes unstable.

Sansui (UK), Emlyn Street, Farnworth, Bolton BL4 7EB. ☎ (0204) 700 139

Verdict

- ▲ Cheap and simple to use twin cassette deck.
- ▼ Unbalanced sound; large response errors with some tapes.
- ▶ £199.95 RRP

SOUND QUALITY

■ □ □ □ □

VALUE FOR MONEY

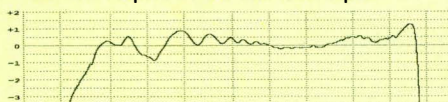
■ ■ □ □ □

Laboratory Report

Although there are no obvious discrete sidebands in the wow & flutter analysis, the breadth of the peak shows how much energy there is around the nominal running speed.

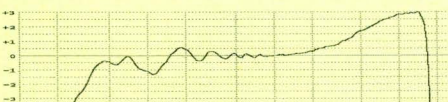
The other figures indicate a competent machine, but the frequency responses are variable. The 1-1.5dB treble excess in the ferric and metal (Type I & IV) plots is innocuous enough, but the Type II plot is too bright to be acceptable. The addition of Dolby compounds the error which can't be corrected just by changing the tape brand. There is no fine bias control unfortunately.

Head and amplifier design limitations result in low MOLs which are particularly disappointing with metal tapes. Add two and two, and what we have in the Sansui is a deck best adapted for use with ferric tapes.



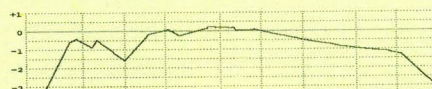
Frequency response — metal tape/Type IV

Good plot overall. The small treble rise (1-1.5dB) is insignificant.



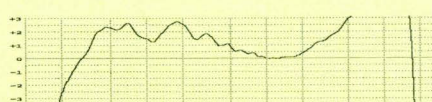
Frequency response — chrome bias tape/Type II

Treble response indicates a sting in the tail when using chrome tapes.



Frequency response — prerecorded ferric/Type I

Reasonable response from musicassettes, but some treble loss is apparent.

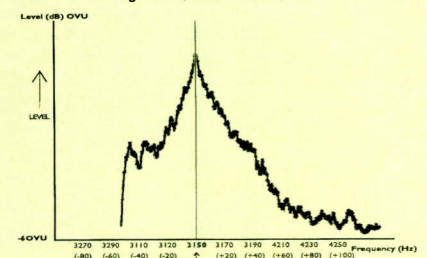


Frequency response — Dolby B chrome bias/Type II

Response errors with chrome tape are exaggerated by Dolby mistracking.

TEST RESULTS

Wow & flutter IEC386 Q-Pk %		Mean Wtd MOL 3% ref 0dB			
Pk Wtd	0.404%	1kHz	-4.5dB	-52.4dB	-42.3dB
Mean Wtd	0.309%	10kHz	-9.3dB	-8.1dB	
Crosstalk ref 0dB		Distortion (THD+N) @ +8dB			
100Hz	-25.7dB	100Hz	13.9%	17.9%	16.1%
1kHz	-27.8dB	1kHz	10.1%	15.2%	11.6%
6.3kHz	-26.8dB	6.3kHz	3.43%	4.34%	4.53%
10kHz	-27.6dB	Distortion (THD+N) @ -8dB			
Noise CCIR 468-3 Q-Pk IEC		100Hz	1.32%	0.963%	1.26%
Type I	-40.5dB	1kHz	1.11%	0.737%	0.845%
Type II	-52.2dB	6.3kHz	0.891%	0.760%	0.879%
Type IV	-42.1dB	Dimensions (wxhxd)			43x13.2x27.4cm
Peak Unwtd	-44.7dB	Tape speed error:			
	-46.0dB	Record/play transport			-0.30% fwd/-0.25% rev
		Play only transport			+0.01%
		Average wind/rewind time (C90)			2 min 49 sec

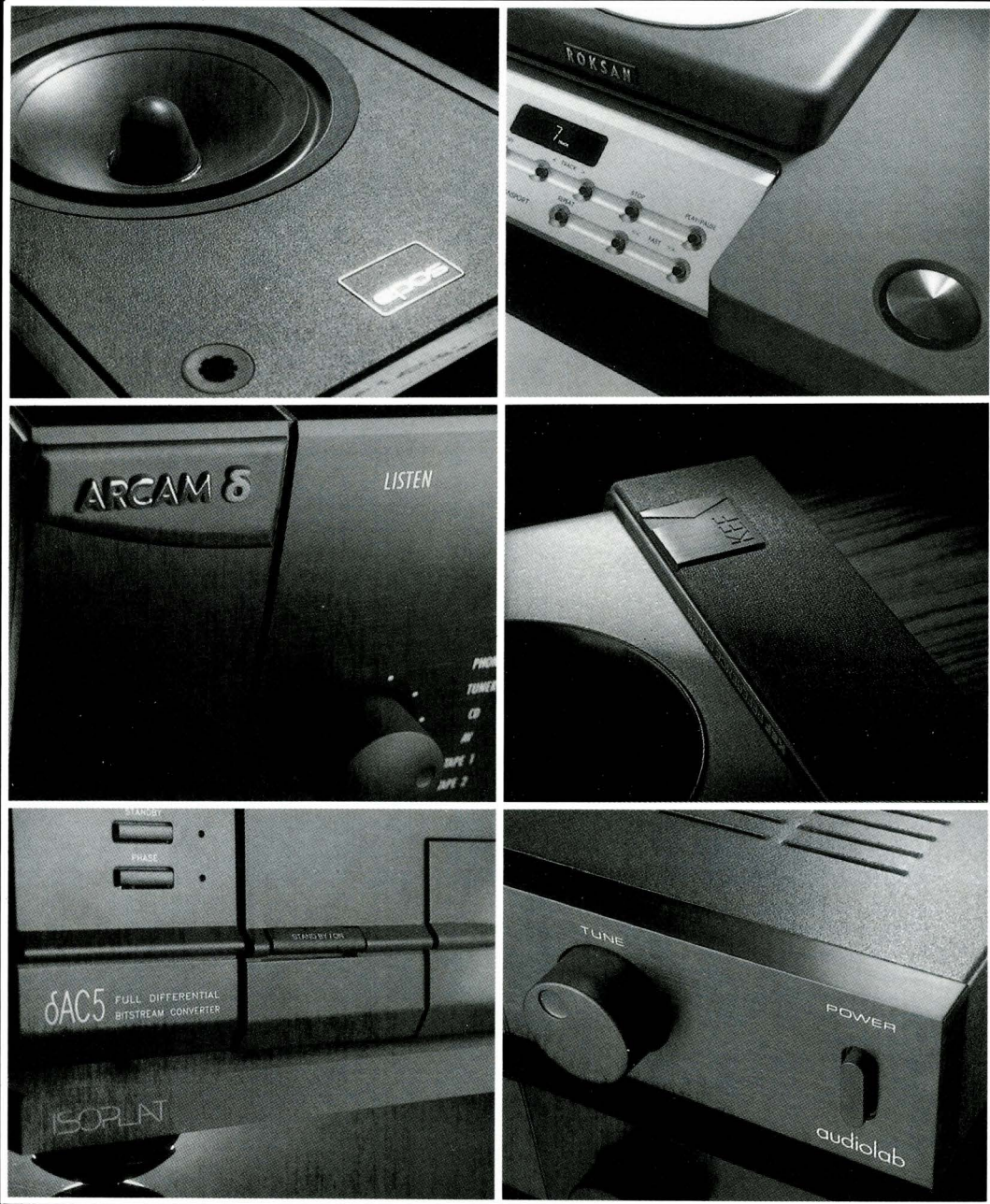


Wow and flutter spectrum

Broad spread around the peak indicates poor pitch integrity.

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TRIPODS

Nakamichi DR-3



Here is a seemingly characteristic Nakamichi cassette deck. Look under the skin, however, and you discover that this is a two-head deck. Moreover, it's one with a single capstan mechanism which lacks the diffused resonance features of most Nakamichi decks. These simplifications allow the DR-3 to be priced at what for Nakamichi is a paltry £350.

In other respects, the DR-3 is a thoroughbred. It looks almost identical to the DR-2 and DR-1, and has a cassette mechanism which is just as sweet to use. Operation is manual, including tape type selection, which I abhor since it can lead to operating errors. Surely a tape sensing switch could be designed that doesn't impact on sound quality. Other features include Dolby B and C (no Dolby HX Pro), a manual bias control and the large, high resolution meters familiar from previ-

ous Nakamichi decks. A headphone socket is fitted, but no level control. System remote control operation is supported.

Sound quality

The only deck to offer the Nakamichi serious competition was the Harman/Kardon TD4200 which, coincidentally or otherwise, is built on the same engineering-led minimum features basis as the DR-3. It seems to be a winning formula.

Although no direct comparisons were made, the DR-3 has much of the agility and transparency I recall from the senior Nakamichi models. It turned out to be extremely difficult to distinguish source from the recording. When this could be detected — a slightly shut in ambience, a mildly excessive warmth with orchestral strings, perhaps a slight loss of authority with piano — the differences were always

tiny. A ranking order between the original and the copy was often a matter of taste rather than substance, especially where Dolby B was used instead of the slightly more opaque sounding Dolby C.

Prerecorded material also had a vivid sense of colour which made most of the other decks sound very lacklustre.

Conclusion

For decades rather than years, Nakamichi has set the standard of excellence in cassette deck design, and the DR-3 proves this holds good in the £350 price area too. The DR-3 outpointed all the decks tested, including the Philips DCC600 in the key areas. Highly Recommended.

Nakamichi B&W (UK) Ltd, Marlborough Road, Churchill Industrial Estate, Lancing, West Sussex. ☎ (0903) 750 750



Verdict

▲ **Wonderfully clear sound and rock-like stability.**

▼ **Manual tape type selection; no headphone control.**

▶ **£350.00 RRP**

SOUND QUALITY



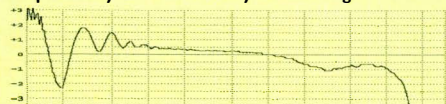
VALUE FOR MONEY



Laboratory Report

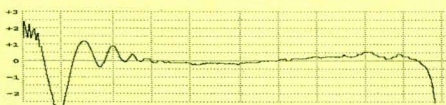
The single capstan, non-diffused resonance transport yields higher capstan wow, but doesn't prevent pitch integrity. It's matched only by the JVC and Harman/Kardon. The Nakamichi's Sendust heads can also deliver high levels of high frequencies onto tape without distortion, and recordings can be peaked using metal tapes up to +5 or +6dB ref OVU without much compression or spectral change with wideband material. Head geometry is good too, with restrained contour effects and strong LF extension.

The response error with metal tapes was a little unexpected. The tape used for test was TDK MA-X, which is explicitly recommended by Nakamichi, but rebiasing produces a response which is audibly and measurably as close as dammit to a straight line, with no possibility of audible Dolby mistracking.



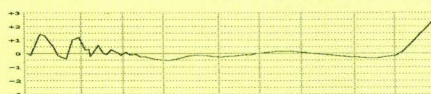
Frequency response — metal tape/Type IV

Slight overbiasing gives depressed top, which is mainly correctable using bias control.



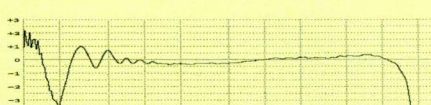
Frequency response — chrome bias tape/Type II

An impressive result using chrome tapes, with the usual Nakamichi flat midband.



Frequency response — prerecorded ferric/Type I

Typical Nakamichi playback curve, with flat midband and a sharp rise above 10kHz.

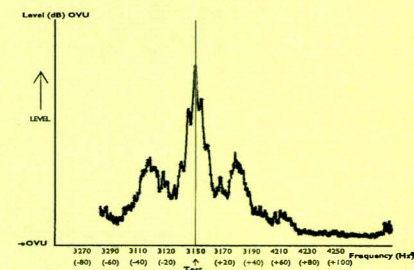


Frequency response — Dolby B chrome bias/Type II

Well aligned Dolby B circuit matches the non-Dolby plot (left) closely.

TEST RESULTS

Wow & flutter IEC386 Q-Pk %	Mean Wtd	-42.6dB	-44.8dB	-39.7dB
Pk Wtd	MOL 3% ref 0dB			
Mean Wtd	1kHz	+1.3dB	-0.9dB	+1.6dB
Crosstalk ref 0dB	Distortion (THD+N) @ +8dB			
100Hz	100Hz	6.79%	11.1%	6.96%
1kHz	1kHz	4.05%	8.00%	3.64%
6.3kHz	6.3kHz	2.92%	3.43%	2.36%
10kHz	Distortion (THD+N) @ -8dB			
Noise CCIR 468-3 Q-Pk IEC	100Hz	0.756%	0.727%	1.14%
Type I	1kHz	0.857%	0.778%	1.21%
Type II	6.3kHz	1.28%	1.05%	1.42%
Peak Wtd	Dimensions (wxhxd)	43x10x32cm		
Peak Unwtd	Tape speed error	+0.02%		
-45.0dB	Average wind/rewind time (C90)	2 min 20 sec		
-45.7dB				
-42.9dB				



Wow and flutter spectrum

Medium-to-low wow and flutter response with no dominant sidebands.



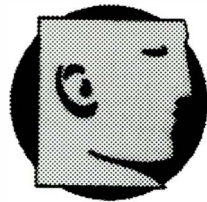
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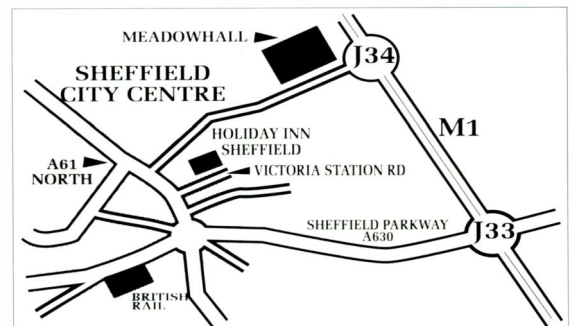
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Philips DCC600



The third DCC (Digital Compact Cassette) deck from Philips, the DCC600, has a rationalised circuit layout, user-friendly styling and a compact transport mechanism.

Capabilities are broadly similar to existing models. It will record and play DCC tapes which are available in playing times up to 90 minutes (120 minute versions are on the horizon), and gives a CD style display of times, track numbers and search features, though the system is slow to find distant tracks. Prerecorded tapes, which are steadily becoming more widely available, have titles which are displayed by the player. However, titles can't be programmed onto blank tapes with this deck.

One of the great benefits of DCC is its backwards compatibility, and the DCC600 will play (but not record) analogue cassettes with full auto-reverse operation,

Dolby B and C included. Other features include a full function remote control, electrical digital I/O socketry and variable level headphone monitoring.

Sound quality

As a stand-alone player, the DCC600 has the attributes of any digital system — a decently low level of background noise and very stable pitch compared with its analogue rivals. Yet even after a thorough warm-up, the DCC600 is soft and stand-offish. Several of the analogue cassette decks offer a more analytical and varied sound, though the DCC600 is more coherent and neutral than previous Philips DCC hardware.

As soon as the internal D/A converter is bypassed by a good outboard DAC (I used an Audiolab 8000DAC), the DCC600 becomes a potent machine, with the at-

tributes of an above average CD player.

Further improvements are available when the input A/D converter is bypassed. In this maximum configuration, the Philips is a star. But when playing analogue cassettes it is flat, lacking in fine detail and broader, architectural strokes.

Conclusion

DCC continues to progress, and appears capable of consistent CD-like sound quality, but only when the internal D/A converter is bypassed, a costly enterprise.

Until September 30th 1993, *Hi-Fi Choice* and Philips are offering you the chance to own a DCC600 for £350 (see September issue for details). At that price, it warrants a firm Recommended tag.

Philips UK Ltd, City House, 420-430 London Rd, Croydon CR9 3QR. ☎ 081-689 4444

Verdict

- ▲ Most practical DCC yet; compact and affordable.
- ▼ Homogenised sound unless analogue stages are bypassed.
- ▶ £499.99 RRP

SOUND QUALITY

■■■□□

VALUE FOR MONEY

■■■□□

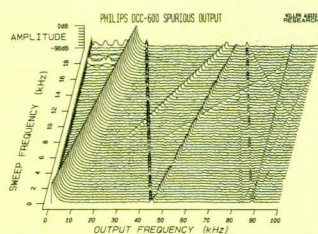
Laboratory Report

The duality displayed by every DCC recorder is just as evident here. On the one hand, we see features directly attributable to Philips' choice of the SAA7321 DAC, including the 97dB signal to noise ratio, the ten-fold increase in total harmonic distortion (0.003 - 0.03per cent at 0dB) across the audio band, and characteristic V-shaped stopband images visible on the standard 3D plot.

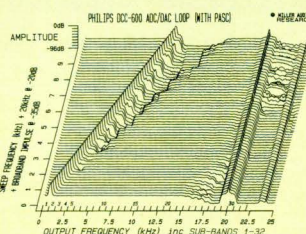
Then there are the characteristic hallmarks of PAS-coding or, to give it its full name, precision adaptive sub-band coding. Hence the erratic coding of its (impulse) frequency response and the miserable linearity of its ADC/DAC loop at 20kHz. The full influence of data reduction can be seen on the second 3D plot where great canyons of audio data are selectively eroded by the PASC system.

TEST RESULTS

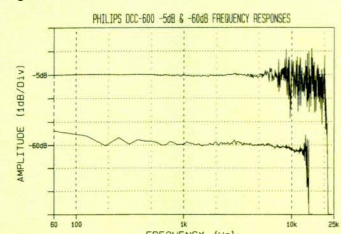
Analogue:			
Replay only wow & flutter (analogue)	0.12%		
Dimensions	43.5x10x31 (wxhxd)cms		
Tape speed error	-0.015%		
Average wind/rewind time (C90)	2 min 28 sec		
Digital:	20Hz 1kHz 20kHz		
Channel balance	0.02dB 0.02dB 0.01dB		
Channel separation	100.1dB 110.4dB 80.7dB		
THD vs level, 0dB	-90.5dB -90.0dB -69.3dB		
-30dB	-77.1dB -71.0dB -66.9dB		
-60dB	-43.2dB -47.9dB -35.3dB		
-80dB	-17.1dB -25.0dB -13.5dB		
Dithered -90dB	-10.3dB -13.5dB -3.5dB		
Dithered -100dB	-9.75dB		
Dithered -110dB	-2.50dB		
DAC resolution at:			
-60dB	+0.04dB -0.13dB		
-80dB	+0.08dB - 2.05dB		
-90dB	-0.05dB -5.55dB		
-100dB	-0.60dB No signal		
ADC/DAC resolution at:			
-60dB	+0.04dB -0.32dB		
-80dB	+0.05dB -10.5dB		
-90dB	+0.17dB no signal		
-100dB	+1.10dB no signal		
Peak output level L/R	2.27/2.365V		
Relative output level	+1.47dB		
Output impedance	311ohms		
1kHz noise modulation	+3.9dB		
CCIR IMD, 0dB	-95.3dB		
Suppression of stop band IMD	54.3dB		
Deemphasis accuracy, 1kHz	-0.38dB		
5kHz	-1.23dB		
16kHz	-1.20dB		
S/N ratio (A-wtd), with emphasis 0LSB	99.6dB		
w/o emphasis 0LSB	97.0dB		
w/o emphasis 1LSB	96.9dB		
Digital I/O	Coaxial		
Crystal clock accuracy	-16.3ppm		



The plot could have come from a CD player but for the unwanted noise modulation, visible top left.



Information is masked (deemed inaudible) and taken out before recording (right of sweep) to save storage.



PASC data reduction means resolution is compromised at high levels and frequencies.

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Pioneer CT-S520



Here is a new Dolby B/C/HX Pro triple header, supplied with remote control. Off tape monitoring is supplemented by Pioneer's now familiar Super Auto BLE (bias, level, equalisation) circuit which aligns the machine for the current tape within about 12 seconds. You also get good quality meters and a quiet running deck of real quality. However, inside lurks a conventional single capstan mechanism, not the Slant mechanism used in Pioneer's upmarket models.

Pioneer has a strong record of innovation; the CT-S520 includes a circuit called FLEX (Frequency Level EXpander) which examines the spectrum of a recording on replay and boosts the treble content if the HF output is too low. This could be the case when playing a recording made from AM radio, when using an old tape or one recorded on a deck with different head

azimuth. The adjustment is made 'intelligently' using a 3-bit microprocessor to control the parameters of a feedback loop according to its analysis of the spectrum and recent history of the music signal.

Sound quality

Although the Super Auto BLE tape alignment system produced objectively accurate results when tested (see Laboratory Report), it failed to produce recordings which sounded much like the originals. While parts of Handel's *Music for Royal Occasion* had breadth and grace enough to make the hairs on the back of the neck stand on end, a copy made on TDK MA-X with Dolby C was curiously lifeless.

The situation was not improved with Dolby B or lower bias tapes, but there was a significant improvement when Dolby noise reduction was switched off alto-

gether. With certain types of music (like heavy rock) this is acceptable, but in practice Dolby B is a minimum requirement.

With an office full of old tapes, some of which are well down in the treble, FLEX was often very effective, giving a touch of brilliance and presence missing from what was otherwise a tired old sound.

Conclusion

Although the Pioneer wasn't strictly faithful to the source, it remained smooth and engaging, with a high level of pitch integrity, a warm, controlled bass and a midband that offered great depth and, on occasion, insight. FLEX adds to the attraction, and the CT-S520 is Recommended.

Pioneer High Fidelity (GB) Ltd, Pioneer House, Hollybush Hill, Stoke Poges, Slough SL2 4QP. ☎ (0753) 789 789

Verdict

▲ **Attractive; sound, auto tape system, FLEX circuit.**

▼ **Sound is slightly coloured, especially with Dolby in circuit.**

▶ **£279.95 RRP**

SOUND QUALITY

■ ■ ■ □ □

VALUE FOR MONEY

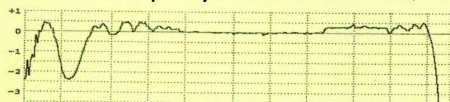
■ ■ ■ □ □

Laboratory Report

Although high frequency distortion levels are well controlled, the measured maximum output levels are disappointing, and so too are the signal to noise figures, especially the unweighted figures which never quite attain 40dB. The best news concerns metal tapes, which produce low harmonic distortion figures even at +8dB, a tribute to the quality of the heads.

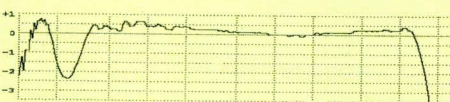
In separate tests, HF two tone intermodulation distortion was well below normal, which helps account for the clean results with high level, HF sounds onto metal tape.

The frequency responses are almost universally accurate and well extended. The downwards tilt with prerecorded tapes is innocuous in the context of a wide operating bandwidth — output is just 0.5dB down at 18kHz, the upper measurement limit.



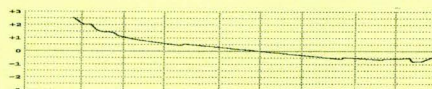
Frequency response — metal tape/Type IV

Another textbook run, with CD-style straight-line response and bandwidth.



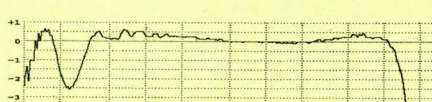
Frequency response — chrome bias tape/Type II

Low frequency output is well maintained using chrome bias tapes.



Frequency response — prerecorded ferric/Type I

Wide bandwidth but mildly tilted response favours the lower frequencies.



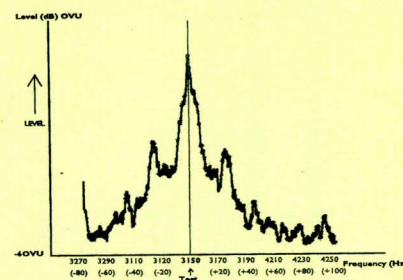
Frequency response — Dolby B chrome bias/Type II

Ideal Dolby B behaviour, an almost perfect match for the non-Dolby plot (left).

TEST RESULTS

Wow & flutter IEC386 Q-Pk %		
Pk Wtd	Type I	Type II
Mean Wtd	-40.8dB	-46.0dB
Crosstalk ref 0dB	-39.3dB	-39.7dB
100Hz		
1kHz		
6.3kHz		
10kHz		
Noise CCIR 468-3 Q-Pk IEC		
Peak Wtd	-44.0dB	-39.5dB
Peak Unwtd		

Mean Wtd	-41.0dB	-46.2dB	-44.2dB
MOL 3% ref 0dB			
1kHz	-0.3dB	-2.7dB	-0.2dB
Distortion (THD+N) @ +8dB			
100Hz	10.7%	14.0%	5.94%
1kHz	7.94%	11.1%	4.92%
6.3kHz	3.83%	3.63%	6.79%
Distortion (THD+N) @ -8dB			
100Hz	0.989%	0.702%	0.668%
1kHz	1.05%	0.666%	0.714%
6.3kHz	1.32%	1.37%	1.49%
Dimensions (wxhxd)	42x12.5x28cm		
Tape speed error	-0.05%		
Average wind/rewind time (C30)	2 min 0 sec		



Wow and flutter spectrum

Good central pitch integrity, but note sideband (wow) energy.

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One bargain becoming increasingly popular is the **ATC SCM 50A**, which may seem expensive at around £4.5K, but with 350 watts of power in each speaker, actually is quite cheap. Customers can then sit back knowing they have nowhere else to go and can save a fortune in the long term.

Cassette decks: conclusions, best buys and recommendations

In the past, cassette decks have tended to be much of a muchness, the progeny of very similar competitive pressures and design processes. Only now is some real diversity and excitement creeping into the market

There were no total duds. The least satisfactory model was the Goodmans *Delta 700W*, an uncomplicated deck which was simply out of its depth. Fitted with an auto level control, the Goodmans is the *Model T Ford* of dual cassette decks. It's cheap, and it works — but not very well.

Another twin deck trailed the Goodmans. This is the Sansui *D-790WR*, which is objectively a much superior product. It is also more expensive at £200, and at this price point is simply overshadowed by the identically priced Aiwa *AD-WX828*. Some of the Sansui's problems were self-inflicted: it was poorly set-up for the important Type II tape group but, in its favour, it is easy to use.

The Sherwood *DS-5010* is a similar case. The *5010* is a single transport deck with basic equipment levels. It does have one marvellous gadget though; a real time tape counter which you don't need to zero at the start of the tape. However, its performance levels are modest.

The recommendations include the extraordinary JVC *TD-V562*. It's a fabulously equipped deck, given the £200 price. It boasts three-heads, allowing you to monitor a recording as it is being made, and has the most controlled tape path this side of a lot of money. That its sound didn't live up to expectations is a disappointment.

The Kenwood *KX-5050*

Best Buy and Recommended Listing

BEST BUY

Aiwa AD-WX828 (£199.99) Twin auto-reverse deck with sophisticated search and tape alignment features, which sets the performance standards for the type up to £200.

Harman/Kardon TD4200 (£249.99) The opposite approach to the Aiwa, here is an ultra simple, but well engineered, two-head model which sounds solid and clean. An excellent, if unglamorous, buy.

RECOMMENDED

JVC TD-V562 (£199.99) Exotic transport and three-heads give this model instant sex appeal, with tremendous image and pitch stability allied to good but not completely transparent audio circuitry. Excellent value for money.

Kenwood KX-5050 (£229.95) Strong on tape search modes, and with a fine three motor transport, this two-head deck offers clean and comparatively unprocessed sound. Enjoyable.

Pioneer CT-S520 (£279.95) Solid yet smooth



Harman/Kardon's *TD4200* is simple and effective: Best Buy.

(£230) and Pioneer *CT-S520* (£280) perform broadly similar middle market roles, providing reasonably priced decks for use in high grade systems.

The former is a two-head deck with a useful auto tape calibration system. The latter adds three-heads/off-tape monitoring to the mix, and a circuit called FLEX — designed to enhance the sound obtained from old tapes. Both offer fine sound quality within their design constraints.

The next two models are both honed down, minimalist two-head designs. The Nakamichi *DR-3* is easily the most lucid and transparent of all the decks tested. It was even placed ahead of the Philips *DCC600*, which, despite its more sophisticated

and easy on the ear music from this three-head deck with FLEX to add some artfully applied pizzazz to old or dull sounding tapes.

Nakamichi DR-3 (£350) Basic equipment levels but immaculate engineering and flawless tape handling distinguish this unusually transparent sounding two-head model.

WORTH CONSIDERING

Philips DCC600 (£499.99) Not formally Recommended (at full price) due to disappointing analogue sound, the DCC side of this new deck now seems well sorted, with optimised PAS-coding. The only real problems concern the ADC/DAC converters, but if you can record digitally and already have an outboard DAC, this model is capable of genuinely distinguished results.

Cassette decks — best of the rest

Alternatives to the models reviewed in this issue? No problem. If you want a low cost, basic deck, look no further than the Aiwa *AD-F410*. Aiwa seems to undercut just about everyone, and the fair sounding *410* is a snip at £100.

For a little bit more, there are several competitive choices. The Technics *RS-BX626II* (£180) is a three-head deck, the Pioneer *CT-339* (£150) has auto tape alignment, and Sony's *TC-K520* (£180) is an easy to use, accurate sounding two-head deck.

The options increase above £200. One of Pioneer's most attractive is the £270 *CT-S620*, high-end engineering at a bargain price. Yamaha has a strong alternative, the £260 *KX0-650*. Harman/Kardon's Dolby S deck, the reliable £600 *TD4600*, and Arcam's excellent *Delta 100*, which is also Dolby S equipped for £850, are worth considering. The latter is also notable as it's the only British made domestic cassette deck.

Swing tags

Products that make the grade are awarded *Hi-Fi Choice's* unique Best Buy or Recommended accolades. This sets them apart as being capable of a higher standard of fidelity than average, at a particular price point.

A product carrying the Best Buy swing tag is significantly better than the alternatives in its price band. It is of excellent quality and very good value for money. Watch out for this logo. It is your guarantee of quality.

Recommended products are also very good, but not in quite the same league as Best Buys. Despite being runners up, they are definitely worth considering, as they may prove to be more compatible when assembling a first class system.





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DAWSONS, 23 Seamoor Road, Westbourne, Bournemouth, Dorset. (0202) 764965. B&O, Castle, Canon, Jamo, JBL, Pioneer, Sony, Target, TDL, Technics. No appts necessary. Free install, Service dept. Various credit facilities available. Open 9 5.30 6 days a week. **★**

SUTTONSHI-FI, 18 Westover Road, Bournemouth. 0202 555512. Linn, Arcam, Mission, Quad, Audiolab, Rotel, Yamaha, Denon, etc, 2 Single Speaker Listening Rooms, Home Demonstrations, Free Installations. Mon-Sat 9-5:30. Call for details. **★**

ESSEX

AUDIO T, Gants Hill, 442-444 Cranbrook Rd, Gants Hill, Ilford, Essex 1G2 6LL. Tel: 081 518 0915 Fx 081 554 8463. Arcam, Audiolab, Cyrus, Denon, Kef, Meridian, Rotel, Micromega, Yamaha & many more. Mon-Sat 10-6. Free demo on Hi-Fi. Free del & instal. 30 day upgrade scheme. Home dems. PX. **★**

1ST AND FOREMOST HI-FI CENTRE, 49-55 North Station Road, Colchester, Essex CO1 1RQ. Tel: (0206) 549842. Fax: (0206) 762900. Tx: 987873 SAIDG. Trio Technics, JVC, Akai, Aiwa, Sony, Pioneer, Kenwood, Nakamichi, Panasonic, Revox, etc. Home trial, free installation. Service dept. Instant credit available + all credit cards accepted. Mon to Sat 9am-6pm. **★**

BRENTWOOD HI-FIDELITY, 2 Ingrave Rd, Brentwood, Essex, CM15 8AT. (0277) 221210. Audio Innovations, Denon, DNAM, EAR, Marantz, Micromega, Mission, Pink Triangle, Quad, Tannoy plus many more. Single speaker dem rooms, home trials, evening appts (high end), home installations. Mon-Sat 9.30-5.30. Access, Visa. Service Facilities. Advice second to none. **★**

LYON AUDIO, 16 Peartree Business Centre, Peartree Road, Stanway, Colchester, Essex CO3 5JN. (0206) 560259. Mission, Cyrus, Arcam, Denon, Rotel, KEF, Rogers, Marantz, NAD, Tannoy. Dem facilities. Mon-Sat 9-6. Installations. Access, Visa, Instant credit. Service dept. **★**

RAYLEIGH HI-FI, 44a High Street, Rayleigh, Essex. (0268) 779762/747571. 216 Moulsham St, On-the-Parkway, Chelmsford. (0245) 265245. 132-134 London Road, Southend-on-Sea. (0702) 435255. A&R, Audiolab, Creek, Cyrus, Denon, Epos, Linn, Meridian, Mission, Naim, Quad, Rega, Roksan, Royd. 0% finance. **★**

GLOUCESTERSHIRE

AUDIO EXCELLENCE, 58 Bristol Road, Gloucester. (0452) 300046. Great Hi Fi carefully selected and demonstrated by friendly and enthusiastic staff. Closed Mon. **★**

AUDIO T, 40-42 Albion St, Cheltenham, Glos. GL52 2RQ. (0242) 583960. Fax (0242) 226435. Great hi-fi from Arcam, Audiolab, Cyrus, Denon, Linn, Meridian, Mission, Rogers, Rotel, Yamaha and many more. Mon-Fri 10-6pm. Sat 9.30-5.30. **★**

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3 yr gntee on Hi-Fi. 30 day upgrade scheme. Home dems. PX. Single speaker dem room Free del. and instal. **[10/07]**

HUTCHINSONS, 295-297 High Str, Cheltenham, Glos. GL503HL. (0242) 573012. Pioneer reference point, Technics, Dual, NAD, JWharfedale, Celestion, Marantz, Aiwa, Kenwood, Sennheiser. No appts necessary, free install, service dept. Instant credit up to £1000. Open Mon-Sat 9.15-5.30.
R LEWIS & CO Ltd, 45 High Str, Stroud, Gloucestershire GL5 1AW. (0453) 762485/9. Bang & Olufsen, Denon, Dual, Mission, Mordaunt-Short, Pioneer, Sony, Technics, Yamaha, Celestion etc. In store dems, free install, service dept. Access, visa. Open 8.30-5pm 6 days.

HAMPSHIRE

AUDIO SOUTH for further details see the Surrey entry.

AUDIO T, 4 Feathers Lane, Basingstoke, Hants. RG21 1AS. (0256) 24311, Fax (0256) 24430. Great hi-fi from Arcam, Audiolab, Cyrus, Denon, Linn, Meridian, Mission, Rotel, Yamaha and many more. Mon-Sat 9.30-5.30pm. 3 yr gntee on Hi-Fi. Free del & instal. 30 day upgrade scheme. Home dems. PX. Single speaker dem room. Free del. and instal. **[10/07]**

HAMPSHIRE AUDIO LTD, 2-12 Hursley Rd, Chandlers Ford. (0703) 252827/265232. Quality CD and analogue equipment. 5 dem studios. Large free car park. Thurs late eve. **[10/07]**

JEFFERIES HI-FI (Portsmouth) 29 London Road, Portsmouth PO2 0BH. Tel: 0705 663604. 2 Dem Rooms, closed Mondays. Late night Wed. Free Parking Bus route. Credit facilities. **[10/07]**

HEREFORDSHIRE

ENGLISH AUDIO, 95 Whitecross Road, Hereford HR4 0DG. (0432) 355081. Cyrus Centre, Pink Triangle, e, Audion, Systemdek, Heybrook, Michi, KEF Reference, Micromega, Nakamichi, Chord, Arcam, Musical Fidelity, Rogers, NAD, Rotel, Denon, Tannoy, Marantz, Mission, Stax, Dual, TDL, Albarry, JPW, Celestion, Ixos, SME, Ruark, Moth, Audio Technica and others.

Single Speaker Dem room. Home trial. Free install. Service dept. Access, Visa, Credit arranged. Open Mon-Sat 10am-6pm. **[10/07]**

GOSPEL MUSIC AUDIO, 32A High St Kingston, Herefordshire. (0544) 230254. New Shop open: Castle Video, 1 Spa Centre, Station Crescent, Llandrindod Wells (0587 824 0200) Alphason, Alison, Revolver, Luxman, Yamaha, QED, Audio Systemline, Wharfedale, Jamo, Micromega. No appts nec., home trial facilities, service dept. - 5.30 + evening dems. **[10/07]**

HERTFORDSHIRE

ACOUSTIC ARTSLTD, 101 St Albans Rd, Watford, Herts. (0923) 245250. Fax (0923) 230798. Absolute Sounds, Acoustic Energy, Audiolab, Chord, Denon, Marantz, Meridian, SME, TDL., Teac, Tues-Sat 9.30-6.00. **[10/07]**

AUDIO FILE, 27 Hockerill St, Bishops Stortford, Herts CM23 2DW. (0279) 506576. 9.30-5.30 open 6 days. Dealer of the Year 1988/89. Linn, Naim, Quad, Cyrus, Arcam, Roksan, Denon, Epos, Rotel, KEF, ProAc. 0% credit. **[10/07]**

HERTFORD MUSIC. Music is pleasure, good when choosing your system in our, appointments only, demonstration rooms (and bar)! Home demonstrations encouraged. Systems form £1,000 to £15,000. Micromega, REL Acoustics, Acoustic Energy, Michell, Magnum, Diamond Acoustics, Beard, Lumley, Renaissance, etc. Access, Visa. Mail Order. Tel: (0992) 700 900

RADLETT AUDIO, 141 Watling Street, Radlett, Hertfordshire, WD7 7NQ. (0923) 856497. Mark Levinson, Proceed, PRO AC, AVI & ATC, Martin Logan, Tube Technology, Teac, Roksan, Audiolab, Rotel. Home trial facilities, Free Install, Service Dept. Visa, Access 9-5.30 Mon-Fri 10-5.30 Sat **STUDIO 99**, 82 High Street, Harpenden. (0582) 764 246. Linn, Naim, Meridian, Rega, Nakamichi, Mission/Cyrus, Quad, Creek, KEF, Bang & Olufsen, Yamaha etc. Quiet single speaker dem room. Appts nec. Home trial, free install. Service Dept. Visa/c, Access/c & finance terms. 9-5.30pm (Mon:Sat). Closed Weds. **[10/07]**

NORTH HUMBERSIDE

JUST AUDIO, 2A Foston Lane, North Frodingham, Driffield. Tel 0262 488700, call for details. **SUPERFI**, 4 Dock Str, Queens Gardens Hull, HU1

3DL. (0482) 24051. See main entry under Nottinghamshire for full details.

KENT

JOHN MARLEY HI-FI CENTRES, 2 Station Rd, West Canterbury. (0227) 769329. Alsoat Dover - (0304) 207562. Arcam, Aura, B&W, Heybrook, JPW, Pro-Ac, Pioneer, Rotel, Ruark, Tannoy, Technics. Dem and home trail fac. Mon-Sat 9-5.30 closed Thurs. Free install. Credit to £1,000. Access, Visa, Credit charge. Service dept.
KIMBERLEY HI-FI, 193 Broadway, Bexleyheath, Kent. (081) 3043272. Pioneer, Technics, Kenwood, Denon, NAD, Aiwa, Tannoy, Mission, Wharfedale, B&W. Separate dem room, no aptt nec. Free installation. Service Dept. Instant credit facilities. 9.30-5.30. No early closing.

PANATEC SOUND & VISION CENTRE, 83b High Str, Gillingham. (0634) 573141. B&W, Bose, Cambridge, Dual, Kenwood, Marantz, Pioneer, Philips, Sony, Tannoy, Technics, Wharfedale. Dem room facilities. 0% credit, Service Dept. Free Installation. Pioneer Reference Point Dealer.
PANATEC SOUND & VISION, 17 Week Str, Maidstone. (0622) 661488. See above for details.

SOUNDCRAFT HI-FI, 40 High Street, Ashford. Seeking music lovers, male or female any age, to share common interest in, musical Pro-aktiv Hi-Fi Systems, Multi Room or Home Cinema. Attractive unusual equipment in unusual setting, your place or ours, we guarantee lasting pleasure. Open Mon-Sat, Appointment Service or just pop in. Tel: 0233 624441. **[10/07]**

VOLUME ONE, 41 Upper Wickham Lane, Welling, DA16 3AD. 081 304 4622. Arcam, Dual, Epos, Exposure, Mordaunt Short, Monitor Audio, JPW, Marantz, Micromega, Nakamichi, Pink Triangle, Rotel, Royd, Ruark, Sony, Systemdek. Large demo room, no aptt nec. Evening dems in shop by aptt. Home trial & demo, free delivery & installation. Access & Visa, 10.00-6.00 Mon-Sat.

V J HI-FI, 29 Guildhall St, Folkestone. (0303) 56860. Mon-Sat 9-6. NAD, Yamaha, Marantz, Sony, Tannoy, Denon, Kenwood, Rogers, Musical Fidelity, Quad, Dem and home trial facilities, free install, credit to £1000. Amex, Diners, Visa, Access. Service dept. **[10/07]**

VJHI-FI, 119 High Street Margate. (0843) 226977. For full details see our above entry. **[10/07]**

LANCASHIRE

NORMAN AUDIO, 131 Friargate, Preston, Lancs. PR1 2EE. Tel 0772 53057. Fax 0772 562731. Marantz, Pioneer, Yamaha, Audiolab, Arcam, Mission, Cyrus, B&W, KEF, Sendeor Catalogue. Home Cinema Dem room. No aptt nec, Home trial facilities, free installation. Instant credit subject to status. Open 9.30-5.30, latenight Wed till 8.00pm. **[10/07]**

NORMAN AUDIO, alsoat 216 Church Str, Blackpool, (0253) 295661, Fax (0253) 295722. **JO KOCZUR LTD.**, 185 Yorkshire Street, Rochdale, Lancashire. (0706) 42107. Harman Kardon, Quad, Revox, Aura, Teac, JBL, Tannoy (including definition) B&W, Canon, Bose and many others. Dolby Pro Logic, A.V. System. Established over 25 years, qualified & experienced staff. Appts nec only after 5.30pm. Home trial, free install, service dept. Open Sat 9-5. Mon, Wed, Thurs, Fri 9-5.30pm. Closed Tues.

ROMERS HI-FI CENTRE, 94-96 High Street, Rishton, Blackburn, Lancs BB1 4LQ. Tel: (0254) 887 799. Stockists of: Sony Esprit Hi-Fi, Technics, Marantz, Musical Fidelity, Pioneer, Kenwood, Rotel, Tannoy, Mission, Ruark, B&W and many more. Demonstration room, Service department. Free delivery and installation (Local area). The area's leading hi-fi specialist.

LEICESTERSHIRE

LEICESTER HI-FI CO, 6 Silver Walk, St Martins Square, Leicester LE1 5EW. Tel: (0533) 539753. Fax (0533) 626097. Acoustic Energy, Arcam, Marantz, Micromega, Mission/Cyrus, Musical Fidelity, Nakamichi. Meridian, Rogers, Roksan, "and oodles more". 2 Dem rooms, home trial arranged, free install, service dept, Credit facilities etc, Access, Visa, Diners, Amex, 6 days 9.30-5.30. Bada Member **[10/07]**

LISTEN INN, 6 Hotel Street, Leicester. (0533) 623754 (Fax) 0533 623758. Linn, Arcam, Royd, Heybrook, Creek, Neat, Mission, Cyrus, Audiolab, Quad, Denon, etc. 2 Dem Rooms. **[10/07]**
SOUND ADVICE, The Factory, Duke St, Loughborough LE11 1ED. (0509) 218254. Shabinhin, Rega, Naim, Linn, Royd, Yamaha, Rotel, Arcam, Nakamichi, JPW. 3 demonstration areas, noappts necessary, free installation, service department. Lombard credit charge, Access, Visa. Mon-Fri 9.30-6.00, Sat 9.30-5.30.
STEREO SHACK, 1-3 Guildhall Lane, Leicester. Tel 0533 530330. Aiwa, A.R., Denon, Kenwood, Jamo, Mission, NAD, Phillips, Pioneer, Rotel, A/V Speciality. Free Install Open 9.30 - 5.30 6 days. Credit available.

LINCOLNSHIRE

BOSTON HI FI CENTRE, 65a Wide Bargate, John Adams Way, Boston, Lincs PE21 6SG. (0205) 365477. Quad, Nakamichi, Arcam, Marantz, NAD, Castle, Tannoy, Rogers, etc. Separate demo studio. Home trial. Free installation. Access, Visa. Tues - Sat 9-5 pm.
STAMFORD HI-FI CENTRE, 9 Red Lion Square, Stamford, Lincs PE9 2AJ. (0780) 62128. Pioneer, Technics, Cyrus-Mission, Rotel, NAD, Yamaha, Kenwood, Marantz, Quad, plus all major speaker manufacturers. Expert advice, comparator demonstrations, on two floors, part exchange Hi-Fi purchased for cash. No appointments necessary, home trial facilities, free installation, service department. Mastercard, Visa & credit charge, finance available. Mon-Sat 9-5.30pm, closed Thursdays.
SUPERFI, 271A High Str, Lincoln LN2 1JG. (0522) 520265. See main entry under Nottinghamshire for full details.

LONDON

ANALOG AUDIO, 849 High Road, London N12. (081) 445 3267. Cambridge, Denon, Rotel, Yamaha, Marantz, Wharfedale, Teac, Mordaunt-Short, Cerwin Vega, Nad. Free install. Service dept. Instant credit up to £1000. Visa & Access. 9.30-6 6 days.
AUDIO T, 190 West End Lane, West Hampstead, London NW6 1SQ. (071) 794 7848, Fax (071) 431 3570. Great hi-fi from Arcam, Audiolab, Cyrus, Denon, Meridian, Mission, Philips, Rotel, Proac, Micromega, Yamaha, and many more. Mon-Sat 10-6pm. 3 yr gntee on Hi-Fi. Free del & instal. 30 day upgrade scheme. Home dems. PX. 2 dem rooms. **[10/07]**

BILLY VEE SOUND SYSTEMS, 248 Lee High Road, London SE13. (081) 318 5755. Arcam, Linn, Naim, Quad, etc. 2 dem rooms. Int. free credit. Access, Visa. Closed Thurs. **[10/07]**
CORNFLAKE SHOP, 37 Windmill St (just off Tottenham Court Rd), London W1. (071) 631 0472 (domestic). (071) 323 4554 (multiroom). Fax. (071) 323 4554 Fax. (071) 436 7165. Tues -Sat 10-7 Rega, Roksan, Naim, Monitor Audio, Arcam, Nakamichi, Rotel, Epos etc. 3 dem rooms. (incl. home cinema) Friendly, professional service. Home trial facilities. Appointments preferred. Full delivery and repair service. Multiroom specialists. Access & Visa.

COVENT GARDEN RECORDS, 84 Charing Cross Road, London WC2 (071) 379 7635, Fax (071) 836 1345. London's premier digital audio centre. Photo CD, DCC, CD, & 16X9 TV'S. Audiolab, B&O, Marantz, Mission, Cyrus, Philips, Pioneer, Rotel, Rogers, Quad, Sony, Technics, single speaker dem rooms, appointments suggested, installation service available. All major credit cards accepted. Mon-Sat 10am-7.30pm.
DOUG BRADY HI-FI, 14-18 Monmouth St. London WC2H 9HB. (071) 379 4010. Wide range of top specialist hi-fi from Britain, America and Japan. 3 dem rooms. Closed Monday. **[10/07]**

GRAHAM'S HI-FI, Canonbury Yard, 190a New North Rd, London N1. 071-226 5500. Winner Sony/HFN Greater London Dealer Award 1986/89/90. "One of the 5 best hi-fi shops in the world". Arcam, Linn, Meridian, Naim, Rega, etc. Systems from £500. FREE PARKING, 4 dem rooms, service dept, open Tues-Sat. RING FOR APPOINT. **[10/07]**
HI-FI & COMPONENTS, 84 Battersea Rise, London, SW11 1EH. Tel: 071 2231 110. Denon, Harman

Kardon, Tannoy, Kenwood, Rotel, NAD, Wharfedale, Dual, Shure, Ortofon, Celestion, etc. Appts nec, Service Dept. Access, Visa, Diners, Amex, Open 10-6 Closed Wed.

INFIDELITY, 9 High Str, Hampton Wick, Kingston-upon-Thames. (081) 943 3530. For full details see entry under SURREY.

K.J. WEST ONE, 26 New Cavendish St, London, W1M 7LH. (071) 486 8262/63. Fax (071) 487 3452. Most established brands stocked. Two Hi-Fi and one Home Cinema dem studios. Appts nec. Home trial. Free installation. Service dept. Major credit cards. Interest free credit usually available - ask for details. Mon-Sat 10-6pm. (Late night Thurs till 7pm)

MUSICAL IMAGES LTD. 173 Station Road, Edgware & 45 High Street, Hounslow, Middlesex. See under Middlesex & full pge ad. in The Directory.

SOUND ORGANISATION LONDON, 4 Pickfords Wharf, Clink Street, London, SE1 9DG. Tel 071 403 2255. Audio Research, Aura, Creek, Epos, Exposure, Heybrook, Koetsu, LFD, Lyra, Martin Logan, Micromega, Naim, Nakamichi, Rega, Rotel, Roksan, Royd, SME, SonusFaber. Interesting new equipment always under evaluation. 2x single speaker listening rooms. Appts preferred. Free Installation. Service Department. Open Tues - Sat. 10-6. Late dem by appointment.

SOUND SENSE, 350 Edgware Road, London W2 1DX. (071) 402 2100. Alphason, B&W, Kenwood, Nakamichi, Celestion, Denon, Monitor Audio, Marantz, NVA, Sony ES, Yamaha. Appts preferred. Installations available. Access, Visa, Standard credit facilities. Mon-Sat 9.30-6.30.

STUDIO 99, 79-81 Fairfax Road, Swiss Cottage, London NW6. (071) 624 8855. Naim, Rega Quad, Meridian, Mission/Cyrus, ATC, Nakamichi, KEF, Yamaha, Arcam, Epos, Acoustic Energy, Bang & Olufsen, etc. 2 single speaker dem rooms. Service dept. Visa/c, Access/c & finance terms. 10-7 Mon-Fri, 10-6 Sat. **[10/07]**

SUPERFI, 2-4 Camden High Street, Camden, NW1 0JH (071) 388 1300. See main entry under Notts for full details.

UXBRIDGE AUDIO - CHISWICK, 109 Chiswick High Road, Chiswick, W4 2ED (081) 742 3444 Fax (081) 742 3295. 2 Demo Rooms, Installations, 2 Year Guarantee, 7 day exchange. Major credit cards, Tues - Sat 10 - 6, See Middx entry for brands stocked. **[10/07]**

VOLUME ONE, 41 Upper Wickham Lane, Welling. (081) 304 4622. For full details see entry under Kent.

ZEBRA, 18-24 Brighton Road, South Croydon CR2 6AA. 081 688 2093. Audio lab, Arcam, KEF Reference, Marantz, Mission, Micromega, Pioneer, Rotel, Sony, Tannoy, and large range of AV equipment. S2 Air Conditioned Demo Rooms. in a more casual environment. Service department. Mon-Sat 9.30-6.00. Access, Visa & instant credit up to £1000 subject to status.

GREATER MANCHESTER

CENTRAL RADIO, 30-32 Shudehill, Manchester M4 1EY. Tel 061 834 6700. Technics, Kenwood, Pioneer, Aiwa, Marantz, Mission, B&W, Wharfedale, JBL, Thorens, Panasonic, etc. TV video, surround sound, AV systems, service dept, free delivery. Access, Visa, Switch finance. Mon-Sat 9-5.30.

THE AUDIO COUNSEL, 12 Shaw Road, Oldham, Manchester OL1 3LQ. (061) 633 2602. Linn, Yamaha, Rega, Rotel, Arcam, Micromega, EPOS, Creek, Nakamichi, Denon. 2 dem rooms. Free install. Visa, Access, Licenced credit brokers up to £1000 instant credit. 10.00-5.30 Tues, Weds, Sat; 10.00-7 Thurs & Fri. Closed Mon.

MURRAY HI-FI, 19 Middle Hillgate, Stockport. (061) 429 7666. Linn, Naim, Rega, Arcam, Yamaha, Royd, Epos, Creek, Nakamichi, Rotel. Full demo facilities, free installation & delivery, service dept. Full 2yr guarantee on all products. Access, Visa, Lombard Tricity, licensed credit broker. 10-6 Tue-Sat.

SWIFT OF WILMSLOW, 4-8 St Annes Parade, Wilmslow. (0625) 526213. Aura, B&W, Denon, Kenwood, Marantz, NAD, Pioneer, Rotel, Tannoy, Revolver, JPW. Open 9:30am-6:00pm 2 dem rooms. No pressure! **[10/07]**

MIDDLESEX

AUDIO T, 159a Chase Side, Enfield, Middx EN2 0PW. (081) 367 3132, Fax (081) 367 1638. Great hi-fi from Arcam, Audiolab, Cyrus, Denon, Meridian, Micromega, Mission, Philips, Rotel, Yamaha and many more. Mon-Fri 10-6pm. Sat 9:30 - 5:30 3 yr gntee on Hi-Fi. Free del & instal. 30 day upgrade scheme. Home dems. PX. 2 dem rooms. A/V Dept.

HARROW AUDIO, 27 Springfield Rd, Harrow. (081) 863 0938. Mon-Sat 9.30-5.30. A&R, Audiolab, Cyrus, Denon, Epos, Monitor Audio, Musical Fidelity, Nakamichi, Quad, Rotel, Tannoy, Thorens, Yamaha. etc.

MUSICAL IMAGES LTD, 45 High Street, Hounslow, Middlesex TW3 1TR. (081) 569 5802. FAX (081) 569 6353. & 173 Station Road, Edgeware HA8 7JX (081) 952 5535. FAX (081) 951 5864. Most brands available - see full page ad in the product directory. Interest free credit, ask for details. Demo Rms, Repairs & Service. Open Sunday and all week. A home cinema specialist. Mail Order. Part exchange.

RIVERSIDE HI-FI LTD, 422 Richmond Road, East Twickenham, Middlesex TW1 2EB. Tel. (081) 892 7613. Fax (081) 892 7749. A.R., Arcam, Audio Innovations, Castle, Dual, Denon, KEF, Luxman, Michell, Musical Fidelity, Micromega, Marantz, Nakamichi, Rotel, Spendor, Systemdek, Tannoy, Yamaha. One demo room, in-car demo for car hi-fi systems. Appts not always necessary. Home trial facilities. Free installation, service dept. Lombard Tricity, Access, Visa, Amex, Diners Club. Mon-Sat 9.30-6, Thurs, Fri 9.30-7.

SIGHT N SOUND, The Treaty Centre, Hounslow, Middlesex TW3 1ES. 081 572 5418, fax 081 572 5417. Sony, Kenwood, Finlux, Toshiba, Philips, Sanyo, Grundig, Pioneer, Technics, Akai. No appts nec, free intall, service dept. Access & Visa, financing available. 9-6pm Mon-Sat.

MERSEYSIDE

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.

P & A AUDIO (BIRKDALE) LTD 31 Liverpool Road, Birkdale, Southport (0704) 68373. Arcam, Cambridge, Creek, Denon, Michell, Mission/Cyrus, Mordaunt-Short, NAD, Pink Triangle, QED, Revolver, Rogers, Rotel, Royd, Tannoy. 3 Single speaker demo rooms and Nicam surround sound dem room. Free delivery, installation (Merseyside) Service dept. Mon-Sat 9 - 5.30 Half day Tues, Access, Visa, Lombard.

PETERS HI-FI 11 Werburgh Sq, Grange Precinct, Berkenhead. (051) 647 5626. 9-5.30 closed Thurs. See Cheshire entry for full details.

PETERS HI-FI, 8 High Street, Bromburgh, Wirral. (051) 334 1874/2825. Open 9-5.30 6 days a week. See Cheshire entry for details.

WEST MIDLANDS

FRANK HARVEY HI-FI EXCELLENCE, 163 Spon Street, Coventry CU1 3BB. (0203) 525200. Audiolab, Arcam, Bang & Olufson, Mission-Cyrus, Denon, Marantz, Meridian, Nakamichi, NAD, Quad, Rega, Rotel, Yamaha. 3 floors, 3 demonstration rooms, nice staff, nice coffee. Appts nec, service dept, free install, home trial facilities. All credit facilities available. Mon-Sat 9.30-5.30. Wed til 8pm.

GRIFFIN AUDIO LTD, 94 Bristol Street, Birmingham. (021) 692 1359/(021) 622 2230. Arcam, Castle, Cyrus, Denon, Linn, Marantz, Naim, Quad, Rega, Rotel. Open Tues-Sat 10-6.

MUSICAL APPROACH, 37 High Street, Aldridge, Walsall, W. Mids. (0922) 57926. Linn products, Arcam, Creek, NVA, Revolver, Onix, Epos, Marantz, Rotel, Quad & more. Dem facs. Home trial. Service dept. Credit facs available. Access, Visa. 9.30-5.30 Mon-Sat. 9.30-1 on Thurs.

MUSIC MATTERS, 351 Hagley Road, Edgbaston, Birmingham B17 8DL. (021) 429 2811. Roksan, Nakamichi, Arcam, Audiolab, Musical Fidelity, Mission/Cyrus, Meridian, KEF, Monitor Audio, Pink Triangle. 2 single speaker luxury demo rooms. Appts nec, home trial facilities, free installation, service dept. Access, Visa, instant credit up to £1000, interest free credit available. Tue-Thur 10.30-6, Fri 10.30-8, Sat 10-5.30.

NORFOLK

AUDIO IMAGES, 7 All Saints Rd, South Lowestoft, Suffolk NR33 0DL. Tel: 0502 582853. For full details see our main entry under Suffolk.

BASICALLY SOUND, The Old School, School Rd, Bracon Ash, Norwich NR14 8HE. (0508) 70829. Arcam, Linn, Naim, Denon, Spendor, Audiolab, Sound Organisation, Creek, Rega, Epos, etc. 2 comprehensive dem rooms. Home trial. Free installation. Visa, Access, HP facilities. Tues-Sat 9.30-1, 2-5.30.

MARTINS HI-FI, 5 High Street, Kings Lynn. (0553) 761683. Est. 1968. Making good vibrations for 20 years

MARTINS HI-FI, 85/91 Ber Street, Norwich. (0603) 627010. Est. 1968. Making good vibrations for 20 years

NORTHAMPTONSHIRE

AUDIO CRAFT 23-25 Dergate, Northampton, NN1 1TY. Tel: 0604 36291/Bang & Olufsen, Kenwood, Technics, Marantz, Celestion, Mordaunt-Short. No appts nec, Free Install, Service Dept. Open Mon-Sat 9-5:30pm
CLASSIC HI-FI + VIDEO, School Lane, Kettering, Northants. (0536) 515766. Rotel, Musical Fidelity, Wharfedale, Yamaha, JBL, Cyrus, Nad, Pioneer, Marantz, Kenwood, Kef, Celestion, and many more. Home trial, free instal., service dept. Access, Visa, credit facs. 9.30-5.30pm.

LISTEN INN, 32 Gold Street, Northampton. (0604) 37871 (Fax) (0604) 601430. Linn, Naim, Rega, Epos, Royd, Mission, Cyrus, Arcam, Audiolab, Neat, Creek, Quad, Denon etc. 2 Dem Rooms

NOTTINGHAMSHIRE

CHANTRY AUDIO, Chantry Walk, 18-18a Eldon Street, Tuxford, Nr Newark, Notts NG22 0LH. (0777) 870372. Pink Triangle, DPA, Rotel/Michi, Micromega, NVA, Alchemist, Michell, Monitor Audio, Lumley, SME and much more! 3 dem rooms. Home trial, free installation, service dept. Access, Visa & credit facilities and mail order. Mon-Sat 9:30-6pm Sun & evenings home dem by appt.

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PETER ELLIS AUDIO, 29 Kirkgate Newark, Nottingham, NG24 1AD (0636 704571) Quad, Castle, Arcam, QED, Sugden, Tannoy, Thorens, Marantz, Denon, Teac. Demo Room, Free Install, Service Department.

SUPERFI, 15 Market Str, Nottingham NG1 6HY. (0602) 412137. Kenwood, Technics, Denon, Aiwa, Rotel, Wharfedale, Mission, Marantz, NAD < Celestion, and many more. 2 single speaker dem rooms. Free install on systems, service dept. Access & Visa, Amex. Open 9-5.30, 6 days.

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OXFORD AUDIO CONSULTANTS LTD, Cantay Hse, Park End Street, Oxford OX1 1JE. (0865) 790879 fax (0865) 791665. NAD, Rotel, Musical Fidelity, Pioneer, Marantz, Rogers, TDL, Thorens, Audio Research, Proceed. 2 Demo rooms. Service Dept, Home trial and free installation. Instant credit, Access, Amex, Visa. 10-6 Mon-Sat.

WESTWOOD AND MASON, 46 George St, Oxford. Tel: 0865 247783 Arcam, Rotel, Rega, Epos, Tanoy, Royd, JPW, Mission, Nakamichi, Denon, Aiwa, Naim, Quad, Aura, Teac. Open 9:30-5:00pm. Dem room. Closed Thur.

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AVON HI-FI, 12 Barker Street, Shrewsbury, Shropshire SY1 1QJ. (0743) 55166. NAD, Quad, B&W, Arcam, Kenwood, Aiwa, Bose, Nakamichi, Revolver, Onkyo. Dem room. Home trial. Free install. Service dept. Access, Visa. £1000 instant credit. Mon, Tues, Wed, Fri, Sat 9-5.30.

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Access, Visa. 10.30-6 Mon-Sat.

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INFIDELITY, 9 High Str, Hampton Wick, Kingston Upon Thames, Surrey. Tel: (081) 943 3530. Arcam, Creek, Epos, Heybrook, Micromega, Naim Audio, Roksan, Rega Research, Shanhinian, TEAC. Single speaker/listening room. Appts pref, free installation, service dept. Major credit cards. Closed Mon, Tue-Fri 10.30-7, Sat 10-6.

PJ HI-FI - the Hi-Fi Shop, 3 Bridge St, Guildford, Surrey GU1 4RY. (0483) 504801. 9-6 Mon-Sat. Linn, Meridian, Creek, Arcam, Quad, Revox, Musical Fidelity, Rotel, NAD, Nakamichi, Marantz.

RIVERSIDE HI-FI, 422 Richmond Road, East Twickenham. TW1 2EB. Tel: (081) 892 7613. Fax: (081) 892 7749. See main entry under Middlesex.
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SURBITON PARK RADIO, 48 Surbiton Rd, Kingston-Upon-Thames, Surrey. (081) 546 5549. Quad, Castle, Dual, Denon, Kenwood, Rotel, Pioneer, QED, B&W, Tannoy. Demo facilities. Access, Visa. 9.30-5.00 Tues-Sat. Service dept.

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TRU-FI SOUND & VISION, 10 Church Street, Leatherhead, Surrey. (0372) 378780. Sony, Technics, Panasonic, Mitsubishi, Ferguson, Aiwa, Pioneer, Sanyo, B&W, Mission. Free installation. Credit facilities. Access, Visa. 9.15-5.30 Mon-Sat. Closed Wed. Service dept.
ZEBRA 18-24 Brighton Road, South Croydon CR2 6AA. 081 688 2093. See main entry under London.

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JEFFRIES HI-FI, 69 London Rd, Brighton, East Sussex. Tel 0273 609431. 2 Dem Rooms, closed Mon. Late night Wed. Free parking. Bus route. Credit Facilities.

JEFFRIES HI-FI, 4 Albert Parade, Green Street, Eastbourne, East Sussex. Tel: 0323 31336. 2 Dem Rooms. Closed Mon. Late night Wed. Free Parking. Bus Route. Credit Facilities.

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FRANK HARVEY HI-FI, 163 Spon Street, Coventry, Warwickshire, CV1 3BD. Tel 0203525200. Arcam, Mission, Cyrus, Musical Fidelity, Marantz, Rotel, NAD, Tannoy, Yamaha, KEF. Open 9:30-5:30 closed Thursday. **BADA**

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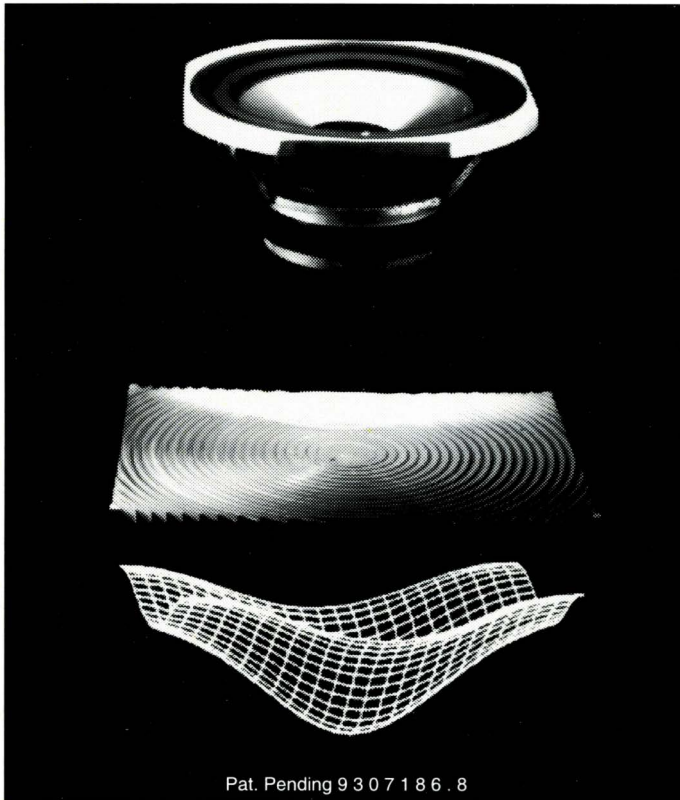
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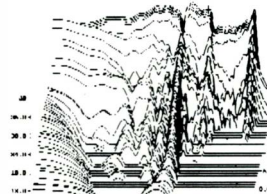
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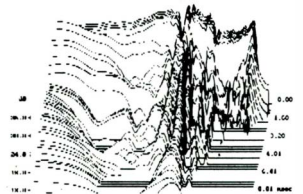
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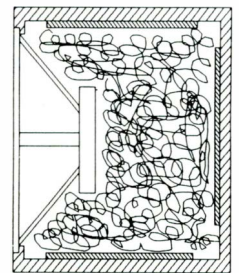
Standing waves are additive at some frequencies and cancelling at others, thus causing irregularities in the response. It is therefore necessary to reduce them to a minimum.

Resonance is the nightmare of speaker enclosure design and is responsible for most of what is normally termed "colouration" and "muddle".

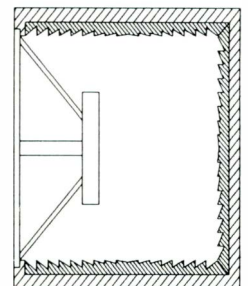
In practice the speaker enclosure exerts a considerable influence over the sound of a complete system. If not controlled properly, unwanted acoustic output can give subjective colouration.

Speaker manufacturers have tended to follow the trend of fitting out their enclosures with bitumen, wool, and foam etc., in an attempt to combat these problems.

However, this approach of trying to absorb unwanted energy still falls short in performance terms and can muffle the sound, especially in reflex designs where air flow is critical. The infill wool and foams move with high sound pressure levels and this can become audible.



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The Directory



This is the legendary Hi-Fi Choice Directory, the only buying guide that is entirely based on comprehensive technical and subjective reviews. Each and every entry carries the weight of our exhaustive test procedures with regularly updated prices and specifications.

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 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 current retail price is placed in its respective category in alphabetical order. The prices of the products are updated on a regular basis, although it should be noted that our value ratings are based on the product's price at the time of review.

Sound quality

This column contains the ratings for the standard achieved in our listening tests. The sound quality ratings range from Poor to Excellent. Their meaning and order are as follows:

P	Poor
A-	Average-
A	Average
A+	Average+
G-	Good-
G	Good
G+	Good+
VG	Very Good
E	Excellent

With P being the worst and E the best rating within a section.

One important point to remember is that these cannot be used to compare products from different categories. For example, 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.

How to use this guide

Perhaps the most influential symbols in the *Directory* are the little red triangles ▲ found in the value column at the beginning of each entry where appropriate.

Products that make the grade are awarded the Best Buy or Recommended accolade.

▲▲ A product carrying the Best Buy swingtag is of excellent quality and good value for money in its price category.

▲ Recommended products are runners up, but still definitely worth considering within their price bands.

Please note however, that an expensive Recommended product will nearly always sound better than an inexpensive Best Buy. 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, and differences in taste, system building is unfortunately not 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.

Finding that component

Before you shop, follow our top eight tips for better buying:

1. Check out the components' recommended retail prices in the *Directory*.
2. Find out as much as you can about the products you want by reading *Hi-Fi Choice's* reviews and lab tests.
3. Visit local dealers that stock some of the brands you want to hear and try to find one that seems sympathetic to your needs.
4. Don't discount a dealer's suggestions just because the products don't have rave reviews.
5. Take your own software (records, CDs, tapes) along for a demonstration of the equipment that the dealer recommends.
6. Listen at the sort of volume you would normally use at home — systems often sound more impressive when played loud.
7. If you are unsure about something or want to hear an alternative, just ask.
8. Audition a system for a reasonable amount of time, say three quarters of an hour or so, before making a decision.

Unless you have first generation masters of course.

Comments

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 we have attempted to put across the essence of the review. Obviously, important

information on compatibility or auxiliary equipment used in the test cannot be included, and we would advise you to refer to the original review for this.

Please note that these comments are those of our own reviewers and not, as is the case with some magazines, those of the manufacturer.

Features

Product features are shown with a combination of figures and blob charts, with headings at the top of each column indicating the appropriate category, a blob indicating the existence of a particular feature.

There are different headings for each section and the more complicated categories are explained in the individual introductions. Where figures are used the unit of measurement is shown in the heading.

Back issues

The final column contains a reference to the issue of *Hi-Fi Choice* which featured the complete review.

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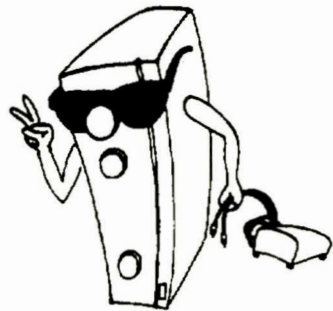
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WHF? APRIL 1993
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Amplifiers

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, even separate power supplies, 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.

We 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 over-load characteristics within a given system (valve

amplifiers invariably sound more powerful than their rating would suggest).

Apart from output the facilities listing shows how many line (that is inputs besides those for phono cartridges) inputs a product has and includes tape inputs. The MM and MC blobs indicate which types of cartridge can be accommodated. Integrated, preamp and power amp indicate the type of amplifier reviewed, and in some instances that a pre/power combination has been tested. In such instances the price given is for both components. The remote control and headphone socket blobs indicate the existence of these facilities.

Amplifiers

Product	£Price	Comments	Output W/R.C.	Line inputs	MM	MC	Integrated Preamp	Power amp	Headphone socket	Remote control	Issue No.
Adcom GCA-510	349	G American power amp with line inputs and passive pot, highly detailed midrange but rather high price.	81	5							121
AMC CVT3030	460	A A well meaning and affordable attempt to mix transistors with valves, albeit one that only really shines with simple musical styles.	35	5							116
Aiwa XA-006	150	A Competent enough performer with plenty of facilities. A gutsy sound though one that's rougher via CD than MM.	67	5							92
▲ Akai AM-47	230	G+ Plenty of widgets and an unexpectedly sharp, open and detailed sound. Looks ghastly but sounds strain free.	104	4							104
Akai AM-95	630	A- A revamped version of the older AM-93 with newer onboard bitstream DACs. Its sound is just too eager, however	110	6							109
Albarray AP4/S508	850	A- A disappointing sound from a pre/power amp that's hamstrung by a variety of technical oversights. Albarray has done better.	46	4							116
▲ Albarray PP1	400	G+ Available with or without various MM/MC options, the 'basic' PP1 has an attractively warm, earthy sound.	48	4							104
Alchemist Kraken	444	A Class-A objet d'art that's far too sensitive to RF interference. Can sound cold and fierce as a result.	54	5							116
Arcam Alpha 3	200	A Generally lacklustre and bland sound offered on this occasion met with (unexpected) disapproval.	53	3							104
▲ Arcam Delta 110/120	1300	G Performance is limited by power amp - in isolation the PDM-preamp offers a remarkably open and detailed sound	112	4							92
▲ Arcam Delta 290	450	VG Combines the dryness and restraint of Arcam's older models with a refreshing sense of detail, dynamics and musical colour.	99	5							116
▲ Arcam Delta 60	300	G+ Very refined and highly detailed sound via MM and CD without any of the hardness tied via the MC stage	59	4							68
▲ Art Audio Quintet	988	VG Switchable triode/ultralinear output stage. In triode mode these are 15 of the sweetest watts around. Surprisingly gutsy	15/25								109
Audio Innovations Series 200	850	G Turns in a fuller and more substantial performance via MM rather than CD. Otherwise its sound can seem slightly bleached.	10	5							109
▲ Audio Innovations Series 300II	500	G+ Under-powered and over-distorted yet capable of realising an open and captivatingly expressive sound. Sensitive speakers are a must	9	4							97
▲ Audio Innovations Series 700	999	G+ Valve amp that can turn the roughest of digital sounds into music, both understated and graceful. Sensitive speakers are a must	24	5							116
▲ Audio Note Ongaku	43125	E A single ended, zero negative feedback, triode, line level integrated amp and a half. Probably the best amplifier in the world!	27	6							Col
▲ Audiogram MB1	500	G+ It'll successfully tackle the most difficult of speakers and still provide a very warm, rich and euphonic sound.	46								116
▲ Audiolab 8000A	450	VG Recent mods have cured the slightly glassy treble, replacing it with a smoother and more solid style of music making	81	7							97
Audiolab 8000C/8000P	1100	G Very distinctive, almost stark neutrality that will not appeal to all listeners. Good value engineering, nevertheless	157	7							97
▲ Aura VA-100 Evolution	300	G+ Might overheat when driving insensitive, low-impedance speakers but was applauded for its sense of scale and drama via CD	81	5							109
▲ Aura VA-50	220	VG Superficially similar to the cheaper VA-40 but with much more of the old MA-80's magic! Great sound from a slimline package	65	5							97
▲ Beard Audio CA35/P35mkII	1790	VG Good build quality and finish and a characteristic valve sound make a first class amplifier capable of great musical enjoyment	35	4							63
Beard CA506	1295	G+ A versatile valve preamp, the bass sounded lively if a touch softened, while the treble was detailed but lacked a little sparkle	4								50
Beard M70	1995	G+ A substantial British monoblok power amplifier, but not a great deal more impressive than the P35	70								50
▲ Concordant Excelsior	1040	E Styling might not inspire confidence, but sonically this preamp is tremendously vivid and detailed. Real high-end performance	3								77
▲ Conrad-Johnson PV-10	1250	E Fabulous preamplifier. Beautiful imaging, superb detail, plenty of gain on the phono stage; class build quality too.	4								78
▲ Conrad-Johnson Premier 7	11000	E The 'Seven is designed without compromise, and is clearly one of the finest (valve) preamplifiers money can buy.	4								Col
▲ Creek CAS 4040 S3	220	G Now in mk3 guise the '4040 offers a dry but tidy sound via disc and one that's slightly leaner and better focussed on CD.	41	3							92
Creek CAS 4140 S2	250	A+ Running production changes inspired us to re-review this amp which now sounds thicker and 'blurred' compared to the original	41	3							109
Creek CAS 6060	500	G Looks like the old '5050 but employs the sort of big, meaty-sounding electronics used in the earlier '4040. Dynamic and impressive.	81	5							104
▲ Cyclone Catalyst	1995	VG Exceptionally load tolerant and very refined in delivery. Extra options available in future	74								80
▲ Denon PMA-250III	160	A- Pretty high resolution for the price, occasionally loses its grip but is generally engaging and enjoyable	55	3							121
▲ Denon PMA-350	190	G Bold claims were made at its launch but the sweet and inoffensive sound, though very pleasant, is not mould-breaking	88	5							92
▲▲ Denon PMA-450	250	G+ Denon's latest integrated amp swept the board with its big, brassy if somewhat extravagant sound.	99	5							116
▲ Dual CV600RC	160	G A very lively, open and vibrant sound. Slightly sanitised via CD perhaps, but still damn good for a features-first integrated amp!	63	5							104
E.A.R. 549	5400	VG Valves imitating trannies give exceptional power delivery but not the delicacy and transparency one expects	200								60
▲ E.A.R. 802/509mkII	4200	VG Extremely well made and combining the sonic strengths of both transistors and valves this EAR combo warrants attention	100	6							63
EMF Audio Sequel	349	G+ A fresh start for Mike Creek has resulted in the Sequel, a minimalist amp with a very refined but mildly restrained sound	47	4							109
Exposure XX	625	A Line only integrated with good sense of timing but limited hf extension. Likely to be very system dependent.	43	4							121
▲ Exposure XI/XII/VIII Super	1650	VG New preamp and improved power amp led to a smooth and refined sound, MM/MC less transparent than CD	61	5							80
▲ Grant G60AMS	1300	G+ Neat and compact valve monoblok gave good sound on the 8ohm tap, better still on 4ohms. The midrange was particularly natural	60								57
▲▲ Harman Kardon HK6150	190	G+ Based on the older HK6100 but with a more solid, punchy and expressive performance that attracted considerable praise	44	5							109
▲ Harman Kardon HK6250	250	G+ Heavily based on the cheaper HK6150, this version offers slightly more power with a similarly gutsy and expressive sound	51	5							116
Harman Kardon HK6550	430	A- Follow up to 6500 is disappointing with grainy hf and limited depth. Quite powerful but ultimately not up to the mark	69	6							121
Harman Kardon HK6850	800	G This monster is derived from the HK6800 with a similarly deep and powerful sound but a rather steep price tag	101	6							109
Heybrook C3/P3	1379	A Heybrook has improved the manufacture of its power amp though flaws in the preamp's disc input remain	146	4							104

Amplifiers continued

Product	Price	Comments	Output W/R/C	Line inputs	MM	MC	Integrated	Headphone socket	Remote control	Power amp	Preamp	Issue No.
▲ Heybrook Signature	2014	G+ A stunningly powerful and vivid-sounding combination which is equally impressive via vinyl or CD	148	4	•	•	•	•	•			109
JVC AX-A342	170	A A value-conscious budget amp offering plenty of power but a slightly untidy and inconsistent sound	77	5	•	•						109
JVC AX-R562	249	A- More fuss and bluster than detail and dynamics was how one listener concisely described this less than wonderful model	90	5	•	•						121
▲ JVC AX-Z1010	650	G+ One of the best behemoths: a big amp with a big, bopy and unmuddled sound and a couple of ancient 16-bit DACs for good measure!	124	6	•	•	•					109
▲ Jadis JP30/JA30	10750	E French tubes. Beautiful build, nostalgic styling and delightful sounding midrange transcend limitations at frequency extremes	30	4	•	•		•	•			60
Kelvin AZI	700	A This latest Absolute Zero still sounds animated but also rather more synthetic and crude. It's also rather more expensive.	100	6			•					116
▲▲ Kenwood KA-3020	160	G+ An unassuming little amplifier that turns in a remarkably balanced and entertaining sound. Lively, detailed and engaging	66	5	•	•						97
Kenwood KA-4020	200	A+ On paper this a beefier version of the '3020 yet our listeners thought it sounded weaker, lacking richness and detail	103	5	•	•						97
Kenwood KA-4050R	250	A- Respectable but ultimately uninspiring model whose remote control is its main asset.	85	5	•	•						121
Kenwood KA-5040R	300	A A flexible amp that uses the old KA-5020 as a building-block. Unfortunately it lacks dynamics, sounding stifled and uninteresting	100	5	•	•						109
▲ Lecson Quattra	370	G Underpowered but with the flexibility of four independent power amps. Very deep, captivating sound with 3D soundstaging.	40	5	•	•	•					92
Lecson Stereo	230	G+ Can reflect the full weight of a classical performance. Genuinely deep, detailed and enthralling sound	76	6	•	•						104
Linn Intek	448	A+ Linn's no-nonsense Intek still lacks the authority and confidence to support its forward balance.	55	5	•	•						104
Magnum Quartet A	329	A- An integrated model that incorporates four monoblocks optimised for bi-wiring, but sound is sandy in the treble.	72	5			•					121
▲ Magnum A-Class	599	G+ Lashings of rich and compelling music, trading a hint of lushness for stark accuracy. An unexpected find. Phono stage option	55	7			•					116
▲ Marantz PM-40SE	250	G+ The improved version of the basic PM-40 model has itself been updated to provide a bigger and more exciting sound	61	4	•	•	•					97
▲ Marantz PM-52SE	430	G+ The SE premium pays for a degree of fluency that draws you into the music and keeps you there. Rather nice	95	6	•	•	•					121
Marantz PM-62	270	A Attempt to introduce remote control that has failed if the rather flat and uninteresting sound of this amp is any guide.	101	6	•	•						116
Marantz PM-72	350	A This is a very neutral, pleasantly detailed and even-handed performer but one that lacks a sense of emotion or expression	155	5	•	•						109
▲ Meridian 201/205	1285	G+ A fine preamp with option of full system remote, plus competent monoblok power amplifiers with generally good performance	100	6	•	•		•	•			62
▲ Moth Series 30	587	G+ A modular system capable of cracking results. The passive preamp and power amp combination warrant a Best Buy in their own right.	35	4	•	•		•	•			109
▲ Musical Fidelity Preamp/Typhoon	500	G+ A combination that plays everything close to its chest but bridge the power amp and you'll witness an explosion of detail.	62	6				•	•			116
Musical Fidelity Tempest	200	P+ Basic but lusty amp has a disturbingly bright and forward sound, accentuating strings and percussive detail above all else.	62	6								116
▲▲ NAD 302	160	G+ A spritely and uplifting performance. Sounds loud but never intrusive or fatiguing.	39	5	•	•						116
▲▲ NAD 304	230	G+ Equally effective with CD and vinyl this is another successful and entertaining NAD amplifier for your shortlist	50	6	•	•						121
▲ Nakamichi IA-3	350	G A minimalist outing for the cassette heroes that's very confident if a tad restrained.	62	3			•					121
▲ NVA AP20	260	G+ Utilitarian amplifier sounds gentle and restrained but is euphonic and utterly engaging. Optional phono stage	35	4			•					109
Onix OA-21S/SOAP	730	G- Via MM disc this amp comes alive with a fresh and vibrant sound though its CD input sounds utterly dead by comparison.	60	4	•	•						97
Onix OA22L	300	A+ Nothing genuinely unpleasant about this amplifier, simply that its hurried and lacklustre sound fails to spark the imagination.	39	5			•					116
Orelle SA-020.2	419	A Potentially system dependent this split the panel but ultimately elicited only limited enthusiasm	86	6			•					121
▲ Philips FA-930	200	A+ Radical styling hides a digital switching facility plus full remote control over what is Philips' best effort to date	99	5	•	•						109
Pioneer A-300X	200	A+ This revamped version of the A-300 was also more confident sounding via CD than MM, yet our panel were still left unmoved.	55	5	•	•						116
▲▲ Pioneer A-400	280	VG Pioneer's design concept snaps into focus with an amp that seems to bubble with musical detail. A budget bench-mark	71	5	•	•	•					92
Pioneer A-676	300	A- A lusty amplifier at a modest price yet one that failed to inspire our listeners with its bland, indifferent sound	98	7	•	•						109
Pioneer A-777	450	A- A larger version (!) of the A-676 that offers more power but an equally sluggish and uninspiring sound	121	7	•	•						109
▲ QED A270CD/PA	370	G+ Recent updates have bolstered the output of the A270 without adding to its colorations. The PA phono option is a touch expensive	61	5	•	•						97
▲ QED C300/P300	630	G A cost-effective combo, limited in its resolution but less beguiling as a result. Disc stage is sweeter but samey	58	3	•	•		•	•			85
Quad 34	388	A Well-built durable preamp, filtering and above average tone controls but was found lacking in sound quality (viz: detail/dynamics)	4	•	•			•	•			44
Rational Audio	175	A+ Wacky Czechoslovakian amp offers a very open and fluid sound via CD but its MM performance depends on cartridge load impedance.	129	3	•	•						92
Ray Lumley Model 75	1995	G+ Valve monoblocks represent good value. What they lack in musical subtlety they make up for in sheer muscle.	75						•			78
Rega Elex	298	A Minimalist amplifier that sounds too forward, hard and unforgiving for its own good. Shows plenty of promise, however.	51	4	•	•						116
▲ Rose RV-23	425	G+ Beautifully built British 'hybrid'. You can spend more to get a more transparent sound but it's hard to criticise at the price		3					•			77
▲▲ Rotel RA-930AX	180	G+ This budget wonder captivated our listeners with its clean, vibrant and thoroughly involving sound	53	3	•	•						104
▲ Rotel RA-935BX	200	G A line only winner that lets a lot of music through and never lets things get out of hand. Could be a touch more enthusiastic	58	5			•					121
▲ Rotel RA-940BX	250	G Rotel's cheapest 'BX' amp prompted a mixed reaction, some finding it muddled while others thought it 'exceedingly musical'	53	5	•	•						109
▲ Rotel RA-960BX	275	G+ If you like music to harbour a latent rather than blatant sense of power this amp's confident restraint could be just the ticket.	88	5	•	•						116
▲ Rotel RC-960BX/RB-960BX	350	G- Excellent standards of construction, flexibility and plenty of power under the bonnet, an ideal choice for the first-time buyer.	80	5	•	•		•	•			104
Rotel RC-980BX/RB-980BX	700	A Plenty of watts per pound, sound is expansive but lacks a sense of poise, of control and fine detail - a disappointment	143	5	•	•		•	•			109
▲▲ Sansui AUX-417R	310	G+ Unusually clean and precise with more subtlety than is usually attributed to remote control amps.	53	5	•	•						121
▲ Sansui AU-X911DG	800	G+ At its best when used with the on-board MASH/PWM DAC where it sounds technically neutral but still emotionally charged	112	7	•	•		•				85
Sherwood AI-2210	80	P Lightweight in all respects this is better than you'd find on a midi and at least its reasonably painless.	47	4	•	•						121
▲ Sony TA-F440E	200	G A new budget amp based on tried-and-tested circuits. A fresh and up-beat sound with plenty of detail, can sound smeared via CD	109	5	•	•						104
Sony TA-F540E	250	G- An MC input but little else over the TA-F440E. Sounds more consistent from input to input but is still rather superficial	108	5	•	•						104
Sugden A21a	469	G The modern-day relative of Sugden's original Class A amp and one that offers a smooth, easy-going sound.	25						•			92
TEAC AX-1000	150	A- Initially entertaining but ultimately unsatisfactory and rather short on high frequencies	62	5	•	•						121
TEAC A-X5000	230	A- This amplifier is compromised by a grey and muddled sound that taxed the concentration of our listeners. Better via MM disc	107	6	•	•						97
▲ Technics SU-VX600	220	G The first 'tweaked' amp from Technics, its solid and sharply focused sound a taste of things to come.	90	5	•	•						104
Technics SU-VX720	250	A+ Big and spacious sound either appears rough and blustery or impressively grand depending on the music at hand.	84	5	•	•						116
Technics SU-VZ220	100	A- Cheap, cheerful and pretty flexible to boot the SU-VZ220 quickly sounds thin, splashy and relentless when the going gets tough	50	4	•	•						109
Threshold FET 10e/SA-4	11852	G+ Almost valve-like limpidity and excellent soundstaging are star qualities of the Threshold amps	100	7	•	•		•	•			Col
Wharfedale 2050A	250	A- Loud and potentially aggressive amp that is reasonably detailed and clear, but ultimately a bit much like hard work	70	5	•	•						121
Woodside ISA230	900	A Smooth and inoffensive valve amplifier if one that lacks the sparkle and euphony required for a truly entertaining sound.	27	5	•	•						116
Woodside SC26/STA35	2743	G+ Synergistic pairing with a cool, controlled sound, good focus and transparency. More about poise than grunt	35	5					•	•		100
YBA Integre	1199	G+ Audiophile spec French integrated with good resolution and nice phono stage.	57	4	•	•						121

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BRITAIN'S LARGEST INDEPENDENT HI-FI/VIDEO BULK BUYER

Our Massive Buying Power gives you the Best Possible Deal. Brand New Factory Sealed units - All Fully Guaranteed.

(NO REPAIRED UNITS, MAIL ORDER RETURNS OR GREY IMPORTS)

- All prices include V.A.T.
- We have Friendly Expert Advisers on hand at our 10,000sq. ft. Superstore at Barking. They can offer Advice and Full Demonstrations.
- We offer the Fastest Mail Order Department in the Business. Insured - 24 Hour Securicor Delivery.
- We Care. We have Fully Trained Service Personnel.
- We want your custom...

If you have been satisfied with the Service at Hyper-Fi tell others. If you're not happy for any reason don't hesitate to tell us.

JUST WRITE TO: HYPER-FI P.R. DEPT. (RICHSIDE), FREEPOST, RM90, CHIGWELL, IG7 6BR.

THIS MONTH'S STAR BUYS

AKAI

CDM659

- * QUALITY COMPACT DISC
- * 3 BEAM LASER PICK UP
- * 20 SELECTION PROGRAM
- * REMOTE OPTIONAL
- * DIGITAL OPTICAL OUTPUT
- * SILENTLINE BLACK 240 VOLT

HALF PRICE £59.95 **SCOOP**

SONY AV

STRD590

- * A.V. REMOTE RECEIVER
- * DOLBY SURROUND SOUND
- * 2 x 60 WATTS FRONT 2 x 10 WATTS REAR
- * 6 AUDIO 2 VIDEO INPUTS
- * VIDEO OUT COPY FACILITY
- * DYNAMIC BASS FEEDBACK SYSTEM

SAVE £50 £199.95

PIONEER AV

VSA740

- * SURROUND SOUND PROCESSING AMPLIFIER
- * DOLBY PRO-LOGIC, DIGITAL DELAY
- * 2 x 95 WATTS FRONT 2 x 23 WATTS REAR
- * 5 CHANNEL 3 x 60 WATTS 2 x 23 WATTS
- * FULL REMOTE CONTROL, 4. S VIDEO TERMINALS
- * 5 AUDIO, 5 VIDEO INPUTS. PRE OUT POWER INPUT

SAVE £££ £ Censored **SAVE £££**

BARGAIN OFFERS

£5 HI-FI CHOICE HYPER-FI VOUCHER

EXTRA

£5.00

OFF PUBLISHED PRICES ONLY FOR HI-FI CHOICE READERS

£5

PIONEER £1/4 MILLION

SPECIAL PURCHASE
 Most at trade price or less, all equipment brand new sealed cartons fully guaranteed direct from Pioneer (G.B.) Ltd. prices inc V.A.T.

MORDAUNT SHORT £1/4 MILLION

SPECIAL PURCHASE
 Trade Price or less Latest Specification Models Brand New sealed Cartons

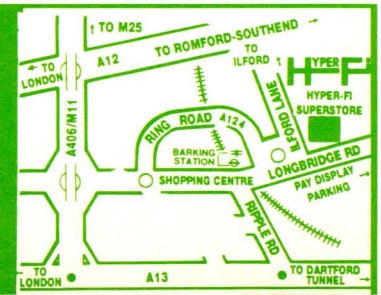
TDK SA90
£1.19 IN TENS
 Free delivery with Hi-Fi orders

WE WILL BEAT ANY GENUINE ADVERTISED PRICE

67-73 LONGBRIDGE ROAD BARKING, ESSEX.

HOTLINE: 081-591 6961

NOW ONLY MINUTES AWAY FROM THE NEW M11 (A406) MOTORWAY CLOSE TO BARKING UNDERGROUND/MAINLINE STATION



PHILIPS
FB290
QUALITY
SPIKED
SPEAKER
STANDS
£ **19.95** PAIR



HYPERS

SONY RACK
VERSATILE
VERTICAL or
HORIZONTAL
CONSTRUCTION
WILL FIT ANY
MAKE UP TO
435mm WIDE
£ **29.95** SAVE
£70



HOTLINE 0181 501 6001

AMPLIFIERS

JVC



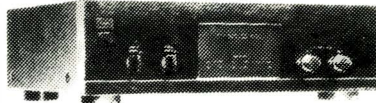
AXA2TN

- 2 x 35 WATTS RMS
- 2 x 60 WATTS DYNAMIC
- G.M. DRIVER • 5 INPUTS
- HEADPHONE SOCKET

SAVE £45 **£79.95** SAVE £45

AMPLIFIERS

SONY AV



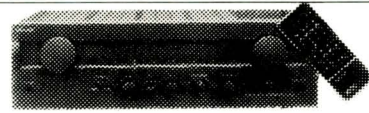
TAN 220B

- 2-4 CHANNEL POWER AMP
- MULTI CHANNEL/ SURROUND SOUND
- 4 x 50 WATTS RMS 8 OHMS
- 2 x 100 WATTS RMS 8 OHMS
- 2-4 CHANNEL SWITCHABLE

SAVE £90 **£139.95**

AMPLIFIERS

NAKAMICHI

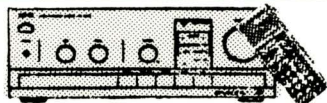


AMP 2

- 2x50 WATTS RMS 8 OHMS
- 2x140 WATTS DYNAMIC POWER
- UNSURPASSED QUALITY
- FULL REMOTE CONTROL

SAVE £170 **£229.95**

AKAI



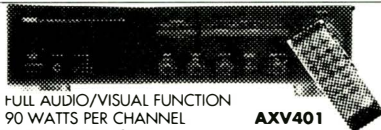
AMM459

- 2 x 40 WATTS OUTPUT 8 OHMS
- 2 x 190 WATTS MUSIC POWER
- FULL REMOTE CONTROL
- 5 INPUT H.P. SOCKET
- SLIMLINE BLACK FINISH

Also AMM 659
2 x 55w (250 w
Music) £129.95

HALF PRICE **£99.95** HALF PRICE

YAMAHA AV



AXV401

- FULL AUDIO/VISUAL FUNCTION
- 90 WATTS PER CHANNEL
- INFRA-RED REMOTE
- 6 INPUTS INC TWO TAPE
- SOURCE DIRECT, LOUDNESS
- TWIN SPEAKER OUTPUTS

Also AX450
£129.95

SAVE £60 **£139.95**

SONY



TAF670ES

- 100 WATTS RMS 8 OHMS
- 7 INPUTS, TWIN DRIVE POWER SUPPLY
- SOURCE DIRECT/RECORD OUT SELECT
- MM/MC, PREOUT, AB SPEAKERS
- HIGHLY REVIEWED AMP

SAVE £150 **£249.95**

SONY AV



TAF319R

- AUDIO/VISUAL AMPLIFIER
- 2 x 40 WATTS RMS 8 OHMS
- REMOTE CONTROL MOTORISED VOL
- TWIN DRIVE POWER SUPPLY
- HEAVY DUTY BINDING POSTS
- TWIN SPEAKERS, SEARCH DIRECT SWITCH

SAVE £70 **£119.95**

MARANTZ AV

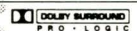


SP50

- DOLBY SURROUND PROCESSOR
- DOLBY PRO LOGIC
- 30 WATT BUILT IN REAR AMP
- SINGLE MASTER VOL CONTROL
- SUITABLE FOR MOST SEPARATE SYSTEMS

SAVE £70 **£139.95**

SONY AV



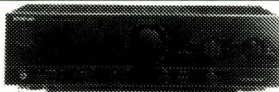
TAN220
100W
POWER AMP
£139.95

- DIGITAL SIGNAL PROCESSING PRE AMP
- 10 MODE, 2 HALL, OPERA, JAZZ
- DOLBY SURROUND LIVE CONCERT STADIUM DISCO
- DOLBY PRO LOGIC
- REVERBERATION PARAMETRIC EQ.
- PROGRAMMABLE REMOTE

TAE1000ES

SAVE £250 **£449.95**

KENWOOD



KA4020

- 2 x 60 WATTS 20HZ-20KHZ 8 OHMS
- 2 x 140 WATTS DYNAMIC POWER.
- LARGE POWER SUPPLY 200VA
- ANTI RESONANCE CHASSIS
- HIGHLY REVIEWED RANGE

Also KA404OR
£159.95

SAVE £70 **£129.95**

SONY

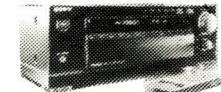


TAF540E

- EXCLUSIVE U.K. AUDIOPHILE DESIGN
- HIGHLY REVIEWED
- 2 x 90 WATTS RMS 8 OHMS
- PURE STRAIGHT PATH DESIGN
- MM + MC CART INPUTS

SAVE £80 **£169.95**

SONY AV



TAAV670ES

- 5 CHANNEL AV SURROUND SOUND AMP
- DOLBY PRO LOGIC • 2 x 65 WATTS RMS 8 OHMS FRONT
- 2 x 20 WATTS RMS 8 OHMS REAR • ES GIBRALTER CHASSIS
- DIGITAL SIG PROCESS HALL JAZZ CLUB STADIUM THEATRE
- MULTI SOUND CONTROL • 12 AV FUNCTIONS
- FULLY PROGRAMMABLE REMOTE

SAVE £210 **£469.95** SCOOP

MARANTZ

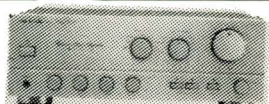


PM40SE

- 2 x 50 WATTS RMS
- 2 x 95 DYNAMIC POWER
- SPECIAL EDITION MODEL
- BI-WIRE TERMINALS
- HIGHLY REVIEWED RANGE

SAVE £££ **£Censored** SCOOP

PIONEER



A676G

- 2x95 WATTS 20HZ - 20KHZ
- 2 x 200 WATTS DYNAMIC POWER
- SUPER LINEAR CIRCUIT
- DIRECT SWITCH 7 INPUTS
- RECORD SELECTOR HIGH GAIN PHONE EQ.

Also A676BL
£229.95

SAVE £100 **£199.95**

TUNERS

SONY



STS170

- HIGHLY REVIEWED TUNER RANGE
- DIAL TUNING SYSTEM AUTOSCAN
- 30 RANDOM PRESET
- 3 WAVEBAND
- QUARTZ LOCKED SYNTHESIZER

SAVE £30 **£89.95** SAVE £30

TUNERS

KENWOOD



KT2030L

- FM/LW/MW 30 PRESETS
- 12 STATION NAME PRESETS
- 6 EVENT PROGRAMME TIMER
- 60 MINUTE SLEEP TIMER
- SUPERB QUALITY

SAVE £50 **£89.95** SAVE £50

SONY

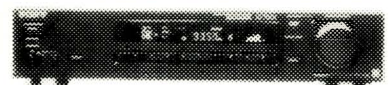


ST5570RDS

- HIGHLY REVIEWED WHAT HI-FI
- BEST TUNER IN CLASS (£200 WHAT HI-FI)
- RADIO DATA SERVICE RDS SYSTEM
- RADIAL POWER SUPPLY
- DIAL TUNING SYSTEM
- ALPHA NUMERIC DISPLAY
- 30 RANDOM PRESET 3 WAVEBAND

SAVE £80 **£149.95**

SONY



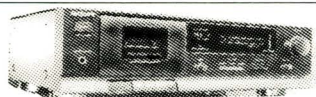
STS770ES

- HIGHLY REVIEWED RANGE
- 3 WAVEBAND AM/FM/LW
- WAVE IF DIRECT DETECTION
- 30 RANDOM PRESETS
- STATE OF THE ART QUALITY

SAVE £100 **£199.95** SCOOP

CASSETTE DECKS

SONY



TCFX170

- QUALITY CASSETTE DECK
- DOLBY B+C
- FINE BIAS ADJUST
- AUTO TAPE SELECT
- MULTIPLEX FILTER

SAVE £20 **£74.95** SAVE £20

SONY



TCK 390

- TWO HEAD SYSTEM
- DOLBY B+C HX PRO
- 2 MOTOR TRANSPORT
- FINE BIAS CONTROL
- AUTO TAPE SELECT
- REAL TIME COUNTER
- OPTIONAL REMOTE CONTROL

Also TCK370
£99.95

SAVE £25 **£99.95** SAVE £25

YAMAHA



KXW162

- QUALITY TWIN CASSETTE
- DOLBY B+C N.R.
- NORMAL OR HIGH SPEED DUBBING
- LEFT & RIGHT RECORD LEVEL
- 2 MOTOR MECHANISM

SAVE £50 **£129.95**

CASSETTE DECKS

SONY



TCK490

- HIGH REVIEWED CASSETTE RANGE
- THREE HEAD 2 MOTOR SYSTEM
- DOLBY B.C. HX PRO
- FINE BIAS CONTROL
- GOLD PLATED H/P SOCK VOL. CONT.
- OPTIONAL REMOTE CONTROL

Also TCK470
£129.95

SAVE £25 **£149.95**

PIONEER



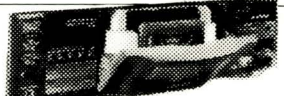
CTS 510

- 3 HEAD CASSETTE
- INFRA RED REMOTE.
- DOLBY B. C. HX PRO
- ELECTRONIC COUNTER
- H/P OUTPUT MUSIC SEARCH

Also CTS210 £99.95
CTS410 £169.95

SAVE £20 **£199.95**

SONY

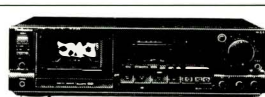


TCCS

- FIVE CASSETTE CAROUSEL
- CONTINUOUS RECORD/PLAY FOR 7.5 HOURS
- 3 MOTOR AMORPHOUS HEAD
- REMOTE CONTROL POWER LOADING
- DOLBY B.C. HX PRO. HIGH SPEED DUBBING

SAVE £100 **£199.95** SCOOP

TECHNICS



RSB808

- 3 HEAD CASSETTE
- CLOSED LOOP DUAL CAPSTAN
- MOTORISED EJECT DOLBY B.C. HX PRO
- L & R CALIBRATION LEVEL BIAS ADJUST
- 3 MTR DIRECT DRIVE REC CALIBRATION

SAVE £80 **£219.95** SCOOP

PIONEER



CT5610

- HIGHLY REVIEWED CASSETTE
- DUAL CAPSTAN 3 HEAD DECK
- DOLBY BC HX PRO
- CD DECK SYNCRO
- MUSIC SKIP DISPLAY OFF

SAVE £70 **£229.95**

AKAI



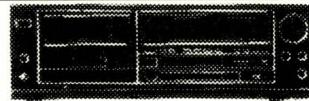
GX9511

- RECOMMENDED HI-FI CHOICE
- 3 HEAD SUPER GX (10 YEAR GUARANTEE)
- CLOSED LOOP DUAL CAPSTAN DRIVE
- DOLBY B, C & HX PRO (SWITCHABLE)
- AZIMUTH & HEIGHT ADJUSTMENT

SAVE £140 **£299.95**

CASSETTE DECKS

AIWA



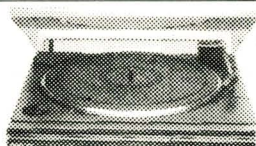
XK57000

- 'RECOMMENDED' WHAT HI-FI
- BUILT-IN DAC'S
- DOLBY B, C, S + HX PRO
- 3 HEAD DUAL CAPSTAN
- CALIBRATION VIA DISPLAY

SAVE £200 **£Censored**

TURNTABLES

PHILIPS



FP320

- D.C. BELT DRIVE
- W+F 0.09%
- DIE CAST PLATTER
- ANTI RESONANCE MAT
- QUALITY M.M. CART £5 EXTRA

SAVE £60 **£39.95** SAVE £60

COMPACT DISC

SONY



CDPM43

- QUALITY COMPACT DISC
- 1 BIT D/A CONVERTOR
- 45 BIT NOISE SHAPING DIGITAL FILTER
- 20 TRACK MUSIC CALENDER
- PEAK SEARCH

CDPM33
£69.95

HALF PRICE **£99.95** HALF PRICE

SONY



CDP597

- GREAT FEATURE REVIEW WHAT HI-FI
- 45 BIT 8 DAC D/A CONVERSION.
- DIGITAL SERVO SYSTEM
- FULL REMOTE/REM VOL
- TIME/MANUAL FADE

SAVE £60 **£119.95**

SONY

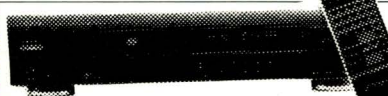


CDPK1

- QUALITY STANDARD MIDI C.D.
- KAROKE VOCAL REDUCTION SYSTEM
- PITCH CONTROL +/-12%
- FULL REMOTE CONTROL
- OPTIONAL MIC £9.95

SAVE £90 **£129.95**

PHILIPS



CD624

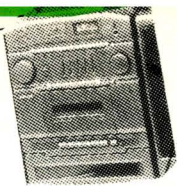
- HIGHLY REVIEWED BY WHAT HI-FI
- INFRA-RED REMOTE CONTROL
- REMOTE VOLUME - DIGITAL OUTPUT
- HEADPHONE SOCKET AND VOLUME CONTROL
- FTS 1 + 2 RANDOM TRACK ACCESS

SAVE £70 **£129.95**

HOTLINE TELEPHONE 0815916961

PHILIPS

- * COMPACT DISC MINI HI-FI
- * 80 WATTS PMPO POWER OUTPUT
- * CD PLAYER
- * PROGRAMMABLE MEMORY
- * AUTOREVERSE CASSETTE
- * FM. LW.MW.SW. TUNER



AZ9514
£149.95

HITACHI

- * COMPACT DISC MINI HI-FI
- * 100 WATTS POWER AMP
- * 3 BAND DIGITAL TUNER
- * TWIN A/REV CASSETTE
- * PROGRAMABLE C.D. PLAYER
- * 5 BAND GRAPHIC EQUALISER

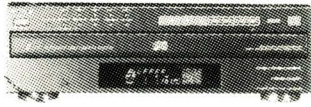


DAW650/MSW620
£169.95

HOTLINE TELEVISION 01801 951600

COMPACT DISC

SONY



CDP322M

- * 5 DISC MULTI PLAY C.D.
- * 1 BIT CD 45 BIT DIGITAL FILTER
- * 20 TRACK MUSIC CALENDAR
- * 5 DISC DIRECT ACCESS
- * PEAK SEARCH TIME EDIT/FADE

SAVE £50 **£149.95**

SPEAKERS

J.P.W.

MINIM

- * HIGHLY REVIEWED RANGE
- * 70 WATTS POWER RATING
- * FERRO FLUID DAMPING DOME TWEETER
- * HARD WIRED X/OVERS
- * LARGE DIAMETER TERMINALS



Also SONATA UNPRINTABLE

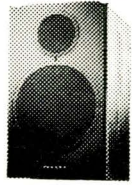
SAVE £££ **£Censored** SAVE £££

SPEAKERS

MORDAUNT SHORT

MS5.30

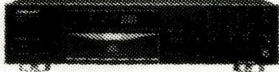
- * 300 WATT HANDLING
- * POSITEC PROTECTION
- * MAGNETIC SHIELDED
- * BI-WIRE FACILITY
- * ROSEWOOD FINISH



Also BLACK FINISH £149.95

SAVE £80 **£139.95**

PIONEER



PDS601

- * HIGHLY REVIEWED RANGE
- * STABLE PLATTER MECHANISM
- * 1 BIT DIRECT LINEAR CONVERSION
- * ANTI RESONANCE DESIGN
- * OPTICAL DIGITAL OUTPUT
- * H/P MOTOR DRIVE OUTPUT

Also PDS101
£119.95
PDS701
£199.95

SAVE £70 **£169.95**

MORDAUNT SHORT

MS5.10

- * FULLY SHIELDED MAGNETS SUITABLE FOR ALL A/V APPLICATIONS
- * HIGHLY REVIEWED HI-FI SPEAKER
- * ORIGINAL DOME TWEETERS
- * POSITEC PROTECTION SYSTEM
- * SHELF OR FLOOR STAND USE
- * 100 WATTS HANDLING



MS5.10 ROSEWOOD IMPROVED TWEETER £69.95
MS5.10 BLACK IMPROVED TWEETER £79.95

HALF PRICE **£59.95** HALF PRICE

WHARFEDALE

507/2

- * AWARD WINNING RANGE
- * HIGHLY REVIEWED HI-FI ANSWERS
- * ALUMINIUM DOME TWEETER
- * POLYMER BASS UNIT
- * 100 WATTS BLACK FINISH



SAVE £80 **£149.95** SCOOP

YAMAHA



CDX 660

- * UK SPECIFIED FOR SOUND QUALITY
- * 1 BIT PDM CONVERTOR
- * REMOTE CONTROL INCLUDES VOLUME
- * RANDOM AND PROGRAM PLAY
- * DIGITAL OUTPUT

SAVE £80 **£169.95**

SONY

APM121ES

- * HIGHLY REVIEWED SPEAKER
- * APM BASS DRIVE UNIT
- * BASS REFLEX TWIN PORTS
- * 4mm BINDING POSTS
- * 80 WATTS HANDLING
- * BI WIREABLE UK BUILT
- * BLACK ASH FINISH
- * 250 X 430 X 297mm



SAVE £90 **£79.95** SAVE £90

MORDAUNT SHORT

MS5.40

- * 3 UNIT BASS REFLEX DESIGN
- * 100 WATTS HANDLING
- * POSITEC PROTECTION SYSTEM
- * HIGHLY REVIEWED SPEAKER
- * GOLD TERMINALS BI-WIRE CAPABILITY
- * ROSEWOOD FINISH



Deluxe Black Finish £229.95

SAVE £120 **£199.95**

NAKAMICHI



CD3

- * QUALITY SINGLE DISC PLAYER
- * 6+1 MULTI DISC SYSTEM
- * DUAL 18 BIT D/A CONV
- * 8xOVERSAMPLING REMOTE
- * MULTI-REGULATED POWER SUPPLY

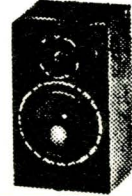
Also CD2 £399.95

SAVE £200 **£299.95**

YAMAHA

NSB50*

- * HIGHLY REVIEWED RANGE
- * 80 WATTS HANDLING
- * SENSITIVITY 89DB
- * 2 WAY SYSTEM. U.K. BUILT
- * STAND OR SHELF MOUNTING
- * 400 x 220 x 210MM



HALF PRICE **£99.95** HALF PRICE

WHARFEDALE

COLERIDGE

- * HIGHLY REVIEWED HI-FI CHOICE
- * 100W POWER HANDLING
- * FREQUENCY RESPONSE 45HZ-25KHZ
- * SENSITIVITY 89DB
- * WALNUT FINISH
- * FB815 SPIKED STANDS £39.95



THIRD PRICE **£199.95** SAVE £400

SONY

SSA505

- * QUALITY BRITISH BUILT SPEAKERS
- * 100 WATT POWER HANDLING
- * 3 WAY INFINITE BAFFLE SYSTEM.
- * SENSITIVITY 88DB PER WATT 1 METRE
- * DELUXE BLACK ASH FINISH
- * 250 X 470 X 195MM

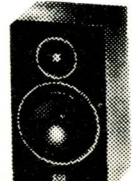


HALF PRICE **£49.95** HALF PRICE

WHARFEDALE

505/2

- * BEST BUY HI-FI CHOICE
- * HIGHLY REVIEWED WHAT HI-FI
- * 100 WATTS HANDLING
- * 2 WAY INFINITE BAFFLE
- * BLACK ASH FINISH



SAVE £90 **£129.95**

MORDAUNT SHORT

MS5.50

- * HIGHLY REVIEWED SPEAKER
- * FLOOR STANDING BASS REFLEX
- * 89 DB 1 WATT SENSITIVITY
- * TWIN BASS UNITS DOME TWEETER
- * ROSEWOOD FINISH



Also DELUXE BLACK FINISH £319.95

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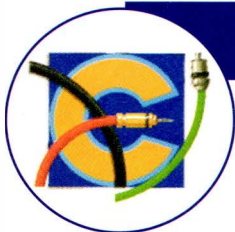
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Amplifiers continued

Product	£Price	Comments	Output W/R/C	Line inputs	MM	Integrated MC	Headphone socket	Remote control	Power amp	Preamp	Issue No.
▲ YBA 1 pre/power amp	7649	E Well finished pre/power amp offers front rank stereo staging and transparency, and is capable of driving the most difficult loads	85	5	•	•	•	•	•	•	62
▲ YBA 2 pre/power amp	3624	G+ Superbly finished with very good space and transparency, slightly softened bass. Needs transformer for MC cartridges	70	5	•	•	•	•	•	•	56
YBA 3 pre/power amp	2350	G This duo produced see-through, ethereal stereo images that were more convincing towards the centre of the soundstage	56	4	•	•	•	•	•	•	72
Yamaha AX-550	260	G Neutral yet lacks the ability to involve on an emotional level	131	5	•	•	•	•	•	•	97
Yamaha AX-750	400	A Impressive handling, but two samples split the opinion of our listeners, one sounded squashed the other fast and articulate	149	5	•	•	•	•	•	•	104



Cables

Cables are not accessories but an integral part of your system. You can make do without accessories but no conventional system will function without cables. Inevitably some cables are greater than others. The best cable for your system will only be found through trial and error, but hopefully by combining our recommendations with those of a dealer you will end up with something that suits both your pocket and your system. Generally speaking budget to spend about ten per cent of the total system cost on cables.

Analogue interconnects are the leads that connect source components to amplifiers and pre to power amps. The cables in this section are priced for a one metre terminated pair. Symmetrical indicates where a twisted pair of conductors are used. Coaxial means that there is a central 'hot' conductor and a shield that carries the negative signal. Stranded cables have multiple strands and solid core use individually insulated strand(s). Copper and silver indicates whether these metals are used as conductors. Digital interconnects connect CD transports

to DACs, and are traditionally coaxial with a 75ohm impedance. They come in optical and electrical varieties, the former being made of plastic or glass and the latter in coaxial or alternative configurations. The prices shown are for a terminated linear metre

Speaker cables are used between the amplifier and speaker. Our prices are for a terminated 5metre pair. Resistance and capacitance are indicated as low (L), medium (M) or high (H). Neither high resistance nor high capacitance cables are suitable for long runs.

Analogue interconnects

Product	£Price	Comments	Symmetrical	Coaxial	Stranded	Solid core	Copper	Silver	Issue No.
Audio Note AN-A	29.50	A- A well-rounded and cuddly sound from a high-ish resistance interconnect. Lacks a sense of scale and dynamics	•	•	•	•	•	•	108
Audioquest Ruby Hyperlitz	70	A+ A crisp, fast and articulate-sounding cable if one that's a little too pointed for our listeners	•	•	•	•	•	•	108
▲ Audioquest Lapis Hyperlitz	329	E An expensive cable that justifies its tag with a beautifully poised sound - natural, relaxed and very compatible.	•	•	•	•	•	•	108
Audio Technica AT620	28	A Plenty of cable for the money but its performance is distinctly lightweight, lacking depth and subtlety	•	•	•	•	•	•	108
Chord Chameleon	59	A+ An unpredictable cable with an 'anomalous treble' that can sound harsh one moment and oddly recessed the next!	•	•	•	•	•	•	108
▲ Chord Solid	115	VG What looks like a military RF cable actually provides a slightly forward but incisive and intimately detailed performance	•	•	•	•	•	•	108
▲ Cogan-Hall Intermezzo Ref	185	E A user-hostile cable with a tight, convincing bass allied to a very relaxed and involving mid/treble.	•	•	•	•	•	•	108
Cogan Hall Intermezzo E-M	320	G+ This bigger, thicker and thoroughly unwieldy 3-core version of the Intermezzo Reference actually sounds a little coarser	•	•	•	•	•	•	108
▲ DNM Interconnect	40	VG Fresh, transparent and packed full of detail, this slither of a cable scored a direct hit with our listeners	•	•	•	•	•	•	108
Goldring 'Studio Quality'	20	A- A bog-standard OFC coaxial cable that might otherwise be given away with a new amp or CD player. Cheap but nothing special.	•	•	•	•	•	•	108
▲ Isoda Electric HA-08-PSR	199	G+ This odd-ball cables utilises a mix of copper, brass and aluminium strands to achieve a very distinct sound	•	•	•	•	•	•	108
▲ Madrigal HPC	215	VG A very unusual cable design with a business-like approach to music-making that barely conceals its underlying 'fizz'.	•	•	•	•	•	•	108
Magnan Type Vi	595	A+ With a series resistance some 500-1000 times higher than average, the furry sound of the Type Vi will alter from system to system.	•	•	•	•	•	•	108
▲ Monster Interlink 500	60	G+ Plenty of hype to keep the marketing bandwagon rolling plus a lively and lucid balance to cheer up the enthusiast	•	•	•	•	•	•	108
▲ Moth Ley Line Black	100	G+ The cheapest of Moth's Ley Line series uses just two twisted conductors to achieve a very solid and confident sound.	•	•	•	•	•	•	108
Moth Ley Line Grey	200	G+ The four twisted conductors of this cable actually mark a downturn in audio quality	•	•	•	•	•	•	108
▲ Panasonic RP-CA910	50	G This conventional coax employs plenty of hi-tech materials which encourage an even-handed balance. A good upgrade.	•	•	•	•	•	•	108
▲ Silver Sounds 12/2 and 12/3	99/150	VG Both these cables share a similarly open, transparent and dynamic sound though the latter is arguably the better integrated	•	•	•	•	•	•	108
Sonic Link Yellow	60	A An interesting non-copper cable with an up-front sounded described as 'heavy-handed and pushy'.	•	•	•	•	•	•	108
▲ Sonic Link Violet	99	G+ Another nickel-based cable but with a very much better-balanced sound than Sonic Link Yellow	•	•	•	•	•	•	108
Straight Wire Laser Link	50	A+ Thanks to its high parallel capacitance this interconnect helps remove ultrasonic noise. Unfortunately it still sounds very odd!	•	•	•	•	•	•	108
Straight Wire LSI-Encore	90	A+ A solid-sounding cable with a strong mid and bass but a disappointingly sat-upon treble	•	•	•	•	•	•	108



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Analogue interconnects continued

Product	£Price	Comments	Symmetrical	Coaxial	Stranded	Solid core	Copper	Silver	Issue No.
▲ Tara Labs Prism	36	G 6N-purity copper, aero-grade insulation and spaced solid-core conductors all add-up to a slightly bright but frisky sound	•			•	•		108
▲ Tara Labs Quantum CD	63	G+ Praised by our panel for its lack of obvious vices, Quantum CD encourages a sweet and positive sound.	•			•	•		108
Tara Labs Quantum II	99	G Bass power and extension is the key to the sound of this unusual and hi-tech cable	•			•	•		108
▲ Van den Hul The Source	70	G+ Accurately reflects the life of the music without detail forcibly from the speakers		•		•	•	•	108
Van den Hul MC D-102mkIII S	80	A+ A rather coloured sound thanks to its full and resonant bass but spoiled overall by a dirty treble	•			•	•	•	108

Digital interconnects

Product	£Price	Comments	Type	Plastic	Glass	Non-coaxial	Coaxial	75Ω	Issue No.
▲ Audioquest Video Z	50	E The very best available with an expressive sound but generous price to sweeten the pill	Electrical				•	•	108
Audioquest Digital PRO	90	A+ A silver cable with all the drive of Video Z but lacking its clean-cut transparency	Electrical				•	•	108
Audioquest Optilink Z	100	A Good level of midband detail but frequency extremes lack depth and extension	Optical			•			108
Bandridge AL560	20	P The disappointingly heavy and muddled sound of this basic fibre thwarts any recommendation	Optical	•					108
Chord Codac	34	A A connection with a stranded inner core and a sound that lacks integration	Electrical				•	•	108
▲ Deltec Digilink	27.50	VG Can seem slightly impassive but there's no avoiding its exceptionally detailed sound	Electrical				•	•	108
Deltec Optilink	20	P Very similar to Bandridge AL560 with an equally naff sound	Optical	•					108
Kimber PSB Digilink	24	A- An analogue interconnect inappropriately pressed into digital service. A visible deterioration in the digital signal results.	Electrical					•	108
Kimber KC-1 Digilink	52	A This cable adopts a woven construction with the addition of a conductive screen. Music lacks detail and spirit.	Electrical					•	108
Kimber KC-AG Digilink	222	A- An asymmetric cable using silver conductors that deviates from the 75ohm standard. Not ideal for digital applications.	Electrical					•	108
▲ Kimber Opti-Link	70	G Hardly cheap for what appears to be a bog-standard PMMA fibre, yet it sounds a little brighter and livelier than most.	Optical	•					108
▲ Monster Cable Datalink 100	45	G+ A colourful coaxial interconnect with an equally colourful and up-beat sound. Very compatible.	Electrical				•	•	108
▲ Monster Cable Interlink LS100	45	G Well constructed stepped-index fibre with polished ends and rugged connectors. Slightly lean, fuzzy but engaging performance	Optical	•					108
Moth Leyline Datalink	140	A- A thin, coaxial version of Leyline Black with a rather hard and unforgiving character. Too expensive.	Electrical				•	•	108
▲ QED Digiflex	19	VG A top performance, low-loss 75ohm coax with a very open, almost liquid quality that allows its music to ease naturally across.	Electrical					•	108
Sonic Link Brown Digital	35	A- A solid-core, twisted-pair interconnect that deviates from the 75ohm standard and provides an equally unbalanced sound	Electrical					•	108
Straight Wire Silver link	G+	A genuine attempt to get things right with a silver-plated, multi-strand coax. Yet it still sounds too dry and mechanical	Electrical					•	108
▲ van den Hul MC Videolink 75	30	VG An AV-cum-digital cable that comes very close to besting QED's Digiflex. Still some emphasis of vocal sibilants, however	Electrical					•	108

Speaker cables

Product	£Price	Comments	Resistance	Capacitance	Stranded	Solid core	Copper	Silver	Issue No.
▲ Audio Note AN-B	165	G+ A very high capacitance Litz-style cable whose sound may well act as a taming influence in many systems	M	H			•	•	109
Audio Note AN-D	100	A Supplied in linear, non-polarised lengths that should be twisted into stereo pairs. Sounds rather gritty and forward	L	L		•		•	109
▲ Audio Note AN-SP	1270	VG Some 15 individually-insulated silver strands go to make up this very civilised but exceptionally detailed-sounding cable	H	L			•	•	109
▲ Audioquest F-14	44.50	A+ Ideal for laying flat under carpets, F-14 encourages a slightly warm and vibrant sound	M	L			•	•	109
Audioquest Type 4	75	A+ Four 18-gauge OFHC copper conductors wound in a Litz-fashion increases capacitance but restrain the cable's 'bite'	M	H			•	•	109
Audioquest Midnight Hyperlitz	260	G Very similar to Type 4 but with a delicate smoothness that contrasts with the brighter sound of cheap cables	L	H			•	•	109
▲ Bandridge LC7259 & LC7401	20/30	A Two very traditional figure-of-eight cables. The thinner version (LC7259) sounds lighter and coarser than LC7401	L	L		•		•	109
Bandridge LC8258 & LC8408	30/50	A- Two versions of the Silverflex series that, sadly, encourage very little sense of poise or decorum in their music	L	L		•		•	109
▲ Cogan-Hall Intermezzo Full-Range	465	VG Extra care must be taken to prevent shorting this user-hostile cable. Nevertheless it sounds superb!	L	L			•	•	109
▲ Deltec IS19	275	G+ Shares the clear, neutral and transparent sound of the older 8S without the tremendous clarity of Gortex Black-16	L	L			•	•	109
DNM Rainbow	84	A+ The high impedance of this simple ribbon cable has an influence on the treble response of some speakers. Lacks 'oomph'	H	L			•	•	109
Heybrook Heywire	66	A This well-meaning facsimile of earlier ribbon-style cables ends up sounding lumpy and uneven	H	L			•	•	109
Isoda Electric HA-20	400	A+ This unorthodox cable employs a combination of copper, brass and aluminium strands. It sounds 'oddly impure'!	M	L		•		•	109
▲ Mission Stranded	20	G+ This Swedish-made cable proved a real hit with our listeners - a slick performer and Best Buy upgrade	L	M		•		•	109
Monitor PC KC27/KC34	40/60	A Two heavyweight multi-strand cables with a thick and chesty (10027) or light and wispy (10034) balance. Take your pick	L	L		•		•	109
Monster Powerline 3 Plus	75	A- The archetypal 'old-style Monster Cable' that labours under a soggy bass and untidy treble	L	M		•		•	109
Naim NAC A5	44	A- Described as a 'dinosaur of a cable' by our listening panel, this stiff rod of wire has little application outside of a Naim system	L	L		•		•	109
QED Bi-wire 79-Strand	35	A Reminiscent of curtain track, this bi-wire version of 79-strand is unfortunately saddled with a 'loud, hard and untidy' balance	L	L		•		•	109
▲ Silver Sounds 12/2	300	E Tonally accurate and exquisitely detailed, this cable opens a very transparent window on the music	L	H			•	•	109
▲ Silver Sounds 16/4	200	VG A prime choice for bi-wire systems even if this cable does lack the full finesse of its sister 12/2	M	H			•	•	109
Sonic Link Grey	80	G- A spaghetti-thin cable composed of silver-plated OF-copper and PTFE insulation. Lacks bass impact and treble 'air'.	H	M			•	•	109
▲ Straight Wire Waveguide 1.5	20	G A conventional multi-stranded cable with a refreshingly up-beat, crisp but slightly lean-sounding balance	M	M		•		•	109
▲ Straight Wire Flex-4	50	G+ Another very quick and dynamic-sounding cable from Straight Wire. A little short on subtlety but very engaging nonetheless.	L	H		•		•	109
Tara Labs Quantum III	238	G An imaginatively-named cable that encourages an equally colourful sound. Described as 'dark and fruity' by our panel!	L	H			•	•	109
van den Hul MC The Clearwater	50	A Despite its evocative title, the Clearwater turns out to be a disappointingly 'murky sounding' cable	M	L		•		•	109
van den Hul MC The Magnum	265	A Touted as vdH's most prestigious twinlead speaker cable, the Magnum sounds surprisingly soft and old-fashioned	L	L		•		•	109
▲ van den Hul MC The Wind	330	VG Blown-in from the continent, vdH's 'Wind' kicks up a storm with its lush midrange and bone-crunching bass!	L	M		•		•	109



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. Buffs may wrinkle their noses, but are happy to use cassette decks to make up tapes for the car or personal.

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 auto-

matically.) Lab performance and sound quality often go hand in hand, and are frequently somewhat dependent upon factory alignment. The mechanical integrity of the mechanism is another crucial factor, that is reflected in the price.

The columns on the right indicate when the facilities shown in the headings are available on a deck. Dolby B and C offer varying degrees of noise reduction and the HX Pro system gives significant treble improvements with ferric (Type I) tapes. Dolby S increases the level of noise reduction with less signal degradation than B or C.

Three-head recorders allow you to listen to a recording as it's being made, a useful quality control function. Bias adjustment allows you to fine tune the deck to suit different types of tape when recording. Auto calibration is an automatic system for setting bias and Dolby levels. Twin deck offers the option to dub tapes or to play two cassettes simultaneously. Autoreverse is a useful convenience feature, but usually with some mechanical compromise. In the case of twin decks a blob is inserted in this column even if only one transport autoreverses.

Cassette decks

Product	£Price	Comments	Dolby B	Dolby C	Dolby S	Dolby HX Pro	Auto calibration Bias adjust 3 Head	Twin deck	Autoreverse	Issue No.
▲▲ Aiwa AD-F410	120	A Comparable to AD-F500 but cheaper: Good all round performance, well adjusted, useful basic and not so basic features	•	•	•					99
▲▲ Aiwa AD-F810	230	G First class budget 3-head machine with a dual capstan transport that really works at reducing the 'fudge' factor	•	•	•			•		99
▲▲ Aiwa AD-WX828	200	G- Equipment levels strong, and sound is both vivid and presentable, but control system daunting.	•	•	•				•	123
▲▲ Aiwa AD-WX929	230	A Superbly equipped twin deck that works and works well - remote control	•	•	•	•			•	117
▲ Aiwa XK-S9000	700	G+ Fabulous build, clunky transport and sharp, refined sound quality with Dolby S or B and metal tapes	•	•	•	•	•	•	•	105
Akai DX-57	220	G Eschews fancy gadgets for a good transport and decent electronics. Sound quality is firm and tidy but avoid Dolby C.	•	•	•	•	•	•		105
Akai GX-65	300	A Fine ungimmicky middle ranking deck with simple, purposeful controls, works best with metal tapes. Performance fair to good	•	•	•	•	•			87
▲ Akai GX-95II	440	G+ Sharp, clear and articulate sounding deck, with superb performance extending to frequency extremes	•	•	•	•		•	•	99
Akai GX-R35	220	A Middling sound quality at best with Dolby B; deteriorates with Dolby C	•	•	•	•		•		99
▲ Akai GX-W45	320	A Costly but musical high-spec dual deck, doesn't like modern high energy Type IIs and IVs. Good stability and clarity	•	•	•				•	111
▲ Arcam Delta 100	850	E Superb transport and a ripe, spacious sound. The Dolby S installation more successful than most. Some replay incompatibility	•	•	•	•	•	•		111
▲ Denon DRM-510	150	A+ An amnesic Dolby switch and lack of timer standby detract from an otherwise strikingly successful deck with a good performance	•	•	•					99
Denon DRM-710	250	A Although this is a fair performing model, the design has lost some of the competitive edge of its predecessor, the DRM-700.	•	•	•			•		105
▲ Denon DRS-610	180	G Unique loading mechanism provides stability, and the deck has a crisp, clean quality. Occasionally anaemic bass.	•	•	•			•		111
Denon DRS-810	300	A Basically good deck with non-stressful material let down by an inability to deal with high energy tapes properly.	•	•	•	•		•		105
▲ Denon DRW-650	200	A This simply equipped model is a little fiddly to operate at times, but sound quality is generally workmanlike - good value	•	•	•				•	93
Dual CC800RS	170	A- Low(ish) cost auto-reverse deck. Delivers a punchy but ultimately rather crude impersonation of source material, thin, lightweight bass.	•	•	•					105
Harman Kardon DC5500	500	A Workmanlike sound quality offset by high price and inexplicable shortcomings like 'forgetful' Dolby switching and no timer support.	•	•	•				•	117
▲▲ Harman Kardon TD4200	250	G+ This is a very basically equipped deck built to a high standard which sounds solid and refined.	•	•	•			•		123
Harman Kardon TD4600	600	A Original Dolby S deck has improved over the years and now sounds very acceptable. A strong, solid sounding deck - but expensive.	•	•	•	•				117
Goodmans Delta 700W	140	P Compact and ultra-basic twin deck which is rough and bass shy, with less than stable tape path.	•						•	123
JVC TD-R452	180	A- Tidy, stable but ultimately rather soul-less experience. Auto-reverse is useful though.	•	•	•				•	117
JVC TD-X352	150	A- Disappointingly amorphous sound despite decent measured results	•	•	•			•		117
▲ JVC TD-V562	200	G+ Ultra-sophisticated transport at a silly price; sound quality is stable but slightly opaque.	•	•	•			•	•	123
▲ Kenwood KX-3050	160	A Acceptable sound quality marred only by a loss of midband analysis and slightly edgy treble.	•	•	•					117
Kenwood KX-5030	200	A Confusing mishmash of listening impressions caused by poor set-up afflicting metal tapes and Dolby C in particular. Promising otherwise	•	•	•			•		99
Kenwood KX-5530	190	A- Neat looking, well equipped deck, adequately engineered but somewhat lacking musically. Worth considering if auto-reverse is a must	•	•	•			•	•	105
▲ Kenwood KX-7030	260	G Fine, articulate middle price cassette deck whose only (mild) failing with some programme material is a just perceptibly synthetic glaze	•	•	•	•	•	•	•	99
▲ Marantz CP230	330	A This is a competitively priced portable recorder though not suited to replay of musicassettes	•					•		52
▲ Marantz CP430	400	A Uniquely flexible and compact package for outside work which at a pinch can double as a domestic cassette deck	•				•	•	•	87
Memorex SCT-5	150	P Poor example of a twin cassette deck where everything has been sacrificed on the altar of flexibility	•	•	•					87
▲ Nakamichi DR-3	400	VG Refined, exquisitely detailed and solid sounding 'budget' Nakamichi 2-header.	•	•	•			•		123
▲ Nakamichi DR-1	780	VG Typically idiosyncratic Nakamichi with manual everything, Good azimuth adjustment and dynamic, authoritative sound.	•	•	•					117
▲ Nakamichi RX-202E	600	G+ Fine, clear and articulate sounding player. Excellent with prerecorded material, but idiosyncratic and sometimes obstructive control	•	•	•			•	•	63
Philips DCC600	500	A+ Simplified circuit and mechanism, but the Philips badly needs a D/A converter transplant	•	•	•				•	123
▲ Pioneer CT-S520	280	G Decent if slightly coloured middle ranker with FLEX to revitalise old or soggy sounding tapes.	•	•	•			•	•	123
▲ Revox B215	1322	G+ Fine, consistent and solid sound, excellent under the skin engineering and many useful features — but you're also paying for it	•	•	•	•	•	•	•	87
▲ Revox B215-S	1697	G+ This is a superbly engineered deck with a classically fine performance that almost transcends the stereotypes.	•	•	•	•	•	•	•	75
Revox Professional Series C115	1083	G Not for the numbers freaks, it's unobtrusively musical, with a slightly wayward top and a very clean, extended bass	•	•	•	•	•	•		111
Sansui D-790WR	200	P Modestly poor sounding but simple to use twin deck. Type II tapes show large response errors.	•						•	123
Sansui D-X117WR	240	P Bass is thin and coloured, and the sound lacks dynamics, pitch accuracy and overall stability - the sound is neither stable nor solid	•	•	•				•	111
Sherwood DD-3010C	160	P Good range of features, let down by poor transport and iffy electronics.	•	•	•				•	117
Sherwood DS-5010C	160	P+ Mediocre performance from well priced deck with some useful secondary features.	•	•	•			•		123
▲▲ Sony (WMD6C) Pro Walkman	280	G+ One of the finest sounding cassette decks on the market today. A mandatory Best Buy, which also fits in your pocket	•	•	•					60
▲▲ Sony TC-K520	180	G Fine, assured and detailed performer with a very well designed and straightforward user interface	•	•	•			•		87
Sony TC-K870ES	350	A+ Good but not outstanding deck which proved slightly disappointing on audition. This model is no standard setter	•	•	•	•	•	•		99
TEAC R-9000	500	G Much better than average auto-reverse deck, well worth considering. Nicely engineered too.	•	•	•	•	•	•	•	105
TEAC V-7000	480	G Intrinsically sharp, clear and solid sound spoiled by exaggerated detail with prerecorded material and losses imposed by Dolby circuits	•	•	•			•	•	99
▲ TEAC V-8000S	700	G Superb stability and real subtlety, this must be the best TEAC yet. The only disappointment was the Dolby C	•	•	•	•	•	•	•	105

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KA 4040R 70 watts per ch. Remote
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TECHNICS

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SLPG 440K NEW, Remote MASH Player
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DP 7050 NEW, 1 BIT Model
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RSTR 333 NEW, A.R. twin deck with Bias adjustment
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RSTR 555 Twin deck, both decks record

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KX 5050 Dolby B/C, 3 motor, power loading
KX 7030 Dolby B/C, HX Pro, 3 head, 3 motor
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KXW 6050 NEW, twin deck - Double record
KXW 8050 NEW, twin deck with HX-Pro

SONY

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TCK 311B With auto calibration. NEW
TCK 411B 3 head deck, auto monitor. NEW
TCK 511S 3 head deck with Dolby S. NEW
TCK 611S 3 head/3 motor deck with Dolby S. NEW
Double decks
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TCWR 535B With record-reverse. NEW
TCWR 635S With Dolby S. NEW

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Compact 559CD Separate components, Multiplay
Compact 759CD Dolby Pro-logic
Compact 707CD 70 watts per ch.

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MHC 710CD, NEW, 40 watts per ch.
MHC 2700CD, 35W, Special/low price
MHC 2750CD, 35W, multiplay CD
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STG 70 Twin Tuner
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ST GT650K with RDS

KENWOOD

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KT 2050 NEW model
KT 3050 NEW model with
R.D.S.
KT 6040 Remote compatible

SONY

STS 211B NEW, with 30 presets
STS 311B NEW, with R.D.S. - EON
STS 570ES With R.D.S.

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TECHNICS

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SAGX 530LK 100 watts, Dolby Pro-logic

KENWOOD

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KRV 7050 NEW model with Dolby Pro-logic, R.D.S. +
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SONY

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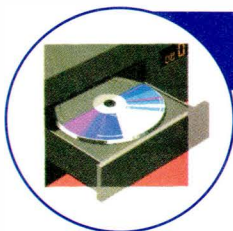
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Cassette decks continued

Product	£Price	Comments	Dolby B	Dolby C	Dolby S	Dolby SX Pro	Auto calibrat Bias adjust	Twin deck	Autoreverse	Issue No.
Technics RS-BX626 II	180	G First rate deck at a bargain price. Losses when recording are low and mostly benign, an all-round achiever	•	•	•	•	•			111
Technics RS-BX828 II	300	G Fine deck, with explicit detail and stability, but in the final analysis it doesn't go much further musically than the cheaper RS-BX626	•	•	•	•	•			111
Yamaha KX-260	160	A Lively, entertaining deck that trades gadgets for a convincing performance at an attractive price point	•	•	•	•	•			111
Yamaha KX-360	200	A Performance has both dryness and precision. Good - but doesn't 'breathe,' and occasionally sounds unstable	•	•	•	•	•			111
Yamaha KX-650	260	G Fine audio manners, especially in the midband and treble, mark this high class deck out from the crowd	•	•	•	•	•			99
Yamaha KX-W362	250	A- Almost a good deck, it is let down by audible levels of wow & flutter, apparent even with prerecorded material, audio circuits are good	•	•	•	•	•		•	111



CD players

Now over a decade old, this all digital music source is well established despite high disc prices and the opposition of some hi-fi enthusiasts. Compact Disc's strengths over conventional vinyl are complete freedom from surface noise, ease of use, and more robust software.

However, many vinyl enthusiasts still find CDs sound less involving than top quality vinyl. But, with the dominance of CD in the high street, even vinyl die-hards need a CD player today.

The columns on the right indicate when the facilities shown in the headings are available on a CD player: DAC type indicates the type of converter chip used in each player, 16, 18 and 20-bit are multi-bit types, all the others are bitstream variants. In much the same way that an amp's output is not indicative of its sound quality, the chip used in a DAC isn't the only determining factor in a CD player's sound, but it is an important one. Remote control is not yet universal, and we have included a tick box, more to show which

machines don't have one than which do. The existence of electrical and/or optical digital outputs is important for future upgrading with an outboard DAC, as a rule electrical outputs are the most desirable. Phase inversion in the digital domain is rare on one box players but can make quite a big difference if you've got golden ears. Headphone sockets are useful but beware of those without volume controls. Track entry keypads are those with calculator style buttons which makes track access much quicker.

CD players

Product	£Price	Comments	DAC type	Electrical digital output	Optical digital output	Remote control	Track entry keypad	Headphone socket	Phase invert	Issue No.
Aiwa XC-300	150	A+ Cheap, cheerful and gratifyingly free of digital 'nasties', well-equipped but safe rather than thrilling on the sonic front.	Toshiba BS	•	•	•	•			107
Aiwa XC-750	180	A A refined version of the XC-700, sadly it has lost the magic of the original	SAA7350	•	•	•	•			119
Arcam Alpha Plus	420	G+ As its name suggests, this is the 1992-version of a classic 16-bit player with an all-round smoother sound!	16-bit	•	•					112
Arcam Delta 70.3	650	G+ A distinctly rugged, beefy sound. Plenty of power behind individual instruments but lacks a feeling of involvement	7350 PDM	•	•					95
Audio Alchemy DDS/DTI/XDP/P52	2047	A+ A multi-box combination with a Bit Stream DAC that is fundamentally more inspiring than its partnering transport.	DAC7	•	•	•	•			120
Aura CD-50	400	G- Based on an older Philips board with new CDM9 transport, this is a slim player with an innocuous sound	SAA7321	•	•					119
AVI S2000MC	999	G+ A stylish, midi-width player with an exceptionally refined and comfortable sound. Lacks passion	20-bit	•	•					119
Cary Audio Design CAD-955	899	A+ Rotel with add-on valve processor to filter-out any RF. Nice idea but sounds very dry and taut, lacking warmth and body.	16-bit	•	•					107
Creek CD60	500	G A big and confident sound from a player that's 'into' green. So it looks ghastly even if the internal design is very thoughtful.	16-bit	•	•					107
Denon DCD-1290	330	G- Looks the business but sound is a real five-minute wonder. Its compelling fizz lasts about as long as a firework.	18-bit	•	•	•	•			107
Denon DCD-2560	600	G Beautifully built but decidedly sluggish, particularly through the bass. Vocals are more forward but can sound a little glassy	20-bit	•	•	•	•			95
Denon DCD-890	270	G- Similar to the DCD-1290 in its execution, sounds lively and powerful but lacks subtlety.	18-bit	•	•	•	•			112
DPA Digital T-1/PDM2mkl	3245	G An ingenious combination that includes a clock-feed from the DAC to CD transport. Capable of astonishing results	DAC7	•	•	•	•			120
Dual CD1080RC	200	A- Strange-sounding player with a top-heavy treble that does little to redress its lack of vibrancy and emotion	MASH/PWM	•	•					107
EAD T-1000/DSP-1000	2195	VG A two-box player based on Pioneer's Stable Platter CD transport. Its music always sounds fast, furious and fascinating.	20-bit	•	•	•	•			120
Goodmans GCD-658	170	A- A 6+1 magazine-loading autochanger with an exaggerated and often aggressive sound	Hybrid	•						117
Harman Kardon HD7450	260	A+ Dominated by a budget decoder/oversampling IC. Good bass nevertheless but pop tracks can sound fizzy and tiring.	18-bit	•	•					107
Harman Kardon HD7500II	300	G+ Tonal integration is very good, packed with detail that's expressed with enthusiasm.	MASH	•	•					95
Harman Kardon HD7600II	400	A+ HD7500II with a motorised volume control and extra-heavy casework. Lacks the transparency and sparkle of the cheaper machine	MASH/PWM	•	•					100
Harman Kardon TL8500	500	A This 5-disc carousel player sounds civilised enough but lacks the detail and finesse of its peers	MASH/PWM	•						117
JVC XL-M406	270	A A 6+1 disc magazine-based autochanger with a rather lean, bright and disappointingly synthetic sound	PEM	•						117
JVC XL-V152	130	A Based on earlier budget designs but minus a remote control. The voluminous but vague sound is equally familiar.	PEM BS							112
JVC XL-Z1050	500	A Technically advanced and luxuriously equipped, this player remains rather bland and unsatisfying on audition	PEM bitstrm	•	•	•	•			119
JVC XL-Z452	180	G+ Another lightweight player but graced with a surprisingly bold and detailed sound. Impressive stuff for the money.	PEM BS	•						112
Kenwood DP-3040	180	G+ The sophisticated sound of this budget player could teach Kenwood's costlier offerings a thing or two!	NPC BS	•						112
Kenwood DP-5040	200	A Better built and technically superior to the older DP-5030 but its untidy, detached treble quality proved a real disappointment	PLM	•	•					107
Kenwood DP-7050	320	A Kenwood's first sowing of Philips' Bit Stream technology has fallen on stony ground judging by its dry and awkward sound	SAA7350	•	•					119
Kenwood L-1000D	830	G A beautifully constructed and very stylish player that really only gives off its best when used in balanced	16-bit	•	•	•	•			100
Kenwood DP-M6640	250	G This 6+1 CD multichanger is hardly the slickest available but it still sounds impressively open and detailed	PWM	•						117
Linn Karik	1497	VG Based on Linn's original CD transport, this player sounds dry but very positive, detailed and engrossing	Crystal BS	•	•					119
Linn Karik/Numerik	2500	G+ Partnering Linn's Numerik DAC with its Karik CD player (as transport) provides a dry, dynamic but also slightly dirty sound.	20-bit	•	•					120
Marantz CD-52II	230	G Launched to usurp the position of its own CD-52SE, the '52II is less colourful but equally appealing	SAA7350	•	•					119
Marantz CD-52IISE	300	G A new mains transformer plus the full complement of internal mods has recaptured the frothy if startling sound of the original '52	SAA7350	•	•					119
Marantz CD-72	400	G+ A heavily-constructed player. This implementation sounds astonishingly solid and immediate but also rather too 'clean'.	bitstream	•	•					107
Marantz CD-72SE	500	G+ A recommendation just eluded the grasp of this superbly built player thanks to its very polished but restrained sound.	bitstream	•	•					112
Meridian 206ΔΣ	995	E A new variation on the 206 theme with the most liquid and captivating sound to date	Crystal BS	•	•	•	•			119
Meridian 208	1550	E State of the art CD sound combined with a decent preamp and full remote control	bitstream	•	•	•	•			83
Meridian 200/263	1390	G Now updated with Crystal Bit Stream technology, this popular duet has unfortunately lost much of the charm and poise of the original.	Bit Stream							120
Meridian 602/606	3100	VG Meridian's top-of-the-range two-box player looks and sounds both distinctive and elegant, the perfect partner for a cultured system!	DAC7	•	•	•	•			120

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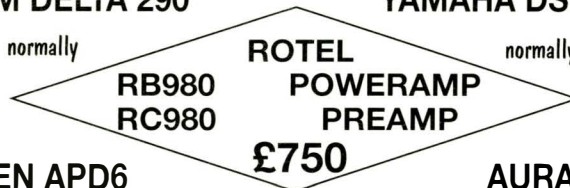
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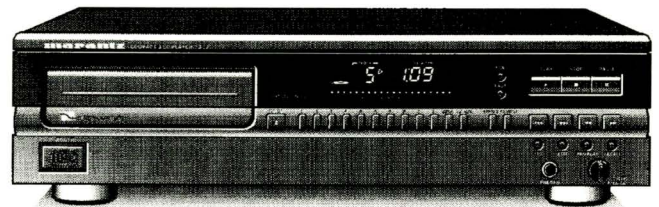
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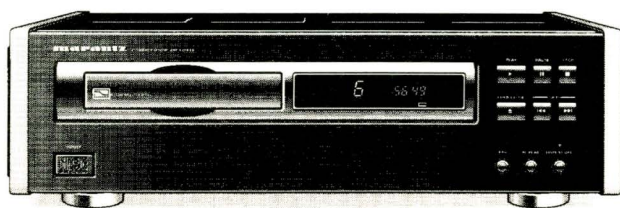
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CD players continued

Product	£Price	Comments	DAC type	Optical digital input	Optical digital output	Headphone socket	Track entry keypad	Phase invert	Issue No.
Micro Seiki CD-M100	5541	G Extravagantly styled, finished and built. The good lab performance led to an only 'good' sonic display	16-bit		•	•			72
Micromega Logic	500	G A version of Philips CD624 with new op-amps and CD tray. Still, it sounds rather meatier, better integrated and more purposeful	SAA7321		•	•			100
Mission DA05	300	A+ Similar to Philips' 600-series: lively, plenty of space and full of 'bounce' but a little too eager to impress in the short term	bitstream		•	•			107
▲ Musical Fidelity CDT	500	G+ Oddball player with a cheap top-loading transport and appalling digital gubbins yet saved by the euphony of its valves!	hybrid						112
▲ NAD 502	200	G This updated version of the 5425 has traded the spontaneity of its forebear for a more precise but mechanical style of music	MASH/PWM		•	•			119
▲ Philips CD920	150	A+ A new budget player with an appalling technical record but a surprisingly clean if understated sound	SAA7341		•	•			119
Philips CD930	180	G- Featuring digital circuitry similar to Marantz's players but a sound that's a little too ripe and soft.	bitstream		•	•			112
▲ Philips CD950	350	G+ Philips' top 900-series player is the first to employ its advanced DAC7 chipset. Sounds very crisp, clear and confident.	DAC7		•	•			112
▲ Pioneer PD-M701	300	G+ A 6-disc multichanger from the originators of the breed. A little untidy perhaps, but still sounds fresh, dynamic and exciting	PDM		•				117
Pioneer PD-M901	400	A Another 6-disc multichanger based on the PD-M701 but with the addition of various 'Sound Field' options. Listening is hard work	PDM		•				117
▲ Pioneer PD-S901	400	G+ The very refined but confident, crisp and powerful sound of the '901 snatches Pioneer's LLC concept from the jaws of defeat	PFM bitstrm		•	•	•		119
Proceed PDT3/PDP3	4598	G+ The third in a series of unusual transport/DAC combinations and a pairing that retains a powerful, confident and rugged sound	20-bit		•	•	•		120
Revox B226S	840	A Top quality build and finish for the Revox system enthusiast. For high value sound look elsewhere	16-bit		•				76
Rotel RCD-955AX	280	A Repackaged version of the evergreen RCD-855. Our sample disappointed, lacking the clean, cohesive quality of the original	16-bit		•	•			107
▲▲ Rotel RCD-965BX	300	E An exceptionally refined bitstreamer: transparent, exquisitely detailed and powerfully emotive. A landmark player	SAA7323		•	•			100
Rotel RCD-965BX LE	380	G- This 'tweaked' version of the fabulous '965BX certainly sounds different, but different is rarely better	SAA7323		•	•			119
▲ Sansui CD-X217	230	G- Sansui has returned to its roots judging by the balmy and very comfortable sound that pours from this player	MASH/PWM		•	•			119
Sansui CD-X317	300	A Not in the same class as older CD-X311mkII. Same technology but the sound is neither as responsive or engaging	MASH		•	•			107
Sansui CD-X617	300	A This 'double-DAC' version of the CD-X317 is more impressive, sounding light and tizzy with pop but dull with classical CD's	MASH		•				112
▲ Sansui CD-X711	600	G+ Luxury features, finish and sound from this classy Sansui; excuses required here	bitstream		•	•			83
▲▲ Sherwood CD-3020R	120	G Although this budget wonder has little respect for musical convention, what emerges is still remarkably entertaining	NPC bitstrm		•				119
▲▲ Sherwood CDC-5010R	200	G+ This highly affordable 5-disc carousel player sounds unexpectedly deep, spacious and involving - a rare find	PDM		•				117
▲▲ Sony CDP-397	140	G The first CD player to be almost entirely composed of miniature surface-mount components. Unsophisticated but enthusiastic sound	PLM		•				112
▲▲ Sony CDP-597	180	G This lightweight version of the acclaimed CDP-797 is equally flexible but provides a slightly warmer and smoother sound	PLM bitstrm		•				119
▲ Sony CDP-797	200	G- Succeeds with its taut imaging, clean and impressive soundstaging. Can seem a little too lean or dry, however.	PLM		•	•			107
Sony CDP-X229ES	300	G- Built to the same standards as the CDP-X339ES but with a colder and less forgiving sound. Lacks a sense of integration	PLM		•	•			112
Sugden SDT-1	850	A Bearing in mind Sugden's SDA-1 converter lies at the heart of this player, its unpredictable performance is disappointing	16-bit		•	•			119
TEAC CD-P3500	170	A A well-meaning attempt to pare-down the CD-P4500 results in a similar looking player with a thoroughly uninspiring sound	bitstream		•	•			112
▲ TEAC CD-P4500	250	G TEAC's first genuine 1-bit player its sound described as having a certain 'organic warmth', very composed and easy-going.	SAA7350		•	•			107
TEAC VRDS-10	769	A+ A basic analogue stage compromises the potential of TEAC's superb engineering and digital electronics. Lacks bass energy	DAC7		•	•	•		119
▲▲ TEAC P-700/D-700	1500	VG They may lack the resolution of high-end colleagues but still sound warm, bubbly and perpetually entertaining.	20-bit		•	•	•		120
▲ Technics SL-PG320A	140	G+ A cheaper and remote-less version of the '420A with an equally dry but vivid, spacious and astringent sound. A good 'un	MASH		•				112
▲ Technics SL-PG420A	160	G+ Offers an open, transparent and uncommonly fresh sound but a little of the 'magic' is missing.	MASH		•				107
▲▲ Technics SL-PG520A	200	G+ A cracking player. Superb clarity and dynamics, thrilling but musically involving too	MASH		•	•			107
▲▲ Technics SL-PS620A	230	G+ A costlier, tarted-up version of the SL-PG520A that loses very little in the way of clarity, sparkle or in compelling dynamics	MASH		•	•			112
▲ Technics SL-PS840	420	A A very refined but highly detailed and engrossing performance from just about the fastest, slickest player on the planet	MASH/PWM		•	•			119
Technics SL-PS900	350	G- Just about the quietest transport in existence and a sound that is equally unobtrusive, polite and refined	MASH		•	•			100
Woodside WS2	1095	G+ Responded well to our jazz and classical selection but sounding bright and grainy with the pop CD's	16-bit		•	•			95
Yamaha CDX-560	180	G An advance on the CDX-450 the light, up-front if t entirely welcoming sound of this newcomer could shock the timid listener	18-bit		•				112
▲ Yamaha CDC-625	300	G A reassuringly solid 5-disc carousel player that sounds smooth, cultured and 'delicately proportioned'. Good value	Hybrid		•				117
▲ Yamaha CDX-660	249	G This cheaper iteration of the CDX-860 provides a similar mix of features with a slightly slower but heavier sound	PDM DAC		•	•			119
▲ Yamaha CDX-860	280	G+ Probably Yamaha's best player to date: powerful and confident yet delicate and nimble when the occasion demands	PDM		•	•			112



CD transports and DACs

A CD player can be split into two basic components, the mechanism which reads the information from the disc, called the transport, and an electronic device which turns the digital bitstream coming off the disc into an analogue audio signal, this is called a digital to analogue convertor or DAC. Although at the lower end of the market both of these are contained in a single box, the best CD players are usually two box affairs.

Although many of these units will be purchased as matching pairs, a DAC can also be

used to upgrade an existing CD player. For instance an early machine with a satisfactory transport but a dated convertor can be rejuvenated by adding an outboard DAC.

The columns on the right indicate the facilities available on a transport or DAC. Remote control is self explanatory. The existence of electrical and/or optical digital in and outputs is pretty fundamental to transports and DACs, as a rule electrical outputs are the most desirable. Class 1 transports are those with an output whose crystal clock accuracy is better than ± 50ppm (parts

per million), certain DACs won't lock onto (and thus can't be used with) transports with a lower clock accuracy. DAC type shows the specific convertor chip employed. In much the same way that an amp's output is not indicative of its sound quality, the chip used in a DAC isn't the only determining factor in a CD player's sound. Phase inversion in the digital domain can make quite a big difference if you've got a high resolution system and golden ears to go with it.

Entries for one make transport/DAC combinations are listed in the CD players section.

CD transports

Product	£Price	Comments	Electrical digital input	Optical digital output	Class 1	Issue No.
Kenwood DP-X9010	500	A+ Compromised by jitter, RF noise and poor clock selection it encourages a dynamic but bright and edgy sound with most DACs	•	•	•	96
▲ Meridian 200	895	G+ Broadly compatible and offering a light, fresh and very bubbly sound that is both natural, engaging and unfatiguing	•	•	•	96

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 Compact 259CD.....£POA
 Compact 359CD.....£POA
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 Compact 707CD.....£POA
 Compact 759CD.....£POA
 MHC-510CD.....£POA
 MHC-710CD.....£POA
 MHC-2750CD.....£POA
 MHC-2800CD.....£POA
 MHC-3800CD.....£POA
 MDS101.....£POA
 SS-V77.....£POA
 SS-J80AV.....£POA
 SA-W90.....£POA
 DSP 2070.....£POA

CD PLAYERS

CDP 411.....£POA
 CDP 711E.....£POA
 CDP 911E.....£POA

CASSETTE DECKS

TCK 411B.....£POA
 TCK 511B.....£POA
 TCK 611B.....£POA

TUNERS

CSTS 2118B.....£POA
 STS 311LB.....£POA
 STS 505ES.....£POA
 Graphic 9.....£POA
 SEO 411B.....£POA

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DSPA500.....£POA
 DSPA1000.....£POA
 DSPA2070.....£POA
 DSP-E200.....£POA
 DSP-E1000.....£POA
 NS-E100.....£POA
 NS-C90.....£POA
 AX 401.....£POA
 AX 470.....£POA
 AX 570.....£POA

CASSETTE DECKS

KX260.....£POA
 KX360.....£POA
 KX650.....£POA
 KXW262.....£POA
 KXW362.....£POA
 KXW952.....£POA

JVC

MACRO HIFI

UXA3.....£POA
 UXA5.....£POA
 UX T1.....£POA
 ADAGIO59.....£POA
 ADAGIO57.....£POA
 ADAGIO56.....£POA
 ADAGIO54.....£POA
 ADAGIO53.....£POA
 ADAGIO52.....£POA

MICRO HIFI

U4A5.....£POA
 U4A4.....£POA

AIWA

CASSETTE DECKS

ADF810.....£POA
 ADF500.....£POA

ADF410.....£POA
 ADWX 929.....£POA
 ADWX 828.....£POA

PIONEER

J10.....£POA
 J10M.....£POA
 J20M.....£POA
 J30M.....£POA
 J40M.....£POA
 N33M.....£POA
 N53M.....£POA
 N73T.....£POA

MISSION

SPEAKERS

760 SE.....£POA
 7601.....£POA
 761.....£POA
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 763.....£POA
 764.....£POA
 753.....£POA
 780.....£POA

BOSE

SPEAKERS

AM 7.....£POA
 AM 5.....£POA
 AM 3.....£POA
 301.....£POA
 401.....£POA
 205.....£POA
 601.....£POA
 701.....£POA

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SPEAKERS

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 PRO 300.....£POA
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 D 165.....£POA
 D 265.....£POA
 D 365.....£POA

TECHNICS

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SC CH950.....£POA
 SC CH750.....£POA
 SC CH650.....£POA
 SC CH550.....£POA
 CD X920.....£POA
 CD X520.....£POA
 CD X320.....£POA
 CD X120.....£POA
 CD C120.....£POA

AMPLIFIERS

SUA 900K.....£POA
 SUA 800K.....£POA
 SUA 700K.....£POA
 SUA 600K.....£POA
 SUV2 320K.....£POA
 SUV2 220K.....£POA

TURNTABLES

SL 1210.....£POA
 SL 1200.....£POA
 SL DD33.....£POA

CASSETTE DECKS

RS BX808K.....£POA
 RS BX747K.....£POA
 RS BX646K.....£POA
 RS BX404K.....£POA
 RS TR777K.....£POA
 RS TR515K.....£POA

RS TR333K.....£POA
 RS TR232K.....£POA

CD PLAYERS

SLPG 340.....£POA
 SLPG 440.....£POA
 SLPG 520.....£POA
 SLPS 620.....£POA
 SLPS 700.....£POA
 SLPS 900.....£POA

KENWOOD

MINI HIFI

UD 300.....£POA
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 UD 500M.....£POA
 UD 700.....£POA
 UD 700M.....£POA
 UD 900.....£POA

MIDI SYSTEMS

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 M 97G.....£POA
 CM 5ES.....£POA
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CD transports

Product	£Price	Comme	Electrical digital input	Optical digital output	Optical digital input	Class 1	Issue No.
TEAC P-2	3300	G Beautifully styled and constructed but sound is bleached and generally less inspiring than that of the P-10	•	•	•	•	96
Technics SL-PA10	470	G Has the unusual limitation of only optical output. Reassuringly solid and more immune to vibration than most		•	•		88

DACs

Product	£Price	Comments	Electrical digital input	Optical digital input	Phase invert	Issue No.
▲ Arcam Black Box 3	300	G+ Top of a series of three decoders it can offer a high sonic standard with top class transports	Bitstream	•	•	88
Arcam Black Box 5	450	G Equipped with Sync Lock for D170.3. It gives off its best with a standard 75ohm transport like the TEAC P-10.	hybrid	•	•	113
▲▲ Audio Alchemy DDE v1.0	420	VG A very sweet and seductive sounding unit that gives good results with a wide range of CD players/transports	Bitstream	•	•	101
Audio Synthesis DSM-M	1234	G+ A weighty but neutral and highly calculated performer, best suited to transports like the P-10, despite Sync Lock facility.	20-bit	•	•	113
Beard DAP-1	975	A- Clad in a wooden case this marriage of digital technology and valves has hit the rocks, a disappointingly flat sound	16-bit	•	•	113
▲ DPA Digital Bigger Bit	700	G With either P-10 or Meridian 200 transports it delivers a very taut and dynamic sound, bathed in an open acoustic	DAC7	•	•	103
DPA Digital Little Bit (Optical)	400	VG Works especially well with Meridian's 200 transport but does require the services of Deltec's 'Power' mains filter	SAA7350	•		101
DPA Digital PDM1 Series 3	1280	G+ Bears technical comparison with both PDM2 and Bigger Bit but - in terms of sound quality - is great advance on the latter	DAC7	•	•	103
▲ ds/d Decode-1	495	G Elegantly designed bitstreamer with plenty of inputs, can sound too bright, immediate or artificial for its own good.	Bitstream	•	•	113
▲ Forte Audio Model 50	950	VG A typically big and full-bloodied sound, infiltrated by a slightly euphonic quality but never hard or gritty.	DAC7	•	•	103
Meridian 606 DAC7	1350	G By refining the 203's sound further Meridian have also tempered its vibrancy and 'life'. Fickle with other transports	DAC7	•	•	101
Micromega Duo BSII	550	G Has a tendency to sound light, airy and 'fast' but it can also become a little hard or - fatiguing with some digital outputs	SAA7321	•	•	101
Micromega Microdac	300	A+ Described as a modest but entertaining performer, achieving its sweetest balance with Arcam's D170.3 transport.	SAA7321	•	•	113
▲ Mission DAC5	299	G+ Another modest DAC but one capable of a lean but clean and detailed sound that's typical of the DAC7 breed.	DAC7	•	•	113
▲ NVA DAC-ON	730	G+ DAC-ON actually turns out to be a QED Digit linked to substantial external supplies. A ruse that undoubtedly improves its sound	SAA7323	•		113
PS Audio Superlink	1498	G- Does the business with Meridian's 200 but can sound bloated, smeared and even vaguely electronic other transports	18-bit	•	•	103
▲▲ QED Digit	139	G+ Bearing in mind its expressive but very forgiving performance the Digit is almost embarrassingly cheap	SAA7323	•		113
Roksan ROK-DA1/ROK-DS4	995	G+ A creditable affair, both expansive and expressive in character but rather also lean in balance.	Crystal	•		113
Stax DAC-Talent	1400	G+ Natural, refined and never over-zealous, its also capable of sounding very spicy and dynamic. Can be a maturing influence	20-bit	•	•	101
▲ Sugden SDA-1	749	G+ A pleasant surprise from the fuddy-duddies of audio, judging by its 'masses of high resolution detail and tremendous dynamics'	TDA1541it	•		113
Sugden Stemfoort PDA-10	1200	G+ Unfortunately this 'upgraded' SDA-1 is less impressive than the original, losing out on dynamics, airiness and subtle detailing	16-bit	•	•	113
Threshold DAC 1/e	3150	G+ Can sound beautifully detailed with a marvellous sense of scale and sharp, solid images. Compatibility is unpredictable	MASH	•	•	103
Woodside DAC1	909	G Fine but slightly dated and costly package in performance terms - but flexible, musical and t well built	16-bit	•	•	87
▲ Woodside DAC2	510	G+ Offering a sharp and dynamic sound, all the more captivating for its lack of graininess and 'tizz'. A reliable upgrade	16-bit	•		101



DAT players

DAT, or digital audio tape, has been on the market for quite some time now but has never really 'made it' as a consumer medium, probably due to the fact that very little prerecorded software has been made available. In the last year or so it has begun to carve itself a niche at the top end of the market replacing reel to reel tape recorders as the audiophile's

tape based medium. The DAT standard specifies a 48kHz sampling rate, which is higher than CD, so direct copying in the digital domain is only possible on those machines with dual sampling frequencies, ie 48kHz and 44.1kHz. Some machines also record at 32kHz to give a longer recording time for a given length of tape, this is shown in the LP

mode column. The optical and electrical in/outputs in the column headings are for digital signals, analogue in/outputs are universal. The AES/EBU and S/PDIF socketry is for connection to professional components and typically DAT machines with this facility have been made for the pro and semi-pro markets.

DAT players

Product	£Price	Comments	Remote control	Optical in/outputs	Electrical in/outputs	AES/EBU in/outputs	S/PDIF in/outputs	Issue No.
JVC XD-Z1010TN	1050	A+ Ambitious but ultimately disappointing deck with an opaque musical delivery and more features than you can shake a stick at	•	•	•	•		111
▲ JVC XD-Z505	620	G Competent middle market DAT with uncomplicated (but still flawed) user interface, but good basic sound quality	•	•		•		105
Kenwood DX-7	500	A Sound quality is pretty fair, but a little rougher than the best of the breed. Controls are good, the display however is poor	•	•				94
Kenwood DX-7030	700	A- Bland sounding deck that lacks low level clarity and imaging. Build quality is good however and ease of use ranks highly		•	•	•		99
Panasonic SV-3700	1111	A Slick, powerfully equipped, this pro DAT has a clear, quick and colourful sound somewhat lacking in weight and substance		•			•	111
▲ Sony DTC-55ES	550	G Broadly comparable to a middle ranking CD player sonically, the Sony is particularly well equipped and well priced.	•	•	•	•		93
Sony DTC-77ES	1000	A Superb engineering, many nice features (including off tape monitoring) but perceptibly slowed, thickened sound	•	•	•	•		105
▲▲ Sony TCD-D3	500	G+ At the time of writing, this model represents the state of the art, and beats all comers.	•			•		94
Tascam DA-30	1199	A+ Interesting pro DAT deck with solid, tangible sound quality which is nevertheless lacking in analysis		•			•	111

EUROPEAN IMAGING & SOUND
ASSOCIATION AWARDS

The Winners available from Bartletts

Mission 753 loudspeakers

NAD 302 amplifier

Yamaha DSPA 2070 DSP amplifier

The HiFi Choice Recommendations & Best Buys available from Bartletts

Amplifiers

**Denon PMA 450
Harman Kardon 6150
NAD 304**

Turntables

**Revolver Rebel
Thorens TD 166/RB 250
Systemdek 11X900/RB 250**

Cassette Decks

**Aiwa ADF 410
Aiwa ADF 810
Yamaha KX 260**

CD Players

**Marantz CD 52 II
Marantz CD 52 II SE
NAD 502**

Loudspeakers

**B&W DM 620i
Epos ES II
Tannoy 609**

Tuners

**Audiolab 8000 T
Denon TU 260 L
Harman Kardon TU 9400**

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Bartletts Suggested Systems

The Bartletts Suggested Systems listed below are supplied with the Marantz CD 52II, an alternative CD player or Turntable are available, see below for price details. All systems are supplied with 8 metres of 79 strand loudspeaker cable. QED 4mm plugs are available at a cost of £1.00 each. Carriage charge for delivery to an address on the UK mainland is £12.00 per order. All items are sent fully insured. Prices were correct at time of printing but are subject to change without notice. E&OE.

	Celestion 1	Mission 760i Celestion 3 Tannoy 603	Tannoy 605	Mission 761i B&W DM 600i Celestion 5	Tannoy 607 B&W DM 610i Celestion 7	Rogers LS2A2	Mission 762i	Rogers LS4A2 Tannoy 609
Marantz PM 44 SE	414.95	459.95	487.95	499.95	533.95	541.95	557.95	590.95
Marantz PM 32	365.95	404.95	435.95	443.95	477.95	489.95	505.95	529.95
Marantz PM 30 SE	381.95	429.95	459.95	469.95	499.95	509.95	524.95	549.95
Marantz PM 40 SE	373.95	413.95	419.95	449.95	481.95	497.95	513.95	559.95
Nad 302	389.95	426.95	454.95	462.95	494.95	510.95	526.95	550.95
Nad 304	439.95	485.95	513.95	521.95	553.95	569.95	575.95	609.95
Harman Kardon 6150	414.95	445.95	475.95	488.95	521.95	529.95	545.95	569.95
Harman Kardon 1200	479.95	512.95	541.95	553.95	586.95	594.95	611.95	652.95

Choices. The following CD players or Turntables can be ordered instead of the Marantz CD 52II in the above systems.

CD Players

Aiwa XC 300	Deduct £90.00	Marantz CD 42 II	Deduct £50.00
Denon DCD 595	Deduct £50.00	Marantz CD 52 II SE	Add £70.00
Denon DCD 695	Deduct £30.00	Nad 502	Deduct £10.00
Denon DCD 890	Add £40.00	Philips CD 930	Deduct £50.00
Denon DCD 1290	Add £100.00		

Turntables

Nad 5120	Deduct £129.00
Dual CS 503-2	Deduct £70.00
Dual CS 505-4	Deduct £30.00
Thorens TD 280 IV	Deduct £22.00
Systemdek IIX 900 inc.RB 250 AT 110e	Add £95.00

Bartletts Super Savers

	Normal Price	Saver Price
Marantz CD 42 II CD player	199.90	169.90
Celestion One Loudspeakers	109.90	79.90
Micromega Logic CD player	568.90	299.90
Micromega Leader CD player	849.90	499.90

Bartletts System of the Month

Marantz CD 42 II CD player	£299.90
Marantz PM 40 SE amplifier	
Celestion One Loudspeakers	
8m 79 strand cable	

Carriage for the above system £20

Bartletts HI-FI

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Headphones



There are a variety of different approaches to headphone design. Amongst the more expensive models, electrostatic drivers are used in open-backed phones. The majority of these come with some form of transformer which usually takes the signal from the speaker terminals on the amplifier, but some can run from a pair of tape out sockets.

The more down to earth (see affordable) models feature dynamic, or moving coil, drivers in circular open or closed backed designs. The advantage of open backs seems to be a correspondingly open sound, but one can also of course hear external noises. Closed-back designs are useful in situations where it is necessary to block out background noise, but they aren't gen-

erally as good sonically.

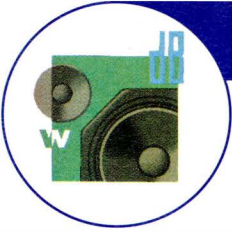
Another means of distinguishing different types is the way they sit on your head. There are three styles: circumaural models enclose the ear and rest on the side of the head; supra-aural designs feature a flat pad which presses on the outer ear (pinna); and intra-aurals rest inside the ear itself, and are popular with personal stereos.

Headphones

Product	Price	Comments	Type	Open back	Closed back	Dynamic	Electrostatic	Issue No.
▲ AKG K1000	500	E One of the best dynamics on the market, hooks directly to speaker outputs and makes much of the competition sound lame	Extra-aural	•	•	•	•	99
AKG K135	33	A The K135s don't live up to the usual AKG standards, though they do have the ability to reproduce rhythm well	Supra-aural	•		•		63
▲ AKG K240 Monitor	60	G Something of a classic, these AKGs are very user friendly in all respects; sonically on the warm side of neutral	Circumaural	•		•		63
▲ AKG K280 Parabolic	90	G+ A very revealing and unusual twin driver design that uses the same principle as a satellite dish to beam sound into the ear	Circumaural	•		•		63
▲ AKG K340	140	E Heavyweight cans in most respects, the K340 with its electrostatic tweeter is a very revealing headphone	Circumaural			•	•	75
AKG K44	40	A Good quality personal oriented phone, could have a better sense of space but is musically quite communicative	Supra-aural	•		•		99
▲ AKG K400	100	VG Comfortable over long sessions. Sound is exquisitely detailed, dynamic and uncoloured	Supra-aural	•		•		121
▲ AKG K500	119	G+ Open and clear, they reproduced music with impressive definition, balance is on the light side but transparency is high	Circumaural	•		•		111
Aiwa HP-X30	31	G- A flashy personal stereo phone which alternatively could be used at home. A slight LF tonal preference colours the response	Supra-aural			•	•	75
▲ Audio-Technica ATH-308	26	A- Small cans with a fairly forward balance which helps perceived clarity but can become wearing over time, good for personals	Supra-aural	•		•		111
▲ Audio-Technica ATH-609	31	A- Warm feeling and sounding with impressive physical substance for the price, could be more relaxed and open	Circumaural	•		•		99
Audio-Technica ATH-611	51	G Same basic design as 609 but bigger thinner diaphragm makes this a more relaxed and informative headphone	Circumaural	•		•		99
Audio-Technica ATH-9000	246	G Electrets which connect to the amps speaker outputs, it sounds a little too smooth but would suit aggressive amps	Circumaural	•				111
▲ Audio-Technica ATH-910	70	G The closed-back 910s are an improvement on the 909s with a nice rhythmic quality rarely found with headphones	Circumaural			•	•	55
▲ Audio-Technica ATH-911	80	VG Nicely finished dynamic headphones with all the trimmings, plus a very clean and subtle sound	Circumaural	•		•		63
Bandridge EH910DD	50	A- Modestly successful mid/top, but dreadfully cloying, ploddy bass makes this model essentially unlistenable	Circumaural			•	•	121
▲ Beyer DT-211	25	A Good value compact, couth and enjoyable, esp in midband. Earpads not removable for cleaning	Supra-aural	•		•		121
Beyer DT411	49	G A reasonable but not very thrilling headphone that doesn't really offer enough at the price	Supra-aural	•		•		111
▲ Beyer DT911	179	VG Probably too revealing for many headphone amps these are very subtle and fine if expensive cans	Circumaural	•		•		111
▲ Beyer DT990	102	VG A significant pair of dynamic headphones; they have a smooth and yet revealing neutral sound that is hard to criticise	Circumaural	•		•		55
▲ Beyer IRS690	203	VG High quality infra-red headphones with soft comfy earpads and mellow but informative sound quality which is hard to dislike	Circumaural	•		•		75
JVC HA-D690	40	A Competent but rather undistinctive cans, a bit middle of the road and well suited to aggressive sources	Supra-aural			•	•	111
JVC HA-D910	60	A Broadly acceptable if unexciting design with low level losses and some colourations	Circumaural			•	•	121
▲ Jecikin Float Electrostatic	399	E These electrostatics have an openness of sound rarely found in the breed, with good dynamic range to boot	Circumaural	•			•	55
▲ Jecikin Float Model One	79	G+ Whilst very unusual in appearance, the Floats give remarkable sound quality and openness at a reasonable price	Circumaural	•		•		55
▲ Jecikin Float Model Two	99	G+ Helmet shaped and pretty unflattering but open sounding and comfortable in the long term. te lack of adjustment	Circumaural	•		•		63
Kenwood KH-1000	20	A- First step up from a true mini: a near miniature which is cheap, comfortable and inoffensive	Supra-aural	•		•		121
Philips SBC3390	60	A Up front but rather aggressive headphone with lightweight, coloured sound. Not very comfortable.	Supra-aural			•	•	121
Quart Phone 75X	70	A Unusually comfortable sealed headphone, though sound isolation poor. Hard, edgy sound quality.	Circumaural			•	•	121
▲▲ Sennheiser HD440 II	30	A+ Still the one by which others at the price are measured, though now slightly leaden sounding, cold treble	Supra-aural	•		•		121
▲▲ Sennheiser HD 480II	50	G Not the most accurate cans on the market but amongst the most enjoyable	Supra-aural	•		•		111
Sennheiser HD 540II	100	G+ A good but not great headphone that due to its high impedance and efficiency should work well with most sources	Circumaural	•		•		111
▲▲ Sennheiser HD40	20	G- Very light and comfortable headphones with an even sonic balance that will suit most sources. 6.3mm jack	Supra-aural	•		•		75
Sennheiser HD450II	40	G- Makes quite acceptable noises with a variety of outputs, could sound more spacious but is pleasantly relaxed	Supra-aural	•		•		99
▲ Sennheiser HD480 Classic II	60	G Same basic design as the 450 but improved sound quality as a result of aluminium coil and extra damping, natural with good bass	Supra-aural	•		•		99
▲ Sennheiser HD520	65	G+ A very comfortable and musically capable headphone. If you've got this sort of bread to blow on cans, give 'em a blast	Circumaural	•		•		75
▲ Sennheiser HD530	75	G+ 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	Circumaural	•		•		75
▲▲ Sennheiser HD560 Ovation II	125	VG Characteristic slightly heavy sound, but still the benchmark at this price level. High class sound and comfort	Circumaural	•		•		121
▲ Sony MDR-CD1000	150	G+ A fine sounding and comfortable headphone that's likely to work well with most sources	Circumaural			•	•	111
▲ Sony MDR-CD3000	300	G+ Better than most of the headphone outputs around so hard to make the most of, potentially up there with the electrostatics	Circumaural			•	•	99
▲▲ Sony MDR-CD350	32	G Very impressive, possibly the most open sounding cheap closed back can around, lightweight in balance but transparent	Circumaural			•	•	99
▲▲ Sony MDR-CD550	50	G+ A very competent headphone, creates a remarkable sense of space for a closed back design and sounds natural to boot	Circumaural			•	•	99
▲ Sony MDR-CD750	73	G+ Reasonably comfortable and eminently listenable these Sonys have characteristically good bass power and relaxed hf	Circumaural			•	•	111
Sony MDR-CD850	100	A+ Very comfortable, and reasonable sound - better than most sealed designs - though hardness intrudes	Circumaural			•	•	121
▲ Sony MDR-R10	2500	E State of the art design built to the highest standards. Sound quality reflects this care, being big, clear, sweet and refined	Circumaural			•	•	72
▲ Stax Gamma pro/SRD-X pro	583	E The Gamma pros are like a stethoscope for your hi-fi, revealing subtleties that many loudspeakers fail to resolve	Circumaural	•			•	63
▲ Stax Lambda Signature/SRM-T1	1370	E The Signature when combined with the SRM-T1 valve driver must be the most transparent headphone available	Circumaural	•			•	72
▲ Stax SR Gamma	219	G+ The next model down the Stax range from the Lambda, the Gamma is an excellent headphone with little to criticise but the price	Circumaural	•			•	55
▲ Stax SR Lambda Pro/SRD-7SB	559	G+ An industry reference, frighteningly revealing, bringing across more information than loudspeakers costing twice as much	Circumaural	•			•	55
▲ Stax SR Lambda Pro/SRM-1	1020	E Extracts layers of information that other headphones only hint at. The SRM-1 has more edge than the SRM-T1	Circumaural	•			•	75
Stax SR34	140	G+ The electret driven SR34s are lively and rhythmic with good tight bass and a sweet midrange	Supra-aural	•				55
▲ Stax SR84	210	G+ The stepping stone between dynamics and full electrostatics, these electret phones are revealing, open and highly enjoyable	Supra-aural	•				63

Headphones

Product	£Price	Comments	Type	Open back	Closed back	Dynamic	Electrostatic	Issue No.
Technics RP-F10	100	A Another very comfortable sealed model, modest sound isolation and uneven sound favouring bass	Circumaural			•	•	121
▲▲ Vivanco SR808 Classic	55	G A new mid-price reference from a new and interesting source. Good all round, no obvious shortcomings	Supra-aural	•			•	121
Yamaha YHD-1	46	G Stylish semi-folding design with a slightly forward balance that very nearly scraped a recommendation	Supra-aural	•			•	111



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 small-

ish 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), shown as 'bass from', for the given box size. After that such subtleties as coloration (or lack of it) and dispersion come into the equation.

Careful placement of the loudspeakers within the room is as important as the initial choice of model. See siting columns for guidance. For good stereo they need to be more or less the same distance from nearby walls. Models not ticked as 'floorstanding' will require rigid stands.

Loudspeakers

Product	£Price	Comments	Size: HxWxD (cm)	Site close to wall Bass from (Hz)	Site in free space Sensitivity (dB)	Floorstanding	Issue No.
ATC SCM20	1461	G+ Massively built, invariably informative but the rather forward presentation can be uncomfortable	44x24x31	28	82	•	86
▲ Acoustic Energy Aegis 1	452	G Rich and slightly heavy balance doesn't mask fine mid/treble coherence and transparency. Entry level for all-metal drivers	39x21x26	28	84	•	118
Acoustic Energy AE1	764	G Amongst the best miniatures around, shows exceptional mid focus and coherence, but is pricey and could be more agile.	29.5x18x25	48	84	•	102
▲ Acoustic Energy AE3	1650	G+ Solid, authoritative and impressively accurate – if a shade ponderous and slow	63x26.5x37	23	85	•	86
Acoustic Research Pi 3	219	A Lively good value box has extra bass driver to give plenty of thump, but lacks refinement and extension	51.5x21x23	50	88	•	110
Acoustic Research AR M.5	129	A- Pretty enough but a bit too tiny for its own good, it's better suited to auxiliary surround sound duties	22x16x23	50	88	•	114
▲▲ Acoustic Research AR M1	199	G Cutely shaped miniature delivers splendidly unboxy bass and midrange, but is a little marred by a rather bright treble	27x20x26	30	85	•	110
Acoustic Research AR M2	269	A Not necessarily as agile or well balanced as the cute little M1, M2 is larger, louder and still attractively unboxy	41x24x36	28	89	•	118
▲▲ Allison AL100	100	A Loud and lively budget wall-mount is bigger and beefier than most of the competition, if lacking some subtlety and refinement	33.5x24x21.5	30	87	•	94
Allison AL105	170	A- Pretty enough in appearance, sonically the AL105 doesn't really make the grade at the £150 asking price	37x24x21	45	87	•	78
▲ Allison AL110	220	G- Compact bookshelf model is a little dry and mid forward, but bass is extended and solid	40x24.5x22.5	28	86	•	102
Allison AL120	420	A Pretty well balanced if slightly mid forward, but sound quality is a little disappointing for the price	63x28x27	30	88	•	98
Allison MS 200	220	A- Small and solid as a brick, this micro-miniature has limited bass and bright balance, but sounds agile and communicative	25.5x14.5x15	50	85	•	106
▲ Apogee Caliper Signature	3998	G+ Power hungry full range ribbon panels have remarkable transparency and delicacy, loudness and 'grunt' are a bit lacking	122x70x6.5	30	81	•	81
▲ Arcam Delta Two	340	G Pretty luxury compact sounds a shade forward and coloured but has dynamic and lively bass for its size	37.5x22.5x27.5	40	87	•	94
▲ Audio Note AN-E	1300	G+ Lovely coherence, great midband dynamics and transparency, extended bass and high sensitivity — pity it's so darn ugly!	80x36x28	20	91	•	106
▲ Audio Note AN-J	799	G+ Light damping and local unevenness adds some coloration, but doesn't spoil the very lively, dynamic and coherent sound	58.5x33x24.5	25	90	•	110
▲ Audioplan Kontrapunkt	899	G+ Sounds as sweet as it looks, dressed expensively in real wood with matching stands. not for bass or loudness freaks	31x24x13	48	83	•	86
▲ B&W 2001	120	A Cunningly concealing its (very real) limitations, this is just about the smoothest and best balanced miniature around	29x18x21	48	87	•	118
B&W 2003	190	A- Flashy and assertive ghetto blaster styling is not reflected in the rather bland, if well balanced sound	43x21x25	30	88	•	122
B&W 610	220	A Bass extension and impressive loudness credentials, but rather indifferent integration and coherence	49x23.5x30	25	89	•	102
▲▲ B&W 620	370	G Has well balanced, laid back and slightly lazy sound that is pleasantly easy on the ears; could do with its own spikes	74x23.5x30	25	89	•	94
▲ B&W DM600	170	A+ An impressively smooth overall balance, but sound is a touch bland with it	35x20.5x25	30	85	•	98
▲ B&W Matrix 801	3495	G+ Lacks the transparency of the best panels, and the drama of the best dynamics, but is something of an acoustic tour de force	77/99x56x43	<20	86	•	81
B&W Matrix 805	845	G Stylish, with remarkable imaging properties, good balance and low coloration, though less successful at musical communication	42x26x22.5	30	87	•	98
▲ Bose 305	390	G- A bit of an oddball, fine dynamic liveliness and a good room match more than make up for the strange stereo imaging and treble	28x45x23	40	88	•	78
Bose 401	456	A Cheaply built but distinctively styled semi-omni floorstander suffers from heavy midbass but still sounds lively and open	78.5x30x28.5	28	89	•	110
Bose 901 MK6	1496	A The pre-equalised multi-driver 901 is cleverly engineered to deliver exceptional loudness	33x54x32	28	89	•	86
Bose Interaudio 3000XL	170	A- Lots of perceived value and well enough balanced, but low cost engineering results in a crude and unobtrusive sound	46.5x29x23	45	89	•	71
Boston HD5	130	A Tiny and prettily shaped miniature has an attractive lack of boxiness, but is a little short of drama and dynamic drive	25x16x18.5	30	86	•	110
Brinkmann Endymion	395	A+ Omnidirectional design with rococo styled urn-shaped ceramic enclosure. Distinctly bass light, but impressively coherent	48x29 (diam)	50	85	•	106
▲ Cabasse Bisquine	600	G+ Classy French large bookshelf speaker has great coherence and dynamic grip, but a rather mid-forward overall character	48x26x30.5	30	91	•	110
▲ Cabasse Skiff	1500	G+ Large floorstanding three-way gives great sensitivity and bass extension with fine dynamic grip	100x30x36	25	92	•	122
▲ Canon S-30	150	A+ Clever and unusual moulded design has attractive lively coherence, along with 'wide imaging stereo' effect	27x22.5x23.5	50	88	•	114
▲ Canon S-50	350	A+ Only a small cone miniature at heart, the fascinating styling and extended sweet spot feature make it utterly original.	30x24(diam)	48	84	•	102
▲▲ Castle Chester	650	G+ A brilliant throwback, using horn-type approach to provide startling midrange dynamics and coherence.	94x23x27	45	87	•	98
Castle Durham	250	A Like the slightly larger York, the very pretty presentation is not reflected in a similarly sweet sound	40x22x24	48	88	•	118
▲ Castle Pembroke	400	A+ Comfortably recommended, a sweet smooth sound with good overall balance of engineering-based performance	55x37.5x30.5	46	88	•	31
▲ Castle Trent II	190	A Very classy finish for the price, plus a sound that passes muster without setting anything much alight	33.5x18x20	50	88	•	122
▲ Castle Winchester	1499	G+ Unconventional and beautifully crafted, large for its bass extension but engagingly agile and attractively open and airy	114x24x47	25	87	•	90
Castle York	340	A+ Pretty little real wood compact has an engaging transparency, good balance and fine timing, could do with more authority	43x22x26	30	86	•	110
▲▲ Celestion 1	109	A Pretty basic performance but at a very basic price — it all sounds a bit scrappy and untidy, but its heart's in the right place	27.5x16x21	50	87	•	114
▲ Celestion 15	389	G Big box and bang for your bucks, short on subtlety and control, but long on both enthusiasm and perceived vinyl wood grain	103x20.5x25.5	28	90	•	114

Loudspeakers continued

Product	Price	Comments	Size: HxWxD (cm)	Site close to wall Bass from (Hz)	Site in free space Sensitivity (dB)	Floorstanding Bass from (Hz)	Issue No.
Celestion 3	129	A- Now reflex ported, this budget miniature is neat enough all round but sounds terminally unexciting with it	30.5x18.5x22	48 87	•		122
Celestion 5	169	A Cunningly conceived and balanced, the 5 may be a little slow for some tastes, but is well suited to CD-oriented budget systems	35x20.5x26	30 89	•		90
▲ Celestion 6000	1510	G+ A genuine full range audiophile quality speaker system – with Star Wars styling to suit a high tech environment	Two box system	30 82	•		C92
▲ Celestion 7	219	A+ Good looking large bookshelf size wall-mount has lively up front presentation. Can sound a bit coarse, stand is critical	45x24.5x32	30 87	•		98
Celestion 9	269	A Nicely presented and fair material value, with impressively flat bass-to-mid balance	49.5x20.5x24	30 89	•		102
Celestion SL12Si	629	A Elements of fine sound quality, but this 'grown up' SL6 variation has a lumpy response alongside its improved power handling	53x20x27	50 85	•		66
Celestion SL600Si	820	G Has certain remarkable qualities that some will find irresistible, but needs careful system and room matching	27x20x23	52 82	•		68
Celestion SL6Si	429	A+ This stereotype luxury compact can sound a bit dull and congested, but really opens up on Slate Audio stands; favours CD	37.5x20x25	30 86	•		94
Celestion 300	1100	G Splendid bass extension and fine panel-like openness and transparency, but dynamics and timing are suspect, balance very laid back.	100x21x31	<20 86	•		118
Creek CLS 10	119	A Almost identical to the Goodmans Maxim 3, this neat miniature is very competently engineered, but not desperately exciting	26x17x21	50 85	•		114
Dali 102	230	A Attractive bookshelf model has fine midband focus and bass extension, but treble's a bit restrained and bass a bit detached	37x21x25	30 86	•		114
Dawn Chorus FS	698	G Compact floorstander with superb coherence but rather forward midband. Would suit smaller rooms best	91x26x21	30 86	•		114
▲ Diamond Acoustics Reference III	895	G+ Lovely free stander suffers from indifferent bass alignment, but is fast, coherent, solid and very informative indeed.	87x27.5x28	30 90	•		106
Dynaudio Contour1.3	1199	G Heavyweight luxury finish bookshelf model has good scale and weight but is pricey and a bit ponderous	38x20.5x29	28 86	•		122
▲▲ Epos ES11	350	G+ Integral baffle/driver to give a remarkable combination of low coloration, transparency and speed; bass is a bit shy	37.5x20x25	45 86	•		94
▲ Epos ES14	515	G+ Substantial stand mount delivers delightful midrange focus and delicacy with good bass control. System sensitive	49x22.5x29	25 85	•		98
▲ Faraday FS1	225	A+ Concrete box on a budget, works surprisingly well despite cheap drivers, wood veneers here Direct sale only	47x27x28	45 86	•		114
Faraday FS5	589	G Pricey and ugly, but with its own sonic charm, thanks to substantial influence of the concrete enclosure has upon the sound	46x27x26	28 90	•		102
Faraday Siren	330	A- Interesting if ugly high mass concrete cabinet is let down by imbalance of ageing driver combination	46x27x27	48 87	•		94
Genexxa SE100	150	A Tandy-budget miniature is attractively lively, coherent and communicative, could do with more grunt and lower coloration	28x15.5x19	50 84	•		110
▲ Goodmans Maxim	120	A Budget miniature offers well balanced strengths and few weaknesses at a very realistic price; a bit feeble	26x17x20	30 85	•		122
Harbeth HL Compact	584	A Clean, neutral sound lacks resolution and gives rather unsubtle though well differentiated stereo	52x27.2x28.1	65 87	•		59
Harbeth LS3/5A	379	A Still a classic miniature, though not to every taste, and none the better for the recent update under our listening conditions	30.5x19x16	60 81	•		66
▲ Harbeth HL-P3	400	G Very limited loudness but impressive full-range scale from uncoloured and very well balanced but time-smearing sub-miniature	31x19x17	23 82	•		118
Heco Presto Superior 750	650	A Tall slim and attractive floorstander delivers a fine, even in-room balance but lacks transparency, coherence and dynamic drive	95x24x27	22 87	•		106
Heco Reflex 10	160	A Nicely balanced small bookshelf is a competent rather than exceptional package for the price, thanks to indifferent build.	32x21x23	30 90	•		102
▲▲ Heybrook HB1 S3	250	G Latest version of long established favourite delivers good liveliness and fine coherence for the price	47x29x24	30 88	•		98
▲ Heybrook Prima	120	A+ Neat and discreet miniature delivers fine coherence, pace and timing, though balance is a trifle forward and bass a bit light	29x19.5x18	50 86	•		110
▲ Heybrook Quartet	555	G Beautifully presented and built large bookshelf model with good sensitivity and a lively, forward sound	41x24x23	48 89	•		122
▲ Heybrook Sextet	1079	G+ Engagingly coherent and a highly analytical, partly due to distinct and t always comfortable upper-mid forwardness	96x27x20	25 85	•		102
▲ Heybrook Solo	170	A+ Discreetly styled, sounds a little untidy in both bass and treble but handles complex rhythmic material much better than most	36x23x22	28 87	•		90
▲ Heybrook Trio	349	G Same drivers as HBS1 in prettier real wood enclosure give a sweeter and more forgiving if less committed sound	47x24x25	45 89	•		118
Infinity Modulus	795	A+ Carefully conceived and beautifully built. Undeniably attractive in the mid and treble, it failed to handle the bass as well	30x18x26	45 84	•		86
▲ Infinity Reference 10	180	A An engaging and lively sound from a prettily finished and substantial small bookshelf size model	36x23x23	50 87	•		98
Infinity Reference 20	230	A Well presented and balanced with good bass control, but somehow lacks convincing cohesion and agility.	46x27x24	27 88	•		102
▲ Infinity Reference 30	400	G Budget price floorstander has good overall balance and bass extension, but is rather coloured and uneven	86x27x24	25 89	•		122
Infinity Reference 50	550	A- Despite hi-tech drivers, good bass extension and sensitivity, this three-way suffers from a forward, coloured sound	86x26.5x25	25 89	•		98
Jamo 307	300	A- Beautifully styled bookshelf baby places more emphasis on presentation than basic engineering	32x18x27	48 86	•		122
JBL Control 1 Plus	250	A Sub-miniature with forward midrange and real bass; highish price partly justified by near-indestructible Pro build	23x15.5x14	50 89	•		90
JBL L1	450	G Good power handling, decent transparency and deep but current hungry bass from a compact and solid enclosure	40x21x25.4	47 87	•		121
JBL ti1000	1500	G Ultra-engineered, beautifully crafted bookshelf model. Performance compromised by over enthusiastic midbass output from port	44x30x28	45 89	•		118
▲ JPW AP2	180	A Offers real wood veneer at a bargain price; performance is cleaner but broadly comparable to P1 Vinyl overall	43.5x25.5x26	45 86	•		106
▲ JPW AP3	225	A+ Pretty good stereo and well balanced overall it had its own character which is well suited to vinyl replay	52x25x29.5	57 90	•		46
▲ JPW Minim	79	A- Very civilised but dynamically limited, the Minim is well suited to the smaller room and where limited loudness is acceptable	27.5x18x19.5	28 85	•		82
▲▲ JPW Mini Monitor	£60	A- Ultra cheap Richer Sounds special is lightweight and short of welly, but a snip for surround sound use	27x18x17	50 85	•		122
▲ JPW P1	155	A+ Honest and basically articulate if not very sophisticated, resolution is good but can sound a little wearing in bright systems	44x25.9x26.1	60 89	•		59
▲▲ JPW P1 Vinyl	135	A A lot of highly competent loudspeaker for the price, with a safe sound that's unlikely to disappoint.	43.5x25.5x26	32 87	•		102
▲▲ JPW Sonata	115	A+ Well balanced and integrated, offers fine sound if limited bass and dynamic range, plus real tree wood at a nearly silly price	32x23x20	55 86	•		71
JPW Sonata Plus	135	A- This luxury variation on the redoubtable Sonata theme features a metal dome tweeter, and isn't the better for it	32x23x21	30 87	•		90
▲ JRT AD1	500	G+ A fair share of cosmetic deficiencies do little to spoil the impressive coherence and timing	59.5x28x36	28 86	•		86
▲ JRT AD1 Micro	389	G Delightful life and coherence, gives surprising impression of scale; some aggressive tendencies but very open to system tuning	28x17x21	50 87	•		94
Jamo Concert II	330	A- A respectable 'bookshelf' performer that needs free space siting but includes attractive cabinetwork and a neat grille	41x24x25	48 85	•		66
Jamo Concert V	500	A Compact, solid, nicely finished delivers unusually extended bass at the expense of lowish sensitivity; midband is laid back	86x24x28	20 85	•		102
Jamo Concert VII	800	A Beautifully built, uses unusual double reflex bass system, unsuccessfully as far as low frequency resolution is concerned	96x28x31.5	25 87	•		94
▲ Jamo Cornet 50	150	A+ Good value bookshelf size speaker has a rough and ready sound but good heart, engaging liveliness and fair timing	42x23x22.5	28 87	•		110
Jamo Silhouette	400	A+ Tall, slim and rather elegant in its way, doesn't sound bad for a styling exercise, just a bit rich and polite	122x24.7x17	45 88	•		114
▲ Jordan JH400	504	A+ Piano finish hexagon has single full range driver and controversial sound, with uneven balance but delightful mid coherence	33x24x30.5	50 83	•		106
KEF 101/2	549	G- Small high class wall-mount has a beautifully even, slightly dull balance, fine freedom from boxiness, but not much bass drive	33x26.5x26	50 86	•		114
▲ KEF 104/2	1495	G+ A reference point for dynamics, preferred without KUBE, suited to many rooms. Good stereo, high sound level	90x28x41.5	50 92	•		60
KEF K120	169	A Physically pretty and sonically competent but undistinguished bookshelf size model has good sensitivity but limited extension	34x20.5x26	45 87	•		106
▲ KEF Q80	549	A+ Uni-Q floorstander has good stereo and fine midband coherence, but bass lacks extension, drive and resolution	85x24.5x26.5	45 87	•		106
KEF Q90	700	A Generous floorstander has even balance and decent extension but fails to communicate excitement and involvement effectively	90x25x32	25 88	•		118
Kammerzell Ref Mini Monitor	425	G A beguilingly sweet sound with good pace and drive, but scale is restricted and presence a little dulled considering the price	27x17x24	50 85	•		94
▲ Kenwood LS-770E	260	G Impressively communicative bookshelf model has fine vigour, scale and dynamics, if not the smoothest sound around	48x27x25	25 89	•		106
▲ Kenwood LS-500G	500	G Japanese designed and built luxury compact delivers an invigorating and exciting sound; an interesting contrast to some lazier models	45x23x26	48 89	•		118

Loudspeakers continued

Product	Price	Comments	Size: HxWxD (cm)	Site in free space Sensitivity (dB)	Site close to wall Bass from (Hz)	Floorstanding	Issue No.
▲▲ Legend II	200	G Liveliness, coherence and fine information retrieval justifies the odd looking moulded baffle construction	37x21x30	48 88	•	122	
▲▲ Linn Index II/KuStone	374	G Stand and speaker looks and sounds very good, good bass extension and control, fine dynamic range. Clean, clear if a shade slow	44x21x23.5	28 86	•	90	
▲ Linn Kaber	1198	G+ Dry, bright balance emphasises superb dynamic range and transient precision, but can sound unforgiving	89x19x29	25 85	•	118	
Linn Kan II	530	A+ Niche product for those prepared to tolerate its strong character for the sake of fine bass performance and near invisibility	30.5x18.5x16.5	35 82	•	78	
▲ Linn Keilidh	579	G+ Stunning timing and coherence and awesome bass drive, especially with ceramic plinth; sounds a bit shut in	83x20x27.5	22 87	•	114	
Living Voice Air Partner	11990	E Formidable horn design with astounding transparency, dynamics and speed. Its idiosyncracies are compensated by sheer energy	165x64x92	40 101	•	117	
▲ Magneplanar MG1.4	1090	G+ Offers a very crisp and articulate sound, particularly revealing of upper mid vocal details	155x8x57	40 88	•	72	
Magneplanar SMGa	688	A Tonally 'rich', in the right room it proved a satisfactory musical experience	122x48x4.5	56 85	•	46	
Marantz DS110	200	A+ Pretty near-miniature trades bass extension for sensitivity, delivering fine midband dynamics but little grunt	33x19.5x20.5	55 88	•	114	
Marantz DS220	300	A+ Nicely shaped and presented large bookshelf model sounds competent rather than inspired; a touch too heavy	37x23x26	50 88	•	122	
▲ Martin Logan CLS II	4200	G+ High resolution design, fussy about system set-up, demanding of ancillaries and software alike. It rewards the efforts though	60x28x7.5	45 86	•	72	
Meridian Argent 1	995	G+ Beautifully built, finished and shaped, has fine bass extension and virtual absence of 'boxiness'; needs a big amplifier	33x27x27	28 83	•	98	
Meridian Argent 2	875	G Beautiful high-tech 'large compact' delivers extended, smooth and neutral sound with fair speed. Slate Audio stands essential	48.5x21x29.5	23 85	•	94	
Meridian M30	950	A Pricey active speaker, easy on the ears and worth considering especially where space is at a premium	38.5x18x32	40 NA	•	46	
▲ Mission 753	700	G+ Gorgeous presentation and potential for open transparency. Floorstander with lots of drivers that gives lots of loudness	90x22x30.5	45 88	•	114	
▲ Mission 760i	130	A+ Attractive little wall-mount miniature has livelier dynamics and bass drive than most of its type, but sounds as little shut in	29.5x18x20	48 87	•	110	
Mission 761i	180	A 760 theme adds an extra driver for easier amp loading and power handling. Slightly inferior to simpler, cheaper 760i	38x19x24	48 88	•	102	
Mission 764i	480	A Generous and handsome floorstander looks fine material value for money, but good scale sound has lazy tendencies	89x25x32	22 86	•	118	
Mission 765i	680	A+ Big heavyweight floorstander has good sensitivity and bandwidth, but somehow lacks agility, authority and dynamic grip	102x25x33	22 91	•	110	
Mission Cyrus 751	300	G Potentially promising high class baby suffered early production inconsistency: full retest scheduled soon	32x17x27	50 86	•	122	
Monitor Audio MA1800	1350	A+ Even when ballasted with lead shot the 1800 inclines towards upper bass richness and lacks genuine extension	106x22x32	30 88	•	81	
Monitor Audio MA700 Gold	400	A Luxury compact does a good job of voice reproduction, but sounds a bit lazy and off the tempo with faster, busier material	35x21.5x25	50 85	•	110	
Monitor Audio MA1200 Gold II	1200	G Pricey but classy floorstanding variation on MA800 theme; beautifully voiced midband, heavy midbass	93.5x17x27	28 85	•	122	
Monitor Audio MA800	600	G Beautifully finished compact has a delightfully even and uncolored midband transparency, sensitivity and bandwidth are limited	51.5x20x27.5	45 85	•	114	
▲ Monitor Audio Monitor 11	330	G Tall, slim and attractive compact has an extra driver to help out in the bass, giving extra urge at some price in delicacy	52x20x24	48 87	•	94	
Monitor Audio Monitor 14	400	A Suffers from excess upper bass, giving a thick, chesty coloration beneath a quite lively and well focused mid and treble	78x20x24	30 86	•	98	
Monitor Audio Monitor 7	180	A Lively and punchy, looks pretty enough and is good value but is let down by an unruly and indifferently integrated tweeter	34x16.5x17	70 84	•	74	
Monitor Audio Monitor 9	210	A Despite a much better treble balance than the 7, the 9 is less engaging and lively at low frequencies than its smaller sibling	37x20x21	30 85	•	78	
▲ Monitor Audio Monitor One	150	A+ Pricey but cute micro-miniature just about gets away with it sonically, though performance envelope is inevitably limited	24x15x16	55 85	•	106	
Monitor Audio Studio 10	1200	A+ All-metal driver diaphragms provide engagingly transparent midrange and treble, spoiled by over-strong mid-bass.	40x20x25	45 87	•	90	
▲ Monitor Audio Studio 15	1600	G A little slow and lazy but better balanced than the smaller Studio models, the midband coherence and focus is superb	51x20x26	45 87	•	102	
Monitor Audio Studio 5	650	A+ All metal diaphragm luxury miniature has splendid presence coherence but sound can be aggressive and lacks welly.	32x18x20	28 83	•	98	
Monitor Audio Studio 6	800	A+ Pretty but pricey metal diaphragm compact has clear and transparent midband but is ultimately lacking in vim, vigour and drive.	35x22x25	45 86	•	118	
Mordaunt-Short 5.10	130	A Plenty of well engineered speaker for the money, and smoother than most of the competition, but lacks timing and enthusiasm	30.5x18.5x21.5	50 85	•	110	
Mordaunt-Short 5.20	150	A Lots of speaker for your money, but not as smooth or well balanced as other M-S 5-series models	36x21.5x21.5	45 87	•	114	
Mordaunt-Short 5.30	220	A- Good hi-tech material value for money, but a disappointingly dull and rather bland sound. Safe but uninspiring.	42.5x25x28	28 86	•	106	
▲ Mordaunt-Short 5.40	299	G Elegant near-floorstander has an even balance that makes it very easy on the ears, yet also inviting and informative	64x21.5x26.5	28 85	•	110	
Mordaunt-Short Classic 20	395	A+ Luxuriously finished, beguiling mid transparency, bass is altogether less convincing	37x22x27	45 86	•	102	
Morel Bassmaster 602	1200	G+ Superbly built compact stand-mount, did well in listening tests but suffers (enjoys?) upper midband peak	24.5x40x22.5	25 84	•	114	
Musical Fidelity MC-3	400	A+ Solid and authoritative large bookshelf model gives fine stereo and decent dynamic drive but balance is rather shut in	47x26x28	25 88	•	118	
▲ NVA Cube 1	720	G+ Attractive, semi-omni is very sturdily built, and gives an idiosyncratic but unusually open, spacious and informative sound	33x32x32	52 85	•	71	
▲ NVA Cube 2	480	G A rude but exciting miniature, with unusually accomplished bass capabilities for its size	28.5x27x28.5	48 85	•	82	
NVA Cubix	1400	G Too idiosyncratic for recommendation, the Cubix possesses remarkable bass extension for its size, but is tricky to optimise	60x32.5x32.5	28 84	•	78	
Naim NA IBL	823	G This tiny floorstanding wall mount delivers outstanding dynamics, speed and detail, marred by pronounced upper mid forwardness	80x18x15-20	30 84	•	94	
▲ Naim SBL	1584	G+ Impressive scale, full bandwidth, coherent, attractively discrete, coloured midband, very well balanced and agile	88x26.5x17-27	25 86	•	102	
▲ Neat Petite	525	G+ Far from perfect, but one of the most entertaining and enjoyable speakers around, colorations notwithstanding	30.5x20x18	33 86	•	102	
Nobis DM7	560	G Pretty US bookshelf model has more than enough speed, timing and coherence to make up for a measure of coloration	38x21.5x28.5	25 85	•	110	

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The suggested systems priced below all include the popular NAD 5120 turntable but an alternative turntable or CD player is available at extra cost. Please see "OPTIONS" list below for further details.

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JPW Sonata (V) Celestion I Goodmans M100	275.95	Aiwa XC300 Denon DCD595 Denon DCD695 Denon DCD890 Denon DCD1290 Marantz CD4211 Marantz CD5211	Dual CS503.2 Dual CS505.4 Thorens TD280 IV Systemdek IX900 (+ choice of arm)	Marantz PM32 Marantz PM40SE Nad 302 Kenwood KA3020 Harman HK6150 Marantz PM44SE Technics SUVX500K Technics SUVX600K Nad 304 Sony TAF540E Harman HK6250
Celestion 3 MK II JPW Sonata (W) Tannoy 603 MK II Mission 760i Widale Diamond 5 B & W 2001	291.95	Marantz CD52SEII NAD 502 Philips CD930 Philips CD692 Pioneer PDS801 Technics SLPG340 Technics SLPG440	Technics SLPG520AK Technics SLPS620AK	296.95
Tannoy 605 MK II MoniAudio One Mission 760i SE	312.95	Technics SLPG520AK Technics SLPS620AK	Technics SLPG520AK Technics SLPS620AK	312.95
Celestion 5 MK II B&W DM600 Kef K120 Heybrook Solo Mission 761i MoniAudio R7	327.95	Marantz CD52SEII NAD 502 Philips CD930 Philips CD692 Pioneer PDS801 Technics SLPG340 Technics SLPG440	Technics SLPG520AK Technics SLPS620AK	327.95
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	471.95	Technics SLPG520AK Technics SLPS620AK	Technics SLPG520AK Technics SLPS620AK	471.95
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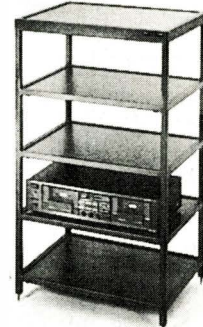
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Suggested Systems

The following suggested system package includes the NAD 5120 Turntable. Alternative items: ie CD Player/Turntable/Cassette deck are available options.

SPEAKERS	JPW Sonata Wharfedale DIA 4 Celestion 1 Mission 760i	Tannoy 603 Celestion3 Boston HD5	Mission 761i BW DM600i Tannoy 605 AR 152 Infinity Ref. 20	Tannoy 607 Mission 780 Boston HD8	BW DM610i Mission 762i Rogers LS2A2 Infinity Ref. 40	Rogers LS4A2 BW DM620i (add £100) Mission 763 Celestion 3.6000 (add £200)	T/T & C.D. PLAYER OPTIONS
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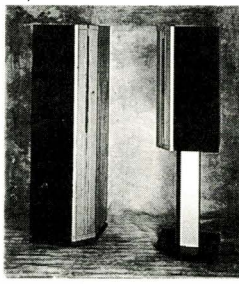
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- * All systems include speaker cable
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Product	£Price	Comments	Size: HxWxD (cm)	Site in free space		Site close to wall		Issue No.
				Bass from (Hz)	Sensitivity (dB)	Bass from (Hz)	Sensitivity (dB)	
▲ Origin Live OL2A	469	G Compact floorstander sounds open, transparent and evenly balanced; needs a big amp but enjoys hard driving	82x19x19	25	85	•	•	122
Origin Live OL1	499	G Luxury miniature has very good overall balance, sacrificing sensitivity to achieve remarkable bass extension for the box size	30.5x19x21	25	82	•		106
Philips FB820	470	A Big-but-less-than-beautiful three-way is well enough balanced but lacks communication skills in the time domain	86x27x35	28	87		•	98
▲ Philips FB825	700	G Generous sounding and impressively uncongested, loudness and bass extension don't quite match plasticky looks	110x29x41	25	88	•	•	90
Pioneer S-4UK	250	A+ Carefully developed minimalist audiophile design has some vigour but suffers an intrusive upper mid peak	37x21x28	50	87		•	122
▲ Pro Mon Co LB1	998	G+ Delightful smoothness and transparency, though bass extension and sensitivity are both limited	53.5x18x26	33	86		•	110
Professional Monitor Co AB1	1600	G+ Bulky stand-mount transmission line has lovely panel-like transparency, slightly shut in balance, and needs a big room	79x27x43	22	89		•	114
QLN Model One	700	A Model One exaggerates the Signature's rich and heavy midbass and lacks its velvet smoothness	35x25x27	28	85		•	82
QLN Signature	1100	G Luxury compact has a rather laid back and 'heavy' sound, but coloration is low and stereo imaging very good	37x18x36	30	83		•	78
▲ Quad ESL-63	2384	G+ This classic electrostatic may not be punchy in the bass, but has strengths that some can't live without	92x66x27	34	84		•	60
▲ Rega EL8	298	G Kyte drivers in compact floorstander give more bass but a shade less coherence; good for small rooms and budget systems	75x16.5x21	55	86			122
▲ Rega ELA	405	G Very compact floorstander with integral stand has serious coherence and dynamics, but a measure of brightness and untidiness	84.5x20x30	30	86			110
▲▲ Rega Kyte	198	G Has splendid timing and coherence, sounds very explicit and informative, if a bit bright and short of grunt	31x19x20	50	87	•		114
Richard Allan CD5	176	A- Neatly presented small reflex design can sound engagingly communicative, but is flawed sonically and technically	38x19x23	80	88	•		68
▲▲ Rogers LS2a/2	220	G Balance is a bit warm and rich but 2a/2 has delightful mid-to-treble coherence and transparency, and more welly than Mk1	35.5x23x22	30	84		•	106
Rogers LS4a/2	300	A+ Civilised but a trifle lazy, this large bookshelf model hasn't quite the timing or agility to be particularly engrossing	43x25.5x25.5	25	86		•	110
Rogers LS6a/2	350	G Largish stand-mount is well built, measures well, good material value, but sounds a bit heavy and lacklustre	51x28x29.5	22	87		•	114
Rogers LS8a	450	A+ A mixed bag, with plenty of scale and welly but lacking the subtlety, clarity and agility delivered by some rivals	89x25.5x25	48	91		•	102
▲ Rogers Studio 3	450	G Pricey LS3/5A-derived wall-mount sub-miniature is excitingly coherent if a bit lightweight, no real loudness capabilities	31x19x17	30	83	•		118
▲ Rogers Studio 1a	599	G- Classic BBC monitor sound sensitively updated – transparent and natural with fine stereo, but a touch 'heavy' in balance	63.5x30.5x30.5	36	87		•	66
▲ Rogers Studio 7	880	G Latest variation on classic BBC-monitor theme looks old fashioned but has beautifully voiced, laid back sound	63x30.5x30.5	30	88		•	122
▲ Roksan Darius	1895	G+ Provides an exceptionally impressive combination of transparency and delicacy with fine information retrieval and speed	47x27x40	20	82		•	86
Royd Topaz	173	A+ Cheerful, articulate and essentially communicative miniature can also sound a trifle scrappy and shut in; well worth trying	30.5x20.5x19	50	87		•	114
Royd Abbot	666	A+ Engaging and dramatic dynamics and fine transient coherence are hampered by a rather coloured mid-forward balance	83x20x34	43	88	•	•	118
Ruark Swordsman Plus	299	A Real wood variation on the Swordsman theme looks and measures rather better than it sounds	38x20x28	27	84		•	98
Ruark Templar	479	A+ Compact floorstander with striking baffle has decent bass/mid but dull treble; could tame over-bright system	73x19x27	25	85		•	122
▲ Ruark Talisman 2	700	G Less ideologically committed than some compact floorstanding rivals, its key strength lies in fine all round compromise	86x25x31	30	86		•	118
SD Acoustics Ribbon	2295	G+ Amplifier sensitive, Ribbon is a lively and loud hybrid marred by some colorations; some like it, others don't	152x30x(15-30)	30	91		•	81
▲ SD Acoustics SD1	1650	G+ A large scale, airy and unusually detailed system with excellent dynamics. A warmer balance than original model	123.5x38.2x32	50	90		•	60
▲ SD Acoustics SD3	399	G Port firmly blocked, the new SD3 has the agility and charm of a quality miniature, with good bass extension but low sensitivity	38x19.5x29	25	83		•	106
SD Acoustics SD4	699	G Tall slim floorstander has fine balance, good bass extension and lovely open midband transparency	100.5x20x30.5	25	85		•	114
Sequence 30	200	A Radical slimline hang-it-on-the-wall design has performance comparable to a typical miniature, with reasonable overall balance	87x25x7	50	85	•		114
Shahinian Arc	1062	G Unusual and occasionally wonderful small floorstanding omni; too bright but exceptionally coherent and revealing	69x35x25	24	85		•	110
Snell JIII	770	G Dated styling belied by fine sensitivity and bass extension, and a lively if slightly untidy and not quite coherent sound	58x33x25	30	89		•	118
▲ Sony APM-101ES	120	A Big hearted sound from small bookshelf model, sounds a little untidy at frequency extremes, so suits CD better than vinyl	39.5x22.5x23.5	52	86		•	71
Sony APM-121ES	170	A- Good perceived value, but balance has an artificial 'loudness', too rich in the bass and too strong in the treble	43x25x28	25	86		•	86
Sony APM-181ES	350	A Big, beefy, fat and bass heavy, has table strengths but lacks transparency and sounds better at lower levels	57.5x29x36	40	87		•	71
▲ Spendor S20	535	G Maintains Spendor's tradition for peerless mid-to-treble coherence and perspectives. Bass is rather unconvincing.	38x22x26	25	83		•	102
Spica Angelus	1295	A A little bass shy and soft in the bass and lower mid, otherwise tidy, extremely lively and fluid, if uneven overall	116.8x53.3x26	50	86		•	60
Spica TC50	599	G This triangular-profile 'grown up' miniature is a shade boxy and laid back but has good rhythmic and musical integrity	40.5x33x29	55	88		•	71
Spica TC50SE	799	G A heavily UK-modified TC50, the SE sounds less boxy and more spacious, but lacks some of the urgency of the standard model	40.5x33x29	55	88		•	71
▲ TDL Monitor	1999	G+ Fine solidity and good accuracy, with great bass extension. Needs a big room and can sound a bit lazy and a shade tinkly	118.5x30x47	28	85		•	66
TDL Studio 0.5	450	G Tiny floorstanding transmission line has good agility but doesn't provide the coherence or even balance of Studio 1	55x20x30	40	85		•	94
▲ TDL Studio 1	650	G Genuinely extended bass from a compact enclosure, very detailed but a shade clinical and detached in presentation	76x23x33	25	84		•	78
▲ TDL Studio 1M	900	G+ Transmission line helps bring the best from metal cone driver: lovely transparency and fine bass extension	81x23x33	<20	84		•	118
▲ Tannoy 607 MkII	220	A Large bookshelf, smart hexagonal box has fine bass for the price, but treble sounds rather shut in	50x32x24	25	88		•	122
▲ Tannoy Westminster	6000	G+ These awesome horn loaded speakers are remarkably controlled and impressive, if only suited to a few pockets and rooms	Huge	38	96	•		Col
Technics SB-EX2	180	A Nicely presented, well built and decent size enclosure sounds solid but somewhat dull	48x23.5x27	20	86		•	98
▲ Technics SB-RX50	650	A+ A smooth and well balanced loudspeaker, its minor weakness being a mildly excessive low bass	48x30x26	40	86		•	46
▲ Thiel SCS	1069	G+ Luxury piano-gloss compact sets class-leading standards for coherence and communication, can sound a shade dark and shut in	40x22x23	45	87		•	114
Thiel CS1.2	1219	G Elegant compact floorstander has fine balance and dynamic range, but transient timing and dynamics are less convincing	94x27x27	30	86		•	118
▲ Totem Model One	995	G Utterly delightful but exasperatingly expensive luxury miniature sets the benchmark for its size	31x16.5x23	28	86		•	122
Vandersteen Model One	1395	G+ This compact American floorstander's elegant staggered baffle arrangement contributes to a refreshing freedom from boxiness	100x30.7x25.6	23	87		•	86
Visonik David 6001	173	P Sharp styling but the complex grillework worsens a sound which starts off with too much top and not enough bottom	20x12x13	130	87	•		74
▲ Wharfedale 425	200	A+ Large bookshelf size 505 heir shows fine control and a conservative balance ideally suited to quality systems on a budget	40x27x26	45	87		•	118
▲ Wharfedale 515	260	G An update on the 505 theme, this is still more evenhanded, with better bass extension and smoother treble.	40x25.5x30	28	85		•	106
Wharfedale 517	400	A Half as big again as the 515, should offer an improvement, but somehow has a less effective overall subjective balance	53x26.5x34	25	86		•	110
▲▲ Wharfedale Delta 30.2	100	A Has a bigger main driver than many, and so packs a bit more welly and loudness. Coloration is rather obvious, but timing is good	38x22x17	48	88	•		98
▲▲ Wharfedale CRS3	110	A+ Loads of fun — a remarkably coherent and lively performer at any price; pity it doesn't look prettier	38x22x18	50	88	•		122
Wharfedale Diamond V	130	A This miniature is smoother than most, but rather stodgy with it, inspiring little enthusiasm among our listeners	27x18x20	50	86	•		114
▲ Yamaha NS 1000M	1100	G+ Living up to its monitor label, and tonally well suited to digital material, it's superbly crafted and capable of high levels	67.5x37.5x32.5	40	90	•		46
▲ Zyp A1	199	A+ Cute metal cased micro-miniature is quite coloured but great fun, with surprising dynamics and fine wall-loaded room balance	22.5x14.5x13	30	85	•		110

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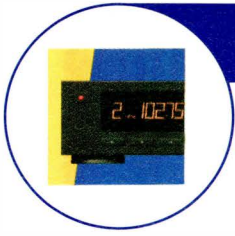
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Tuners

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 certain transmissions in the UK.

Something of a hi-fi afterthought, tuners are often selected merely to match a chosen ampli-

er cosmetically. However, the task they carry out is far from simple, 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.

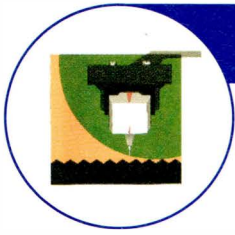
Tuners come in two basic types. Analogue models tune gradually (and usually manually) across the bands, and can have analogue or digi-

tal displays; they are often preferred for sound quality, and are certainly best for AM bands. Digital tuners offer convenient automatic tune facilities and pre-set memories.

The 'Presets' column heading shows how many different frequencies a tuner can memorise for instant access. FM, LW and MW show which wavebands it can access. 'Signal strength meters' are useful for aerial alignment. 'Automatic tuning' means that a tuner can seek out signals for you.

Tuners

Product	£Price	Comments	Presets	Signal strength meter			Automatic tuning		Issue No.
				FM	LW	MW	Manual tuning	Issue No.	
Aiwa XT-003	110	A- Economically designed and built in the UK, but trade-offs have a marked influence on FM and AM sound quality.	30	•	•	•	•	•	93
▲ Akai AT-93L	280	G+ By AM standards presentable (good) while FM delivers the goods	20	•	•	•	•	•	65
▲ Arcam Alpha 2	185	A+ Arcam's cheapest tuner makes up for its lack of features with a sensitive front-end and mellow sound.		•		•	•		93
Arcam Delta 280	350	G+ Fine sound quality marred by mild synthesiser whine; RF performance only average, remote £60 extra	20	•			•	•	120
▲ Audiolab 8000T	700	VG Unusually combines fine sound quality and RF performance (inc AM); superb ergonomics are a joy to use	39	•	•	•	•	•	120
Aura TU-50	260	G Tonally neutral, but with rather poor imaging and a certain woodenness to the sound.	16	•			•		109
Creek T40S3	250	A Analogue tuner. Sample was hampered by an obvious bass 'hump', production units are said to be cured		•			•		93
▲▲ Denon TU-260L	120	G+ Bare minimum of features. Careful designwork promises a surprisingly open and vivacious sound, so don't overlook it!	20	•		•	•	•	93
▲ Denon TU-580RD	220	G Fine feature package including remote and RDS, plus excellent RF performance and decent sound quality	30	•		•	•	•	120
Harman Kardon TU9200	200	A The listening panel appreciated its liveliness, but found it a little muddled.	32	•		•	•	•	109
▲ Harman Kardon TU9400	270	G+ Striking in appearance and with a sound to match, it comfortably exceeded our expectations. On stereo FM it's HK's best yet.	24	•		•	•	•	93
Harman Kardon TU9600	380	G Good bass and detail, and good - perhaps slightly enhanced dynamics	24	•		•	•	•	109
Kenwood KT-3050L	170	A Excellent RF performance and plenty of features including RDS, but did sound rather ordinary under our conditions	39	•	•	•	•	•	120
▲ Linn Kremlin	1779	E Controversially good sound at a very high price. The reviewer's saving up but you should check it out for yourself	80	•			•	•	120
▲ Magnum Dynalab FT101	795	G+ Although expensive for its fairly minimum set of facilities, its excellent sound makes up for what it lacks elsewhere		•			•	•	72
▲ Marantz ST-40L	120	G Slow to tune but provides a meaty and dynamic sound on FM. AM too has a little extra bite to its performance	30	•	•	•	•	•	93
Meridian 204	660	G Pleasant sounding with a fine finish but does not make the grade at this price	18	•			•	•	55
▲ Meridian 604	1350	VG Unique digital convertor makes most sense in Meridian system context; smooth sweet sound with fine front end	30	•			•	•	120
▲ Naim NAT 01	1425	E There may be better sounding tuners in the world, but we have yet to hear one		•			•		50
Nakamichi ST-7E	765	G+ Exceptionally good for weak-signal areas, and good all round	16	•	•	•	•	•	55
▲ Pioneer F-676	200	VG A tuner that's detailed and clean-sounding. Perhaps a little bright, but not unpleasant.	36	•		•	•	•	108
▲ Quad FM4	424	G+ Fine sound, excellent ease of use, good build and finish and a more than satisfactory technical performance	7	•			•	•	50
Quad 66	519	G+ Very pretty and compact but technically unadventurous. Smooth sound but only makes sense in Quad system context	19	•			•	•	120
▲ Rotel RT-930AX	160	G- A competent rather than exciting performer, with low audible interference though slightly compressed and muddled sound.	20	•	•	•		•	108
▲ Rotel RT-950BX	200	G+ Fine fast and coherent sound quality for price, but RF performance only adequate and sample build was suspect	20	•	•	•	•	•	120
Sherwood TX-3010C	120	A Lots of features and fine RF discrimination for price. Sound is communicative but inconsistently tacky	30	•		•	•	•	120
Sony ST-S570ES	230	A A host of features, but the sound is muddled, compressed and lacking in frequency extremes.	30	•	•	•		•	109
▲ Technics ST-G70L	200	G+ Another very polite and refined-sounding tuner but one that does retain just enough sparkle to keep your interest. Plenty of widgets	39	•		•	•	•	93
▲ Yamaha TX-950	260	G+ Very clean and civilised, tonal balance, detail and clarity are all very good, lots of useful features	40	•		•	•	•	108



Turntables – cartridges

Cartridges fall into two groups: high output models, capable of working directly into most amplifiers and categorised as having a normal (N) output, and more expensive low and very low output models (L, VL). 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. With CD now the dominant medium many amplifiers are no longer equipped with the necessary phono input for a cartridge and a separate phono stage is necessary. Valve designs need either an extra head amp or transformer to cope with the low output of moving coil cartridges.

Cartridge/amplifier interfacing can be very

subtle, but even basic high output MM designs benefit in overall balance from optimised amplifier capacitance loading. The mechanical characteristic of cantilever compliance ('springiness') needs to be considered in the light of the effective mass of the tonearm, and to achieve a good match compare the effective mass requirements figures with the actual effective mass of specific arms.

Turntables – cartridges

Product	£Price	Comments	Arm effective mass (g)	Output	MM		MC	Issue No.
					MM	MC		
▲▲ Arcam C77	30	A+ A sensible moving magnet package with good bounce at a competitive price	6-16	N	•			48
▲▲ Arcam C77Mg	40	A Punchy sound quality with plenty of extra energy to liven things up. The solid body seems well worth the extra £10	4-8	N	•			67
▲ Arcam E77Mg	60	A Our sample had a disappointing stylus, but gave a coherent, rich and laid back sound, with good 'scale'	3-8	N	•			48
▲ Arcam P77Mg	73	A+ Preferred to its cheaper partner by virtue of a better tip. Channel balance could have been better	4-9	N	•			48
▲ Audio Note IO IIV	1395	E One of the best, giving 'an extraordinarily relaxing midrange clarity', needs a transformer	8-18	VL			•	100



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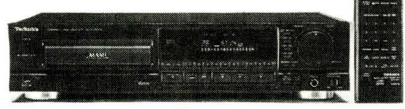
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Pioneer F-676	£199 149	Yamaha KX-W232	£199 149
Sony ST-S444ES	£299 99		
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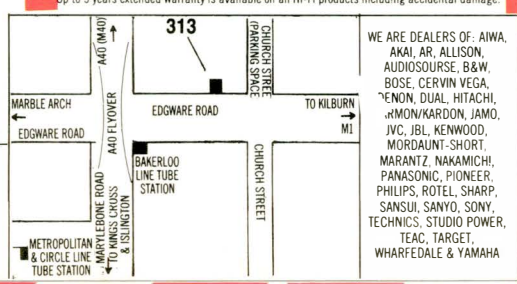
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Turntables – cartridges continued

Product	£Price	Comments	Arm effective mass (g)	Output	MM	MC	Issue No.
▲ Audio-Technica ART1	850	VG This is a delicate and very fluid-sounding MC that tracks well, offers very low distortion and exceptionally good separation	9-18	L		•	72
▲ Audio-Technica AT-420E	36	A Better suited to pop recordings, this MM bears some of the sonic hallmarks of the Linn K5	7-14	N	•		67
▲▲ Audio-Technica AT-95E	20	A Clear, dynamic if richly balanced, the magnetic '95E is a definite Best Buy	8-14	N	•		48
▲ Audio-Technica OC-10	320	G+ Good treble and good detail too, but some congestion and coloration reduces its informativeness.	4-12	L		•	103
▲ Audio-Technica OC-5	130	G For the price, it's unusually effortless and detailed, but it tends to become rather relentless and tiring after a while.	5-14	L		•	103
Audioquest AQ 404i-L	500	G+ Slight harshness detracted from the performance of this otherwise clear-sounding and detailed cartridge	8-16	L		•	84
Audioquest AQ 7000	1300	G+ Stunning stereo imaging and good detail at low levels are spoiled by less-than-perfect tracking and high sensitivity to arms.	6-20	L		•	91
Denon DL103	99	A+ Good performance in bass and general 'life' is seriously let down by its spherical stylus which kills subtle details.	9-22	L		•	103
▲▲ Denon DL110	69	G Firmly recommended as a fine all-rounder, this high-output MC model is likely to perform well in nearly all circumstances	6-16	N		•	48
Denon DL160	90	G Although listeners just preferred the 110, its brother here proved a twin in lab tests and is still "thoroughly competent"	6-16	N		•	43
▲ Denon DL304	200	VG Uncolored, detailed, neutral, superb tracking; top notch altogether, and a top notch bargain too.	4-12	L		•	103
▲ Dynavector 17D2	298	VG Clear, detailed, neutral and generally very informative - excellent	6-18	L		•	91
▲ Dynavector DV10X IV	138	A+ Fine sounding and realistically priced, damping is recommended to ensure successful tracking ability	8-18	N		•	48
Dynavector XX-1	698	G+ Good, but not immensely competitive at the price, and not helped by comparison with the low output version	7-15	N		•	84
▲ Dynavector XX-1L	698	VG Very clear, very detailed, no troubles with tracking; response lift around 20kHz seems to do no harm	7-13	L		•	84
Empire Benz Micro MC-Gold	150	G Nothing is obviously wrong, but nothing is stunningly right either. Safe, but perhaps a little too safe	7-17	L		•	103
▲ Empire Benz Micro MC-Silver	150	G Ultimately not the peer of the MC Gold is more appropriate to the sort of equipment it's likely to be partnered with	8-18	N		•	103
▲ Empire Benz-Micro MC-3	800	G+ Offers a warmer and very transparent account of the music. Its tracking prowess is slightly limited	5-12	L		•	72
Glanz GMC-10LX	80	A+ Bearing some of the hallmarks of the '10EH, the '10LX is still less competitive in the sonic stakes	7-15	L		•	67
▲ Glanz GMC-20E	129	G+ Very good tracking, smooth sound and good detail. Very slight surface noise enhancement	5-10	L		•	91
▲ Goldring 1012	50	G Slightly harsh sound but plenty of life and quite good detail. Some very high frequency coloration apparent	6-12	N	•		85
▲ Goldring 1022	70	G As with 1012, a touch harsh; detail and transient purity improved, though, and it goes well with electric guitar!	5-11	N	•		85
Goldring 1042	90	G Not terribly subtle, and not such good value alongside 1012 and 1022. Quite lively, though	7-12	N	•		91
▲ Goldring Elan	20	A A lightweight and frisky-sounding MM that appears to be based upon the same body as the Nagaoka mm4	7-15	N	•		67
Goldring Elite	200	G The basics are right, and it will cheerfully tackle any source material, but its sound possesses a certain dirtiness	8-18	L		•	103
Goldring Eroica H	100	G- More confused and coloured than low-output LX, high output less of an issue these days	8-15	N		•	84
▲ Goldring Eroica LX	100	G Not the most subtle cartridge in the world; can sound edgy at times, but lively and informative	8-14	L		•	84
Goldring Excel	549	G Errs on the warm and heavy side of neutral. Strong bass lines are its forte, but resolution of subtle treble details is weak	6-13	L		•	72
Goldring Excel GS	600	G+ True high end quality in its lack of colorations, but tracking seems indifferent and high levels tend to sound rough and edgy.	9-20	L		•	103
Kiseki Blackheart	1995	G Demonstrated refined poise and a delicate but at once potent security, however, the price did seem a little on the high side	6-16	L		•	60
Kiseki Blue Goldspot	499	G+ Good bass and imaging, but hints of spit and coloration let the side down slightly	8-15	L		•	84
Kiseki Lapis Lazuli	5000	G+ Combining very sensible design concepts at a silly price, combines the detail of the MC3000 and the fluidity of the Clearaudios	4-12	L		•	60
Kiseki Purpleheart Sapphire	899	G+ Rare, beautiful to look at and sweet to listen to, our review of this high-flyer conjured up images of Japanese art	5-14	L		•	48
▲ Linn K5	49	A+ Not as crisply focused as the costlier Linn magnetics, the K5 offers a smoother presentation	7-16	N	•		67
▲▲ Linn K9	98	G Linn threw this model into the leading pack by beefing up the Basik's bodywork and adding a super stylus	6-15	N	•		Col
London Maroon	199	A+ Now manufactured under the London brand name this Decca cartridge is as iconoclastic as ever	9-20	N	•		67
London Super Gold	339	A- Immediate and detailed, but very coloured, very nonlinear and questionable effect on records. Devotees swear by it	9-15	N	•		84
▲ Milltek Aurora	299	G+ An overall feeling of relaxed ease characterised this clear and atmospheric Kiseki-built cartridge	8-16	N		•	Col
▲ Nagaoka MP10	19	A High frequencies sounded "shut-in" with this spherical-stylus model, but mid and mass were energetic, bouncy and punchy	5-13	N	•		48
▲▲ Ortofon 510	30	G+ For the price, a good blend of virtues weight, clarity and neutrality.	3-11	N	•		85
▲ Ortofon 520	50	A+ Very sensitive to load capacitance this new Ortofon maintains the company tradition for a lively, effervescent SQ	7-16	N	•		67
▲ Ortofon 530	80	G+ Very clean and assured sound; transients not quite perfectly pure but plenty of detail.	4-11	N	•		85
Ortofon 540	100	A Graced with FGII stylus but possessed of too high a compliance for broad arm matching. It could also sound a little unforgiving	3-8	N	•		67
▲▲ Ortofon MC10 Super	80	G "What a delightfully sweet-sounding cartridge this is . . ." we said	5-15	L		•	48
▲▲ Ortofon MC15 Super	100	G+ A good all-rounder, with outstanding performance in detail retrieval, even if it can be very slightly bright and close-up	10-24	L		•	103
▲ Ortofon MC3 Turbo	110	G Not terribly subtle, but it obviously doesn't aim at that. The 3 Turbo is bright, cheerful and bouncy - take it as it comes!	10-24	N		•	103
▲ Ortofon MC3000 MkII	900	E Low levels of body resonance are a real ear-opener. Nothing to criticise elsewhere; one of the very best	9-16	VL		•	84
Ortofon MC5000	1500	G Review sample could not be fully run-in, limited tracking ability, bright and forward sound, though imaging is excellent	12-20	VL		•	91
▲ Ortofon Quartz	140	G Lively, quite detailed, and a touch bright, the Quartz has many qualities of the much dearer Quasar	3-12	L		•	91
▲ Ortofon Quasar	350	G+ Many of the qualities of the MC3000, although a touch bright. Good detail and delicacy	8-15	L		•	84
Ortofon Quattro	210	G+ Undoubtedly a competent performer. Generally neutral, but can be edgy and bright in loud passages	6-18	L		•	103
Rega Bias	34	A+ Difficult to mount in some arms due to its shallow build, the bias offers a gentle, refined SQ	4-10	N	•		67
▲ Rega Elys	74	G Clearly superior to the Bias, despite their common heritage, the Elys is both more detailed, accurate and musically convincing	8-15	N	•		67
▲▲ Revolver	20	A This modified AT-95E enjoys a very lively mid and treble even if the bass is somewhat 'slower' in comparison. A firm budget buy	8-16	N	•		67
▲ Roksan Corus Black	130	G Recognisably related to Corus Blue, but distinctly more civilised and smoother.	7-12	N	•		91
Roksan Corus Blue	75	G Roksan-specified modified Goldring 1012; slight harshness detracts from otherwise good sound.	7-12	N	•		91
▲ Shure ME97HE	55	A+ 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	8-20	N	•		48
Shure V15 VMR	220	A+ Initial listening gave promising results, but extended familiarity gave the feeling of a lack of energy and a "shut-in" sound	5-12	N	•		38
▲ van den Hul MC One	975	G+ This extended all the positive qualities of the '10 but added greater authority and scale worth it for the extra money	6-12	L		•	60
van den Hul MC One Super	1100	G+ Slight softening on transients was the only real flaw, but it didn't quite seem to have that special touch one expects	8-15	L		•	84
▲ van den Hul MC Two	1300	G+ Connected directly to any standard MM input it rewards with a highly detailed yet fluid and musically convincing portrayal	6-13	N		•	72
▲ van den Hul MC10	775	G+ A neutral balanced performer giving transparent midrange, fine depth and focus with firm extended bass. Gosh!	5-10	L		•	60
▲ van den Hul MM1	275	G+ If woody midrange coloration could be tamed, the excellent imaging and admirable security would make it excellent	7-15	L		•	103

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POWER AMPS

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TUNERS

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LOUDSPEAKERS

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B&W SPEAKERS

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B&W SPEAKERS



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CASSETTE DECKS

Table with columns for models like CT-S220 SR, CT-S320 SR, CT-S420 SR, CT-S520 Sound Eq, CT-S620 SR, CT-S620G Gold, CT-S920S Dolby S, CT-95 Dolby S, CT-W420R Twin, CT-W620R, CT-W820R, CT-M601R Multiplay.

CASSETTE DECKS

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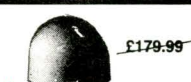


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Table with columns for models like 603 II, 605 II, 607 II, 609 II, 611 II, 613 II, 615 II, Tannoy Stand, Tannoy Base.

CD PLAYERS

Table with columns for models like PD-102, PD-202, PD-502, PD-S602, PD-S702, PD-S702G, PD-S802, PD-S901, PD-77, PD-95, PD-M902 Multiplay, PD-M701 Multiplay, PD-M901 DSP, PD-DM802 12 Disc, PD-TM318 Disc.

GRAPHIC EQUALIZERS

Table with columns for models like GE-4030, GE-7030.

RECEIVERS

Table with columns for models like SX-102, SX-202R, SX-302.

RECEIVER

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NAD AUTHORIZED DEALER

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CD PLAYERS

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AV/PRO-LOGIC AMPS/RECEIVERS

Table with columns for Yamaha, Kenwood, Sony models.

AMPLIFIERS

Table with columns for models like KA-1030, KA-3020, KA-3050R, KA-4020, KA-4040R, KA-5050R, KA-7050R, DA-9010.

AMPLIFIERS

Table with columns for models like AX-V401, AX-470, AX-570, CX-630, CX-830, MX-630, MX-830.

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Turntables and tonearms

Specialist turntables are what high fidelity sound is all about, CD may offer silent backrounds and flat frequency responses but they can't match the dynamics and superlative timing that serious turntable users take for granted. 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 components, but 'sympathetic' combinations exist.

The columns show from left to right, 'arm effective mass' which relates to cartridge compliance and is explained in the 'Cartridges' introduction. 'Suspended subchassis' - decks which have some form of internal isolation, generally in the

form of springs but occasionally more solid materials such as rubber. 'Manual' and 'Automatic' refer to the operational tendencies of the deck/arm combination - automatic high end turntables are as rare as hens teeth. 'Cartridge' - if one is supplied. 'Belt drive' as opposed to direct drive is the preferred method in most quality decks. An 'Electronic PSU' offers switchable speed change and a 'smoother' power supply, and better sound.

Turntables - integrated

Product	£Price	Comments	Arm effective mass (g)	Suspended subchassis	Manual	Automatic	Cartridge	Belt drive	Electronic PSU	Issue No.
▲ Alphason Sonata/HR100S MCS	1785	G+ Good sound in all areas - bass, clarity and neutrality all in the top class and bettered by very few decks at price	13	•	•			•	•	79
▲ Dual CS-503-2	160	A Not wholly inspiring; generally coarse and wooly sound is at least not offensive, but easily bettered by the CS505-4	10			•	•	•		91
▲ Dual CS-505-4	200	A Consistent sounding and well isolated turntable. It is slightly lacking in balls, compensates with a consistently unmuddled presentation	10			•	•	•		103
▲ Dual CS430	120	A- Ragged, sometimes unpleasant cartridge mixes with a modest pleasing player in a very sharply priced package	5			•	•	•		67
▲ Kuzma Stabi/Stogi Reference	2000	G+ Beautifully made solid oak plinth, the Stabi also sounds very clear, detailed and extended. Stogi Reference is very capable.	12	•	•			•		91
▲ Linn Axis/Akito	535	A+ A neat, attractive and well-made package which delivers a rather harsh sound with a 'one-note' effect in the bass	10	•	•			•	•	79
▲ Linn Basik	299	A+ Strong midband analysis and imagery, clean if sharp treble is matched to a good if occasionally wooden bass	10		•			•	•	103
▲ Linn LP12 Basik/Akito	855	G Trails the full LP12 significantly, but pace, rhythm, timing etc. still in top class, and bass tauter than of old	10	•	•			•		103
▲ Linn LP12-Lingo/Ekos	2642	G+ The classic reference is improved by the Lingo but charming character remains. Ekos is well made and suited to many decks	9	•	•			•	•	91
▲▲ Rega Planar 2	185	G A remarkable product at the price, surprisingly articulate and confident	11.5		•			•		48
▲▲ Rega Planar 3	250	G A long time leader in its category, the '3 (with excellent RB300 arm) sounded nicely 'musical' in a balanced and coherent manner	11.5		•			•		48
▲ Revolver Rebel	185	G- Quite lively and detailed but not the strongest on subtlety, with slightly lumpy bass. Motor breakthrough audible	12	•	•			•		91
▲ Roksan Radius/Tabriz zi	740	G Design is subtle, refined and easy on the eye. Musically it offers exceptional performance with a minimum of fuss	9		•			•		103
▲ Roksan Xerxes 33/Tabriz zi	990	G At its optimum with a relatively inexpensive arm/cartridge unless upgrade to full Xerxes is contemplated. XPSII PSU	9		•			•	•	103
▲ Roksan Xerxes/Artemiz/Artaxerxes 2114	2114	E Superb, highly integrated and synergistic in nature, suitable for use with any good MC. Will not suit all tastes, however	8		•			•	•	103
▲ Systemdek 1.920	235	A- The motor unit is derivative of the Rega Planar 2 with a Moth arm. Up tempo even bright at times but never lacks enthusiasm	12		•			•		115
▲▲ Technics SL-DD33	150	A As with the QD33 though better value. P-mount cartridge	7.5			•	•			48
▲ Technics SL-QD33	180	A Quartz controlled version of the DD is short on sound quality but not features. But it did have fair focus and some depth	7.5			•	•		•	48
▲ Thorens TD-3001/TP90SF	760	G Excellent middle ranking esoterica, with strong all round abilities rather than excellence in particular areas		•	•			•	•	103
▲▲ Thorens TD166 V/UJ/RB250	280	A- Refined and articulate sound with well focused imagery, suitable for use with good MM and budget MC cartridges	11.5	•	•			•		103
▲ Thorens TD2001	650	G- Similar to TD320 but much dearer - why? Sound is comfortable but not very detailed	15	•		•		•		91
▲ Voyd Reference	5950	E Voyd's flagship, equipped with three substantial motors, a Lexan platter and brute PS. A strong contender for world's best		•	•			•	•	C91
▲ Well Tempered WTAT	1690	G+ Intriguing/challenging design. Musically it is not ideal, but has a limpid quality and a lack of artificiality that sets standards	7.5		•			•		67

Motor units

Product	£Price	Comments	Suspended subchassis	Solid plinth	Belt drive	Electronic PSU	Issue No.	
▲ Michell Gyrodec	697	G Sweet and natural sounding player, well suited to Rega RB300. Aesthetics, and the acres of clear acrylic are very distinctive		•		•	•	55
▲ Michell Syncro	425	G A happy blend of qualities endows the stylish Syncro with a blend of subtlety and force - the mailed fist in the velvet glove		•		•		67
▲ Origin Live Oasis A	395	G- Rather coarse sound lacking resolving power - but lively sound may appeal. Industrial appearance		•		•		79
▲ Pink Triangle Anniversary	1495	E Possibly the most detailed, clear and neutral deck around. Likeness to master tape is uncanny		•		•	•	91
▲ Pink Triangle Export	890	E The PT TQO with built in PS. Retains features of great transparency and neutrality. Review sample had highish motor noise		•		•	•	91
▲ Pink Triangle Little Pink Thing	500	G+ Semi suspended, leads the field for clarity and neutrality at the price. It also looks good. Excellent value				•		79
▲ Revolver	200	A Nicely balanced, but unimpressive timing and lightweight bass made this deck rather average for the price			•	•		48
▲▲ Systemdek IIX/900	230	G A high performance budget turntable which is particularly strong at fine detail resolution and imagery		•		•		103
▲ Systemdek IIXE/900AP	388	G+ The acrylic platter'd IIXE is one of the most capable budget decks on the market, good resolution, dynamics and timing		•		•	•	103
▲ Voyd 0.5	3368	E Halfway between standard and Reference Voyds with the latter's platter and bearing. Superb finish, colourful and dynamic sound		•		•	•	72
▲ Voyd Valdi	955	VG Acrylic plattered twin motor deck is remarkably capable, revealing and neutral, for dynamics it's hard to beat at the price		•		•	•	79

Tonearms

Product	£Price	Comments	Effective mass (g)	Height adjustment	Parallel tracking	Pivoted	Issue No.	
▲ Airtangent 1B	3000	E A complex but superbly built arm for high quality systems, giving excellent stereo and resolution	7.5	•			•	60
▲ Alphason HR100S	490	VG S-shaped arm sounds smooth, but nevertheless reproduces transients with fine attack	10		•			C86
▲▲ Moth arm	95	G+ The ultimate budget arm? Refined, detailed, sweet and natural	12			•		60
▲▲ Rega RB300	139	VG Despite its modest price it sets exceptional performance standards and could be used on many high end turntables	11.5			•		60
▲ Roksan Tabriz	190	G+ Targetted at the Xerxes, this is a good alternative to the Rega arms in many cases - a trifle bright	9		•			91
▲ SME 309	568	VG Beautifully made and finished, fully adjustable, a highly neutral performer	10		•			79

Choice accessories

Let our fine range of accessories help boost your system performance

Isolation cones

Supplied in packs of four, these cones are ideal for supporting just about any item of hi-fi, from sub-woofers through to amplifiers and CD players. The cones provide effective isolation and decoupling, thereby increasing the stereo image and fidelity. Available in precision turned brass or black anodized aluminium, some experimentation will reward the listener with improved sound quality, at a minimal cost.

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4 Isolation cones (brass)

Order ref: JE11A £14.00

4 Isolating cones (black coated aluminium)

Goldring Magic Record Cleaner

Kit consisting of a double-sided velvet brush and spray on Goldring Magic record rejuvenating fluid.

Order ref: JE13A £11.95

Technics Auto CD Cleaner

A powered wet/dry CD cleaner that can be run off batteries or the mains. It works by rotating the disc and applying the wet cleaner first (cleaning solution is supplied, then reversing direction and dry cleaning it. The whole process takes just 40 seconds and a set of batteries should clean 80 discs.

Order ref: JE20A £39.95

Kontak Cleaning Solution

A two stage contact cleaner for all audio and mains connections. All connections are susceptible to oxidation and contamination which impairs electron flow and thus affects sound quality.



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Order ref: JE17A £19.90

The Purifier

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Nagaoka Anti-Static Record Sleeves No 102

Packs of 50 plastic record sleeves that can be used on their own or inserted into an existing card or paper sleeve. The sleeves keep records dust free and eliminate static.

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Audio Technica CD Lens Cleaner AT-6078

The focusing assembly for the laser head of a CD player is a very delicate affair and yet it requires cleaning from time to time to give of its best. Rather than fumbling about with cotton buds, we would suggest you employ an Audio Technica AT-6978 CD lens cleaner.

This is a standard size disc with a set of eight tiny brushes set into it. To clean your laser, just apply a drop of cleaning fluid on to one of the brushes, place the cleaning disc in to your player and press play.

Ten seconds later, a clean laser assembly and a cleaner sound from your Compact Discs.

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SF-300 is the cleaner to use on a day-to-day basis on LPs which have been treated with SF-100 and SF-200.

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Last SF-600 CD Clean And Protect

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Last SF-601 CD Cleaner

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Last RCM Record Cleaning Machine Fluid

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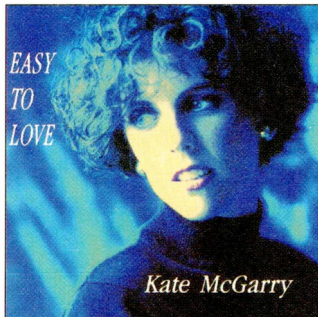
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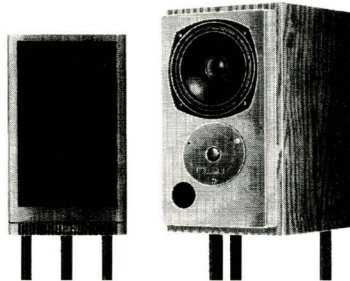
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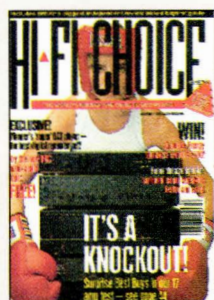
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Driving a hole in the wall

Much as I love the enormous Tannoy *Westminster Royal* loudspeakers I've been using the past year or so, the prospect of losing those huge folded horn enclosures is very appealing. Such an unlikely possibility became a reality through the two service-hatch type openings I created in order to try out various flush-mounted wallspeakers (see issue 119).

The various commercial wallspeaker mounting arrangements all introduce some mechanical compromises, but my appetite for flush-mounting — the effective elimination of all cabinet coloration, and the removal of rear wall reflection effects through a near ideal and

genuine infinite baffle — was well and truly whetted by the splendid performance of the little KEF *CR160* driver, when its decent cast frame was rigidly mounted and the back left open (*Personal Messages* issue 113).

Quality compares well with £1,000 box loudspeakers. The snag is that there's simply not enough quantity to do proper justice to a good room and serious hi-fi system. The little cone simply runs out of excursion as soon you try and turn it up loud.

If you can remember your school geometry, you too will be able to figure out that the KEF has a moving cone area of 95cm², whereas a 15 inch

Tannoy driver has a 280mm diameter cone, giving more than six times the driving area — not to mention inherently much higher sensitivity and greater amplifier power handling.

Tannoy kindly supplied me with a pair of *Westminster Royal* drivers, plus a pair of *Canterbury* crossovers (which were considered likely to make a better match than that used in the horn design). Installing these massive cast frame drivers was a bit tricky, but accomplished without mishap, and the end result has been immensely worthwhile. It's genuinely state-of-the-art, yet takes up only a litre or so of room volume.

I'm not suggesting you should all rush out and order exceedingly expensive *WR* drivers and cut holes in your walls. A great many homes will be architecturally unsuitable, either for want of a really strong internal wall, or the impracticality of filling the room behind with unwanted bass and midrange. (In my case this is just a loo and vestibule, and can be completely sealed off from

the rest of the house when I get around to moving a door). But if you're lucky enough to have the same opportunity, the possibility is certainly worth serious consideration. Tannoy makes plenty of less expensive ten, 12 and 15 inch dual-concentrics, any of which should do a good job, or one could look around for a second-hand pair of old and bulky box speakers (*Ardens* or *Berkeley's* perhaps), and transpose drivers and crossover, almost certainly to good effect.

Horns versus infinite baffle

The wall-mounted driver doesn't, of course, sound the same as the horn-loaded version, and doesn't measure the same either. But the differences between them are very much of the swings and roundabouts variety — in some areas the true infinite baffle scores, in others the horn has the edge. Every state-of-the-art speaker system involves some set of compromises, which is where personal preferences come into the picture. But after a few weeks living with what is arguably the ultimate wall-mount, the pendulum of overall preference is swinging very slightly in its favour.

Its vital statistics are most impressive. Sensitivity is around 91dB with a slightly tricky load, but with stunning in-room bass extension registering 0dB at 20Hz, which puts serious loudness and bass both firmly on the agenda. There's a little too much output at 50Hz, but above 60Hz the in-room balance stays within a remarkably good +/-3dB up to 15kHz.

I do rather miss the midband grip and drama of the horns, but the improved neutrality and superbly clean and deep bass is ample compensation. The most serious criticism is that one is rather conscious of the beaming of the treble horns, and the best results are certainly along the centre line of the room.

It's a slightly lazy sound for some tastes, maybe, but above all it's beautifully relaxing and exceedingly informative. Which probably explains why I haven't got around to trying all manner of potential tweaks (like adding some resistive acoustic damping behind the cones, hardwiring and simplifying the adjustable crossover, and getting hold of the extra electronics for bi-amping). And while I'm thinking about all these tantalising possibilities, I think I'll just put another record on. . .

The smart *Westminster Royals* before being disembowelled to create 'arguably the ultimate wall-mount'.

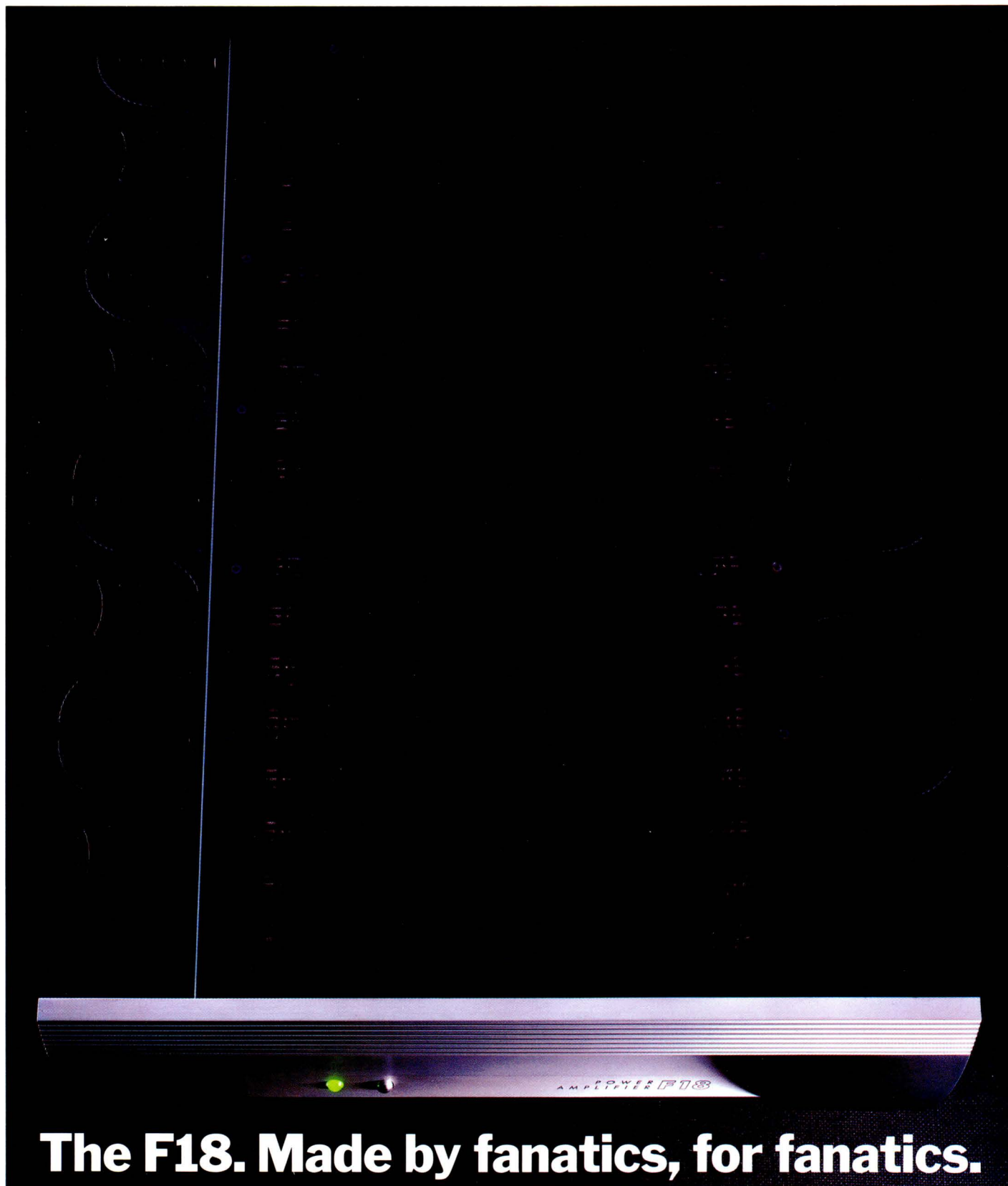


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